REPORT OF THE INDEPENDENT REVIEW COMMITTEE TO THE GAVI ALLIANCE ON THE REVIEW OF APPLICATIONS

JULY 2020

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List of Acronyms

30 DTR	30-day temperature recorder
AEFI	Adverse event(s) following immunization
AFRO	WHO Regional Office for Africa
AMC	Advance Marketing Commitment
CCE	Cold-chain equipment
CCEOP	Cold-chain equipment optimization platform
CCL	Cold-chain logistics
COVID-19	Coronavirus Disease 2019
CSO	Civil society organization
EPI	Expanded Program on Immunization
EVM	Effective Vaccine Management
HPV	Human papillomavirus
HR	Human resources
HSS	Health System Strengthening
ICC	Inter-Agency Coordinating Committee
IRC	Independent Review Committee
JA	Joint Appraisal
JRF	WHO and UNICEF Joint Reporting Form
LTPCs	Long-Term Passive Containers
M&E	Monitoring and Evaluation
MCV	Measles-containing vaccine
MenA	Meningococcal Group A Vaccine
MR	Measles-Rubella Vaccine
MRfu	Measles Rubella follow-up SIA
MRI	Measles and Rubella Initiative
NGO	Nongovernmental organization
NITAG	National Immunization Technical Advisory Group
NVI	New Vaccine Introduction
NVS	New Vaccine Support
PCV	Pneumococcal vaccine
PEF	Partners' Engagement Framework
POA	Plan of Action
RI	Routine Immunization
RTMD	Remote Temperature Monitoring Devices
SC	Supply chain
SCM	Senior Country Manager
SIA	Supplementary immunization activity
SOP	Standard Operating Procedures
TA	Technical assistance
ToR	Terms of Reference
VIG	Vaccine introduction grant
VPD	Vaccine-preventable disease
WHO	World Health Organization
YF	Yellow fever

Executive Summary

The Independent Review Committee (IRC) met on 3rd – 14th July 2020 and reviewed 17 applications from 13 Gavi-eligible countries, including 2 remote reviews. This was the second meeting held virtually because of the COVID-19 pandemic.

16 IRC members participated in this review round, including one new member who underwent induction training. Areas of expertise included: Immunization Services; VPDs (Measles, HPV, YF); AEFI Surveillance; Cold Chain and Supply Chain management; Health Development and HSS; Outbreak, Epidemic and Emergency Response; Fragility, Emergencies, Refugees; Monitoring and Evaluation of Health Services; Health Policy and Planning; Primary Health Care; Epidemiology; Reproductive Health; and Health Economics and Financing. Two members focused on in-depth financial reviews, and three members focused on cold chain and logistics issues (see Annex 1 for the list of participating IRC members).

Prior to the meeting, the IRC members prepared draft reports of their assigned countries, which were presented and extensively discussed in plenary sessions. The Gavi Secretariat and partners provided country-specific briefings and additional information to assist in the process of determining the IRC recommendation of approval or re-review of each country application.

During the review period, the IRC members focused on the following specific tasks:

- Review of country's funding requests and supporting documentation for vaccine introductions and campaigns to support national efforts to improve coverage and equity.
- Production of country-specific review reports and recommendations.
- Development of a consolidated report of the review round, including recommendations for improving funding requests and strengthening routine immunization.
- Provide recommendations to the Board and Alliance partners on improving processes relating to Gavi policies, governance, and structure.

Review modalities included:

- Desk review and virtual discussion in plenary with the participation of the full committee of 13 NVS applications from 9 countries.
- Desk review and virtual discussion of 2 CCEOP applications from 2 countries with reduced committee participation (only CCL experts plus chair and vice-chair)).
- Remote reviews of two additional applications from Niger (YF diagnostics) and Togo (MenA additional doses) without full committee discussion. The findings and recommendations of these remote reviews were shared with the whole IRC only "for information".

The IRC recommended approval of 15 out of the 17 applications reviewed in this round, with an overall approval rate of 88%. This includes 11 of all 13 NVS applications and 2 out of 2 CCEOP applications. The total funding amount recommended for approval is US$ 137,110,085 to support immunization of a target population of 268,551,067 children and adults (in the case of YF campaigns).

Five applications were re-reviews from previous rounds. They were all approved and the IRC noted again the higher quality and completeness of the re-reviewed applications with improvements going beyond the specific action points requested in the previous IRC reports.

Table 1 summarizes the specific requests by countries and the IRC review outcomes.

Table 1. Requests by countries and IRC review outcomes.

Country	Application	Outcome
Bangladesh	HPV	Approval
Burkina Faso	HPV*	Approval
Cambodia	CCEOP	Approval
Cote D'Ivoire	MR2* + follow-up*	Approval Approval
Guinea Bissau	M1+2* MenA routine + campaign	Approval Approval
Myanmar	CCEOP	Approval
Nigeria	Measles follow-up YF campaign MenA additional doses	Approval Approval Approval

Country	Application	Outcome
Pakistan	MR 1+2 + MR catch-up*	Approval
Timor Leste	PCV (AMC)	Approval
Uganda	YF routine + campaign	Re-Review
Uzbekistan	MR follow-up	Re-Review
Remote Reviews		
Niger	YF diagnostics	Approval
Togo	MenA additional doses	Approval

*= re-review from previous rounds

In this review the IRC identified several best practices proposed by countries, including better use of coverage and surveillance data to target activities (Togo and Uganda); development of specific strategies to target vulnerable populations (Cote d'Ivoire and Togo); use of house-to-house canvassing as an element of social mobilization and outreach for urban slums (Uganda); setting-up an ambulance deployment system to support the AEFI focal point and AEFI response (Pakistan); a transparent budget with all necessary details about calculation assumptions of activity volume and input costs (Nigeria).

The IRC also identified several key issues and topics from the review that need to be emphasized:

- The need for targeted strategies for reaching zero-dose children
- Inadequate use of equity analyses to tailor strategies
- The need to improve immunization data quality and its use for planning, targeting, monitoring and evaluation
- AEFI data increasingly collected, but not analyzed
- Quality of budgets is generally improving, and some good practices are emerging. However, significant difficulties persist and may require:
    - Revision of the Gavi guidance on classification of activities and input costs
    - Clarifying the HR policy and guidance and adapting it to specific program delivery strategies
    - Requiring countries to demonstrate budget alignment with POAs and provide programmatic rationale for quantities and inputs
    - Allowing sufficient time for IRC budget reviews and improving the Gavi budget pre-review process.
- Waste management is a persistent problem, not limited to campaigns.
- COVID-19 will continue to disrupt immunization services and challenge the support provided by Gavi and partners. This will require continuous monitoring of the pandemic impact and

greater flexibility to adapt Gavi support to the changing needs of countries.

- Processes for holding virtual IRC meetings have improved but are still not ideal and cannot fully replace face-to-face meetings.

Methods and Processes

Methods

The Independent Review Committee met on 3rd – 14th July 2020. For the second time the meeting was held virtually because of the COVID-19 outbreak. To address some of the limitations of meeting virtually, the IRC experimented with the use of a dedicated shared drive (OneDrive) for co-authoring of documents and presentations, and with online communication tools (e.g. Skype, Zoom, WhatsApp). The usefulness of these tools should be evaluated as some members found it difficult accessing or using them.

Sixteen IRC members participated in this review round, including one new member who underwent a virtual induction training. Areas of expertise included: Immunization Services; VPDs (Measles, HPV, YF); AEFI Surveillance; Cold Chain and Supply Chain management; Health Development and HSS; Outbreak, Epidemic and Emergency Response; Fragility, Emergencies, Refugees, Monitoring and Evaluation of Health Services; Health Policy and Planning; Primary Health Care; Epidemiology; Reproductive Health, Health Economics and Financing.

The country applications and supporting documents were shared with IRC members about one week prior to the meeting. Based on these, IRC members reviewed and analyzed the applications and prepared draft reports of their assigned countries. The Secretariat provided clarifications and any additional documentation needed.

The meeting started off with a briefing by the Secretariat on the COVID-19 situation update and current Gavi response, the latest guidance on the Gavi COVID-19 response/recovery phase, and the possible implications for the IRC review. Thereafter, the briefings continued with updates from the Secretariat and Alliance partners on key topic areas relevant to this review round, i.e. vaccine updates (Measles and Rubella, Yellow Fever, Men A and HPV), CCEOP and program financing.

After discussing the issue, the IRC agreed that due to the rapidly evolving situation, information on the current COVID-19 situation in the applicant country should not be included in the country report, though it could be mentioned, when relevant, in the different sections. It also agreed not to modify the established criteria for reviewing the proposal, which should continue to be based on technical merit, soundness of approaches, and value for money.

Each country proposal was reviewed by at least 2 members, a primary and a secondary reviewer (3 reviewers were assigned to the proposal from Nigeria that included Measles follow-up SIA, YF campaign and MenA additional doses). Each member reviewed the applications and supporting documents independently and prepared separate, individual reports. Reviews for the cross-cutting issues of budgets and financial sustainability, and supply chain and waste management were conducted by two financial cross-cutters and three IRC members specializing in supply chain.

These reports were presented in daily plenaries, during which the initial findings were extensively discussed, with a final, consensual, outcome decision of either approval or re-review. The Secretariat and Alliance partners supported the plenaries by providing information and clarifications when needed, especially in terms of country-specific background and context. The IRC decisions were not

always agreed upon immediately after the plenaries; sometimes discussions were postponed to clarify outstanding issues or acquire additional documentation or information from the country, the Secretariat, or technical partners. Eventually, all decisions were taken jointly with the involvement of all IRC members, except for CCEOP reviews and remote reviews. The first reviewers then consolidated the discussions, decisions and recommendations in draft country reports; these drafts were then finalized after editing, thorough fact and consistency checking as well as quality review.

There were three review modalities during this round, as presented in Table 2:

1. Desk reviews of 13 NVS applications from 9 countries with full committee discussions.
2. Desk reviews and virtual discussions of 2 CCEOP applications with the mandatory participation of only the CC/SC experts and the chair and vice-chair, though other IRC members were also encouraged to assist.
3. Remote reviews by selected IRC members, without full committee discussions, of Togo request for MenA additional doses and Niger request for YF diagnostics.

Table 2: Country Applications by Type and Review Modality

Countries	Application/ Support requested	Modality	No. of applications
Côte d'Ivoire; Nigeria; Uzbekistan	MR follow-up	Desk review (Virtual)	3
Côte d'Ivoire; Pakistan*	MR 1+2 introduction	Desk review (Virtual)	2
Guinea-Bissau	MCV2 introduction	Desk review (Virtual)	1
Bangladesh; Burkina Faso	HPV vaccine introduction	Desk review (Virtual)	2
Guinea-Bissau	MenA introduction incl. MenA catch up campaign	Desk review (Virtual)	1
Uganda	YF routine + campaign	Desk review (Virtual)	1
Nigeria	YF campaign	Desk review (Virtual)	1
Nigeria	MenA additional doses	Desk review (Virtual)	1
Timor Leste	PCV (AMC)	Desk review (Virtual)	1
Cambodia; Myanmar	CCEOP	Desk CCL review	2
Niger	YF diagnostics support	Remote review	1
Togo	MenA additional doses	Remote review	1

* and MR Catch-up SIA

Criteria for Review

The review of the applications was guided by the IRC Terms of Reference and key concerns in line with Gavi's mission. These include the justification for the proposed activities; soundness of approach; country readiness; feasibility of plans; system strengthening; programmatic and financial sustainability; and public health benefit of the investment. The IRC adhered strictly to these guidelines in a bid to ensure that the integrity and consistency of the transparent funding process are guaranteed.

Decisions

There were two decision categories:

I. **Recommendation for Approval** when no issues were identified that require re-review by the independent experts; the issues raised by the IRC will be addressed by the country in consultation with the Secretariat and Partners.

II. **Recommendation for Re-review** for a situation where there are issues that require review by the independent experts; this will entail detailed revision of the application and a revised submission to the IRC.

Table 3 presents the summary of the review outcomes for this round. Eleven of the 13 NVS applications and 2 out of 2 CCEOP applications were recommended for approval. Overall approval rate was 88%.

Table 3: Requests by Countries and Review Outcomes

Country	Application (*= re-review from previous rounds)	Outcome
NVS, campaigns and CCEOP		
Bangladesh	HPV	Approval
Burkina Faso	HPV*	Approval
Cambodia	CCEOP	Approval
Cote D'Ivoire	MR1+2* plus follow-up*	Approval Approval
Guinea Bissau	M1+2* MenA routine + campaign	Approval Approval
Myanmar	CCEOP	Approval
Nigeria	Measles follow-up YF campaign MenA additional doses	Approval Approval Approval
Pakistan	MR 1+2 and MR catch-up*	Approval
Timor Leste	PCV (AMC)	Approval
Uganda	YF routine + campaign	Re-Review
Uzbekistan	MR follow-up	Re-Review
Remote Reviews		
Niger	YF diagnostics	Approval
Togo	MenA additional doses	Approval

Five applications were re-reviews from previous rounds. They were all recommended for approval and the IRC noted again the higher quality and completeness of the revised submissions with improvements going beyond the specific action points requested in the previous IRC reports.

Key Findings and Recommendations

NVS and Campaigns

The IRC reviewed 13 requests for new vaccine introductions or campaigns from nine countries. Overall, most applications used available data from surveillance, vaccination coverage, equity studies and other disease burden assessments to justify the applications for new vaccine introductions and for campaigns. Sub-national epidemiologic analysis and assessments of non-vaccination, including zero-dose children, from recent post-campaign and EPI surveys were either included in the POAs, or available within the applications. However, information on disease outbreaks, especially for measles, has remained incomplete. This is mainly due to the failure to conduct a careful outbreak investigation. Information on chains of transmission, especially for those cases that were considered "non-preventable" (i.e., infants younger than the recommended age for measles vaccination) was lacking. Of total funds requested the majority was for M/MR operational support and introduction grants which amounted to US$90,108,720, with US$ $89,073,440 approved.

Issue 1. Critical importance of conducting careful outbreak investigations

Many countries experience outbreaks of VPDs but fail to include information in their proposals about lessons learned from surveillance data and outbreak investigations.

Recommendation:

- Gavi and partners to continue working with countries to assure that VPD outbreaks are investigated and that lessons learned from these analyses are fully used to identify and reach un- and under-immunized children, strengthen national immunization strategies and enhance Plans of Action and Gavi proposals.

Issue 2. Determination of target populations for additional doses requests

Introduction of MenA vaccine into routine programmes should include a one-time catch-up campaign for countries that previously conducted an initial preventive MenA campaign, to catch-up birth cohorts who were too young to be vaccinated at the time of the campaign or born afterwards. At this IRC, two countries requested support for additional doses for catch-up campaigns (i.e. Togo because of delayed implementation of the catch-up campaign, and Nigeria to capture the cohorts missed by previous catch-up campaign and routine). The target population was defined by age in both requests, which may - as IRC has previously noted - lead to missing a cohort or more in a country. The target population should include all those born after **one year before** the preventive MenA campaign, and in all applications for catch-up campaigns or additional doses it appeared that the cohort born during the year before the preventive campaign was not included in calculations. IRC appreciates that determining target populations may be challenging in populous countries where preventive campaigns were phased. However, the priority remains not to miss any child.

Recommendation:

- Gavi and partners to assist countries to accurately determine target populations for MenA catch-up campaigns to include all those born after one year before the initial preventive campaign, as recommended by WHO. Expressing target population in years can leave room for error and misinterpretation. Therefore, it is best to determine the target population using months rather than years of age.

Coverage and Equity

In this round of applications, most countries provided information on coverage and equity. Detailed analysis for districts with low coverage, including on zero-dose children, and traditional analyses of wealth, gender and mother's education were included in applications. The use of this information was variable and, in most cases, provided only general strategies for reaching under-served populations; in some cases (Guinea Bissau, Uzbekistan and Cote d'Ivoire) available data were not fully utilized to tailor interventions or improve routine EPI. One country (Pakistan) provided a detailed strategy for the vaccination of children in the second year of life and beyond who would be detected during the catch-up campaign and the MR introduction into routine.

Issue 3: Limited use of equity data to inform strategies

The IRC is pleased to note the increased inclusion of Equity and Knowledge, Attitude and Practice analyses in application packages. However, these analyses tend to remain limited to the traditional dimensions of district of residence, gender, education, wealth and mother's education. Other possible factors such as household health care decision making structures, minority status, cost of vaccination and access to information were not included in most applications.

Recommendation:

- Gavi and partners to provide examples of other dimensions of equity in the application materials and encourage countries to include them in the application situation analysis.

Issue 4. Inadequate strategies to reach unreached population

Most countries use available data including equity analysis to identify districts and areas with low immunization coverage and zero-dose children. However, the POAs often fail to demonstrate specific strategies to address the coverage and equity gaps identified in the analysis. The IRC notes a few identified strategies to address inequity such as house-to-house canvassing in urban setting (Uganda) and matching unreached populations with strategies (Cote d'Ivoire MCV2 VIG) but no budget was allocated for these activities.

Recommendations:

- Gavi and partners to continue working with countries to assure that efforts are made to develop, use and evaluate specific strategies for reaching zero-dose children and that these strategies are clearly articulated in proposals and plans of action accordingly.
- GAVI and partners to ensure that, once evaluated, new positive experiences of countries in reaching zero-dose children are well documented and disseminated as best practices.
- The participation of schools to help identify under-vaccinated and zero-dose children should be promoted further, including by encouraging countries to make reporting of vaccination status at school entry obligatory and to establish policies to vaccinate all those who are found missed

Issues 5. Need for focused RI strategies for temporary or permanent migrants

Some countries have areas of conflict or insecurity and high concentrations of temporary or permanent migrants (Nigeria, Pakistan, Uganda). These communities are likely to have low coverage. Few applications included routine immunization strategies to reach these areas or populations and those were primarily focused on vaccines that prevent disease outbreaks rather than a broader focus on routine EPI.

Recommendation:

- Gavi and partners to encourage and provide support to countries to include migrants into routine EPI and to develop specific strategies to reach them.

Data Quality and Use

The IRC congratulates countries on the increasing presentation of data and information in the applications and on diversification of data sources, including surveys. However, significant challenges remain, including the quality of available information (e.g. numerators, denominators, granularity) and the use of data to define and target specific strategies.

Issue 6: The quality of immunization data (administrative and target population estimates) continues to be a limiting factor at all levels for improved planning, targeting and monitoring of immunization activities

The IRC has repeatedly recommended improving the quality of immunization data. For example, in July 2018 the IRC has encouraged countries to triangulate multiple data sources in reviewing and reporting national and subnational coverage data and recommended that increased efforts/investments and appropriate TA be provided to improve reported data quality. It also requested Gavi to continue in its efforts to improve data quality and the data-literacy of programme managers. In November 2018, the IRC encouraged Gavi to implement the new data quality strategy and recommended that Gavi and WHO support on-going efforts to increase data quality in countries and strengthen the capacity for data analysis and use.

However, evidence of implementation of these recommendations by Gavi and partners is limited and their effect on the improvement in data quality was hardly noticeable in the applications reviewed in this round. The quality of immunization data (administrative and target population estimates) continues to be a limiting factor at all levels for improved planning, targeting and monitoring of immunization activities. To avoid repeating the same recommendations over time, the IRC would find it useful to be briefed by Gavi on the level of implementation of the past recommendations and the ongoing efforts of Gavi and partners to improve on data quality and use.

Recommendations:

- Gavi to provide a status update on the action/progress of IRC recommendations regarding data quality during the briefing at the next IRC meeting.
- Gavi to continue to encourage partners and countries to address issues with data quality and provide support to WHO as the technical lead on data issues.

Issue 7: Inadequate use of surveillance data to identify underserved populations

Countries with good EPI performance are not using data from surveillance (e.g. fever/rash, AFP, confirmed cases, etc.) or analyzing data on outbreaks to identify underserved populations. For example, Nigeria has extensive surveillance data by state and local level, including children with non-poliomyelitis AFP who had received 0-2 dose of OPV. These data were included in the application but their use to help formulate target strategies was not evident. In another example, Uzbekistan presented measles surveillance data by year, province, age, and vaccination status. The vaccination status was largely “unknown”. Utilization of this data could have helped improve the quality of this surveillance indicator.

Recommendation:

- Gavi to continue to work with countries and partners to ensure that surveillance and outbreak investigation data are used to identify, characterize, and reach unvaccinated populations.

AEFI

In this round, all countries report having AEFI surveillance systems in place and strengthening of vaccine safety surveillance remains a strategic objective in their planning documents. The WHO mandates the systematic collection, analysis and evaluation of medically important AEFI for all immunization programmes. Countries report the numbers of AEFI cases collected (total and serious AEFI cases) in the WHO and UNICEF Joint Reporting Form (JRF).

We used that information to look at the minimal capacity indicator for the countries (AEFI reporting rate above 10/100 000 surviving infants per year). Just 4 of the 11 countries (Guinea Bissau, Uganda, Cambodia, Myanmar) do not meet the basic minimum standard, and one just barely makes it (Timor Leste, with 11/100K). Two countries report only numbers of serious AEFI cases (Timor Leste, Myanmar), and the majority report observing more than 1 serious AEFI case in 2018. (Table 4)

Table 4: AEFI reporting rates in countries applying for Gavi support

Countries	AEFI reporting rate/ 100K surviving infants	Countries	AEFI reporting rate/ 100K surviving infants
Bangladesh	80	Nigeria	60
Burkina Faso	5438	Pakistan	40
Cambodia	9	Timor Leste	11
Cote d'Ivoire	487	Uganda	2
Guinea Bissau	0	Uzbekistan	25660
Myanmar	2	(source: JRF 2018)	

Issue 8: **Progress of AEFI surveillance systems in countries remains slow**

While the AEFI reporting rate is useful for assessing trends over time, it is a general indicator and does not provide information on the quality of the reporting system or the actual capacity to deal with vaccine safety issues. Despite previous IRC calls for technical support for AEFI surveillance and continued funding requests from countries that include system strengthening and/or training on AEFI, few if any countries analyze their data or report on AEFI system performance and not much progress is noted in reaching this target. AEFI reporting is especially critical when new vaccines are being introduced since concern about potential adverse events can undermine overall confidence in immunization services if they are not addressed appropriately.

Recommendations:

- Gavi to consider requesting countries to report on AEFI performance and include information on reporting and analysis of AEFI data in their applications.
- Training for vaccine introductions that includes clinicians should include a module on AEFI reporting and response.

Supply Chain and Waste Management

The IRC reviewed CCL aspects of applications for NVS for 9 countries and 2 CCEOP applications. The IRC approved the procurement of 1,070 CCE and a total budget of US$ 5,842,044 for 2 countries applying for CCEOP support (Cambodia, Myanmar). No application was recommended for re-review because of CCL aspects, despite limitations in data from countries.

Most countries that applied for new vaccine or SIA support evaluated their cold storage gap. To face insufficient storage capacity, mitigating measures presented by countries included: splitting of deliveries and supplies, use of secondary depots, leasing of CC equipment, implementation of the "Controlled temperature chain" (CTC), and deployment of new equipment financed by CCEOP, government or other sources. Most countries did not provide a detailed inventory of passive cold chain equipment.

Issue 9: Supply chain data management

Most supply chain data are missing and not used for planning. For years, through the CCEOP, HSS funds and other sources of funding, countries have been able to extensively deploy temperature monitoring devices (RTMD and 30DTR) at all levels of the cold chain. Temperature data allows close monitoring of the functioning of cold chain equipment. The monthly data on temperature alarms (30DTR) provide a simple way to monitor performance and maintenance. This enables immediate action to be taken to maintain the quality of vaccines, to assess maintenance efficiency and to plan for maintenance or replacement of poorly performing equipment.

None of the countries in this round used these data to establish cold chain rehabilitation plans and CCE replacements were driven by age or PQS compliance rather than actual performance. Reasons for the absence of temperature data can include the lack of a suitable information system and the lack of capacity at all levels to report or analyze these data for plan actions.

The possible future introduction of a COVID-19 vaccine will require considerable efforts by countries to ensure vaccine availability and quality through a flexible and performing supply chain. An efficient logistics management information system including a regular update of functional storage capacities will be essential.

Recommendations:

- Gavi Alliance partners to accelerate the slow progress in SC data systems implementation to better manage the supply chain, starting from ensuring that the CCEI provide live information status on each CCE and overall indicators of performance and maintenance. Temperature data should be included in the SC information system as a key indicator for immediate action and long-term planning.
- Gavi to consider including monthly temperature alarm data as a mandatory CCEOP indicator and use of temperature performance data over age to prioritize replacement.

Issue 10: Long-term passive containers (LTPCs)

LTPCs have a cold life of more than 30 days using ice instead of active energy. They offer a novel option for vaccine storage in specific settings, such as remote health facilities in less populated areas, and can facilitate greater immunization service mobility to better serve underserved communities. This equipment could play a major role in vaccination with the future COVID-19 vaccine. However, their role in the supply chain is not yet clear. For safe operation, LTPCs require monthly supplies of ice, personnel to implement new policies and guidelines, close supervision and monitoring, and adequate

funding. Often countries planning to use LTPCs (e.g. Myanmar in this round) do not describe such systems, nor a strategy to test their functionality. It is vital to monitor the effectiveness of these devices in improving access to quality vaccines in a sustainable way.

Recommendations:

- Countries are encouraged to develop a system for efficient use of LTPCs including policies, guidelines and training, ice production and transport capacities, monitoring and evaluation and proper funding
- Gavi Alliance partners to assess the use of LTPCs deployed under CCEOP, share findings and provide clear guidance to countries for their deployment.

Issue 11: EVM assessment

Some countries (e.g. Cambodia, Myanmar, Uzbekistan) conducted their last EVM assessment in 2015. These countries have postponed new EVM assessment due to travel restrictions on international technical assistance because of the COVID-19 pandemic and it is not clear when the situation will allow international travel in the future. Logistics management information systems in these countries are not strong enough to provide a clear status of supply chain performance, which challenges planned and ongoing CCEOP-funded CCE deployment.

Recommendations:

- Countries to consider conducting EVM self-assessment and developing a new improvement plan within the year to ensure optimal conditions for the deployment and sustainable operation of CC equipment within a strengthened logistics system
- Gavi Alliance partners to increase efforts for developing in-country capacity and skills for assessing, planning, implementing, and monitoring the immunization supply chain.

Issue 12: Waste management

The SIAs approved in this round require 305 million syringes that will generate major injection waste (15,948 m3) within a short period of time (Fig 1).

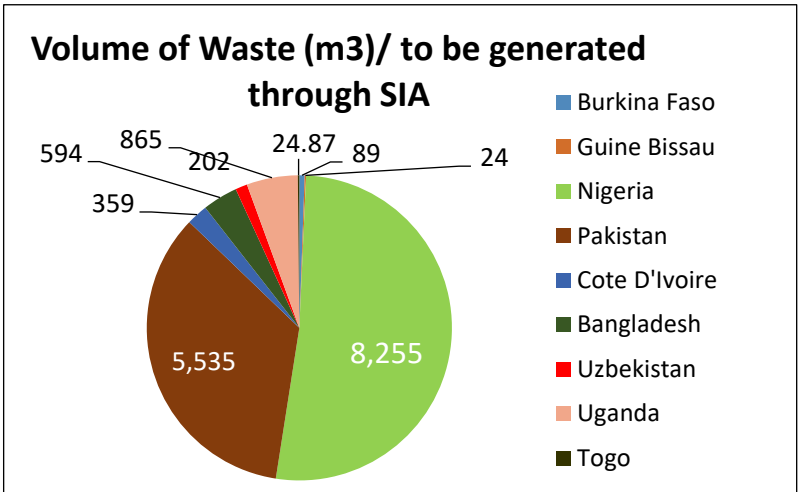

Fig.1 Countries generating waste with implementation of SIA according approved

More than 268 million children (and adults) will be vaccinated during planned MR and YF campaigns and an estimated 1,377 tons of immunization waste generated across countries. Côte d'Ivoire's was the only application to estimate waste volume for MR follow-up campaign and provide a comprehensive waste management plan. Nigeria provided a good mapping of incinerators for both Measles follow-up and YF campaign.

Implementation of adequate and sustainable waste management systems requires tools, procedures, equipment, training and supervision. A budget must be allocated to ensure this activity is effectively operational, which is the greatest challenge for programs. Deficiencies in waste management have been highlighted in previous IRC reports, and remain an ongoing concern. When there is no plan,

budget or industrial units (*foundry/smelters*), countries frequently opt for the simplest solutions: burning waste in pits and open spaces. This results in incineration without proper supervision, post-burning waste left accessible to surrounding populations, and involuntary accidents and environmental damage. All planned vaccination activities will take place in one or two years (2021 or 2022) leaving sufficient time for countries to develop plans that ensure safe disposal of waste and account for local resources (treatment technology options, legal requirements), exposed communities, and the environment.

Recommendations

- Countries should develop waste management plans to be implemented before the campaign starts and afterwards, to ensure safe waste disposal at central, regional and peripheral levels.
- Gavi Alliance partners should provide guidance and support to countries for conducting waste management situation analysis, including estimates of waste volume and development of a costed waste management plan for its destruction.

Budgets, Financial Management and Sustainability

This round the IRC reviewed 18 budgets from 8 country applications totaling US$191.9 million. The total amount requested from Gavi was $156.25 million, or 81.4% of total planned budgets. Three countries (Pakistan, Nigeria, Uganda) accounted for 89% of the total amount requested from Gavi, with the remaining 5 countries accounting for 11%. About 90% of the total amount requested from Gavi was for campaign operational costs and 10% for vaccine introduction. The breakdown of total funds requested from Gavi by antigen shows the following distribution: 41% for MR, 37% for YF, 12% for Measles, 8% for HPV, and 2% for Men A. Only two countries (Burkina Faso and Bangladesh) included partner contributions and 5 of 18 budgets presented 100% Gavi contributions.

Because of widespread mis-categorization of costs and activities in most budgets, any discussion of budget distribution between activities and inputs costs would be misleading at this aggregate level (see issue 14 below). Overall, while the IRC noted some improvements in the quality of budgets and budget pre-screening by the Secretariat, important difficulties persist that continue to affect budget quality.

Issue 13. Inadequate categorization of activities and costs resulting from errors and from inadequate guidance within the budget template

Cost categorization errors were observed in most applications. HR costs and transport costs were most frequently misclassified. For example, in Guinea Bissau and Cote d'Ivoire budgets, HR costs were often categorized under events and program administration, resulting in some of these cost groupings being artificially inflated (e.g. for Cote d'Ivoire 67% of total budget was classified as "program administration").

A new issue arising this round is some countries presenting budgets with no identified HR costs (e.g. Côte d'Ivoire, Guinea Bissau, Bangladesh, Uganda VIG budget). For example, a detailed examination of the Uganda VIG budget showed that 83% was in fact allocated to HR costs. Some countries may be burying HR costs under other categories to try to comply with Gavi budgeting guidelines.

Another misclassification issue observed was different cost inputs grouped under a single budget item. For example, Surveillance in the Pakistan budget was allocated US$1.69 million and included costs for training, printing, and external services. In Guinea Bissau, communication expenses were grouped

with events expenses. In Uzbekistan external professional services were grouped with communication costs.

While some of the above issues are due to categorization errors, others likely result from how countries interpret current Gavi guidance on categorization of activities and input costs. Requirements are scattered in different documents, e.g. HR policy document, budget guidelines, and the budget template. A key issue is confusion between inputs costs such as HR, transport and cold chain, and activity costs such as events and programme administration, all of which are used as cost grouping categories. To overcome this, costs should be classified separately - either as input costs or as activity costs - but not together as currently the case in the second summary table of the budget template.

Recommendation:

- Gavi to revise guidance to countries on classification of activity costs and input costs.
- Gavi to update the budget template to reflect classification changes and ensure that input cost groupings do not include any activity or sub-activity costs.

Issue 14: Lump-sum allocations, missing budget calculations assumptions and calculation errors

Lump-sum allocations, missing budget calculation assumptions, inadequate justification of inputs and costs, calculation errors and misalignment of budges with POA were present in most applications. For example, calculation errors in the number of vaccinations teams in the Pakistan application resulted in at least US$3 million inflation of the budget. In the Nigeria budgets, the number of vaccination teams needed per state was calculated based on a standard workload of a vaccination team (number of vaccinations per campaign period) and the size of the target population per state. However, the calculation of the standard workload assumed a 50%-50% distribution of the target population between urban and rural areas, the practical consequence of which was that states with greater urban populations would have a surplus of vaccination teams and those with greater rural populations would have a deficit. The size of the surplus or deficit in the number of vaccination teams will vary nationally according to the degree of urbanization of each state. The other consequence is that more funding would be allocated to states with bigger urban populations with potentially negative consequences for equity and achieving campaign objectives in rural states.

While reviewers can often identify and correct calculation errors and deficient calculation assumptions, there is little that can be done when underlying assumptions are missing or information is inadequate. This was particularly the case of the Uganda application, which included an excellent technical proposal but a very opaque budget of US$28.5 million with very little justification of the range, frequency, and scale of proposed activities and an apparent disconnect from the POA.

Recommendations:

- Countries to be required to demonstrate that budgets are aligned with POAs and to provide a programmatic rationale for the range, frequency, and scale of planned activities in a separate document as part of the applications.
- Gavi to pre-screen budgets for lumpsum allocations, missing budget calculations assumptions and calculation errors.

Issue 15: **Funding sources are not always disclosed and included in the budget**

Very few applications disclosed funding sources other than Gavi and government. In applications with essential activities that are not funded or only partially funded by Gavi, the likelihood of achieving POA objectives will depend on whether these activities will be funded from other sources. In addition, when planned activities appear to be adequately budgeted for, there is still a risk of duplication and that some of these activities may be funded from different sources at the same time.

Recommendation:

- Gavi to pre-screen budgets to ensure that all funding sources are included in the budget template.

Issue 16: **Share of HR costs**

The share of HR costs continues to be an issue in most applications. In this round, it exceeded the 30% Gavi ceiling in 7 of 8 country budgets. In some cases, the share of HR costs was more than 50%, as in Nigeria budgets, reaching 69% and 83% respectively in Uganda YF campaign and VIG budgets. This is not only a non-compliance issue, but also a financial sustainability issue as funding HR costs is primarily a country responsibility.

Of importance is the question of whether per diems, allowances and other incentives are considered by Gavi as HR costs. HR guidance in the budget template and the HR policy seem to provide different answers to this question. In addition, the 30% ceiling applies to all grants and does not consider specific HR requirements as dictated by different service delivery strategies (e.g. immunization campaigns versus routine immunization, HPV versus other vaccine introductions).

Recommendation:

- Gavi to update and clarify guidance on HR costs (per diems, transport allowances)
- Gavi to consider adapting HR guidance and ceilings for specific programs and service delivery strategies (Routine vs Campaigns / HPV vs others).

Issue 17: **Significant duplication of activities and costs in applications with more than one budget**

In applications with multiple funding requests, budgets are generally prepared separately for each intervention, with no attempts made to identify potential synergies and opportunities for integration. As a result, activities and costs are duplicated across budgets (e.g. as seen in this round for Bangladesh, Burkina Faso, Cote d'Ivoire, Nigeria, Pakistan, and Uganda). While it may sometimes be challenging, for operational reasons, to integrate the vaccine delivery components of two or more interventions, many common activities target the same people and can potentially be integrated, including but not limited to planning and coordination meetings, training of health workers, advocacy, communication and social mobilization activities, transport of vaccines and other supplies, and coverage surveys. Implementation of these activities will often repeatedly involve the same actors (e.g. officials, health workers, religious leaders, CSO, media), resulting in unnecessary burdens on all of them. Activity integration would therefore not only significantly reduce overall costs of planned interventions, but also lower the burden and absenteeism of staff and other actors involved. In addition, reducing meetings would be wise in the context of COVID-19. However, as long as budgets ceilings are calculated separately by antigen and not affected by whether activities are integrated, countries will

continue to have strong incentives to use all amounts in budget ceilings, often resulting in duplication of activities and costs.

Recommendation:

- Gavi to consider modifying the current incentives associated with budget ceilings and country entitlements to discourage duplication of activities and costs and encourage greater integration.

Issue no. 18: Budget review process

The budgets reviewed during this round were complex and extensive and the associated workload was heavy for just two reviewers. Some budgets included more than 200 Excel worksheets of variable contents and dimensions (e.g. Nigeria). The time initially allowed for budget reviews prior and during the IRC meeting was insufficient. Maintaining the quality of the budget reviews requires that sufficient time and reviewers be allocated based on number and complexity of the budgets submitted.

The budgets pre-screening helped to identify and address several inconsistencies, but many issues and errors were not captured in this process or not addressed by countries before final submission. As a result, the quality of budgets submitted to the IRC remains inadequate. The "budget analysis tool", recently developed by the Secretariat, provides good insights to reviewers about past budget statistics and metrics. However, the tight IRC schedule did not allow the reviewers to use the tool in this IRC round.

Recommendations

- Gavi to consider addressing the issues of workload and time allowed for budget reviews to ensure continued quality budget reviews
- Gavi to consider pre-screening of all budget submissions in all applications, regardless of the amount requested and allocate more resources to the budget pre-screening process

Governance

In total, 12 out of 13 countries submitting applications to the July 2020 IRC described an established ICC or equivalent (the exception, Niger, was a YF Diagnostics request that did not require ICC review) and 10 provided ICC ToRs. In 7 countries submitting ICC ToRs, membership included representation from CSOs (e.g. usually NGOs, often Rotary International). ICC functionality was indicated in 9 countries that submitted minutes of previous ICC meetings, though 5 countries only provided minutes of one previous ICC meeting. ICC endorsement of re-submission, a relatively new Gavi requirement, was included in all revised submissions. The IRC noted that ICC endorsement of the Burkina Faso revised submission appeared beneficial in ensuring an improved application.

11 countries have a NITAG, according to WHO/UNICEF JRF data, though TORs were only found in the application for 4 of them (i.e. Bangladesh, Nigeria, Pakistan, and Uganda). Two country applications reported being informed by NITAG recommendations (e.g. Bangladesh, Timor Leste). Only 2 countries reported that their NITAG reviewed applications prior to submission (i.e. Bangladesh, Uzbekistan).

Issue 19: Incomplete information on ICC or NITAG involvement in application preparation

It was not always easy to find complete information on the level of involvement of ICC or NITAG in application preparation and review. For example, Myanmar named every document either 'required document x' or 'other relevant document x' giving no indication of content. Similarly, it was not easy

to find complete information on the level of involvement of ICC or NITAG in application preparation and review.

Recommendation:

Countries to clearly summarize governance contributions (e.g. from ICC and NITAG) in section 3.5.3 of the application document so that this can be assessed more effectively during review.

Issue 20: Alternative governance arrangements for COVID-19

The IRC noted that ICC review and endorsement of applications generally improved proposal quality. The COVID-19 pandemic caused suspensions of many face-to-face meetings, which required additional creativity. For example, in Cambodia the ICC could not review and endorse the CCEOP application so it was reviewed by the ICC Secretariat who provided a non-objection letter. In Burkina Faso, the ICC met by videoconference to consider and approve the revised submission of the HPV application. The IRC noted, considering the emergency nature of the evolving pandemic, these approaches appeared to work sufficiently well.

Recommendation:

- Countries to continue to be flexible and creative in using rigorous remote governance when it is not possible to meet physically.

Technical Assistance

As Gavi does not usually provide TA, international partners (e.g. WHO, UNICEF, other multilateral and bilateral agencies, national and international NGOs) provide substantial technical assistance to countries in the development and implementation of vaccine introduction.

Issue 21: **TA needs are not described in a systematic or coherent way**

Technical assistance was not described in a systematic or coherent way in applications, perhaps because it is usually funded or provided directly by partner organizations. Plans of Action do not usually mention the usefulness of past or ongoing TA support or include details in budgets. It is thus difficult for reviewers to meaningfully assess the quality and likely effect of previous or proposed TA from country application documents.

Recommendation:

- Gavi to consider encouraging countries to disclose what TA support, if any, has been negotiated with partners prior to finalizing the application, so as to improve assessment of TA.

Yellow Fever Diagnostics Support

This is a window of support from Gavi for procurement and distribution of yellow fever diagnostics focused on 24 African countries at high risk for yellow fever and eligible for Gavi support. For this IRC, only one country (Niger) applied. Niger has not been performing testing for YF since 2009 and samples have been sent to the Regional Reference Laboratory (Institut Pasteur, Dakar, Senegal). Gavi support will provide opportunity to do YF testing again. The IRC noted that the country will need to invest in laboratory facilities and additional support including accreditation to ensure safe and high-quality testing.

The IRC has previously commended Gavi for providing this important surveillance support and encourages further Gavi investments to address key surveillance deficiencies for all vaccine-

preventable diseases. With the approval of the Niger application, since 2019 the IRC has now approved diagnostics requests for 21 of the 24 African high-risk countries eligible for Gavi support.

Issue 22: Investment in facilities and human resources for the national yellow fever laboratories

The IRC notes that for the countries to fully benefit from the YF diagnostic support so as to perform safe and high-quality testing, countries need to invest in laboratory facilities and human resources and develop long-term financial sustainability plans for the national laboratories, to get the full benefits of the YF diagnostic support.

Recommendation:

- Gavi to review if the investment made in YF diagnostics did catalyze increased country support and assess the outcomes of this unusual Gavi support for diagnostics. This could be particularly relevant in surveillance for yellow fever and other vaccine preventable diseases, as well as for the response to the COVID-19 pandemic.

Review Processes

The IRC has not been able to conduct face-to-face meetings in 2020 because of the COVID-19 pandemic. The 3-14 July 2020 meeting was the second time the IRC met virtually through videoconference. Some of the logistic difficulties experienced during the March 2020 meeting (loss of connections, poor voice quality) were resolved quickly and more familiarity with the communication software facilitated smooth running of the sessions. However, the difference in time zones remained a challenge. Attempts were made to facilitate exchanges and discussion among members by using available co-authoring and communication tools (OneDrive, Zoom, Skype).

The July IRC had a compressed schedule and all proposal reviews and plenary presentations were completed during a continuous 5-day period (Monday to Friday). With an average of two countries for each reviewer, the interval between plenary presentations was too short for subsequent consolidation of reports and further discussions.

Issue 23: Scheduling of plenary discussions for the IRC members:

The continuous 5-day plenary reviews and discussions did not provide adequate time for incorporation and immediate revisions of the draft IRC reports, as each IRC member had at least two presentations to make to the plenary during the 5 days.

Recommendation:

- Gavi to adapt the format of the regular IRC, with spacing that has a weekend in between, for any future virtual IRC meetings to provide enough time between plenary presentations of applications for immediate consolidation of comments into draft reports.

COVID-19

The COVID-19 pandemic has disrupted the delivery and uptake of immunization services in many countries, endangering the gains made in the past decades in increasing immunization coverage and VPD control. The risk of outbreaks will increase as immunization coverage drops, especially for measles where important pockets of zero-dose children remain. The disruptions affect both supply (delivery of RI services and campaigns) and demand (restrictions in movements and the fear of infection by caregivers) for immunization services.

Countries are increasingly adapting their delivery strategies and implementing existing measures that allow immunization services to continue in safe and effective ways even during the pandemic. For example, Cambodia reported data comparing coverage for the first 5 months of 2020 compared to 2019 showing maintained and even increased coverage for some scheduled activities; they are also one of the few countries to have prevented local spread. Gavi and partners can play a critical role in learning and sharing ways to maintain essential services during this pandemic and for future public health emergencies in a world with increasing complexity and commercial focus and in the context of accelerating climate change.

The applications did not require specific information on COVID-19, but several countries described in their proposals the initial disruption caused by the pandemic and how it affected proposal development and future implementation. The main challenges included:

- Ongoing difficulties for the program and partners to meet in person with stakeholders and secure the required external technical assistance.
- Since March, Gavi Secretariat staff could not visit their assigned countries, though regular meetings could be held virtually.
- Some ICCs and NITAGs could not meet to review and endorse the proposal, though a few resorted to virtual meetings and email approvals.
- In some countries, essential activities in support of the proposal development and future implementation were delayed, including: cMYP finalization, EVM and DQA assessments, PCA assessment and follow-up visits, and CCE procurement.
- Some countries mentioned the possibility of vaccine stock-outs.

Four countries described in their applications the expected impact of the pandemic and three countries included information on plans and activities to mitigate the impact of the pandemic on immunization.

Issue 24: Disruption of Gavi processes and procedures due to the pandemic

In addition to disrupting the delivery and access to immunization services, the COVID-19 pandemic will impact on Gavi processes and procedures in providing support to countries in ways that are currently difficult to foresee. It is likely that several planned activities will need to be postponed and that estimated targets will have to be revised based on the evolution of the situation at the time of implementation. This might result in additional unforeseen requirements and costs. There will be ongoing costs and resources needed to deliver immunization with adequate infection prevention and control actions. This calls for increased attention on making the best and most efficient use of Gavi resources to ensure that plans can be completed, and targets achieved, despite the challenges of the pandemic.

The IRC commends the efforts of the Secretariat to establish systems and a dashboard to monitor the impact of the pandemic on immunization services and for developing the Immunization Maintain and Restore strategy.

Recommendations:

- Gavi and partners to continue to monitor the evolution of the pandemic's impacts on immunization services including Gavi-supported activities and disburse support with maximum flexibility to allow adaptation to the changing needs of countries.

- Gavi to ensure that grants (already provided or planned) are used in the most effective and efficient way to achieve its mandate of saving lives through vaccines, including planning for the pandemic vaccine that could be available before year end.

Best Practices

The IRC noted some best practices described by countries in key planning and implementation areas. These could be shared with countries to inspire them to focus on improving these key areas.

Data Quality and Use

- **Togo** – used surveillance data to target MenA campaign, limiting the campaign to those regions with a history of MenA outbreaks prior to 2014 campaign while introducing MenA vaccine into routine nation-wide.
- **Uganda** - updated its targets to include refugee populations, which will enable better planning and coverage monitoring.

Coverage and Equity

- **Cote d'Ivoire and Togo** - listed vulnerable populations and described specific strategies for targeting them in a table format as recommended by Gavi.
- **Uganda** - Described a strategy to improve performance of immunization services through the use of school children to send information to their parents, mobile vans to disseminate information on the campaign in urban slums and high populated area, and House-to-house canvassing and outreach in urban slums.

AEFI management

- **Pakistan** MR campaign - set-up an ambulance deployment system to support the AEFI focal point and the response to AEFI, with a planned mock exercise to be conducted one week before SIA to ensure that procedures are understood, and the ambulance system is in place and working.

Budget and Finance

- **Nigeria** - presented a transparent budget with all necessary details about calculation assumptions of activity volume and input costs. While still requiring corrections and modifications, this was a highly transparent budget, which is rarely the case.

Conclusions and key messages

The conclusions focus on key areas and topics that emanated from the review that the IRC agreed should be emphasized.

- **Need for targeted strategies for reaching zero-dose children**. Most countries provided information about vaccination coverage and high-risk populations but did not use the information to develop and test tailored strategies for reaching zero-dose children.
- **Inadequate use of surveillance and outbreak response data to identify underserved populations**. Countries are not using data from disease surveillance (e.g. fever/rash, AFP, confirmed cases, etc.) or analyzing data from outbreak response to identify underserved populations.
- **AEFI data increasingly collected, but not analyzed.** Countries should be encouraged to include reporting and analysis of AEFI data in their applications.
- **Equity analyses are being conducted but the information is not used to inform strategies.** Most

countries use equity analyses to identify districts and areas with low immunization coverage; however, specific strategies to address the coverage and equity gaps identified in the analyses were not apparent in the plans of action submitted for review.

- **Waste management is a persistent problem, not limited to campaigns.** Most countries provide insufficient emphasis or budget for waste management. This should be rectified and Gavi could assist countries in development and testing of environmentally friendly long-term solutions.
- **Quality of budgets is generally improving, with some good practices emerging, though significant difficulties persist**. The IRC noted improvements in the quality and completeness of budgets, in part due to improved Secretariat pre-screening of proposed budgets. However, issues like inadequate categorization of activities and costs, lumpsum allocations, missing budget calculations assumptions, calculation errors, and duplication of activities and costs remain common. Gavi should update and clarify the budgeting and costing guidance provided to countries and continue strengthening the Secretariat budget pre-review processes.
- **COVID-19 will continue to disrupt immunization services and challenge the support provided by Gavi and partners**. This will affect the implementation of Gavi-supported activities and processes in ways that cannot be currently foreseen. Effective solutions are available to ensure continuity of Gavi support to immunization programs and help maintain adequate coverage levels.

Acknowledgements

To the Gavi Secretariat

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Big thank you to the FD&R Team: Lindsey; Verena, Sonia, Anjana. This review would not have been possible without your cooperation and assistance at every stage.

All SCMs, Focal Points, Finance Team Members – your pre-screening and comments during the plenary sessions were timely and valuable, often providing country level perspectives that were immensely useful, especially during the final decision-making steps. The IRC remains grateful and looks forward to your continuing cooperation and assistance.

The IRC is grateful to the IT team that ensured that this second virtual IRC meeting could be successfully conducted.

To Alliance Partners WHO and UNICEF

Immense gratitude to our key, dependable Technical Partners, WHO and UNICEF. You were always there, especially with clarifications on global policies and strategic issues.

Annex 1: List of IRC Members

Name	Nationality	Profession	Gender	Review languages	Relevant expertise
Caric, Aleksandra	Croatia	Independent consultant	F	EN, FR	Measles, AEFI surveillance and vaccine safety, programme management
D'Alva, Henrique	Portugal	Independent Consultant	M	EN, FR	Supply Chain and Logistics
Hersh, Bradley	USA	Independent consultant	M	EN, FR	Health policy, epidemiology, immunisation/NVS, outbreaks, campaigns, measles, and rubella control
Howard, Natasha	Canada, UK	Associate Professor, National University of Singapore and London School of Hygiene and Tropical Medicine.	F	EN, FR	Fragility, Emergencies, Refugees, HSS, HPV.
Izurieta, Hector	USA/ Uruguay	GS15 Epidemiologist, U.S, Food and Drug Administration	M	EN, FR	Epidemiology of vaccine preventable diseases, vaccine effectiveness and safety. Control and elimination of measles, rubella, meningitis, cholera and other diseases.
Jaillard, Philippe	France	Independent consultant	M	EN, FR	Supply chain and logistics
Kaucley, Landry	Benin	Director of Logistics, National Agency for Vaccination and Primary Health Care, Benin	M	EN, FR	Supply chain and logistics
Khrouf, Wassim	Tunisia	Certified Accountant/ Independent Consultant	M	EN, FR	Budgeting, Financial Audit, Accounting, Management and International Donors' Grants, Governance
Lazzari, Stefano *INTERIM CHAIR*	Italy	Independent Consultant	M	EN, FR	Outbreak, epidemic and emergency response, HSS, monitoring and evaluation, grant management
Lymo, Dafrossa *VICE-CHAIR*	Tanzania	EPI Manager	F	EN	Program Management, HSS, RI, Surveillance, M&E
Mansoor, Osman David	New Zealand	Medical Officer of Health, Tairawhiti DHB, NZ	M	EN, FR	Measles, epidemiology, Programming, CCL
Miller, Mark*	USA	Independent Consultant	M	EN,	Biomedical and Health Outcome research, Infectious Disease/Vaccine Development, Epidemiology Modelling, Health Economics
Nkowane, Benjamin	Zambia	Independent Consultant	M	EN	Measles, epidemiology, mass vaccination campaigns, technical support for field operations in risk areas
Tibouti, Abdel	Morocco, Canada	Independent Consultant	M	EN, FR	Financial and Budget Analysis, Health Economics, Health Financing Strategies, Program M&E
Tsu, Vivien	USA	Clinical Professor, University of Washington, Seattle	F	EN, FR	Epidemiology, New Public Health Interventions, Women's Reproductive Health, HPV, JE
Wilkins, Karen	USA	Independent Consultant	F	EN, FR	Routine immunization, measles, polio, surveillance, planning & evaluation

* New Member