REPORT OF THE NEW PROPOSAL INDEPENDENT REVIEW COMMITTEE TO THE GAVI ALLIANCE SECRETARIAT ON THE REVIEW OF APPLICATIONS

GENEVA, NOVEMBER 2016

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List of Acronyms

AEFI	Adverse Effects Following Immunisation
CC	Cold Chain
CCEOP	Cold Chain Equipment Optimization Platform
CCL	Cold Chain Logistics
CHW	Community Health Care Worker
cIP	Country improvement plan (cold chain)
cMYP	Comprehensive multi-year plan for immunisation
CSO	Civil Society Organization
DTP3	Diphtheria-Tetanus-Pertussis vaccine, 3rd dose
DQA	Data Quality Assessment
EPI	Expanded Programme on Immunization
EVM	Effective Vaccine Management
HPV	Human Papilloma Virus
HR	Human Resources
HSCC	Health Sector Coordination Committee
HSSP	Health Sector Strategic Plan
HSS	Health Systems Strengthening
ICC	Inter-Agency Co-ordination Committee (for immunisation)
iCCM	Integrated Community Case Management
IPV	Inactivated Polio Vaccine
IRC	Independent Review Committee
ISCL	Immunisation Supply Chain and Logistics
JA	Joint Appraisal
JRF	Joint Reporting Form (on Vaccine Preventable Diseases, WHO / UNICEF)
MCV	Measles Containing Vaccine
MMR	Measles, Mumps and Rubella vaccine
MNCH	Maternal Neonatal and Child Health
MenA	Meningococcal A vaccine
MoH	Ministry of Health
MR	Measles-Rubella vaccine
MSD	Measles Second Dose

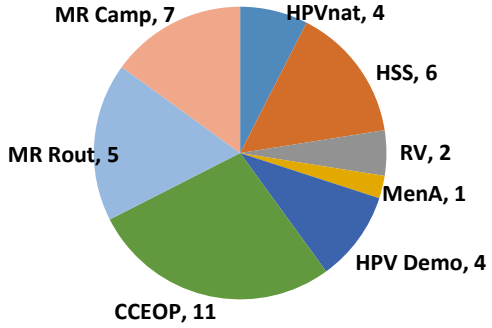
NITAG	National Immunisation Technical Advisory Group
NLWG	National Logistics Working Group
NRA	National Regulatory Authority
NVS	New and underused Vaccine Support
OPV	Oral Polio Vaccine
PCV	Pneumococcal Conjugate Vaccine
PEF	Partners Engagement Framework
PSR	Programme Support Rationale
RI	Routine Immunisation
RV	Rotavirus Vaccine
SAGE	Strategic Advisory Group of Experts on Immunisation
SCM	Senior Country Manager
SDD	Solar Direct Drive (vaccine refrigerators)
SDG	Sustainable Development Goals
SIA	Supplementary Immunisation Activities
TA	Technical Assistance
VIG	Vaccine Introduction Grant
VPD	Vaccine Preventable Disease
VVM	Vaccine Vial Monitors
WUENIC	WHO and UNICEF Estimates of National Immunisation Coverage

INTRODUCTION

This final report of the November 2016 IRC review meeting contains an analysis and summary of the main findings of the key thematic areas. It also highlights key issues and specific recommendations. An effort has been made to capture the richness of the IRC discussions during the review period. The 29-member November IRC was chaired by Bolanle Oyeledun (Nigeria) and co-chaired by Miloud Kaddar (Algeria).

BACKGROUND

Figure 1:

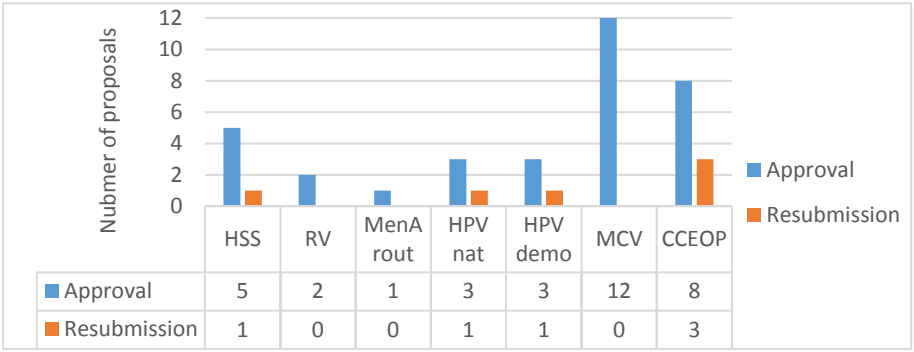


During the November 2016 review meeting, the IRC reviewed a total of 40 applications from 29 countries. 11 of these applications were for the CCEOP **(Figure 1).**

Methods: The review approach differed during this review window due to the number of applications received with the introduction of two daily plenaries. The daily plenaries were preceded by independent peer review. All findings were fully discussed at the plenaries before consolidation into single country reports.

Decisions remain based on two main decision categories – **Approval** with issues (if any) to be addressed and **Resubmission** with explanations. The review criteria remained as for previous windows. However, additional consideration was provided for countries with exceptional catalytic support for HPV vaccine. These were proposals that did not qualify for approval but cannot be resubmitted because the country is transitioning from Gavi support.

Figure 2 : Approval rates



	HSS	RV	MenA rout	HPV nat	HPV demo	MCV	CCEOP
Approval	5	2	1	3	3	12	8
Resubmission	1	0	0	1	1	0	3

Overall approval rate for all proposals (34 out of 40) reviewed is 85%. The CCEOP window has a 75% approval rate compared to 50% of previous windows.

What's working...

Better governance mechanisms: The IRC noted that ICC bodies are in place in almost all countries and are making progress. 13 country applicants report having a NITAG. However, it is unclear how functional these governance bodies are. It is critical for Gavi and partners to continue to provide guidance and assistance to countries to further strengthen their functionality.

During this review period, the IRC identified innovations either in place or proposed by countries. It is important that technical partners support countries to further evaluate these innovations and scale up where effective. Examples include:

- **Côte d'Ivoire:** Role of CSO in mentoring children through the "One sponsor for 100 children to be immunised" initiative. Pilot phase of the roll out in two districts produced very convincing results. Drop-out rates fell from 52% at the start of the project to 27% at the end of the project. The country has considered scaling-up in 29 health districts to capitalise on these achievements and early learnings.

- **Sri Lanka:** NITAG equivalent is very strong as they had ensured full buy in from various stakeholders prior to the HPV introduction; their AEFI notification systems are well in place; and they have planned for any emergency situation during the introduction at schools with ensuring availability of medical staff and emergency medicines at all centres. For the few girls who may be missed through their school system, the current public health system with public health workers will ensure that these girls are not missed. One of the best planned HPV introductions, other countries can learn from this experience. Sri Lanka is quite unique with their excellent public health system with strong leadership and has been reporting confirmed 99% coverage for almost all their antigens across the country.

- **Burkina Faso:** An initiative is described aiming to involve CSOs in performing random checks/controls on vaccine availability at health district levels.

The IRC noted significant improvements in Secretariat and partner engagement: There is increased responsiveness and better country level engagement by Gavi Secretariat as evidenced by prompt revision to guidelines based on new learnings; better engagement at country level by SCM and other Secretariat staff as demonstrated by the quality of programming, reporting and joint annual reports. The IRC commends the responsiveness of the HSIS team especially in addressing previous guidelines challenges for CCEOP.

IRC Work Process: Numerous briefings and a new member orientation were held during this review. Whilst these provided a platform for new IRC members to understand Gavi operations, the two days were extremely intense and loaded. There is a need for future orientations to be more structured; focused and needs based. Concurrent daily plenaries further helped to reduce work load and ensured quality review of country applications.

Recommendations for Gavi Secretariat:

- Institute better planning and more practical hands-on approaches for new member orientation;

- Streamline Secretariat and partner presentations to focus on updates and "must know" information;

- Explore a peer support mechanism during orientation/ briefings.

New and underused Vaccine Support(NVS) and Campaigns

16 countries submitted proposals requesting support from Gavi for introduction of new and underused vaccines in the current November, 2016 IRC meeting. The proposals submitted were for introduction of measles (1st or 2nd dose as MR) vaccine, HPV (national, demo) vaccine, Rotavirus and Meningitis A vaccines.

Five countries (Lao PDR, Cameroon, Solomon Islands, Mozambique, Côte d'Ivoire) applied for introduction of measles-rubella vaccine in their routine immunisation (RI) programme, eight countries applied for introduction of HPV vaccine (Georgia, Guyana, Senegal, Sri Lanka, Moldova, Armenia, Congo, Angola), two countries applied for rotavirus vaccine (Bangladesh, DRC) and one for Meningitis A vaccine (Gambia). The IRC approved all the proposals except for Congo and Angola, both of which were applying through the Gavi exceptional catalytic support provision.

Table 1: Summary of NVS application outcomes

Country	Vaccine	IRC Recommendation
Angola	HPV National	Resubmission*
Armenia	HPV Demo	Approval
Bangladesh	Rotavirus	Approval
Cameroon	MR2	Approval
Congo	HPV Demo	Resubmission*
Côte d'Ivoire	MR1	Approval
DRC	Rotavirus	Approval
Gambia	Meningitis A	Approval
Georgia	HPV Demo	Approval
Guyana	HPV National	Approval
Lao PDR	MR2	Approval
Moldova	HPV Demo	Approval
Mozambique	MR1	Approval
Senegal	HPV National	Approval
Solomon Islands	MR2	Approval
Sri Lanka	HPV National	Approval

* under current Gavi policies, there is no opportunity to resubmit.

Some key issues noted by the IRC are outlined below:

Issue 01: Measles vaccine coverage rates lag far behind global targets. Although progress has been made in controlling measles globally there is still a need for more focused effort to meet WHA, 2010 recommendation to reduce the measles mortality rate by 95% and to meet the objectives of Global Vaccine Action Plan (GVAP) for elimination of measles in 4 WHO regions and rubella in 2 WHO regions originally targeted for 2015.

Recommendation: The current Gavi requirement of DTP3 (latest WUENIC) coverage ≥70% and MCV1 (latest WUENIC) ≥80% or measles campaign coverage ≥80% (by high quality survey) should be dropped in line with the October, 2016 SAGE recommendations. Gavi may also consider providing one time support

for the introduction of measles second dose to countries that have transitioned from Gavi support to incentivize this global effort.

Issue 02: Inadequate epidemiological and surveillance data for prevalence of measles and rubella in the country and impact of past campaigns on controlling the disease and lessons learnt. For countries like Cameroon, the cases of measles were reported inconsistently in various documents while most the countries were yet to initiate the CRS surveillance for rubella.

Recommendation: Countries should undertake a detailed epidemiology and risk assessment at national and sub-national level to determine disease burden and identify high risk regions. It would be useful if separate funds are allocated by Gavi to encourage countries for developing such strong epidemiology and sero-surveillance data for measles and rubella outbreaks, which would help in identifying key geo-socio-economic factors associated with disease prevalence. Gavi Alliance and partners should also assist countries in developing suitable protocols and in undertaking such activities so as to harmonize and ensure consistency of data coming from the countries.

Issue 03: Availability of MR vaccine can become a bottleneck jeopardizing the countries vaccine introduction timelines. In the current IRC review meeting, many countries intended to introduce either MR2 or both MR1 and MR2 in their routine immunisation programmes, while equally high number of transition phase countries wanted to undertake MR campaign in 2017 as this was their last chance to get Gavi grants with lower co-financing. Thus it may create a supply and demand pressure, given there is a single approved manufacturer at present.

Table 2 : List of countries proposing MR vaccine introduction in 2017

Country	Date of introduction	Introduction
Angola	October, 2017	Campaign
Cambodia	October, 2017	Campaign
Cameroon	July, 2017	MR2
Congo	November, 2017	Campaign
Côte d'Ivoire	January, 2018	MR1/Campaign
Lao PDR	May, 2017	MR2
Mozambique	October, 2017	MR1/ Campaign
Senegal	November, 2017	Campaign
Solomon Islands	January, 2018	MR2
Tajikistan	September, 2017	Campaign

Recommendation: Gavi along with UNICEF SD should plan the actual dates of vaccine delivery and notify the countries accordingly so that they can plan the vaccine introduction timelines more appropriately without compromising their other routine immunisation programmes.

Issue 04: Importance of school linkages for HPV vaccine even when not using school based delivery for the vaccine: One country during this IRC round (Georgia) proposed administration of the HPV vaccine at

health facilities, but did not specify plans to leverage the high number of girls in school to increase vaccine uptake (i.e. using schools to facilitate sensitization and mobilization of parents/communities, assisting with vaccination call/recall mechanisms, etc.).

Recommendation: Countries that select a non-school based delivery strategy for HPV vaccination should establish strong linkages with schools to increase vaccine uptake, especially in contexts where school enrolment is high.

Issue 05: Countries applying for support through the exceptional catalytic support provision do not have the opportunity to resubmit their applications (e.g. Angola, Congo).

Recommendation: Gavi should consider allowing countries eligible for HPV exceptional catalytic support to resubmit their applications to encourage introduction of this life-saving vaccine into routine immunisation programmes.

Gender and Equity

Issue 06: Lack of plans/Inconsistent use of equity and coverage plans in country proposals and design of implementation services:

The Gavi Strategy 2016-2020 calls for removal of "barriers to immunisation particularly those related to wealth, geography and gender, to make sure we reach all children". Gavi therefore states in the guidance to countries that reviewers will be looking for "Robust analysis of barriers related to equity in access and utilisation of immunisation services (including socio-economic, geographic and gender issues) and clear linkages with programmatic actions to address these issues."

In the review of the proposals from 29 countries presenting in November 2016, only three countries based their proposals on a robust equity analysis. Another 12 countries provided a partial equity analysis, for example, described problems with hard to reach groups, but most of these did not demonstrate clear linkages between the analyses to the actions proposed. However, half of the proposals did not include "a robust analysis".

So while Gavi guidance documents reflect the greater focus on equity, proposal templates are still not asking for comprehensive information and, for the most part, countries do not attach their equity strategies. Gavi and partners need to invest in capacity development on generating, analysing, and using quality sub-national equity data for equity-oriented interventions in the context of immunisation.

Furthermore, the findings and recommendations of the IRC cover a set of interlinked issues that will require engagement of the senior levels of the MoH and government to address satisfactorily. A robust equity analysis can be accomplished in the short-term by a survey, but monitoring progress towards equity requires strengthened administrative data from a robust HMIS, as well as mapping each donor's support. Data quality is a sector-wide affair that improves as immunisation is integrated into a strong DHIS2 that reaches the facility level. However, there is clearly a need for the Gavi SCM and Alliance Partners to engage in dialogue on equity with countries and address the quality of equity strategies in Joint Appraisals and in screening proposals. The IRC noted more reference to equity issues in WHO pre-review.

The IRC is concerned that there is not enough learning being shared on how attention to gender and equity improves outcomes. It would be useful for Gavi staff, Alliance partners, and countries if there were

more case studies on equity issues and approaches that identify local bottlenecks and local solutions. For example, one country has developed an approach called "one sponsor for 100 children to be immunised" which involves community members in working with parents and actively searching for dropouts. Does this approach enable the immunisation of the more difficult to reach? What are the most successful strategies for reaching out of school girls with HPV vaccination?

With regard to the new Country Engagement Framework (CEF) process, there are real opportunities for discussing equity analyses and approaches in harmonization meetings. As well, Gavi should develop equity-related tools/guidance/checklist for countries preparing key CEF documents because these documents will be guiding activities over a five year period – and experience shows that equity is hard to retrofit.

Recommendations

- Gavi and partners should invest in capacity development, including for Gavi staff, on developing and using quality national /sub-national equity data in the context of immunisation.
- Gavi should develop equity-related tools/guidance/checklist for countries preparing key CEF documents
- Proposal templates, including those related to the CEF, should be modified to ask clearer strategic questions related to achieving equity in coverage

Table 3: Summary of proposals on campaigns reviewed by November 2016 IRC

	Country	Campaign Type	Recommendation
1	Angola	MR catch-up	Approval
2	Cambodia	MR follow-up	Approval
3	Congo	MR catch-up	Approval
4	Côte d'Ivoire	MR catch-up	Approval
5	Gambia	Meningitis A	Approval
6	Mozambique	MR catch-up	Approval
7	Senegal	MR follow-up	Approval
8	Tajikstan	MR follow-up	Approval

Issue 07: Detailed epidemiologic analysis of measles and rubella status for countries requesting support for MR follow-up or catch-up campaign support.

Of the seven applications for MR campaign support, three were for follow-up campaigns and four were for catch-up campaigns. In general, they were of good quality and fulfilled the minimum requirements for submission. However, one area of common weakness was the lack of detailed epidemiologic analysis to inform the timing, target age group, and geographic extent of the campaigns. The recent mid-term review for the Measles & Rubella Global Strategic Plan 2012-2020 highlighted the need for MR activities to be increasingly based on good quality data and appropriate analysis.

Recommendation: Gavi Secretariat and TA partners should support countries in ensuring all MR submissions include a detailed epidemiologic analysis of cases and modeling to justify the campaign timing, target age range, and geographical scope. This analysis should also include subnational surveillance data, vaccination coverage, risk factors, and previous Measles/MR campaign performance.

Issue 08: Updated epidemiological information for requests for Meningitis A vaccination campaigns:

One application (Gambia) was submitted for a one time mini catch-up campaign planned for July 2017 to cover a birth cohort of children 1-5 years of age who did not receive the first dose of MenA vaccine during and after the 2013 campaign. This one time campaign will be followed by introduction of the vaccine into the routine programme at the same time as MenA. The application provides justification for the chosen strategy for the one-time campaign but does not provide an update of the epidemiology of meningitis since the last campaign was conducted in 2013. This is critical as there are often epidemiological shifts and risks, including the serotypes of MenA circulating.

Recommendation: Gavi Secretariat and TA partners should support countries in ensuring all applications for meningitis campaigns and vaccine introduction requests should be accompanied by an up-to-date epidemiological analysis of the meningitis situation in the country as well as serotype distribution of the cases.

Technical Assistance/Partnership Engagement Framework

For the last couple of years IRC meetings, TA issues have been highlighted with many recommendations. Most important issues that raised concern: limited design, absence of specific TA plan, insufficient coordination within in-country partners, non-systemic approach, non-project life-cycle related, insufficient monitoring and evaluation. All those issues and recommendations are progressively but not sufficiently taken into consideration in proposals.

TA needs expressed are very diverse and vary from country to country with a wide range of domains and activities. Among others, the following areas are frequently concerned: proposal development (HSS and HPV); governance (strengthening of EPI management capacity, strengthening of decision or advisory bodies); development of national health strategic documents; data quality, monitoring and evaluation activities; planning and activities implementation, etc.
During this IRC session, two main observations have been raised:

1. Three critical domains need more TA:

   - ✓ **Country gender and equity analysis**: for baseline studies, detailed and systematic analysis approach
   - ✓ **CCEOP:** as new technologies, computerized devices and system design complexity are concerned
   - ✓ **Data quality analysis:** non-systematic, inconsistently addressed in proposals.

2. There are some countries that need global TA plan designing due to the facts that they are low performing or facing some challenges (proposal resubmissions, and «last chance» of submission). These are for example: Chad, Angola, Congo, Solomon Islands, etc.

Issue 09: Transparency in TA
Selection process of Consultants for TA is not clear. International or local Consultants engaged by partners may not be the right choice for the identified tasks. In some cases, the local or national Consultant is part of the programme staff, with less independence or objectivity.

Recommendation: TA partners and country representative should ensure transparency in the identification and selection of international or local Consultants with relevant knowledge and skills required. A specific Terms of Reference with clear deliverables for the needed TA should be developed and the consultancy position advertised to ensure a wider selection of Consultant.

Issue 10: Sustainability and efficacy of TA

TA is focused on a specific programme area such as HSS, supply chain, data quality, coverage and equity, sustainability etc. There is no sustainability for the TA requested. On the other hand, it was not mentioned who is going to pursue the achievements gained by the TA.

Recommendation: TA should be designed to be a component of the overall support package for the countries. It should be mandatory that at least one qualified government counterpart needs to be identified, with subsequent resources, to work with the Consultant. This will build the capacity of the counterpart to be able to sustain progress made in the implementation of programme activities.

Issue 11: PEF (Partnership Engagement Framework) elaboration process: PEF elaboration process seems not to be inclusive, as there is neither activity mentioned in proposal nor signed report to describe how different parties negotiate or engage together for the project. Therefore, there is risk that PEF not to be fully used by countries and partners.

Recommendation: In-country elaboration process of PEF should be fully documented. Like the ICC, attendance list of partners engaged and the report of PEF endorsement meeting should be provided.

Lastly, **« PEERS TA»** was suggested as an innovative TA assistance approach. Personnel or experts from countries that have registered success stories in designing, innovative approach, planning or implementation of their project (proposal elaboration, grant management, etc.) can be used as consultants for TA in countries in same situation.

Health Systems Strengthening

In this November 2016 round the IRC reviewed five HSS application and one request for bridge funds, for the special case of Chad. The IRC noticed some positive developments and identified two main issues of concern.

Positive developments: All HSS proposals reviewed by the IRC are aligned to National Health Development Plans. The inclusiveness and participation in country seem to be with wider engagement of MoH and health partners in the development of HSS proposals. There are clear signs of improved country dialogue, a very positive result of the JA process and closer relationship between the Gavi Secretariat and the country.

Issue 12: The HSS proposals lack innovation and mostly repeat the approaches of previous HSS grants. The new HSS proposals (all HSS2 and for Burkina Faso HSS3) seem to miss opportunities to build upon the experience of previous grants and on locally generated ideas and solutions, they rather re-propose business as usual, even in countries in preparatory transition phase. Where used, local solutions produced interesting results and strong cases for scale up, such as the CSO initiative of mentoring children in Côte d'Ivoire, piloted in two districts and now being proposed in 29 districts. However, the general approaches for all HSS proposals appeared too cautious, repeating usual activities without real evidence of their value.

Recommendation: HSS applications (subsequent to HSS1, as all are) should foster innovation and build on the specifics of local contexts for strengthening health systems. They should be informed by previous

achievements, rather than gaps, incrementally promoting the use and continuous development of local capacities, both in government and non-government stakeholders, in a wide range of functions including service delivery and monitoring.

Issue 13: HSS in countries approaching transition: It should be a decisive support to build capacity and sustainability in view of transition, developing local potentials and encouraging locally made solution. But in many cases this does not happen. Some countries are applying for HSS2 or 3 but without building on previous achievements. Examples include Côte d'Ivoire (HSS2), Mauritania (HSS2) and Solomon Islands (HSS2) in preparatory transition phase; Burkina Faso (HSS3) and Somalia (HSS2) in initial co-financing.

Recommendation: Technical assistance should not be used to perpetuate usual solutions but it has a critical role in fostering the development of local potentials and generating locally relevant innovations. Especially in countries approaching transition, technical partners can provide a decisive support to build capacity and sustainability of health systems.

Issue 14: Synergies between HSS and CCEOP applications could be better designed and have to consider potential challenges. The HSS grants are critical for the effectiveness of CCEOP grants in improving coverage and equity. In fact, HSS proposals should consider all the necessary elements of effective vaccine management (of which cold chain equipment is one) and related system design; HSS funds are expected to provide the managerial component for CCE, other equipment not eligible on the platform, trained staff, demand generation, actually the whole range of activities and capacities for the new CCE to be effective. In addition, HSS funds cover the 20% or 50% required co-investment in the platform. The issues are related to these challenges: the links and sequencing between HSS and CCEOP applications are not adequately tuned. Very high CCEOP application requests pose a heavy burden on HSS grants; the risk is emerging to have HSS applications more narrowly focused on CCE, overlooking the wider supply management system and all other health system components.

Recommendations:

- Encourage a wide health sector support vision in the HSS proposals, with CCE rightly placed within the supply management system and without detracting attention from other key health systems components (HR, data, governance, financing).
- Promote better alignments (in time and programme) between HSS and CCEOP, and every possible synergies (e.g. embedded management, synergic trainings, harmonized workforce).
- Ideally, CCEOP required co-investments should come from sources other than the HSS grants, especially in countries in transition.
- The Technical assistance should help the country in positioning new equipment and logistics within the wider HSS support, motivated by, linked to and fully exploited for the improvement of coverage and equity.
- Proper harmonization between HSS and CCEOP is critical for the continuity of Gavi business model: CCEOP proposal should be commensurate to the country capacities and the Gavi HSS support, a disproportion would risk to drive away from the core business to increase vaccine coverage and equity. Such a holistic approach mandates coherent and well-aligned donor support. Mapping external support is important, but the focus must also be on helping the MoH lead and manage harmonization, to promote government accountability for rational domestic investments that move from donor dependency to sustainability, especially for recurrent costs. For instance; only the Minister of Health can convene a sector-wide harmonization workshop that is politically endorsed and

linked to domestic funding decisions. The aim of harmonization should be to focus and leverage GAVI support with that of the Global Fund, other donors', and domestic investments to build up the foundations of critical service delivery areas such as: improved data quality; community services (e.g. using CHWs/iCCM to increase immunisation demand); cost-effective and robust supply and cold chains; and a pro-equity coverage strategy that is efficiently coordinated with all health outreach efforts.

A special case: Chad bridge fund: The value of Gavi contribution in this peculiar case can be very relevant for strengthening institutional capacity, as a catalytic support to the coordinating functions of the MoH in a phase of strategic planning in the country health sector.

Cold Chain Equipment Optimization Platform

The large number of CCEOP applications submitted in its first year of operation confirms the important need for CCE in countries. The recommendations of the previous IRC remain largely relevant and need to be further considered. The IRC proposes that there is a need to adjust both the process and content of CCEOP applications to better meet the Alliance's aim to add new vaccines and increase coverage equitably. In addition, there is a need to evaluate if (1) the bundling process is getting functioning CCE in place; and (2) monitoring systems have been established to provide data on field performance meeting the expected quality and duration of CCEOP equipment.

Furthermore, it is critical that the CCEOP applications are fully harmonized with the HSS applications and/or on-going HSS grants. Gavi Secretariat and partners should ensure that CCEOP applications are need-based, coherent with a national cold and supply chain strategy, and that any co-financing from HSS does not undercut the equity and coverage goals the HSS grant was supposed to deliver.

Key Issues 15:

- Countries were not able to meet all the stated requirements for the application, because of their complexity and limited national capacities.
- The Gavi screening process does not select out country applications that do not include mandatory documents; the WHO screening process does not assure quality of submitted documents especially the CCE inventory. Some applications did not include any monitoring indicators.
- Reviewers found it challenging to extract all the relevant information contained in multiple documents often with conflicting data.
- There are no required links between a CCEOP investment and the other aspects of the Gavi immunisation supply chain and logistics (iSCL) strategy.
- CCEOP co-investments have been from HSS rather than other sources: country co-investment participation and sustainability are not being addressed.
- Countries seek maximum CCE rather than improving system efficiency and contributing to coverage and equity.
- The application process provides no assurance that there is adequate HR to implement and manage the new CCEOP
- The updated CCE inventory provided did not include CCE in the pipeline for several countries; the update process was not always clear.

- Lack of guidance on the use and implementation of remote temperature monitoring and other innovations (e.g. long-term passive devices).

Recommendations:

1) The Gavi Secretariat to fully address recommendations from the March 2016 and June 2016 reviews.
2) Adequacy and accuracy of the CCE inventory and rehabilitation plan to be undertaken as part of pre-review, and only applications including fully updated inventories and rehabilitation plans submitted to the IRC for review.
3) The process and content for CCEOP application is reviewed and adjusted by establishing an independent working group with the following aims:
   a) Make the application easier for countries to complete without the need for consultant support.
   b) Make application form contain all required information with fewer additional documents.
4) Make mandatory a consideration or action on the other elements of the iSCL strategy in the CCEOP application (dedicated supply chain managers, continuous improvement and planning; supply chain data; and system re-design for optimization)
5) Consider involvement and/or establishment of a National Logistics Working Group (NLWG) to review and endorse the application, and ensure effective implementation of a national iSCL strategy where the CCE investment can help other aspects of supply chain improvement.
6) Incentivize countries to (1) mobilize domestic resources for the CCEOP co-investment; and (2) develop a plan to sustain investments after Gavi support ends. This could consider a graduated scale for country investment or alternative incentives rather than encouraging dependence upon HSS co-investment
7) Mandate use of WHO Inventory Tool or PATH CCEM tool for inventory data; ensure that it really is up-to-date for planned or procured CCE through pre-review process.
8) Clarify role of IRC vs. pre-review and screening processes, to remove elements that IRC does not need to address (e.g, Ministerial signatures; submission of mandatory documents; and that minimal quality expectations are met)
   a) The NLWG should provide the first level of technical review, then the regional offices to review the CCE inventory, needs, rehabilitation and maintenance plans.
   b) Gavi pre-screening must ensure that the application meets all requirements and conditions.
   c) Role of IRC should be clearly defined: not consistency checking, or meeting requirements, but a technically appropriate direction and approach.
9) CCEOP needs to include provision for vaccine management and temperature management remote monitoring packages and operating costs and consider inclusion of other products to strengthen the supply chain products contributing to C&E and Efficiency.
10) Introduce a scheme to broaden/train/accredit guidance resources for CCEOP application preparations.

Supply Chain

Effective Vaccine Management Assessments (EVMA) have become the yardstick for determination of supply chain quality, adequacy and readiness and the EVM improvement plans (EVM/IP) are transitioning from a wish list of required equipment to an improvement plan on a positive note. However, substantial additional effort is required to standardise the quality of both EVMA's and EVM/IP's.

Issues 16: Several major shortcomings are apparent, putting aside the variance in quality.

- The EVMA tool generates a table (Matrix) summarizing EVM performance at each level of the

supply chain and across each of the 9 assessment criteria. The Alliance adopts the numbers generated in this matrix as an indicator of supply chain quality and readiness. This can be very misleading and can totally misrepresent readiness for the introduction of new vaccines.

- The Executive summary of EVMA, often discusses methodology rather than key issues such as statements of supply chain readiness for the introduction of new vaccines, adequacy of temperature monitoring and reporting, adequacy of stock management reporting etc.
- Even when EVMA's are recent and conducted in the same or preceding year to the submission of an application to Gavi for CCEOP support, there is major budgetary variance and equipment need between the 2 documents, where a certain synergy should be expected.
- In addition EVM/Improvement Plans frequently lack close synergies with supply chain requests in HSS applications.

Recommendations:

- Synergies and complementarity between EVM/IP's, HSS and CCEOP applications should be mandatory, with readily traceable correlations of budget, equipment and supporting activity. This requirement should be reflected in guidelines.
- Executive summaries of EVMA reports should provide key statements relating to supply chain quality, adequacy and readiness.
- The value of the EVM summary performance matrix, should be viewed with caution and not taken as a statement of "All is Well"

Issue 17: Improvements in supply chain efficiency and sustainability are generally not being addressed in HSS or CCEOP applications.

Recommendations:

- A broad based strategic analysis of supply chains should be an inclusive element of JA and/or HSIS reviews. This should go far beyond a functional verification of the existing system of storage, distribution and reporting. The TORs for JA's and Guidelines for HSS/CCEOP applications and reviews should address this specific requirement.
- HSS applications, which include a supply chain-strengthening objective, should include a supply chain optimization study as a mandatory component of the submission unless already conducted.
- Supply of CCE in response to the years 3, 4 and 5 Supplementary Priorities section of CCEOP applications should only be provided if a network optimization study has been conducted during the first 2 years of the CCEOP implementation or before.

Issue 18: Very few countries are responsibly addressing Health Care Waste Management

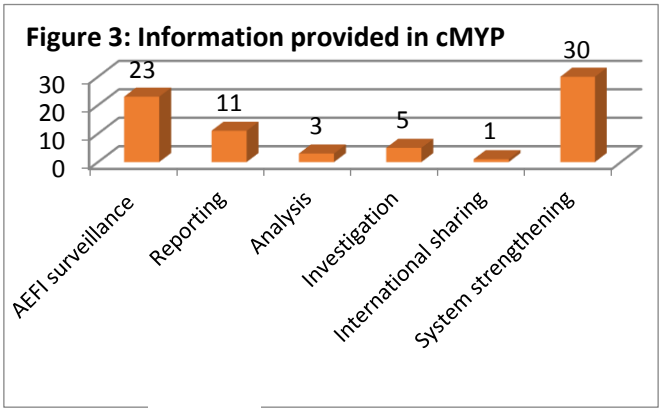
Recommendation: Secretariat to consider establishing a Gavi hosted task force to define waste management policies and strategies and explore possible scenarios to responsibly address immunisation waste management. Considerations may include but are not limited to:

- EPI sharps waste management bundled in vaccine supply agreements.
- Country incentives for responsible waste management practices.
- Inclusion of budgets and activities in HSS and/or NVS applications to responsibly handle and

dispose of immunisation waste.

- Inclusion of budgets and activities to responsibly dispose of defunct waste management equipment (Vaccine refrigerators, solar batteries, incinerators).
- Revised HSS/HSIS guidelines to include waste management as a mandatory component of supply chain management.

AEFI Surveillance



For successful implementation of routine immunisation programmes and supplementary immunisation activities it is important that **functional** AEFI surveillance system is in place. IRC recommendations related to strengthening technical capacity of AEFI surveillance system are included in over 50% of IRC final reports over the past three years. When asked about AEFI surveillance system performance, countries provide mainly general information in their applications, such as injection safety measures, intention to report AEFI cases and existence of an expert committee **(Figure 3).** To understand better their capacity to detect, investigate and respond to vaccine safety concerns, the IRC examined Comprehensive Multiyear Plans of 30 countries which applied for various grants in this review cycle.

Issue 19: Findings reveal a disparity between available infrastructure and performance: underreporting is vast and only 3 of 30 applicants analyse observed and reported cases. **77%** applicants had basic AEFI surveillance system elements in place. **ALL** applicants have the objective of AEFI surveillance strengthening in their cMYP. However, only **10%** applicants analysed their data. This cannot result in quality evaluation of vaccine safety nor provide sound basis for risk assessment, management and communication, but it can be changed.

Recommendations: Countries should be encouraged to enhance quality reporting, local analytic capacity and international information sharing. Actions following this effort should have a positive impact on the NIP, and regional and global programmes and planning.

Partners at country level should enhance efforts within the existing systems to collect quality data with applied standard case definitions so that they can be analysed and used locally and internationally.

Financial sustainability

Gavi eligible countries are required in their NVS and HSS applications to provide financial data on the finances of the EPI and the health sector in general. In cMYPs and narrative section of countries' proposal, information provided on financial sustainability is not sufficiently detailed and informative enough on actions/mechanisms in place to make sure that Gavi or other donors' investments will be complemented

or replaced by Government or other domestic funding sources as the countries prepare for transition. Proposal development processes do not include action points or measures from the ICC to scrutinize countries' financial commitments reflected on the cMYPs' tables (total resource requirements, total secured and probable, total funding gaps, etc.). During this November review, IRC highlighted key findings and made some recommendations.

Issues 20:

- The cMYP financial tables show needed financial resources versus secured and probable funding to achieve EPI goals. In this review, 3 out of 5 HSS applications reviewed (Burkina Faso, Mauritania and Solomon Islands) have not provided EPI financing tables consistent with the financial sustainability sections in their HSS applications.
- For the countries which provided cMYP financing tables (Côte d'Ivoire, Somalia) consistent with the gap analysis provided in the HSS application, Gavi HSS investments do not leverage on other HSS sources (Government, other donors, domestic private sources, etc.). In Somalia (a country with huge funding challenges and low fiscal space), 68% of the EPI financing gaps are covered by Gavi HSS. In Côte d'Ivoire (country to enter soon the transition phase and with a relatively high fiscal space), Gavi HSS represents 14% of the total EPI funding gaps to be covered and other funding details are not provided to explain how the country will address it.
- For example, government funding for routine immunisation declined from 34% in 2012 to 20% in 2015 in Mozambique.

Recommendations:

- In-depth scrutiny and robust appraisal of cMYPs during HSS proposal development stage should be reinforced through in-country governance mechanisms (ICC/HSCC, PEF arrangements, etc.) to make sure that financial sustainability is addressed from a holistic approach in the proposals and that Governments are accountable on their financial commitments.
- Gavi should consider incentives to make governments match its HSS investments. As countries approach or enter transition phase, there should be a requirement to progressively increase domestic funding each year so that Gavi HSS funds decline to zero? by the final year of the support, without negative impact on the health sector.
- This will allow applicant countries to own early their financial responsibility with regards to EPI and health sector sustainability in the long term perspective.

Data Quality

Data quality has repeatedly been the focus of IRC recommendations. This is for good reason. Review of the 2015 WUENIC coverage estimates suggests that for more than half of lower coverage countries (DPT3 <85%) their administrative data over-estimate the UN estimate of coverage by from 10 percentage points to as much as 40 percentage points. During this review, the IRC saw several examples of how problems with data quality and the resulting uncertainty about coverage and about geographic disparities in coverage, significantly hampered efforts to boost coverage and pursue equity.

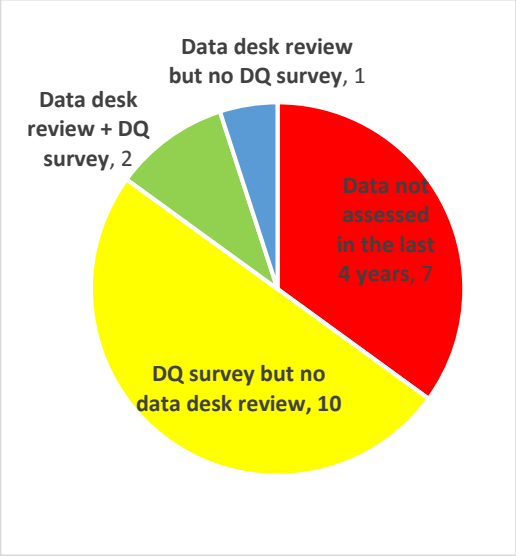
Gavi has four data quality requirements for all types of HSS and NVS support:

1. Annual desk reviews;
2. Periodic (at least once each 5 years) in-depth assessments of data quality;

3. Periodic (at least once each 5 years) high quality immunisation coverage surveys;
4. Data quality improvement plan;

At the November 2016 meeting, the IRC examined how HSS and NVS applicants (other than those applying only for HPV demo) responded to Gavi's first and second requirements to submit reports on any data quality assessment conducted in the last 4 years. Figure 4 presents the findings:

Figure 4: How was data quality assessed in the last 4 years, among 20 countries applying for HSS/NVS in November 2016.



- Only 3 applicants (15%) provided a report of a data desk review;
- 12 applicants submitted a report of a periodic in-depth assessment of data quality (a DQ survey typically referred to as a DQS or DQA);
- 7 applicants (35%) did not provide any documentation of any data quality assessment in the previous 4 years.

These findings raise the question of whether applicants (or those reviewing the applications) have sufficient clarity on what a "desk review" entails.

This section summarizes what can be learned about data desk reviews from "Cambodia's Data Quality Report Card" of 2012.

First it is necessary to understand what is involved in a "data desk review". Unlike, with a DQA or DQS, there are no field expenses. The desk review, as the name implies, is conducted from any place where the full dataset[1] can be accessed. Because the full dataset is reviewed, there is no sampling involved. In this way the review is able to identify all of the units (all the districts +/- all the facilities depending upon the level of disaggregation of the data) which have the most extreme problems with data quality. Data managers can then follow up with these units, through site visits and communications to address the problems identified.

WHO and Gavi encourage countries to conduct such a review annually as an initial step in compiling and analyzing the available information needed for an annual performance review of the health sector. However, it is practical, affordable and desirable for such desk review to be conducted at lower administrative levels (province and/or district) and to be carried out regularly, routinely (even monthly) so that data problems can be identified and addressed almost in real time.

It should be noted that there is more than one methodology for conducting a data desk review. Cambodia's Data Quality Report Card provides a good example of a methodology developed and supported by WHO (see Annex 2). Cambodia provides an example of a multi-programme data desk review at national level supported by WHO in 2012 and repeated in 2013. The review focused on 4 domains of data quality namely: completeness of administrative data; internal consistency of administrative data; external consistency of administrative data (i.e. consistency with survey estimates); and consistency of

[1] The full national dataset in the case of a national level review or the full district or provincial dataset in the case of a desk review at one of those levels.

estimates of the size of the target population (the denominator for calculating coverage). Consistency of denominators. The final domain to be assessed during the desk review is the consistency between diverse estimates of the target population. In the case of Cambodia's report, for each district, the number of surviving infants as estimated by the National Statistics Office was compared to the number of children receiving DPT1 (as an alternative estimate of the number of surviving infants)[2].

Issues 21: Are countries responding to WHO and Gavi data quality review requirements?

1. There is abundant evidence that the quality of data used by many immunisation programmes is a significant problem that is hampering efforts to boost coverage and achieve equity.
2. There are simple and affordable steps to take to review the completeness and consistency of data. WHO has developed an Excel-based tool for such review as well as a "Data Quality app" for automatic review of data managed with DHIS2.
3. Countries may elect to use alternative methods to conduct such a review. The reports submitted by Lao and Mozambique provide examples of such alternative approaches. However, there are advantages to harmonizing approaches so that the reviews can be as rigorous as is practical (given in-country technical capacity) and the findings can be compared over time and between countries.
4. Such review can and should be done at district and province as well as at national level. Data review can and should be done regularly, routinely to identify the facilities or districts with the least complete or least consistent data and follow up with them through site visits and communications to resolve any issues identified.
5. Few applicants to Gavi now report on or provide evidence of such a systematic process of data review. Many applicants do not even provide statistics on the completeness of their data – the most basic attribute of data. Without such information, how is anyone to interpret the data?

Recommendations:

- There are good reasons that WHO and Gavi ask countries to conduct an annual data desk review. The process needs to be made routine and decentralized to become a monthly or quarterly function of each province and/or district. The fact that so few countries are now submitting any documentation of such a process suggests that many applicants do not yet understand what Gavi and WHO mean by a "desk review". Gavi and WHO should provide clearer guidance on this and they should support efforts to strengthen capacity for such reviews at the same time that they support the building of capacity for data analysis and use at all levels.
- Gavi and WHO should document best practices on how desk review and other approaches to DQ assessment can lead to DQ improvement and improved coverage and equity.

Emerging Issues

Country Engagement Framework (CEF)

The IRC strongly supports the current efforts by Gavi Secretariat to institute differentiated approaches to address critical country contexts in the most responsive ways. IRC members have also been part of in-country reviews in recent times and propose below recommendations to further strengthen the process.

[2] This is a somewhat artificial comparison as the number of children reported to have received DPT1 is not really used by any programme in Cambodia as a denominator estimate.

Recommendations:

- **Logical multi-tiered and well sequenced approach to CEF process** with adequate planning considerations. Gavi to consider adapting the pace of number of countries in the CEF process to allow more preparation/thought/planning about how the new vaccine applications and HSS applications will be evaluated and the vaccine introduction plans reviewed and approved;
- **PSR** must deal adequately with key strategic issues (e.g. equity/targeting, financial sustainability; recurrent costs, capacity for programme management);

Issue 23: Insufficient number of days allocated to country based reviews.

Recommendation:

The IRC strongly recommends that a minimum number of days must be identified to ensure thorough review of country documents/consultative meetings.

Conclusion

- Dropping the coverage requirement for MSD in line with the recent SAGE recommendations will provide opportunities for additional countries to apply for support;
- Need to incentivize countries to match and/or exceed Gavi HSS investments as they approach or enter transition phases from a sustainability perspective;
- Gavi to further work with Alliance partners to demystify gender and equity issues by providing tools and aids to translate analyses to measurable innovative interventions;
- Maximize opportunity at country level for the PSR to address strategic programme issues especially gender, equity and coverage;
- CCEOP important, and catalytic but critical that it is harmonized with HSS applications and responsive to Gavi's strategic goals.

Acknowledgements

The IRC acknowledges the Gavi executive team for their continued responsiveness to key IRC recommendations; the A & R Team especially Adrien de Chaisemartin, Patricia Kuo, Verena Oustin, Anjana Giri, Friederike Teutsch; the Country Support Team especially Hind Khatib-Othman, and all the Senior Country Managers/key members for invaluable insights into the country activities and progress. The IRC further acknowledges the role of the CCEOP/HSIS Team: Alan Brooks, Hamadou Dicko, Marya Getchell, Olamide Folorunso in ensuring that the lessons learned from the roll out of the CCEOP platform continue to be rapidly integrated and shared through revised guidelines. Finally, the IRC particularly thank the WHO and all the Alliance partners for their invaluable technical inputs and increasing attention to quality technical support to countries.

ANNEX 1: LIST OF IRC MEMBERS NOVEMBER 2016

NO.	Name	Nationality	Profession/Specialisation	Gender	French Speaking
1.	Dora Curry	USA	Senior Technical Adviser, CARE	Female	
2.	Rafah Aziz	UK	Independent Consultant	Female	
3.	Linda Eckert	USA	Professor, University of Washington (Gynaecology)	Female	
4.	Terence Hart	UK	Independent Consultant	Male	X
5.	Zeenat Patel	Canada	Public Health Physician/Independent Consultant	Female	
6.	Philippe Jaillard	Benin/France	Agence de Medecine Preventive (AMP) Country Representative	Male	X
7.	Miloud Kaddar **VICE-CHAIR**	Algeria	Independent Consultant	Male	X
8.	Bolanle Oyeledun **CHAIR**	Nigeria	CEO, Center for Integrated Health Programmes	Female	
9.	Diana Rivington	Canada	Independent Consultant	Female	X
10.	Mario Stassen	Netherlands	Independent Consultant	Male	
11.	Ousmane Amadou Sy	Senegal	Independent Consultant	Male	X
12.	Robert Pond	USA	Independent Consultant	Male	
13.	Kshem Prasad	India	Independent Consultant	Male	X
14.	Shamsa Zafar	Pakistan	Head of Department, Centre of Excellence MNCH	Female	
15.	Aleksandra Caric	Croatia	Independent Consultant	Female	
16.	Beena Varghese	India	Independent Consultant	Female	
17.	Charles Shey Wiysonge	Cameroon	Director, South African Cochrane Centre / Professor, Stellenbosch University	Male	X
18.	Marina Madeo	Italy	Independent consultant, health advisor to the European Commission.	Female	X
19.	Kapil Maithal	India	Vice President - R&D, Indian Immunologicals Limited	Male	
20.	Jean Marie Edengue Ekani	Cameroon	Independent Consultant	Male	X
21.	Osman David Mansoor	New Zealand	Public Health Physician, Regional Public Health, New Zealand	Male	X
22.	Salah Al Awaidy	Oman	Communicable diseases advisor, MOH/Epidemiologist/Public Health	Male	
23.	Ibnou Khadim Diaw	Senegal	Independent consultant CCL/HSS, Sr Technical advisor to African Resource Center (ARC)	Male	X

24.	Ranjit Dhiman	India	Independent Consultant	Male	
25.	Thierry Copois	France	Independent Consultant	Male	
26.	Peju Olukoya	Nigeria	Independent Consultant	Female	
27.	Rahman Kelani	Nigeria	Independent Consultant	Male	
28.	Alejo Bejemino	Philippines	Independent Consultant	Male	
29.	Benjamin Nkwowane	Zambia	Independent Consultant	Male	

ANNEX 2: Cambodia's Data Quality Report Card for 2012

Cambodia provides an example of a multi-programme data desk review at national level supported by WHO in 2012 and repeated in 2013. The review focused on 4 domains of data quality:

- completeness of administrative data;
- internal consistency of administrative data;
- external consistency of administrative data (i.e. consistency with survey estimates);
- consistency of estimates of the size of the target population (the denominator for calculating coverage).

Cambodia's 2013 "Data Quality Report Card" assessed the quality of 2012 numerator and denominator data for multiple programs: number of ANC visits; number of institutional deliveries; number of immunisation doses administered; number of outpatient visits; number of malaria cases. Numerator or denominator data for these various programmatic indicators were reviewed to assess each of the above 4 data quality domains.

Completeness – The importance of this domain should be clear. Data *cannot/should not* be interpreted without first knowing what % of all health facility reports have been submitted. Remarkably, most Gavi applications fail to provide any statistics on the current completeness of their administrative data. The findings from Cambodia's data desk reviews suggest that completeness has been quite satisfactory and should not be an issue when interpreting the data (see Figure 5).

When reviewing completeness, it is essential to assess facility reporting completeness and not just the completeness of reporting from a district or higher level. This is because a district can submit a report without that district report being based upon data from all of the health facilities within that district.

Notice that the desk review not only provides a national score for completeness but also identifies the specific provinces (Mondul Kiri, etc …) and ODs (Operational Districts; Kroch Chhmar, etc …) which have the least complete data.

Figure 51: Table 1 from Cambodia's Data Quality Report Card of 2012, showing facility completeness, 2009 - 2012

Table 1: Facility reporting completeness rate and provinces with poor completeness rate

	2009	2010	2011	2012
National facility reporting completeness rate	94.2%	100%	99.8%	99.8%
Number (%) of provinces with completeness rate below 80%	2 (8%)	0 (0%)	0 (0%)	0 (0%)
Provinces with facility completeness rate below 80%	Mondul Kiri, Oddar Meanchey	–	–	–
Number (%) of ODs with completeness rate below 80%	4 (5%)	0 (0%)	0 (0%)	0 (0%)
ODs with facility completeness rate below 80%	Kroch Chhmar, Sen Monorom, Ankor Chhum, Samraong	–	–	–

Internal consistency – Data are reviewed for internal consistency to determine whether they are *plausible*. One way to assess for internal consistency is to visit a random sample of health facilities to determine whether the data on source documents (registers and/or tally sheets) agrees with the data on a monthly report for the same period. Such "data verification" with calculation of a "verification factor" (= data on

the source documents divided by data on the report) is performed as part of a Data Quality Assessment (DQA) or Data Quality Self-Assessment (DQS). The IRC's review of documentation submitted with this round of applications found that 60% of applicants for HSS and/or NVS support had recently conducted such a health facility survey to assess data quality.

A desk review assesses the internal consistency of the data without having to collect any new data. Three different types of internal consistency can be assessed with a data desk review:

- Presence of extreme outliers;
- Consistency of data from year-to-year; and
- Consistency between related indicators (e.g. DPT3 versus DPT1; DPT3 versus OPV3; ANC1 versus DPT1)

Cambodia's report provides very good examples of how each of these types of internal consistency can be analyzed and presented.

Presence of extreme outliers

Extreme outliers are suspicious values found in a dataset. One definition of an extreme outlier is any monthly value that is more than 3 standard deviations above or below the average monthly value for the year that is being assessed. When reviewing any dataset it is unfortunately common to find an anomalous value such as the one featured in Figures 6, 7, and 8 taken from a desk review performed in another country. These figures illustrate how erroneous data from one small health facility (see Figure 8) was responsible for distorting the aggregate data reported by the district in which it is located (see Figure 7) as well as the region in which it is located (see Figure 6). An important lesson from this example is how subtle the distortion may be in the regional data after data from hundreds of other facilities are aggregated together. The anomaly is much more apparent if we "drill down" to look at the district data (Figure 7) and it becomes obvious if we drill down further to look at data from the individual health facility for which the erroneous datum was recorded. The lesson here is that when reviewing for extreme outliers it is highly desirable to use district level data rather than just regional/provincial level data. Another lesson is that when the dataset is disaggregated to the level of individual health facilities (as with DHIS2) then it becomes possible to identify precisely which monthly report from which health facility was responsible for the extreme outlier. Follow-up can then be precisely targeted.

Figure 6: A suspicious value found among regional data

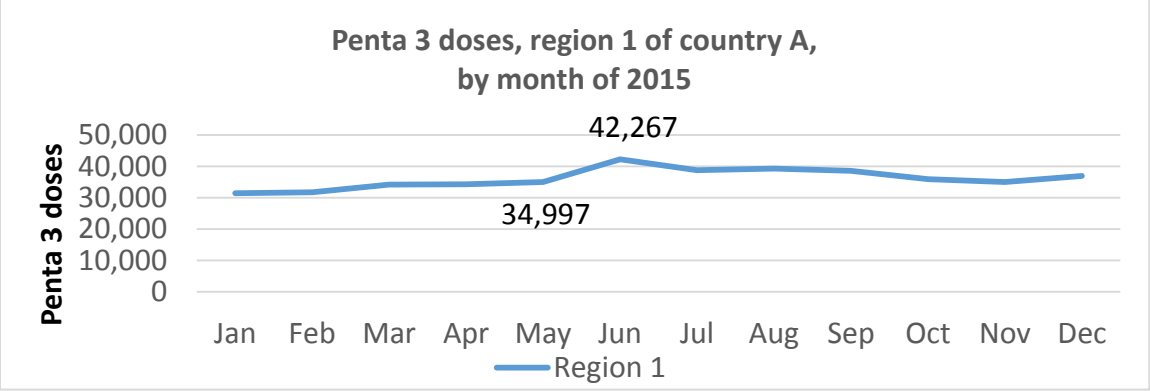


Figure 7: A suspicious value found among district-level data

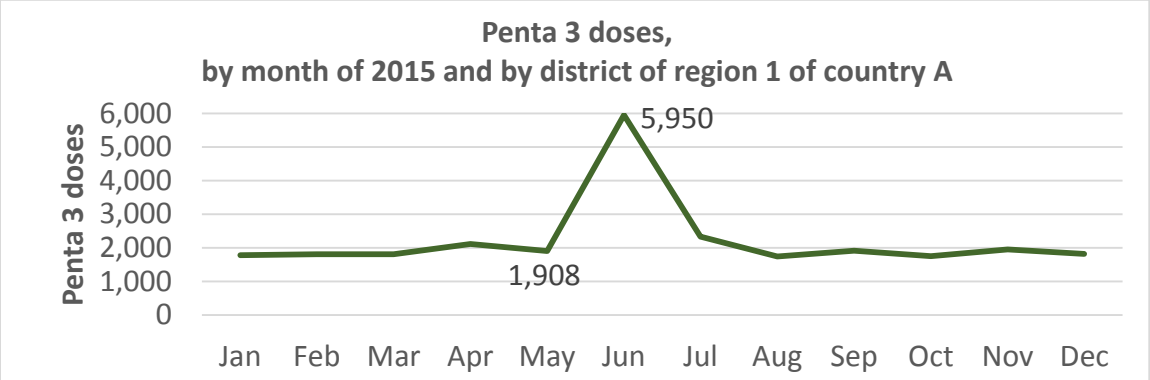


Figure 8: A clearly erroneous value reported by a single health facility

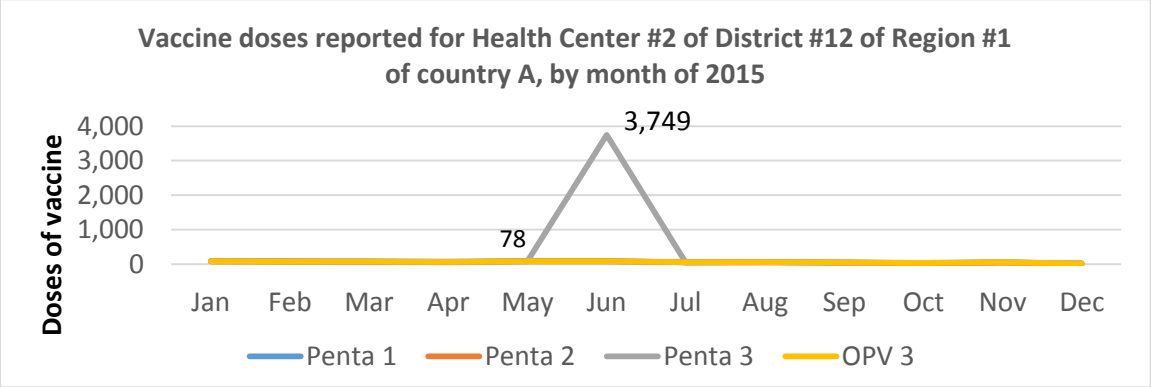


Figure 9 shows a summary from Cambodia's report of extreme outliers found for 2012 for each of five indicators. Again, review has identified the responsible districts (Lech) and provinces (Koh Kong) and the

month that the extreme outlier was reported. Very few extreme outliers were found in Cambodia's data for 2012.

Figure 9: Table 4 from Cambodia's Data Quality Report Card for 2012, extreme outliers found in provincial and district data

Table 4: Extreme outliers in OD and provincial monthly data in 2012 for five indicators

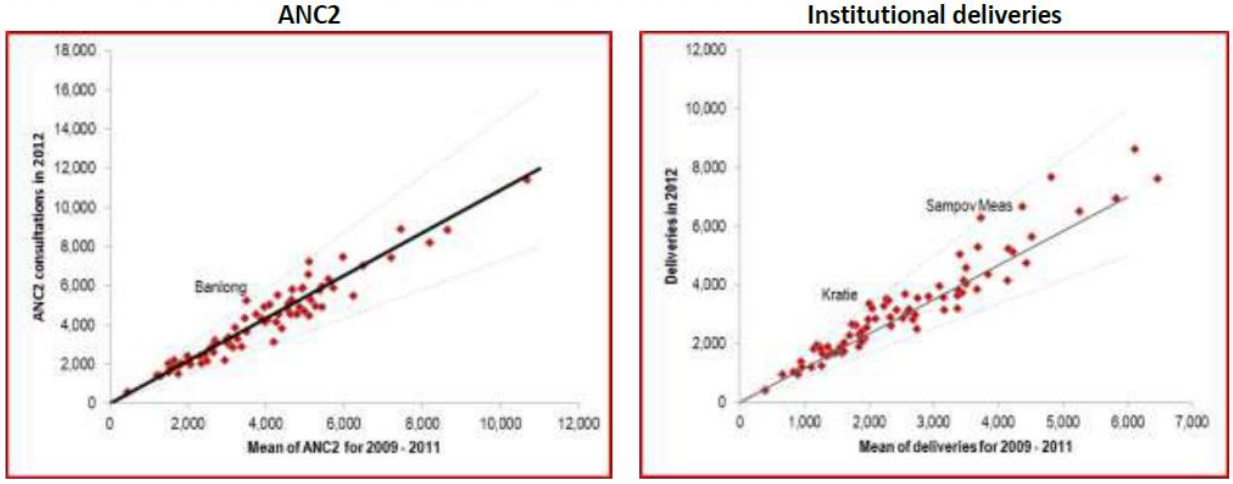
	ANC2 (revisits)	Measles	Institutional deliveries	OPD	Malaria cases
Operational districts					
Number (%) of monthly data that are extreme outliers (outside 3 SD of mean)[1]	0 (0%)	1 (0.1%)	0 (0%)	1 (0.1%)	1 (0.1%)
ODs with extreme values much higher than mean	–	Lech (Dec)	–	Smach Mean Chey (Feb)	Lech (Jun)
ODs with extreme values much lower than mean	–	–	–	–	–
Provinces					
Number (%) of monthly data that are extreme outliers (outside 3 SD of mean)[1]	0 (0%)	0 (0%)	0 (0%)	1 (0.3%)	0 (0%)
Provinces with extreme values much higher than mean	–	–	–	Koh Kong (Feb)	–
Provinces with extreme values much lower than mean	–	–	–	–	–

Consistency of data from year to year

For this assessment of consistency, scatterplots can be used to compare a district's total value for the previous year (2012 in this case) to the average annual value that the same district had in the 3 preceding years (2009, 2010 and 2011; see Figure 10).

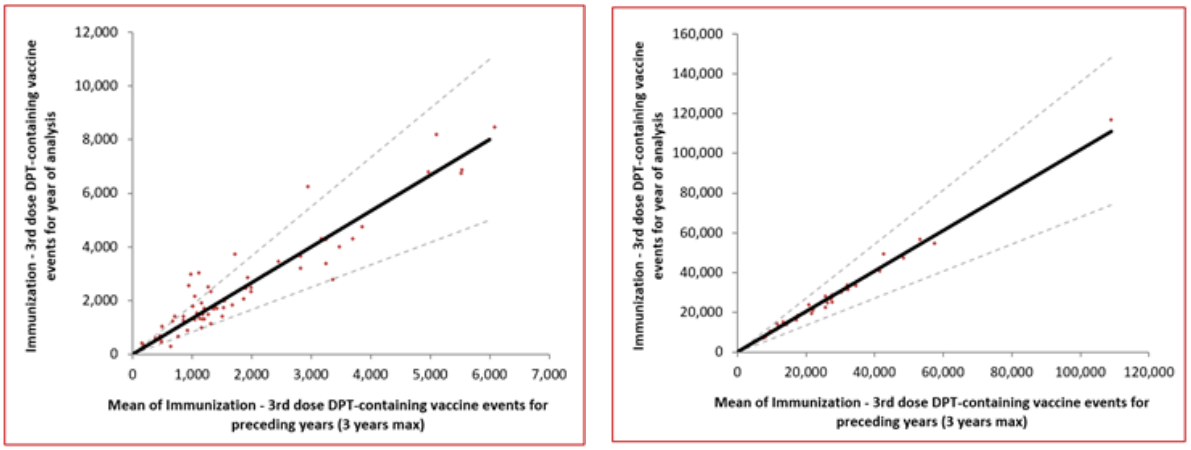
Figure 10: Figure 1 from Cambodia's Data Quality Report Card for 2012, showing consistency from year-to-year in district data on ANC2 and institutional deliveries

Figure 1: Consistency over time for ANC2 and institutional deliveries for 2012 compared to 2009–2011 for ODs (solid line indicates the national ratio; dashed lines indicate 33% relative difference from the national ratio)



Each dot in such a scatterplot represents a single district. The solid line indicates the national ratio between reporting in 2012 and the average annual reporting in 2009 to 2011. The dashed lines indicate 33% above the solid line (much higher values reported in 2012 than in previous years; the district of Banlong is identified as having anomalous ANC2 data for 2012) and 33% below the solid line (much lower values report in 2012 than in previous years). The greatest value of such an analysis is to identify the specific districts that have anomalous data so that these few anomalies can be investigated. It is also possible to compare scatterplots such as this to see if there is improvement over time or if one province or country has a more consistent scatterplot than another. This is shown by the graphs included as Figure 11, which are taken from desk reviews performed for 2 different countries. The district-level DPT3 data shown on the right is much more consistent year-to-year than the district-level DPT3 data shown on the left.

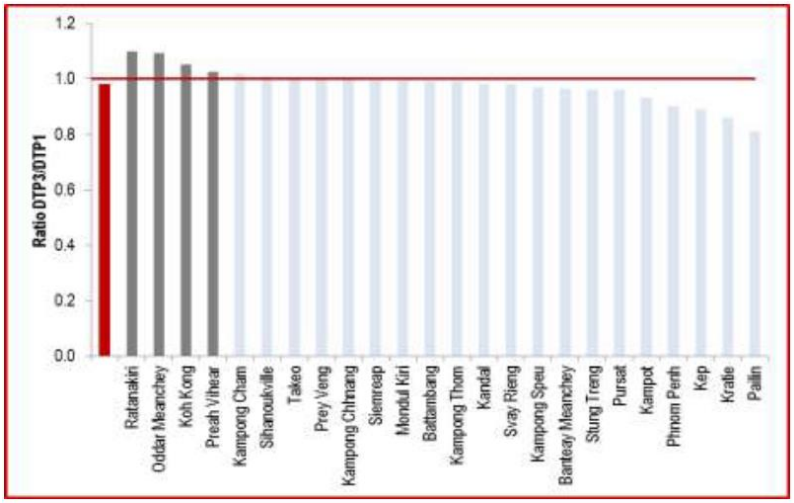
Figure 11: Scatterplots showing consistency of district-level DPT3 data from year-to-year for two different countries



Consistency between related indicators

Examples of related indicators are: DPT3 & DPT1; DPT3 and OPV3; ANC1 & DPT1.

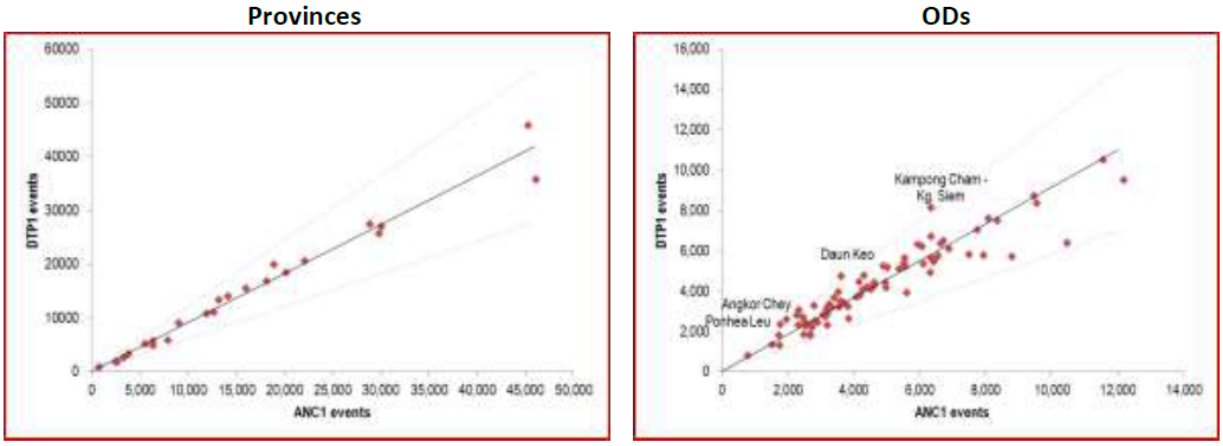
Figure 12: Figure 3 from Cambodia's Data Quality Report Card for 2012, showing the ratio, by district of DPT3/DPT1



Cambodia's data quality report card includes graphs showing a) the relationship, for each district, between DPT3 and DPT1 (see Figure 12 above); and b) the relationship, for each district, between ANC1 and DPT3 (see Figure 13). While Cambodia chose to analyze the relationship between DPT3 and DPT1 as a ratio, the more conventional practice is to calculate the DPT1 to DPT3 dropout rate (= {DPT1 – DPT3}/DPT1). A negative DPT1 to DPT3 dropout rate (or a DPT3/DPT1 ratio >1), for a district for a full year is a fairly robust indicator of poor data quality. Again, the analysis identifies the specific districts with this problem.

Some programme managers are surprised that anyone would consider comparing a district's annual value for ANC first visits to its annual value for DPT first doses. Upon reflection, however, it makes sense to compare values of these two indicators as long as ANC1 and DPT1 coverage are greater than 90% almost everywhere in a country and as long as there are not many pregnant women who attend ANC in one district but subsequently travel to another district for immunisation of their children. As the data come from two different programmes, the close correlation shown in Figure 13 suggests that these Cambodian data were of quite high quality. Notice again that the correlation is looser for district-level data than for province-level data. Province-level data are much less likely to show problems with inconsistency between related indicators.

Figure 13: Figure 2 from Cambodia's Data Quality Report Card for 2012, showing the relationship, at provincial level and at district level, between DPT1 and ANC1

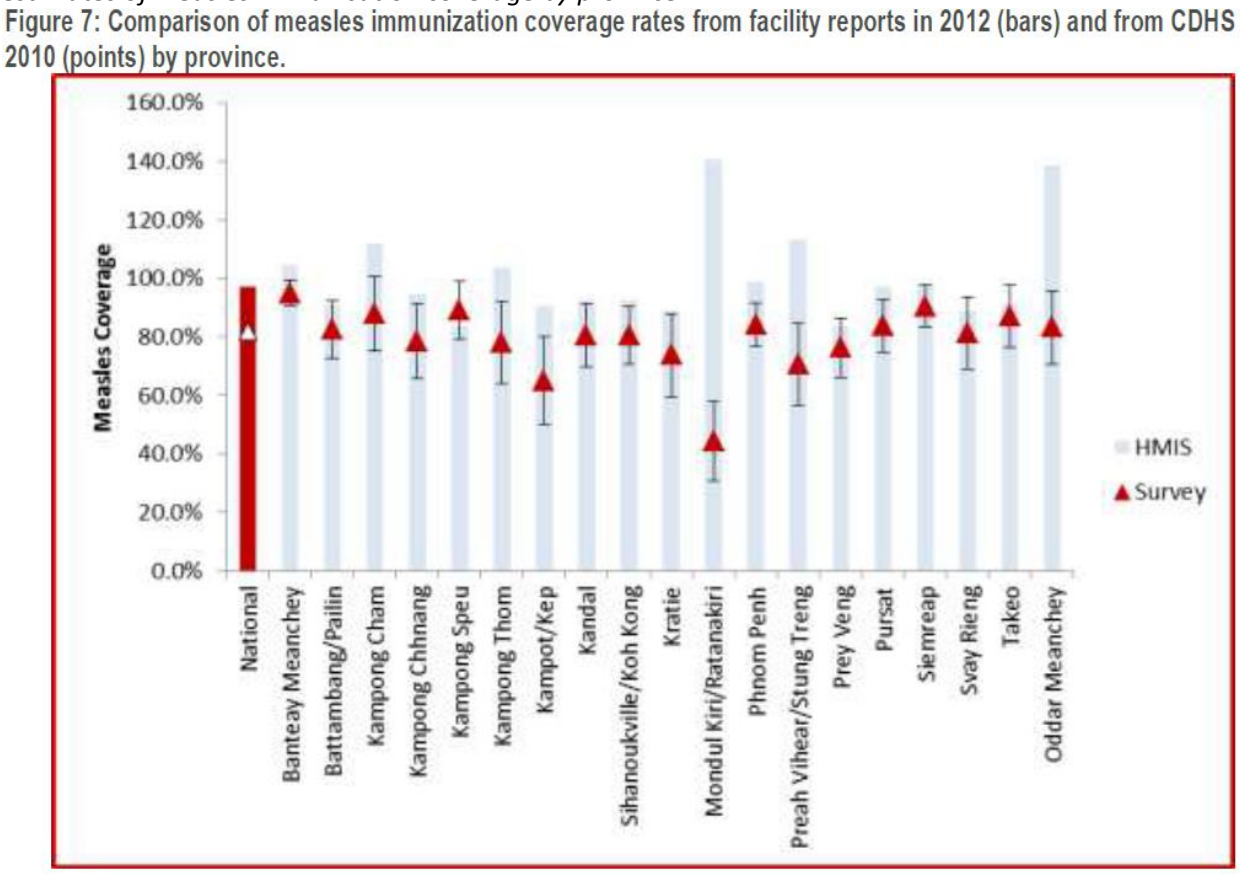


External consistency

External consistency refers to the correlation between administrative data (e.g. number of third doses of DPT administered) and estimates or data from an entirely different source such as an immunisation coverage survey (e.g. DPT3 coverage as measured by a DHS or MICS household survey). An example of this from Cambodia's Data Quality Report Card of 2012 is shown as Figure 14.

Another example of assessment for external consistency is comparison of data from two parallel data management systems. For example, health facility staff in Tanzania and Ghana must complete two separate forms for reporting of immunisations: one form goes to the HMIS Unit which manages this and other data using DHIS2 while the other form goes to the EPI Unit which uses an Excel-based DVD-MT system to manage its data. There can be significant discrepancies between the data of the 2 systems.

Figure 14: Figure 7 from Cambodia's Data Quality Report Card for 2012, showing HMIS versus survey estimates of measles immunisation coverage by province



As with all other analyses of consistency, it is essential for the report to interpret the findings. Concerning the above chart, Cambodia's report notes that, "…coverage from facility reports is systematically higher than the survey-based coverage rates (children immunised any time before survey) across provinces." Three provinces are seen to have especially large discrepancies[3].

[3] As much as we might want to use population-based surveys as a "gold standard" for assessment of coverage, we should keep in mind the diverse reasons why there may be discrepancies between routine and survey estimates:

- Limitations of administrative estimates:
  - Incomplete reporting (especially from private providers);
  - Uncertain denominators (especially at regional level)
  - Clients may live in one region and seek services in another region
  - Over-reporting
- Limitations of survey estimates:
  - Surveys do not provide estimates for some important indicators
  - Survey estimates apply to services delivered during previous years
  - Surveys seldom provide district-level estimates
  - Surveys themselves are sometimes inaccurate or imprecise:
    - For some surveys, sampling has not been sufficiently random;
    - The confidence interval depends upon sample size
    - Recall bias

Consistency of denominators

The final domain to be assessed during the desk review is the consistency between diverse estimates of the target population. In the case of Cambodia's report, for each district, the number of surviving infants as estimated by the National Statistics Office was compared to the number of children receiving DPT1 (as an alternative estimate of the number of surviving infants)[4]. The correlation, as shown in Figure 15, is a close one. This is because Cambodia's DPT1 coverage is so uniformly high and its DPT 1 data is apparently of high quality.

Figure 15: Figure 6 from Cambodia's Data Quality Report Card for 2012, showing the consistency between two different denominator estimates

Figure 6: Estimated number of children under 1 year, official estimate vs. estimate derived from DTP1 coverage, 2
(solid line indicates an exact match between the two estimates; the dashed lines indicate 33% relative difference from an exact match)

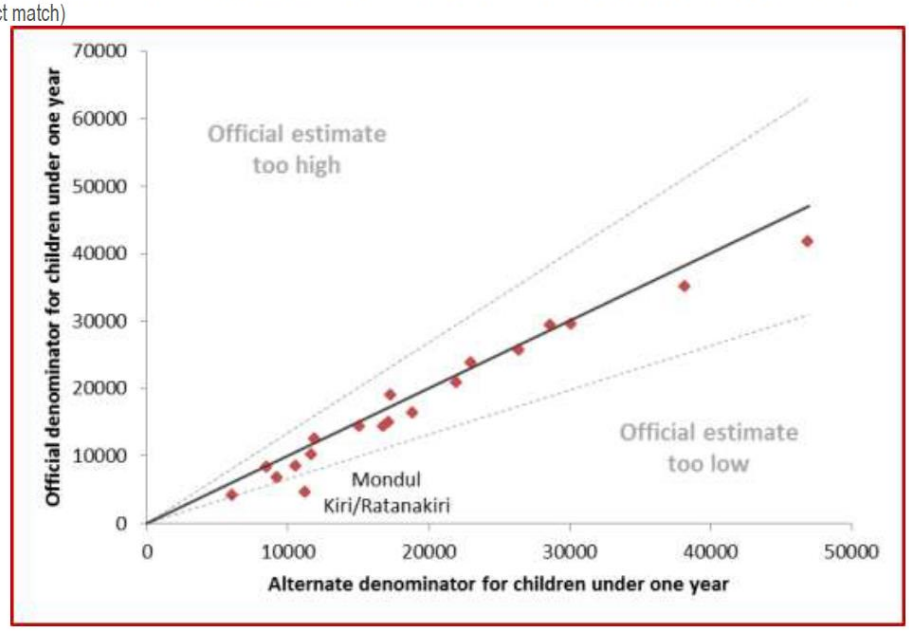
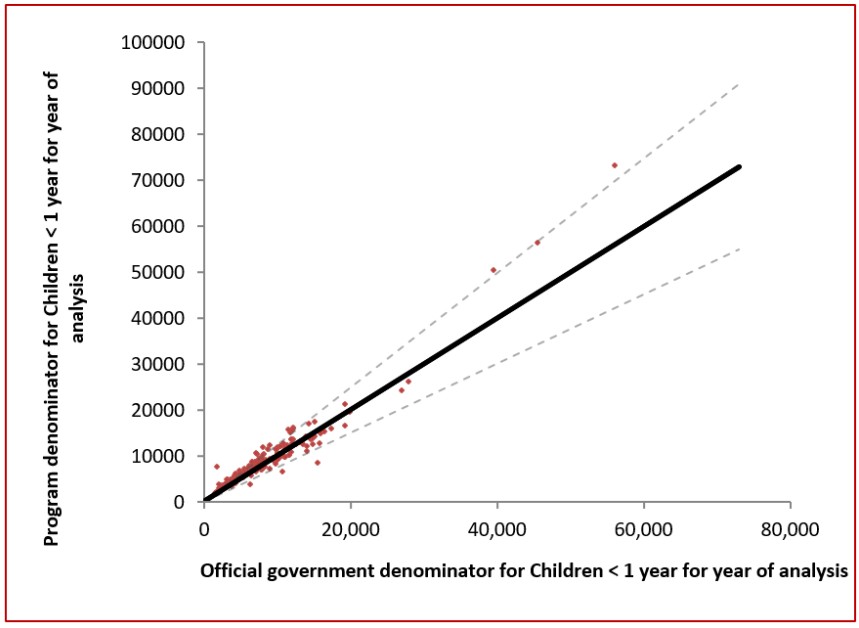


Figure 16, from a desk review for another country, shows a more typical comparison of denominator estimates. In this country, the number of surviving infants is estimated differently by the National Statistics Office than by the National Immunisation Programme (N.I.P; reported on the annual JRF). Figure 16 shows that there are some significant discrepancies between the two estimates, and, perhaps more importantly, the national total number of surviving infants as estimated by the National Statistics Office is significantly lower than the national total as estimated by the N.I.P[5].

[4] This is a somewhat artificial comparison as the number of children reported to have received DPT1 is not really used by any programme in Cambodia as a denominator estimate.

[5] For more than a quarter of districts in the Country, the number of surviving infants in 2014, as estimated by the N.I.P., differed by 25% or more from the number of surviving infants in 2014 as estimated by the National Statistics Office (NSO). NSO estimates are based upon a recent census which some believe significantly under-counted the population. As a result, if the NSO estimate of surviving infants is used, the administrative estimate of DTP3 coverage nationwide was 104% in 2014. In contrast, if the N.I.P. estimate of surviving infants is used, the administrative estimate of DTP3 coverage was 96%.

Figure 162:



Summary: why WHO and Gavi promote data quality review

1. There is abundant evidence that the quality of data used by many immunisation programmes is a significant problem that is hampering efforts to boost coverage and achieve equity.
2. There are simple and affordable steps to take to review the completeness and consistency of data. WHO has developed an Excel-based tool for such review as well as a "Data Quality app" for automatic review of data managed with DHIS2.
3. Countries may elect to use alternative methods to conduct such a review. The reports submitted by Lao and Mozambique provide examples of such alternative approaches. However, there are advantages to harmonizing approaches so that the reviews can be as rigorous as is practical (given in-country technical capacity) and the findings can be compared over time and between countries.
4. Such review can and should be done at district and province as well as at national level. Data review can and should be done regularly, routinely to identify the facilities or districts with the least complete or least consistent data and follow up with them through site visits and communications to resolve any issues identified.
5. Few applicants to Gavi now report on or provide evidence of such a systematic process of data review. Many applicants do not even provide statistics on the completeness of their data – the most basic attribute of data. Without such information, how is anyone to interpret the data?
6. Thus, there are good reasons that WHO and Gavi ask countries to conduct an annual data desk review. The process needs to be made routine and decentralized to become a monthly or quarterly function of each province and/or district. The fact that so few countries are now submitting any documentation of such a process suggests that many applicants do not yet understand what Gavi and WHO mean by a "desk review". Gavi and WHO should provide clearer guidance on this and they should support efforts to strengthen capacity for such reviews at the same time that they support the building of capacity for data analysis and use at all levels.
7. Gavi and WHO should document best practices on how desk review and other approaches to DQ assessment can lead to DQ improvement and improved coverage and equity.