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List of abbreviations

AFRO	WHO Regional Office for Africa
CFR	Case fatality rate
FONALEP	Fonds national de lutte contre les épidémies
Gavi	Gavi, the Vaccine Alliance
GOC	Governance Oversight Committee
ICG	International Coordinating Group
IFRC	International Federation of Red Cross and Red Crescent Societies
MSF	Médecins sans Frontières
Nm	Neisseria meningitidis
SD	Supply Division of UNICEF
SAGE	Strategic Advisory Group of Experts on Immunization
SII	Serum Institute of India
UNICEF	United Nations Children's Fund
VIS	Vaccine Investment Strategy
WHO	World Health Organization

Executive summary

The meeting of the ICG on Vaccine Provision for Epidemic Meningitis on 10 September was held at the headquarters of the International Committee of the Red Cross in Geneva. The ICG, its partners, and stakeholders reviewed vaccine shipments, epidemic response activities and lessons learned during 2019; discussed the anticipated stockpile size, composition and funding for 2020 onwards; and exchanged information with the extended group of ICG partners and stakeholders, including vaccine manufacturers.

Participants were also updated on the activities of the new ICG Governance Oversight Committee, and the implementation and refinement of the ICG Accountability Framework. Finally, Gavi gave a presentation on proposals for the establishment for the establishment of an ICG-like stockpile and allocation mechanism for emergency Ebola response.

Four requests were made for emergency vaccines in 2019, of which three were fully approved and one partially approved for a total of 977,460 doses. This was over twice the quantity approved in 2018. The performance of the ICG mechanism against its time performance targets, and challenges and lessons learned for emergency vaccine response during 2019. Mean decision time for the four requests in 2019 was 1.25 days and mean delivery time was 9 days for the three approved requests. Mean time to campaign start after arrival of vaccines in-country was 15.5 days.

The ICG members agreed that the meningitis stockpile should remain at its current size of 5 million doses of C-containing vaccines for 2020, of which at least 3 million should be C-W containing, and that this number of doses be available at the beginning of each epidemic season in January. UNICEF SD and Gavi agreed to work towards a solution for continuing funding for the ICG meningitis stockpile as the current four-year (2017–2020) funding cycle comes to an end, and for supply of vaccines to the stockpile for 2021. Additionally, and as agreed within the 2019 Supply and Procurement Roadmap, Gavi highlighted that in cases where offered volumes and conditions do not meet ICG and/or Gavi targets, Gavi will analyse its financial risk exposure and provides input in the strategy for awards with UNICEF-SD, with the ultimate goal is to maximize the health impact (lives saved), while making efficient use of limited resources and budgets. The ICG will develop standard operating procedures on the strategy for repurposing meningococcal vaccine doses nearing their expiry dates for preventive immunization campaigns. After validation by ICG stakeholders, including Gavi approval on the use of Gavi-supported doses for non-emergency use, this strategy will be implemented in high-risk countries during the inter-epidemic season (July to December), if vaccines with short shelf-life remain in the emergency stockpile.

Since the conclusion of the external review of the ICG in 2017, the new Governance and Oversight Committee (GOC) has since held two meetings and approved the ICG Accountability Framework which sets out the actions and responsibilities of the ICG and each partner involved in the stockpile mechanism. It also sets out performance indicators for which each partner, including countries receiving vaccines, will be accountable. During the 2019 epidemic season, the average number of days from outbreak confirmation to request submission by countries was 16.75 and the number of days from vaccine arrival to start of campaign was 15.5 days.

The ICG and partners also agreed, based on the recommendations of the July 2019 GOC meeting, to initiate a technical consultation on the establishment of an Ebola vaccine stockpile and ICG-like decision-making mechanism.

1. Introduction

Meningococcal meningitis is primarily caused by *Neisseria meningitidis* (Nm). Globally, six serogroups (A, B, C, W-135, X and Y) are implicated in epidemics, and all except B and Y have a widespread distribution in Africa. Although meningococcal meningitis epidemics can occur elsewhere, the majority of cases are found during the dry season from December to June in the "meningitis belt", a region encompassing 26 African countries home to around 450 million people which spans the Sahel biogeographic zone. Outbreaks involving *Streptococcus pneumoniae* and *Haemophilus influenzae* type b are also occasionally detected.

It is estimated that, in 2015,300,000 deaths occurred in all ages from bacterial meningitis globally[1]. Survivors of bacterial meningitis are at high risk of experiencing severe, long-lasting and disabling sequelae. Much of the disease burden is experienced by infants and young children, particularly in low income countries on the African continent.

The International Coordinating Group (ICG) on Vaccine Provision for epidemic meningitis has existed since 1997, following a large-scale epidemic caused by Nm serogroup A (Nm-A) that resulted in over 20,000 deaths across the meningitis belt. It acts on a global level as a mechanism for allocation of vaccines from global stockpiles to respond to emergency requests following major infectious disease outbreaks. In addition to vaccines, the ICG for meningitis maintains a stockpile of Ceftriaxone for management of cases.

The ICG brings together four founding agencies: The International Federation of Red Cross and Red Crescent Societies (IFRC), Médecins Sans Frontières (MSF), the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO). It also consults with extended partners including technical experts and vaccine suppliers. Gavi, the Vaccine Alliance, is the principal funder of the meningitis stockpile. In performing its mandate, the ICG pursues it guiding principles of ensuring equitable and timely access to essential vaccines while maintaining its independence of decision-making based on objective assessment of scientific evidence.

The ICG's objectives are:

- To provide equitable vaccine allocation through careful and objective assessment of risk, based on epidemiological and operational criteria
- To rapidly deliver vaccines in response to infectious disease outbreaks.
- To coordinate the deployment of limited quantities of vaccines and other essential medicines.
- To minimize wastage of vaccines and other supplies.
- To advocate for readily-available, low-cost vaccines and medicines.
- To work with manufacturers through UNICEF and WHO to guarantee availability of vaccine emergency stock supplies at the global level.
- To follow standard operating procedures and establish financial mechanisms to purchase

[1] GBD 2016 Meningitis Collaborators. Global, regional, and national burden of meningitis, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2018; 17(12): P1061–1082.

emergency vaccine supplies and ensure the sustainability of stocks.

The 2019 annual meeting of the ICG on Vaccine Provision for epidemic meningitis was held on 10 September at the headquarters of the IFRC in Geneva. Participants included representatives of the World Health Organization (WHO) Headquarters, including ICG Secretariat, the WHO Regional Office for Africa (AFRO), United Nations Children's Fund (UNICEF), with participants both from HQ and the Supply Division (SD), Médecins sans Frontières, the IFRC and Gavi. Representatives from vaccine manufacturers, the Bill and Melinda Gates Foundation, Dahlberg and the University of Cambridge, who delivered presentations during the meeting, were also in attendance.

The primary objectives of the meeting were to review relevant epidemic response activities and lessons learned during 2019; discuss the anticipated stockpile size, composition and funding for the period 2019–2020; and exchange information with the extended group of ICG partners and stakeholders, including vaccine manufacturers. Participants discussed the epidemiological situation in 2019, the outcomes of ICG emergency requests and vaccination campaigns, procurement of vaccines for use in the stockpile, preferred stockpile size, vaccine supply and demand, stockpile funding, the progress of global efforts aimed at controlling the risk of meningitis outbreaks, and ongoing work towards improving the ICG's transparency and oversight.

2. Epidemiological update 2019

During 2019 meningitis outbreaks have been reported in Burkina Faso, Togo, Chad and Ghana. Benin and Nigeria also had districts pass the epidemic threshold and Mongolia had NmB cases. There were a total of 14,756 cases and 842 deaths reported across the countries of the meningitis belt from weeks 1 to 30[2], compared with 20,843 cases and 1,498 deaths over 2018[3].

Since the introduction of MenAfriVac in 2010 and the immunization of 300 million people against Nm-A, the proportion of cases in the meningitis belt attributable to Nm-A has seen a constant decline from over 70% one decade ago to the point where no confirmed Nm-A cases were reported in 2018. As of 2019 Nm-C and *Streptococcus pneumoniae* each represent just over 30% of African Belt cases in 2019 (weeks 1–30), with Nm-X and Nm-W accounting for 11% and 10% respectively. In terms of the geographic distribution of strains during the 2019 epidemic season, Nm-C was most frequently reported in Nigeria, where significant transmission has been ongoing from 2018, and Burkina Faso. Significant numbers of cases attributed to Nm-X and Nm-W were also confirmed across Nigeria and Ghana, and Chad and Burkina Faso. Transmission of *Streptococcus pneumoniae* has increased notably in recent years, with the majority of cases in Burkina Faso and Ghana.

In **Chad**, a Nm-W outbreak in Goundi Sub-prefecture of Mandoul Region in the south of the country was reported in February 2019 with 336 suspected cases and 49 deaths (Case fatality rate [CFR]: 14.6%). *Haemophilus influenzae* type b and *Streptococcus pneumoniae* cases were also reported.

In **Burkina Faso** it was reported that there were 11 districts in which number of cases crossed the alert threshold during weeks 1–26 of 2019. Out of these, the epidemic threshold was crossed in two zones in the District of Diapaga in epidemic weeks 4 and 9, and one zone in the Department of Sebba in week 14. During this period (weeks 1–26) there were a total of 1,693 suspected cases and 125 deaths (CFR: 7.4%) in the country. Of these, 156 suspected cases (9% of the total) attributable to Nm-C occurred in Diapaga where routine surveillance activities had been disrupted due to the uncertain security situation. It is hypothesized that detection of this outbreak was delayed as individuals with infections did not attend medical centres and cases were not reported until after security forces had alerted health authorities that several deaths due to meningitis has occurred. Another challenge for case finding was the fact that these regions are home to transitory populations involved in semi-nomadic pastoral agriculture.

A meningitis outbreak also occurred during the 2019 epidemic season in Kpendjal Prefecture in the far north of **Togo**, in which 213 cases and 7 deaths were reported (CFR: 3.3%). Another 746 cases and 20 deaths (CFR: 2.7%) occurred in **Ghana** across the north of the country where *Streptococcus pneumoniae* was the predominant pathogen.

While the near-elimination of Nm-A outbreaks across West Africa can only be considered a positive development, the unpredictability of which Nm serogroups will emerge in which locations remains a significant challenge. The emergence of a new Nm-C strain in 2013 and its expansion highlights the continued risk of emergence of strains with high health impact. The outbreaks in

[2] World Health Organization Regional Office for Africa. Meningitis Weekly Bulletin: Week 27–30. 2019. https://www.who.int/emergencies/diseases/meningitis/meningitis-bulletin-27-30-2019.pdf?ua=1. Accessed 13 December 2019.

[3] World Health Organization Regional Office for Africa. Meningitis Weekly Bulletin: Week 49–52. 2018. https://www.who.int/csr/disease/meningococcal/meningitis-bulletin-49-52-2018.pdf?ua=1%EF%BB%BF. Accessed 13 December 2019.

Burkina Faso during 2019 represent part of the trend of expansion of Nm-C to the western part of the Sahel.

To respond to this change in the nature of meningitis outbreaks in the meningitis belt and maintain the effectiveness of vaccine response, continued efforts are needed to support surveillance activities and the functioning country emergency committees, strengthen the region's laboratory network, and ensure laboratories are regularly stocked with key reagents to allow rapid case confirmation, identification of causative Nm strains, timely declaration of outbreaks, and efficient resource mobilization to support emergency response. Most importantly, in the medium term, securing the availability of affordable (CW-containing) vaccines in sufficient quantities is key to allow for an adequate response. One positive development however, has been the consistent falling trend in the case fatality rate for meningitis cases in African Countries since 2010, possibly associated with improved case management.

3. ICG response and performance outcomes in 2019

ICG requests and vaccination campaigns in 2019

During the 2019 epidemic season there were a total of four emergency vaccine requests for a total of 1,271,433 doses requested. Of these, three were fully approved and one partially approved for a total of 977,460 doses (Table 1). Subsequently, 977,499 doses were released from the stockpile and shipped for response activities. This compares with 734,520 doses requested and 412,830 approved in 2018 and represents increases of 73% and 137% in numbers of doses requested and approved from 2018 to 2019.

Table 1. Summary of emergency requests to the ICG for meningitis vaccines in 2019

Request number and country	Request date	Days for request circulation	Days for additional information	Days decision time[1]	Approval	Days delivery time	Days to campaign start	Vaccine doses requested	Vaccine doses approved
#1 Chad	5/03/2019	same day	N/A	2 days	Partially approved	10 days	11 days	481,321	209,109*
#2 Burkina Faso	08/03/2019	same day	N/A	1 day	Fully approved	10 days	7 days	293,889	300,000**
#3 Togo	28/03/2019	same day	N/A	1 days	Fully approved	6 days	6 days	193,890	193,890***
#4 Burkina Faso	24/04/2019	1 day	N/A	1 days	Fully approved	10 days	38 days	302,333	274,461*

*ACW-polysaccharide vaccine (Bio Manguinhos/Finlay, 10-dose presentation), ***Menactra* ACYW-conjugate vaccine (Sanofi Pasteur, 1-dose presentation), ****Menomune* ACYW-polysaccharide vaccine (Sanofi Pasteur, 1-dose presentation). [1]Working days.

A request for 481,109 vaccine doses was made by **Chad (#1, 2019)** in March 2019 to respond to the outbreak of Nm-W in the Mandoul Region, for which 209,109 doses were approved by the ICG alongside $72,166 for operational costs from Gavi. Response was timely, and the vaccination campaign, targeting the population aged 2–29 years in the affected district, was started within four weeks of crossing the epidemic thresholds. WHO, MSF, the Centers for Disease Control and Prevention (CDC) in Atlanta and World Vision gave technical assistance for the campaign's implementation and an administrative coverage of 98.7% was achieved.

Two requests were made in response to Nm-C meningitis outbreaks in **Burkina Faso** during the 2019 epidemic season. The first request **(#2, 2019)**, for 293,889 doses was fully approved and 300,000 doses were dispatched to the country. Campaigns started one week after declaration of the outbreak using ACYW-containing polysaccharide vaccines from a national stockpile in Diapaga (Zone 1) during 8–13 February. Campaign monitoring showed that 117,887 people (107.7% of the target population) were vaccinated. The second campaign, using doses from the ICG stockpile, reached a further 272,780 people aged 1–29 years (111.2% of the target population) in Diapaga (Zone 2) with ACYW conjugate vaccines in week 9 (29 March–2 April), or three weeks after detection of the outbreak. Implementation of vaccination campaigns was supported with $102,334 in operational funding from Gavi.

The second request from Burkina Faso **(#4, 2019)** for 302,333 doses targeted a population of 247,262. The ICG approved 274,461 doses of ACW polysaccharide vaccine doses for shipment to the district of Sebba (Zone 2) and the country also received $135,557 to support with operational costs. The campaign took place in week 14 (13–17 June). The time between arrival of vaccines in the country and the start of vaccination campaigns was 38 days. National authorities expressed that this delay is due to strike action by healthcare workers. After the emergency outbreak response campaigns, a total of 26,000 doses provided from the ICG stockpile remained in the country, and these were repurposed for preventive immunization of health workers and students.

A request from **Togo (#3, 2019)** in late March was fully approved by the ICG for a total of 193,890 vaccine doses following the Nm-C outbreak in the country's northern-most Prefecture. The campaign was stated on 11th April 2019. 3,950 doses of ceftriaxone doses were shipped to the country from the ICG's stockpile for case management as well as $61,190 for operational costs from Gavi and $40,607 from UNICEF.

All requests were made by the ministries of health of the respective countries, or, in the case of Burkina Faso (#2 and #4), by WHO on their behalf.

ICG performance outcomes in 2019

Regarding the ICG's key time performance indicators (Table 1), the mean decision time for the four requests in 2019 was 1.25 days (range: 1–2) and mean delivery time was 9.5 days after approval of requests (range: 7–11). This resulted in a mean ICG process time, from receipt of requests to arrival of vaccines in requesting countries, of 10.75 days (range: 8–12). Mean time to campaign start after arrival of vaccines in-country was 15.5 days (range: 6–38).

These performance outcomes compare with 2.75 days (range: 1–4) mean decision time, 21.5 days (range: 16–27) mean delivery time and 10.5 days (range: 5–16) mean time to start of vaccination campaigns in the 2018 epidemic season. While there were improvements in mean decision time and mean delivery time from 2018 to 2019, mean time to campaign start after arrival of vaccines in-country was five days higher; this can be attributed to the delay in arrival of vaccines in affected areas in Burkina Faso following the country' second emergency request (#4) due to ongoing strike action from health workers and difficulties reaching affected areas due to insecurity.

As of 2019 the ICG Secretariat has collected data on time taken for countries to complete preparation of requests (time from declaration of an outbreak to submission of a request to the ICG). Mean time for request preparation in the 2019 epidemic season was 16.8 days, with a range of 6 days (#2) to 26 days (#3).

Table 2. Summary of ICG performance indicators for emergency meningitis vaccine requests, 2019 epidemic season

Number of requests	Number additional information requested (%)	Number approved (%)	Mean days decision time (range)	Mean days delivery time (range)	Mean days ICG process (range)	Mean days request preparation (range)	Mean days reception to campaign start (range)
4	0 (0%)	4 (100%)	1.25 (1–2)	9 (6–10)	10.75 (8–12)	16.8 (6–26)	15.5 (6–38)

The ICG currently has three key performance targets: requests are circulated to ICG members within one working day; the ICG decision-making body reaches a decision on approval of requests within two working days; UNICEF SD delivers approved vaccines to the requesting country within seven days.

All requests in 2019 were circulated to ICG members the same day or within one working day (#4). Decisions were reached within two days for all four requests. However, delivery time was within seven days for only one of the four requests (#3).

This compares with the 2018 epidemic season, in which all requests were circulated to ICG members the same day, decisions were reached within two days for two of the four requests made that year, and, of the two requests approved by the ICG, in neither case did vaccines arrive in-country within the seven-day target. Although this suggests there was an improvement from 2018 to 2019, the small number of requests for meningitis vaccines prevents a reliable comparison of the effectiveness of the ICG process or any strong inferences to be drawn as to any trends in time performance.

Although the seven-day target for vaccine delivery following approval of requests by the ICG has not been met in the majority of cases, ICG members continue to believe it is achievable. It has been recognized that a number of important factors contributing to delays fall outside the control or responsibility of the ICG, UNICEF SD and partners, and that this target may not be feasible for every single request due to specific challenges unique to each outbreak emergency.

According to UNICEF SD, factors contributing to the low proportion of approved requests for which the seven-day delivery target was met include limitations of existing logistics infrastructure, remoteness of countries and regions affected by meningitis outbreaks, and delays related to licensing and customs clearance in countries receiving stockpiled vaccines. Specific vaccine types may not be registered in receiving countries or may not have received prequalification from the WHO. UNICEF SD has a policy never to approve delivery unless it has received confirmation that all regulatory requirements have been met or a waiver provided by receiving countries. Once vaccines arrive in-country, delays may arise due to time needed for authorities must give the green light for vaccine deliveries, waiver forms to be signed and customs clearance to be granted.

Challenges for emergency vaccine response and lessons learned in 2019

WHO AFRO reported on the specific challenges encountered during vaccine response after arrival of vaccines in affected countries, in particular Burkina Faso. These included a lack of on-the-ground infrastructure and insufficient cold chain capacity for efficient transport of required vaccine doses to districts targeted for campaigns.

In **Chad (#1)**, specific challenges included limited technical capacity for laboratory confirmation cases and cold chain capacity. The country also lacked a preparedness and response plan until after the outbreak was detected. Successes were also noted, however, including effective engagement of communities receiving vaccines with the involvement of community health workers and efficient management of suspected meningitis cases with prompt referral to district hospitals.

While the first campaign in **Burkina Faso (#2)** achieved notable success in quickly preparing and disseminating operational guidelines, mobilising health workers, and familiarizing them with campaign protocols, contributing to rapid vaccine response, campaign activities following the

country's second ICG vaccine request **(#4)** were hampered by strike action by health workers and insecurity in the targeted areas.

Burkina Faso was adequately prepared for a potential meningitis outbreak, and deployment of vaccines from national stocks allowed for a swift initial response in Diapaga Zone 1 ahead of the arrival of doses released from the ICG stockpile. The availability of vaccines as part of the country's national stockpile, which facilitated rapid initial response in the area immediately surrounding the initial outbreak, holds key lessons for the wider region and potential for containing outbreaks before they can expand geographically. The country's national emergency epidemic response plan, which is reviewed annually to account for new developments, contributed significantly to ensuring a high degree of emergency readiness. Response activities were facilitated and coordinated through a national operations centre, allowing centralized decision-making while improving cooperation between partners from the national to the department level. The country's Ministry of Health was proactive in obtaining and compiling the information necessary for ICG requests. It was also noted that laboratory sampling of suspected cases and provision of data was efficient, allowing for rapid preparation of ICG emergency vaccine requests. After arrival of vaccines in-country, there was effective collaboration between the Ministry of Health and implementation partners, supervision of health workers and engagement with local communities receiving vaccination.

Despite ongoing strike action and delays in starting vaccination campaigns following the second vaccine request, the Ministry of Health was able to reach some accommodation with health workers to ensure that campaigns were completed as planned. Post-campaign evaluation could not be carried out due to a lack of vaccination cards (due to lack of supply within the country), the challenging security situation in some of the affected areas and ongoing strike action. Although data were collected in some areas, striking health workers were unwilling to share these with authorities. As of September 2019, the Ministry of Health is continuing negotiations for the release of campaign evaluation data.

Going forward, the country will continue making advanced preparations for the 2020 epidemic season against a backdrop of ongoing security challenges and the large number of internally-displaced people in at-risk regions. The Ministry of Health will appeal for regular funding for FONALEP (*Fonds national de lutte contre les épidémies*), to provide ongoing financial support for epidemic preparedness and response efforts. After response to 2019 meningitis outbreaks, Burkina Faso's national vaccine stock had fallen from a size of 120,000 doses to 11,000 doses; the Italian Agency for Development Cooperation is providing support for its replenishment.

Meeting participants discussed the ongoing need to strengthen laboratory capacity for case confirmation. It was also suggested that UNICEF SD may consider providing vaccination cards along with released vaccines in future instances where needed. Gavi emphasized the availability of operational funding that countries may access if costs exceed expectations (for example, due to security risks) up to a ceiling determined by Gavi. Finally, vaccine supply continues to be insufficient to meet the ICG target for the meningitis stockpile, and only the availability of low-cost pentavalent conjugate meningitis vaccines in sufficient quantities can eventually eliminate the risk of meningitis outbreaks in the region.

4. Vaccine stockpile, supply, procurement and forecasting

The ICG meningitis stockpile in 2019

As of September 2019, the meningitis vaccine stockpile contains 2,021,035 doses, with an additional 967,090 doses contracted to be available by January 2020 for a total of 2,988,125 doses. Of the doses expected to be available by January 2020, 2,718,525 are CW-containing (including ACW polysaccharide and ACYW conjugate or polysaccharide) and 1,539,185 of the total (51.5%) are conjugate vaccines.

The current stockpile of 2,021,035 doses compares with a total stockpile size of 3,049,505 doses in January 2019. Without additional contracted doses, the ICG meningitis vaccine stockpile is expected to stand at 1,436,690 doses by January 2021. It was noted that, of the 1,551,435 doses expected to expire during 2020, 76,500 doses of ACW polysaccharide vaccine are due to expire in March 2020. This will be followed by the expiry of an additional 469,585 in July 2020, 300,000 in August 2020 and 705,650 in September 2020.

The ICG members reaffirmed that the target ICG meningitis stockpile should be maintained at its current level of 5 million doses of C-containing vaccine to be ready at the beginning of the epidemic season, of which at least 3 million should be CW-containing. This target reflects the expansion of Nm-C in recent years and the risk of Nm-W outbreaks. It was also agreed that preference would be given to conjugate vaccines over polysaccharide vaccines, and that stockpiled products should have a shelf-life of at least two epidemic seasons.

Vaccine procurement

UNICEF SD noted that the requested stockpile size of 5 million doses at the beginning of the epidemic season had not been met for 2019.

The small number of suppliers may pose a major challenge for maintaining the stockpile at its targeted size if one or more face issues relating to production or licensing, or other delays. It was noted, however, that the use of four-year tenders has given a manufacturer a clear signal, and some have responded by investing in development of innovative new products.

Discussions between UNICEF SD and manufacturers on additional vaccine supplies for the 2020 epidemic season are ongoing, although no concrete agreement could be confirmed as of September 2019. Given the overall availability time of vaccine is almost 12–18 months, any batches of doses contracted in 2019 will likely not materialize until the 2021 epidemic season, especially if done after the September 2019 ICG meeting. Gavi highlighted that all doses offered so far within this tender have been contracted. UNICEF SD notes that, over the past nine years since 2011, most vaccine shipments in response to emergency requests take place in March and April. It was therefore reiterated that vaccines should be available for deployment at the start of the epidemic season (preferably by 1 January). Not all meningitis vaccines on the market or in the ICG stockpile are currently WHO prequalified, and, non-prequalified products will continue to be assessed on a case-by-case basis by the WHO Prequalification Team before their inclusion in the stockpile.

Gavi's commitment to funding the meningococcal emergency stockpile is ongoing, not time-bound. As agreed within the 2019 Supply and Procurement Roadmap, the ICG leads the stockpile level analysis and recommendation in collaboration with UNICEF-SD and Gavi. This serves as the

target for procurement taking into account epidemiological aspects, as well as market conditions. Gavi will analyse its financial risk exposure, define the accepted level of risk and provide input in the strategy for awards with UNICEF-SD, with the ultimate goal is to maximize the health impact (lives saved), while making efficient use of limited resources and budgets.

Repurposing of vaccine doses approaching expiry

A large quantity of stockpiled vaccines is due to expire between September 2019 to March 2020 (almost 279,410 in 2019 and 76,500 by March 2020). There is currently no routine mechanism for transfer of vaccines to preventive mass campaigns under wider disease control initiatives (as the case for cholera and yellow fever). Although sale or donation of vaccines nearing expiry to individual countries for immunization of Hajj pilgrims could potentially present a solution, the month of expiry of most batches may not coincide with the Hajj dates in a given year. As payments for these vaccines have already been made to manufacturers, destruction of stockpiled doses represents a missed opportunity to immunize populations at risk of meningitis outbreaks and to maximize the stockpile's public health impact. Furthermore, it sends a negative signal to manufacturers as to actual demand for meningitis vaccines.

The ICG explored the repurposing of doses for preventive use to be made available to high-risk countries, a final decision is pending the approval of a strategy to developed by WHO. Meeting participants agreed that it would be necessary to define criteria for allocation decisions for non-emergency campaigns. These criteria should consider population needs, the local epidemiology of meningitis and circulating Nm strains, whether presentations of vaccines are appropriate, and, given the lead times for delivery of vaccines to receiving countries and the start of campaigns, whether it is feasible to schedule deployment of vaccines so that immunization takes place before vaccines expire. Importantly, these campaigns should not conflict with ICG requests or divert vaccines from emergency use. It should therefore be made clear to stakeholders, particularly countries, that the realization of such campaigns is contingent on specific batches of vaccine doses not being deployed for emergency response.

Another significant area of uncertainty is that of Gavi funding, since current Gavi Board approval only includes the use of stockpile vaccines for outbreak response. An alternative use of stockpile doses will be assessed based on the proposal to be presented by ICG.

The University of Cambridge gave a presentation on a modelling exercise to inform strategies for repurposing stockpiled conjugate vaccines approaching expiry to avoid wastage. Models were applied to data on meningitis cases from Niger, Nigeria and Burkina Faso, and employed a combined approach for prioritizing preventive campaigns: incidence risk (based on suspected cases) and microbiological risk (strain-specific and based on laboratory-confirmed cases). While areas with recent meningitis outbreaks were at greater risk of subsequent outbreaks, those districts adjoining areas with recent outbreaks were predicted to be at highest risk based on both approaches. On the basis of the model results, it was suggested that a two-tiered strategy be used to prioritize districts for vaccination, with districts identified using both approaches being highest-priority.

Quality of model predictions is dependent on the quality of surveillance data, however, and further refinements are needed to account for the fact that alert and epidemic thresholds are different for very small districts. While the proposed modelling strategy may prove an effective tool for identifying where repurposed vaccines may be deployed for maximum public health impact, its findings come too late for the next batch of doses due to expire in March 2020. For meningitis, decisions on repurposing vaccines should be taken around May when vaccine needs for the rest of the epidemic season are known. The proposed modelling strategy could potentially be applied to doses expiring from July to September 2020. Epidemic risk should not be the sole consideration when deploying repurposed vaccines however and should be considered alongside the practical feasibility of campaigns. For example, in insecure areas where routine vaccination may be disrupted, security "windows of opportunity" should be exploited to immunize populations which may not otherwise have been reached.

It was agreed that immediate action is required to plan for the repurposing and deployment of the doses expiring in November 2019, December 2019 and March 2020. This represents a quantity of 338,410 doses from two manufacturers (Pfizer and Finlay). One suggestion was that 355,910 doses of these vaccines expected to reach expiry at the end of March 2020 epidemic season be allocated to immunize internally-displaced persons in Burkina Faso in areas not covered by emergency vaccination campaigns during 2019.

ICG, UNICEF SD and Gavi agreed to start the discussion immediately on an alternative use of the aforementioned doses near expiry as an exceptional case, while a longer-term approach is finalized. The proposed strategy must be presented to, and approved by, the Gavi Board before operational funding for both release of vaccines and campaigns can be secured. For its part, Gavi will review its internal processes for approving funding for this purpose and clarify what information would be needed for decision-making. Participants also agreed that clear timelines for use of specific batches of vaccines nearing expiry, particularly doses expiring in early 2020, should be prepared as a matter of priority.

Analysis of emergency meningitis stockpile needs

While there is considerable year-to-year variation in transmission of meningitis in the meningitis belt, the drivers of outbreak risk are not fully understood and no proven method for accurately forecasting meningitis outbreaks currently exists.

The mean annual target population for ICG emergency campaigns is in the region of 2–3 million, and it is estimated, based on data from 2005–2017, that a stockpile of 5 million doses would meet emergency needs in approximately 5 years out of 6 years. Previous estimates based on an analysis conducted by the University of Cambridge show that stockpile of 10.6 million doses would be sufficient to meet emergency needs in almost any scenario, and it was proposed that a stockpile of 10 million doses could be considered in the context of Nm-C expansion across the meningitis belt. This is in line with the ICG's recommendation to the Gavi Board in 2016 that the meningitis stockpile should be of sufficient size to cover 95% of outbreaks

The Bill and Melinda Gates Foundation, in collaboration with the development consultancy Dahlberg, are exploring tools for evidence-informed decision-making on stockpile needs and optimal stockpile size and composition. Dahlberg gave a demonstration of the platform, covering six infectious diseases including meningitis, which is still under development. It is designed to estimate both distributions of vaccine demand, based on parameter values inputted into the software, and the probability that needs for emergency response will be met at each given stockpile size. Its underling model will allow consideration of factors such as vaccine shelf-life, strain coverage, and whether vaccines are polysaccharide or conjugate. The platform's primary purpose is to provide guidance for decision-making on an optimal stockpile size analysing both epidemiological and financial risks, in particular, with a view to avoiding situations where the stockpile may be insufficient to meet demand, or where the stockpile is likely to exceed demand in most years—resulting in procurement of excess doses that may be wasted.

The platform is not intended to provide definitive recommendations, but rather to draw attention to the key factors driving costs and benefits of different stockpile sizes and compositions in different scenarios, and to allow Gavi and other stakeholders to better understand the trade-offs involved between preventing disease and financial exposure when making funding decisions. It could also provide a tool for advocacy or to inform market shaping efforts. Users can flexibly define their own priorities and constraints, and model parameters can be adjusted as new and more reliable information becomes available over time. Further work is needed to define the

parameters to feed into the model, and this is complicated by the changing epidemiological situation on the ground—in particular the westward expansion of Nm-C meningitis.

It was noted that the current model only considers the cost of stockpiled vaccines and does not include operational costs for campaigns or case management. Although it could be argued that the optimal stockpile size is one where the marginal costs of maintaining the stockpile equal marginal benefits, the definition of "costs" and "benefits" requires more comprehensive examination (for example in terms of disability-adjusted life years lost per additional meningitis case over an individual's lifetime, and the wider economic and social costs of meningitis cases associated with the disease's burden on families and communities).

Further discussion on the use of both modelling tools is needed among ICG members, partners and stakeholders (particularly Gavi) to reach consensus on needed on how they can contribute to effective decision-making.

The ICG Ceftriaxone stockpile

The ICG Ceftriaxone stockpile contains a total of 65,628 vials as of September 2019. This comprises 804 vials (EPICO, Egypt) held in a physical stockpile at WHO Headquarters for rapid deployment and 63,768 vials in a revolving stockpile held by the manufacturer (DEMO SA, Greece). Around 12,000 vials from the physical stockpile were borrowed in May 2019 for the Ebola response in DRC. The ICG members decided to replenish this stock with 4,000 fresh vials from EPICO.

During January to September 2019, 3,950 vials from the physical stockpile were shipped to Togo for management of meningitis cases as part of the country's emergency vaccine request (#3). This contrasts with 2018 when no vials were deployed from the stockpile.

While it was agreed during the previous year's ICG meeting to retain the physical stockpile, the 804 vials of ceftriaxone currently in the physical stockpile have an expiry date of August 2020. Participants agreed in principle that it would be beneficial to retain the physical stockpile and to replenish the doses allocated to Togo, as this would facilitate rapid response during an outbreak emergency. The ICG members decided to replenish the physical stockpile with a further 4,000 doses.

Vaccine investment strategy

Gavi is continuing planning and development of its Vaccine Investment Strategy (VIS) for its 2021–2025 strategic period as set out in the Gavi Supply and Demand Roadmap. Following the decisions reached at the November 2018 Gavi Board meeting, the current investment strategy provides conditional approval for funding a targeted use of ACW-containing multivalent conjugate meningitis vaccines for reactive, routine and preventive use. This is contingent on the availability of licensed products and the outcomes of the relevant technical and regulatory review processes. It is expected that the SAGE (Strategic Advisory Group of Experts on Immunization) working group will provide further guidance informing strategies for multivalent vaccine use, with initial discussions following the next SAGE meeting, which will take place in October 2019.

For mass preventive use, the scope of campaigns will depend on the burden of disease associated with meningitis, the expected operational costs, and anticipated impact. Decisions on age groups targeted would be informed by carriage data, age-specific disease burden, and considerations as to the impact on health equity. For routine use, meanwhile, there remain

uncertainties as to which age groups should be targeted, and whether one or two doses should be given. Specific guidelines for routine campaigns will depend on the determination of the efficacy of vaccines employed in terms of their immunogenicity and duration of protection. It is expected that recommendations will be finalized in October 2020.

Regarding the current state of the meningitis vaccine market, to date only three vaccines are WHO prequalified, and the number of suppliers remains limited; over the last five years only two suppliers have offered doses for procurement by UNICEF. Consequently, prices remain relatively high and contracting terms are often challenging for procurement of large volumes of vaccines for humanitarian use. Gavi forecasts suggest that global supply of multivalent meningitis vaccines will be insufficient to meet demand until at least 2021; this would be especially the case in the event of a major Nm-C outbreak, for which a global supply of 10 million doses would be required for its successful containment.

With the development of new CW-containing vaccine products, expansion of production capacity by current suppliers and entry of new suppliers to the market, Gavi predicts that availability of CW-containing vaccines will begin to improve over 2022–2023. Supply is expected to increase by 1 million doses per year from 2023 onwards such that, by 2026, all vaccine demand will be met (even in a high-demand scenario) and that prices will become more sustainable for humanitarian procurement.

The Gavi Board has identified the need for further efforts towards securing prequalification for existing vaccines in use; one of the vaccines currently included in the ICG stockpile has yet to receive WHO prequalified status. Vaccine prices are expected to remain relatively high in the medium term, and the high cold chain footprint of the conjugate product currently available is an ongoing challenge for campaign implementation. The lack of buffer capacity maintained by current producers remains a concern in the event of a large-scale meningitis epidemic.

Gavi's market shaping activities emphasize the expansion of market competition, and Gavi targets the introduction of a new ACYWX-containing conjugate vaccine with WHO prequalified status by 2022 and the entry of at least one new manufacturer by 2024. In the meantime, Gavi, as part of its Stakeholder Action Plan, will engage manufacturers to explore creative solutions to increase supply and respond to sudden spikes in demand; support the development of new products and WHO prequalification for existing products; and contribute to developing new analytical tools to support cost-benefit analyses for different sizes and compositions of the ICG meningitis stockpile with a view to developing an empirically-driven strategy across the infectious diseases covered by Gavi's funding portfolio.

Meeting participants agreed that engagement with manufacturers should go beyond contracting terms and prepayments for vaccines. While the global market for ACYW-containing meningitis vaccines for all uses has a value of $1.5 billion as of 2018, the value of doses procured by UNICEF account for just under 1% of this total. There is therefore potential for Gavi and UNICEF to further their collaboration with manufacturers and explore possibilities to access a greater proportion of this market.

Defeating Meningitis by 2030

The ten-year "Defeating Meningitis by 2030" strategy, which was introduced at the World Health Assembly in May 2018, aims to reduce case mortality rates due to vaccine-preventable meningitis, reduce risk of disability and improve quality of life after recovery meningitis and eliminate meningitis epidemics in at-risk countries through support for prevention, surveillance, diagnosis and treatment of cases, advocacy and support for people affected by meningitis. These objectives represent the strategy's five pillars, which are complementary with the priorities set out in the 13th

General Programme of Work of promoting health, keeping the world safe, and serving vulnerable people. The strategy itself does not emphasize specific targets for reductions in annual cases, but rather to put in place the structures and build the capacity, through collaborations with partners both within and outside WHO, to both respond to outbreak challenges and reduce the overall burden of meningitis on affected individuals, their families and communities. The strategy will aim to improve the availability and affordability of multivalent conjugate and Mn-B vaccines, and support product registration and WHO pre-qualification.

Participants were updated on the strategy's progress. The strategy's Taskforce Inception Meeting, where the strategy's partner organizations began the process of initial drafting of its Roadmap, was held in Geneva in July 2018. Since then, the strategy partners held their 2019 Extended Taskforce meeting at Wilton Park in February 2019, where they initiated a round of consultations with the public and stakeholders to refine the strategy's vision, scope and goals, define priority areas for activities, propose an implementation structure, and develop a framework for the strategy's monitoring and evaluation with baseline indicators. Consultations with WHO Regional Offices are ongoing and Regional Immunization Technical Advisory Groups and SAGE (after a second review) are expected to provide their technical input by October 2019. It is expected that the finalized Roadmap will be presented to the WHO Executive Board in January 2020 and World Health Assembly in May 2020.

5. Governance, accountability and transparency

Over 2016–2017 a formal, independent evaluation of the ICG's structure and its activities was carried out by the consultancy Hera, and its results were presented to the ICG Secretariat in October 2017. The evaluation report highlighted the need for improved accountability, transparency and oversight of the ICG mechanism. Specifically, the evaluation noted that responsibilities of different parties within the ICG mechanism overlapped, and that it lacked an oversight mechanism to ensure that the ICG decision-making groups are accountable to both their stakeholders and the organizations they represent.

In response to these recommendations, the ICG Governance and Oversight Committee (GOC) was established in February 2018 to provide overall oversight and strategic direction to the ICG mechanism; review performance of the process against agreed performance indicators; ensure alignment of the mechanism with ICG's founding principles; and to advise on linkages with wider disease control initiatives (such as the Defeating Meningitis by 2030 strategy). To ensure its independence, committee members will not be directly involved in the work of the ICG mechanism and will comprise senior staff drawn from the WHO, IFRC, MSF, UNICEF and Gavi.

The GOC held its first meeting in September 2018, where agreement was reached on its composition and procedures. During the second meeting of the GOC on 12 July 2019, its members approved the ICG Accountability Framework, which sets out the roles and responsibilities of the ICG and each of its partners involved in the mechanism in relation to five key functional areas: general oversight and management; emergency stockpile requests and decision-making; vaccine deployment and follow-up; sustainable funding of vaccination campaigns and campaign implementation; and vaccine demand and supply environment.

During the last GOC meeting, UNICEF suggested that the role of the GOC should include both strengthening collaboration between the ICG, its partners and wider disease control initiatives, and ensuring that the ICG's work should be complimentary to achieving their objectives. The GOC holds a unique position to view the ICG's work from a strategic perspective and to work with other global health actors on advocacy (for example, in calling for the development of new vaccine products based on known needs and operational challenges faced by the ICG and partners). GOC members were requested to advise on specific aspects of the Accountability Framework including terms of reimbursement for vaccines by non-Gavi-eligible countries, vaccine allocation criteria for emergency requests, and estimation of operational budgets for vaccination campaigns.

The GOC also discussed the ICG meningitis stockpile, and, specifically, measures aimed at meeting the targeted stockpile size of 5 million doses. These included advocating for expansion of supply from existing manufacturers, encouraging the entry of new manufacturers to the market, and accessing doses in national stockpiles and coordinating their use alongside doses released from the ICG stockpile during acute emergencies.

Gavi Secretariat was accorded temporary observership at ICG deliberations in 2017, and its observership status was made permanent at the GOC meeting in July 2019.

As agreed in the Accountability Framework, the range of key performance indicators (KPIs), reflecting the responsibilities of each ICG partner, will be significantly expanded. These will be systematically reported in future ICG publications. ICG meeting participants agreed that the term "ICG KPIs" has outlived its utility. Instead, the range of KPIs included in the Accountability Framework are attached to a wider range of partners and not all are specific to the ICG alone.

Participants also highlighted the responsibilities of individual countries receiving stockpiled vaccines in relation to request preparation, implementation of vaccination campaigns, campaign monitoring and evaluation, reimbursement for vaccines (if non-Gavi-eligible) and financial reporting on vaccination campaigns. At the same time, it was also agreed that appraisal of countries' performance against the KPIs should account for their unique challenges and situations where a country faces multiple outbreaks simultaneously (including infectious diseases not currently covered by the ICG mechanism). Furthermore, the ICG and partners should also consider the degree of support individual countries require in making ICG requests and carrying out reactive campaigns, and how support can be targeted for to maximize impact.

Proposal for an Ebola vaccine stockpile

It is expected that, following efforts to expedite the development of Ebola vaccines in the wake of the 2014–2015 West African Ebola epidemic and recent outbreak in the DRC, the first Ebola vaccine will be licensed by end of 2019. Gavi has proposed an ICG-like mechanism for licensed and WHO prequalified Ebola vaccines once these are available, and participants at the second meeting of the GOC in July 2019 were supportive of the proposal. While Gavi agreed an initial funding window from 2014 to 2020 to explore possibilities for the establishment of such a mechanism, the Gavi Board will deliberate on a new funding window to continue this work at its next meeting in December 2019.

An Ebola-specific stockpile mechanism would likely differ from that of existing ICG stockpiles and would likely involve allocation of vaccines for both reactive and preventive vaccination for emergency response. Specific vaccination strategies would likely involve ring vaccination as opposed to mass vaccination strategies used for other infectious diseases currently covered by the ICG mechanism. The stockpile's size, composition, decision-making criteria for release of stockpiled vaccines, and strategies for vaccine deployment, will require revisiting periodically as the epidemic situation on the ground evolves. Input from UNICEF SD will also be needed to inform the procurement strategy for any potential stockpile. Meeting participants also agreed that technical input is needed from SAGE. While there is recognition of the value of establishing an ICG-like mechanism for Ebola, the ICG's effectiveness in timely and equitable decision-making on vaccine allocation, and recent improvements in its transparency and accountability, given the complexity of Ebola response it is likely that an even wider range of stakeholders and technical experts may need to be engaged.

Meeting participants agreed to initiate a technical consultation on the establishment of an Ebola vaccine stockpile and ICG-like decision-making mechanism for its use. It was suggested that the GOC could play a role not just in providing feedback, but also in advocating for its establishment and its potential impact on global public health. In addition to uncertainty surrounding the quantity of Ebola vaccines that would be available and their specifications, other challenges identified by representatives of the ICG partner organizations included the need for specialized cold chain infrastructure and establishing the conditions by which Gavi non-eligible countries could access stockpiled vaccines.

6. Discussion

A number of key issues were raised over the full day of discussions and a mixture of short- and long-term priorities was identified.

While bolstering surveillance coverage in known high-risk areas, laboratory capacity to confirm cases, and infrastructure for transporting both samples to laboratories and vaccines to areas affected by outbreaks remain key to facilitating timely vaccine response, specific lessons learned during 2019 highlighted the value of preparing national emergency response plans before the epidemic season and establishing national operations centre for centralized coordination. Work is also ongoing to identify bottlenecks and resolve delays in delivery of vaccines to requesting countries, including those related to registration of vaccines and obtaining approval for importation of vaccines from national customs authorities.

UNICEF SD working to meet the targeted stockpile size of 5 million doses, and although this could not be achieved in 2019, discussions with manufacturers to supply doses for the 2020 epidemic season are ongoing. Meanwhile, agreement between the UNICEF SD and Gavi is needed on continuing funding of the ICG meningitis stockpile as the current funding cycle comes to an end.

One pressing priority identified was to reach consensus on whether, and how, to repurpose stockpiled vaccines approaching expiry for preventive campaigns to prevent wastage and maximize public health impact. While immediate action is needed for the repurposing and deployment of doses due to expire in March 2020, further work is called for over the medium term on how to prioritize which populations should receive these vaccines, and the process for approval of funding for operational costs to carry out non-emergency preventive campaigns.

Over the long term, while continuing market shaping efforts and long-term commitments to fund vaccine stockpiles are not only essential to ensuring sufficient supply of WHO prequalified vaccines to meet the targeted stockpile, only a healthy and competitive vaccine market, and the availability of sufficient quantities of affordable pentavalent conjugate vaccines to overcome current supply constraints, can achieve comprehensive coverage of circulating strains and eliminate the risk of meningitis outbreaks in the meningitis belt.

Better information is needed to inform market shaping efforts and support decision-making on the size and composition of the ICG meningitis stockpile, and on for allocation of repurposed vaccines for preventive campaigns. While the expanded use of statistical modelling tools has the potential to provide Gavi, the ICG and other partners a fuller understanding of financial and public health implications of their decisions, consensus must first be reached on how these tools should be employed, what data should be used to parameterize their underlying models, and how the results they provide relate to the ICG and partners' principles and priorities.

The ICG has fully established its GOC and is moving forward with the implementation of the Accountability Framework. These developments will improve the transparency and accountability of the ICG mechanism. The GOC's role in advising on linkages with wider disease control initiatives and providing strategic direction for the ICG mechanism may prove key in bringing together market shaping, forecasting and modelling efforts to achieve consensus between the ICG's partners and stakeholders on the ICG's strategic direction. As the Defeating Meningitis by 2030 strategy develops over the coming years, one task of the ICG will be to define an approach to coordinating with the strategy's partners to achieve complementarity with its activities.

7. Meeting decision and action points

The following decisions were taken by the members of ICG in relation to the meningitis vaccine stockpile:

- The targeted size of the ICG meningococcal vaccine stockpile is to remain at 5 million doses of C-containing vaccines, to be available at the beginning of each epidemic season. Of these, at least 3 million should be CW-containing.

- All stockpiled vaccines should be WHO-prequalified and preference will be given to conjugate over polysaccharide vaccines.

- The ICG members decided to replenish the physical Ceftriaxone stockpile with 4,000 vials.

The ICG for meningitis identified the following action points:

- The ICG, UNICEF SD and Gavi will start communication as a matter of urgency to discuss how vaccine doses nearing their expiry dates can be repurposed for preventive immunization campaigns to maximize their impact on public health.

- Based on research by the University of Cambridge, the ICG Secretariat will develop standard operating procedures on the strategy for repurposing meningococcal vaccine doses nearing their expiry dates for preventive immunization campaigns. After validation by ICG stakeholders, this strategy will be presented to high-risk countries for implementation during the inter-epidemic season (July to December), if vaccines with short shelf-life remain in the emergency stockpile.

- UNICEF SD and GAVI are to organize a meeting to ensure continuing funding for the ICG meningitis stockpile and for supply of vaccines to the stockpile for 2021

- The ICG will proceed with procurement of 4,000 vials of Ceftriaxone from EPICO to replenish the existing physical stockpile held at WHO Headquarters.

Action points for Ebola:

- The WHO is to initiate a technical consultation on the establishment of an Ebola vaccine stockpile and ICG-like decision-making mechanism for its use.

- The ICG partners will contribute to development of an Ebola emergency stockpile mechanism, operational strategy and procedures for Ebola-specific decision-making.

Common issues were also raised over the three consecutive days of ICG meetings. Action points identified from all three meetings included:

- The ICG Secretariat is to follow up by email to formulate specific KPIs for countries submitting emergency requests to which they will be accountable within the ICG Accountability Framework. These will reflect countries' areas of responsibility, including timeliness of request submission and campaign implementation and evaluation, and give consideration to countries' capacity to implement these effectively. Following these discussions, the ICG and GOC are to define, compile data on, and report on consistent indicators for all ICG stockpiles.

- The ICG and UNICEF SD are to continue their work on identifying and evaluate specific bottlenecks in the procurement and delivery process with a view to improving vaccine delivery lead times.

All participants agreed on the action points by consensus and expressed their commitment to moving forward with their implementation over the coming year.

8. Progress since 2018

Progress has been made on implementing the recommendations of the following action points raised during the ICG meetings in 2018:

- **Action point:** The ICG is to include time from declaration of outbreaks to submission of emergency vaccine requests and time required for laboratory confirmation of cases as performance indicators in future years. The ICG will report on this indicator annually going forwards.

  ►**Result:** The ICG Secretariat has started to collect data on time from declaration of outbreaks to submission of emergency vaccine requests since the beginning of the 2019 epidemic season, and this indicator will be reported in future ICG reports and publications. As part of ongoing work to implement the ICG Accountability Framework, it is expected that data on time to confirmation of cases and declaration of outbreaks will be gathered in future years.

- **Action point:** A meningococcal vaccine stockpile of 5 million doses of C-containing vaccine is to be available at the beginning of each epidemic season (2019 and 2020). Of these, at least three million should be CW-containing.

  ►**Result:** Some of the initially offered doses for the 2019 season were not produced due to manufacturing issues. Had these does been made available, the target of 5 million doses would have been achieved.

- **Action point:** UNICEF SD is to intensify efforts with vaccine suppliers to ensure the required 5 million doses are available from the start of the epidemic season.

  ►**Result:** Discussions between UNICEF SD and manufacturers on additional vaccine supplies are ongoing for 2020 and 2021 with a view to meeting this target by the start of the 2021 epidemic season.

Annex 1: Meeting agenda

ICG Meningitis Annual Meeting

IFRC, Geneva

10 September 2019, Auditorium B

Agenda

Objectives:

- Review the epidemiological situation in 2019
- Review the outbreaks and campaigns supported by ICG during 2019
- Present the vaccine supply and future development plans with the manufacturers
- Discuss the stockpile size and composition
- Present the proposed Ebola vaccine stockpile mechanism

Chair: Frank Mahoney

Time	Topic	Presenter
08:30 – 09:00	Arrival and welcome of participants	
	Opening remarks	ICG Sec.
	Update on the independent evaluation of the ICG	ICG Sec.
Session 1: 2019 epidemic season, campaigns		
09:00 – 10:30	Meningitis outbreaks: campaigns, lessons learned	WHO AFRO
	Reactive campaigns in Burkina Faso: challenges, lessons learned	WHO Burkina Faso
	Vaccine shipments	UNICEF SD
	ICG performance – review of key indicators	ICG Sec.
	Meningitis strategy 2030 – progress and status	WHO HQ / IVB
10:30 – 10:45	Coffee break	

Session 2: Vaccine supply		
10:45 – 12:45	Gavi roadmap and market shaping – VIS update	Gavi
	Vaccine supply: current and short-term projections	UNICEF SD
	Ceftriaxone supply	ICG Sec.
	Manufacturers production plans 2020-2023	Bio-Manguinhos/Finlay GSK Pfizer Sanofi-Pasteur EuBiologics Serum Institute of India Hualan Bio-Med Walvax
12:45 – 14:00	Lunch	
Session 3: Stockpile size/composition and financial trade-off (closed session)		
14:00 – 15:15	Stockpile needs for epidemic meningitis response	WHO HQ
	Meningitis modelling tool for stockpile size – demo	Dalberg / BMGF
	Strategies for repurposing meningococcal vaccine from the emergency stockpile	University of Cambridge
	Financial trade-off	Gavi
15:15 – 15:30	Coffee break	
15:30 – 16:30	Discussion: Stockpile size and composition	IFRC, MSF, UNICEF PD, WHO, UNICEF SD, Gavi (only)
Session 4: ICG mechanism for other diseases		
16:30 – 16:50	ICG mechanism for Ebola vaccine response	Gavi
16:50 – 17:00	Conclusions – wrap up	All participants

Annex 2. List of participants

International Coordination Group (ICG) for Vaccine Provision
Annual Meeting for Meningococcal Vaccine
10 September 2019
IFRC, Geneva, Switzerland
Auditorium B

Provisional List of Participants

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