Report to the GAVI Alliance Board

7-8 July 2011

Subject:	**Accelerated Vaccine Introduction – progress report**
Report of:	Nina Schwalbe, MD, Policy and Performance
Authored by:	Jon Pearman, Director of Accelerated Vaccine Introduction (AVI) Initiative
Agenda item:	07
Category:	For Discussion
Strategic goal:	SG1 - Vaccines and SG4 - Market shaping

Section A: Overview

1. Purpose of the report

1.1 To provide a summary on the progress of the Accelerated Vaccine Introduction (AVI) initiative and to review ongoing challenges to building a successful platform for future introduction of new vaccines.

2. Recommendations

2.1 The Board is recommended to take note of this report, in particular the following:

(a) GAVI had an excellent start of its pneumococcal (pneumo) vaccine roll out under AVI. Since manufacturers signed initial supply agreements under the Advance Market Commitment (AMC) last year, pneumo vaccines have been shipped to twelve countries on three continents. Vaccine supply is tight but we are confident that we can meet the needs of 19 approved countries. Beyond this, as anticipated, additional supply contracts are needed.

(b) Rotavirus (rota) vaccine implementation outside of Latin America is scheduled to start in 2011 and accelerate in 2012.

(c) In May 2011, GAVI received a record number of 75 new applications for new vaccines[1] from 50 countries.

[1] Pneumo conjugate vaccine (PCV), rotavirus, meningitis A, yellow fever (YF), Haemophilus influenzae type B vaccine (HiB) and measles 2nd dose vaccines.

3. Executive summary

3.1 As a result of the success of GAVI's efforts to raise resources, GAVI needs to focus particular attention on country readiness and vaccine supply. The Accelerated Vaccine Introduction (AVI) initiative serves as the primary coordination effort to manage for success in these areas. The following provides a summary of key progress since the last update to the board:

(a) Introductions of pneumococcal vaccine (pneumo) are proceeding rapidly with 19 countries scheduled to have introduced by early 2012. Further, there is strong demand from other countries as evidenced by the recent application round. For this reason, management of supply of pneumococcal vaccines is one of the key priorities of the AVI work over the coming year.

(b) AVI has also been working to prepare for introductions of rotavirus vaccines outside of Latin America in the coming year. The first African country will introduce the vaccine with GAVI support in September 2011 and an additional 16 countries are expected to be recommended for approval to introduce in 2012 and 2013. UNICEF is currently conducting a vaccine tender and bids will be assessed in the coming months.

(c) In light of the positive results on funding, preparations are proceeding for introduction of HPV, Japanese encephalitis, rubella and typhoid vaccines. Recommendations on next steps will be brought to the board for approval in November.

(d) Although in general there is adequate cold chain capacity to introduce new vaccines in many countries, further investment will likely be needed to strengthen countries' capability to introduce multiple new vaccines.

4. Context

4.1 This progress report provides an overview of key activities undertaken by AVI since December 2010. AVI was set up to optimize the coordination of activities to support informed decision making and facilitate vaccine introduction. Through the AVI initiative GAVI aims to: 1) ensure adequate supply of vaccines; 2) secure adequate financing; 3) support informed decision making; 4) facilitate country introductions; and 5) establish a platform for introduction of future vaccines. Under the Secretariat's leadership, AVI is managed by the AVI Management Team which comprises representatives from the GAVI Secretariat, WHO, UNICEF and the AVI Technical Assistance Consortium (AVI TAC[2]).[3] In addition, AVI has established a range of sub-teams to cover specific operational tasks or areas (see Appendix I). The majority of AVI activities fall

[2] A consortium of PATH, Johns Hopkins University (JHU), US Centers for Disease Control and Prevention (CDC) and others
[3] The Bill & Melinda Gates Foundation also participates as an observer to the AMT.

within SG1 (vaccines introduction goal) and SG4 (market shaping goal) of the GAVI Business Plan.

5. Next steps

5.1 Immediate next steps:

(a) Introduction of rota in September in Sudan.[4]

(b) Introduction of pneumo in Central African Republic, Benin, Cameroon, Burundi, Ethiopia and Malawi by year end.

(c) Development of GAVI strategy for Human Papillomavirus (HPV), Japanese encephalitis (JE), rubella and typhoid roll out to be presented to the PPC in September.

(d) Generation of demand forecast version 4.0 for all vaccines.

(e) Preparation of budget for 2012.

6. Conclusions

6.1 Based on the current demand forecast[5] GAVI is performing over and above the Business plan[6] targets in terms of number of countries expected to introduce pneumo and rota vaccines by 2015.

Section B: Implications

7. Impact on countries

7.1 Children in developing countries are being immunised against pneumococcal disease with PCV10 and PCV13 secured through the AMC. It is estimated that more than three million children will be vaccinated by the end of 2011 in 17 countries. Rota will be launched in the first African country (North Sudan) this year.

[4] Shipments expected to begin in July 2011
[5] Based on the SDF v3.0
[6] When the Strategy was approved, targets were set at 44 introductions for pneumococcal and 33 introductions for rotavirus vaccines by 2015. These targets were based on the version 2.0 of the Strategic Demand Forecast. According to the current demand forecast (v.3.0) the Alliance anticipates these targets will be exceeded by 23% and 24%, respectively.

8. Impact on the Business Plan / Budget / Programme Financing

8.1 Given the increased number of forecasted vaccine introductions (2011-2013) and opportunities to accelerate introductions globally, the AVI program is reviewing implementation strategies and activities through the 2012 budget process. This includes an assessment of funding and staffing levels for all partners contributing to AVI.

9. Risk implications and mitigations

9.1 Given the positive outcome of the Pledging conference, the key risks to accelerating vaccine introduction are primarily vaccine supply and country readiness. In this context, AVI will need to pro-actively assess and closely coordinate its activities to ensure supply is available to meet demand from countries, effectively assess countries' readiness to introduce new vaccines, and provide relevant country support.

10. Legal implications

10.1 Not applicable.

11. Consultation

11.1 This progress report was developed in collaboration with the AVI Management Team (AMT).

12. Gender issues

12.1 AVI is working to identify tools to effectively monitor the ratio of boys to girls who are receiving current vaccines to measure gender equity and to identify gender related barriers in the access to all new vaccines.

13. Implications for the Secretariat

13.1 See section 8

Annex 1

1. Pneumo Vaccine Update — Progress Since December 2010

1.1. Thanks to the **Pneumo Advance Market Commitment (AMC),** pneumo vaccines have been introduced in GAVI countries just over a year after vaccines were available in the developed world.

1.2. Of the 19 approved countries, 12 countries have launched vaccine programmes thus far [7] and a total of 17 countries will introduce by year end. The two final roll outs are planned for early 2012. From the latest Strategic Demand Forecast[8] (SDF), AVI expects an additional 10 countries to introduce in 2012 and another 18 countries in 2013 (See Appendix II). The AMC also guarantees supply for a period of 10 years and this predictability of supply is critical to the success of AVI. The 2011 Pneumo AMC Annual Report - which provides a detailed overview of all activities linked to the Pneumo AMC - was published on the AMC website on 25 May 2011. It summarizes all activities from 1 April 2010 to 31 March 2011 (see www.vaccineamc.org.)

1.3. Countries are requesting both PCV10 and PCV13 – there is no confirmed understanding for the country preference for one product over the other. However, due to the novelty of its presentation, the WHO Prequalification team required that the PCV10-valent in a two dose vial without preservative only be introduced in countries meeting specific conditions[9]. PCV10 was introduced in Kenya in January 2011 and Ethiopia is working closely with WHO to launch PCV10 later in 2011. By early 2012, the results from the Kenya studies should be available, providing data to inform WHO as to whether the current restrictions for use can be lifted to allow other countries to freely access PCV10.

1.4 **Strengthen country introduction – ensure sufficient supply***:* Currently supply is tight and a risk of insufficient supply for new countries is high; however there is sufficient vaccine availability to allow for all of the approved 19 countries to launch pneumo as planned. In order to better inform country introduction planning, AVI, through the Pneumo Introduction Ad-Hoc group, provides regular updates to approved countries on supply availability for each product presentation, possible timelines for introduction and related impact.

1.5 Since the signature of Supply Agreements under the AMC in March 2010, the two existing AMC manufacturers have offered additional quantities (under the headroom) compared to quantities originally contracted. As a result, the total supply available in 2011 amounts to 42.7M doses instead of the 24.2M originally expected. This has been critical in ensuring sufficient supply for early

[7] Nicaragua was the first to introduce pneumo vaccines in December 2010 under the AMC. Prior to this, Rwanda and Gambia introduced through donations of PCV7

[8] SDF v3.0 was published in February 2011

[9] Intensified health care worker training, repeated operational monitoring surveys and a Phase IV study assessing the potential risk for abscess formation and Toxic Shock Syndrome

introductions and guaranteeing a sustainable supply in 2011 and 2012 for the 19 approved countries.

1.6 Under the AMC pilot, GAVI and UNICEF agreed to issue a new Call for Supply Offers to contract additional doses of pneumo vaccine. The call was based on the Strategic Demand Forecast v3.0. A Request for Proposal was published on 8 April and closed on 6 May. UNICEF received four offers which are currently being reviewed. Award letters will be issued following consultations with the Procurement Reference Group (PRG) and new supply agreement(s) are expected to be signed late September/early October 2011 after the Executive Committee's approval of new applications.

1.7 Due to the complexities of the new vaccines, pneumo has a production timeline of at least two years. In view of the very high number of launches and increase in demand, the risk of insufficient supply is likely for some of the countries which may be approved later this year (applications received in May) and plan to launch in 2012. In the situation where additional contracts do not meet country requested introductions for pneumo, mitigation measures would be taken. For example, those countries approved for both pneumo and rota which rank low for access to pneumo supplies could be offered the option to introduce rota vaccines first.

1.8 **Coordination of product launches in country[10]*:*** Since November 2010, GAVI, WHO, UNICEF and AVI TAC have been working closely through the Pneumo Ad-Hoc Introduction group to ensure day-to-day operational coordination, information sharing and trigger country support activities. Under the Secretariat's leadership, the Pneumo Ad-Hoc introduction group proactively works with the launching countries to facilitate introduction of pneumo vaccines. This includes monitoring and regular sharing of information; updates on country readiness and planned introduction dates; transfer of funds/supply issues; delivery dates; and ceremonial launch dates. In addition, the AMT approved several operational procedures to facilitate AVI objectives. These include:

(a) ***Allocation process in short supply:*** should there be insufficient supply to meet demand or should countries choose predominately one product over the other, an interim procedure to allocate pneumo vaccines between countries taking into account countries' product preferences has been developed. Details are available upon request.

(b) ***Management of requests for switch:*** Countries may at any time request a switch of vaccine presentations through their Annual Progress Report. AVI is working to revise the current allocation process to include justification criteria from countries requesting a switch for IRC consideration. In the case of pneumo, it is proposed that country requests for switch will not be considered until 2015, after which country requests

[10] Coordination is over *GAVI Alliance input* into country launches, the launches themselves are carried out by Ministry of Health, WHO and UNICEF staff. Ceremonial launch support has been coordinated by GAVI External Relations.

would be reviewed based on supply availability and market shaping objectives.

(c) ***Size of eligible population in year of introduction:*** AVI is collecting data from those GAVI countries that are currently implementing pneumo programmes and have offered these vaccines to all children under one year of age irrespective of their pentavalent vaccine status. These "mini catch-ups" could impact demand levels and lead to country shortages as the basis for approval has been the birth cohort only in the first year of introduction. At present, AVI is tracking stock levels and supply requirements and is obtaining increased in-country reporting from partners to monitor the situation.

1.9 **The AVI Dashboard***:* In order to successfully accelerate vaccine introductions and monitor AVI's progress towards achieving its mission, GAVI and AVI TAC developed a country readiness dashboard currently being piloted for the Pneumo introduction group. The dashboard tracks the availability of financial resources *(source: GAVI),* supply considerations *(source: UNICEF)* and country readiness factors including cold chain capacity *(source: WHO, GAVI, UNICEF)*. The Dashboard has proven to be an excellent tool for the coordination of partner activities while providing transparency at all levels and allowing AVI to identify critical issues in need of attention and/or additional support. A review of the dashboard and its indicators is planned to take place end 2011.

2. Rota Vaccine Update — Progress Since December 2010

2.1 In Q3 2011, North Sudan will join four other GAVI-eligible countries in launching rota immunisation programmes (see Appendix III). We currently expect a total of three countries to introduce in 2012 and another 13 countries in 2013. However, these projections will have to be updated following the IRC review of new applications in July 2011.

2.2. **Strengthen country introduction – ensure sufficient supply***:* In 2010 UNICEF issued the first tender for rota supply to meet demand in Sudan. In 2011 an Expression of Interest (EoI) was issued to all industry to inform future procurement strategies. Subsequently a Request for Proposal was issued to five vaccine manufacturers having either a prequalified vaccine or vaccines in the pipeline expected to reach the market no later than 2016. Prior to the Pledging conference, several suppliers made their price offers publicly available, and committed to provide rota vaccines at a significantly lower price. UNICEF and GAVI are currently reviewing all offers to inform decisions on mid to long term supply.

2.3 **Coordination of product launches in country:** As with pneumo, the AMT set up a Rota Ad-Hoc group to ensure close coordination and improved information flow around pre-launch activities, day-to-day operational issues

and actions required initially for Sudan. The subgroup covers rota issues such as surveillance requirements, product choice and advocacy. The Rota Ad-Hoc group is also currently reviewing in-country data that might influence demand in the coming years. For example, some countries that have already launched rota vaccines are experiencing lower coverage compared to DTP3, presumably due to the strict age limitations for administration of the first and last rota vaccine doses. This could have implications for the number of infants immunised and application guidelines with regards to the amount of rota doses to be approved for countries in the future.

2.4 **The AVI Dashboard:** The Rota Ad-Hoc group is also piloting the AVI Dashboard with rota. The Dashboard will be reviewed by the end of 2011 with an eye to consolidating information for rota and pneumo to track coordination of partner activities for both vaccines.

3. Yellow Fever Vaccine Update

3.1 The GAVI Alliance has supported routine use of yellow fever vaccines since its inception and to date 17 countries have introduced the vaccine with GAVI support. The GAVI Alliance has been funding yellow fever prevention campaigns since 2007. In 2010, a yellow fever preventive campaign was conducted in Guinea and preventive campaigns were approved for Ghana and Côte d'Ivoire which will take place in 2011 and 2012, reaching a further 22 million people. Strategies are now being refined to assess the risk of the disease in new areas and ascertain the immediate needs for ongoing country support for yellow fever prevention. In the current context of very limited vaccine supply, manufacturers have indicated a need for robust forecasts to sustain production levels in order to meet the objectives set by the Initiative.

4. Meningitis A Conjugate Vaccine Update

4.1 In the lead up to the launch of the conjugate Meningitis A (Men A) vaccine in Burkina Faso in December 2010, a “Meningitis A vaccine working group” was set up to facilitate the introduction of the Men A vaccines across affected countries in Africa. With coordination provided by WHO, the Men A working group has supported the introduction of the new vaccine in two additional countries, Mali and Niger – reaching nearly 19 million people to date. A further three countries are expected to launch the vaccine this year.[11] At the end of the meningitis season, there have been only four confirmed cases of meningitis A in Burkina Faso, the lowest-ever incidence in the nation’s history (three cases from Togo seeking care). Niger has reported four cases, and Mali

[11] Cameroon, Chad and Nigeria were approved for funding in April and ten additional applications for Men A launches in 2012 and 2013 have been received as part of the recent application round.

none. AVI is working with the Men A working group to plan new vaccine introductions and sequencing of country introductions. The coordination among these groups will also provide an opportunity for AMT to serve as a resource for the Men A working group and enable the exchange of information and experience related to other policy issues and challenges faced with the introduction of pneumo and rota vaccines.

5. New Vaccines Update: HPV, Typhoid, Japanese encephalitis (JE) and Rubella

5.1 In addition to rota and pneumo introduction campaigns, AVI is proactively working to prepare for the distribution of important new vaccines that could have a significant impact on child survival rates and women's health. Following the approval of the GAVI Board in 2008 to develop the vaccine portfolio – but not at that stage to open a window for funding support for HPV, Japanese encephalitis, rubella and typhoid — AVI has been working on application guidelines and implementation strategies for each vaccine. For this purpose, vaccine specific sub-teams were set up. Each group will review the current WHO position paper, advise on drafting application guidelines and propose implementation strategies as appropriate. In line with GAVI's strategic goal on market shaping, a market analysis will also be conducted for each vaccine, identifying the dynamics that will affect GAVI's ability to ensure a sustainable price that is considered acceptable to GAVI and ultimately to countries if appropriate.

5.2 To date, GAVI has funded a number of activities for 2011-2012 through WHO to prepare for the November 2011 GAVI board discussions on the possibility of opening an application window for HPV vaccines in 2012. These activities include developing and communicating updated technical guidance on HPV vaccine introduction and comprehensive cervical cancer prevention; developing and disseminating tools for countries to collect data needed for decision making on introduction; additional operational research to identify how to ensure affordable and sustainable delivery and monitoring introductions in early adopter countries. There are two WHO pre-qualified vaccine suppliers.

5.3 There are no JE vaccines prequalified by the WHO, so timelines for introduction and plans to date are preliminary.

5.4 With regards to rubella, GAVI is expected to follow WHO recommendations to implement rubella vaccines only in countries that have reached measles coverage of at least 80 percent. The rubella antigen is currently only prequalified from a number of different suppliers in a combination with measles or measles and mumps.

5.5 Typhoid vaccines have a WHO recommendation for use. The use of polysaccharide and oral vaccines needs to be re-assessed in view of the delays in the development of the conjugate vaccine. Recently the first WHO

pre-qualification was obtained for a polysaccharide multi-dose vial without preservative.

5.6 Based on the sub-teams' recommendations, a paper will be submitted to the PPC for consideration in the September 2011 meeting and the November 2011 Board meeting such that windows for support could be opened for the next round (expected application deadline in 2012 to be determined).

6. Build a platform for (All) vaccine introductions - evidence based decision making

6.1 The unprecedented number of applications in the May 2011 round – 25 for rota vaccines and 28 for pneumo - are the best reflections of AVI's impact on countries' decision making. Although the lifting of the "pause" on new applications in 2010 partially contributed to the increase in applications this year, AVI played a central role, notably through WHO and UNICEF activities. These included, for example, high-level regional meetings with EPI managers and MoH decision makers where evidence on burden of disease, vaccine characteristics and country readiness for immunisation programmes were provided. The WHO NUVI website also contains relevant online publications and data sources to provide evidence for country decision making.

6.2 Through GAVI's investments in AVI TAC Special Studies and WHO Surveillance, new information regarding vaccine introduction and sustainability are forthcoming. These studies will help countries and advisory bodies to make evidence-based decisions by providing data that directly answer key policy questions. Examples of Special Studies outcomes to date include: determining ways to use rota and pneumo vaccines to maximize effectiveness and herd immunity; monitoring serotype replacement and adverse event risks; and evaluating the effectiveness of these vaccines in the context of limited health care access. Studies are currently taking place in Nicaragua, South Africa, Kenya, Gambia, Bangladesh and Pakistan. Data being collected and analyzed will generate a comparable and rigorous evidence base on disease burden, vaccine effectiveness and cost-effectiveness of rota and pneumo vaccines (see Appendix VI).

6.3 As pneumo conjugate, rota and other new vaccines are rolled out in GAVI countries, additional studies will be needed to evaluate the impact of these vaccines, update disease burden data and answer remaining policy questions. While the AVI TAC Special Studies team has begun to identify critical gaps in the evidence base to generate a research plan for the future, the GAVI Alliance will need to define which research activities it is willing to fund and what it believes to be out of its scope to help inform plans for future investments. The PPC has requested an options paper on this issue for their September 2011 meeting.

7. Build a platform — demand forecasting

7.1 AVI TAC develops Strategic Demand Forecasts (SDF) which inform the number of anticipated doses needed, vaccine impact and GAVI's expenditure forecasts. The SDF team led by AVI TAC also provides support analysis and runs scenarios for operational decision making and policy development. The latest SDF Version 3.0 was completed in February 2011 and takes into account the Board decisions of December 2010. Like all versions it assumes that there are no financial or supply constraints (see Appendix IV and V).

7.2 A Standard Operating Procedure (SOP) was established by GAVI and the AVI TAC to cover the forecasting process. Currently there are 10 vaccines[12] for which SDFs are provided twice per year. The main assumption updated each time is the year each country is expected to introduce each specific vaccine. Updated information is provided by WHO, UNICEF and the GAVI Secretariat based on regular calls with countries, information from regional offices and meetings.

7.3 The forecasts for HPV, JE, typhoid, and rubella are currently undergoing a separate review procedure bringing in experts from partner organizations.

7.4 AVI TAC through its Strategic Vaccine Supply (SVS) team has defined a standardised transparent methodology and reporting process and facilitated communication across stakeholders within the Alliance through ongoing consultations. The AVI TAC is also developing a web-based tool to allow wider access to forecasting information. This platform will be used in the preparation of SDF version 4.0 to be delivered in August 2011. As additional data on actual country applications, introductions and quantities is collected, the SDF methodology will be further refined.

7.5 GAVI and the SVS team also meet with multinational and developing country manufacturers on an annual basis. These meetings allow AVI to present the latest demand forecasts as well as GAVI procedures and policy. The briefings also provide the opportunity to exchange information on demand/ supply issues and vaccine development pipelines.

8. Build a platform - cold chain capacity

8.1 To improve vaccine supply and logistics competencies, WHO has developed an updated evaluation and management tool called Effective Vaccine Management (EVM). As part of the business plan, WHO has recently started a roll out to countries via 'train the trainers' workshops. GAVI evaluation of applications now mandates an EVM (or the like) to have been conducted within three years with a corrective action plan in place. As this is a new

[12] AMT has endorsed the pneumo, rota and pentavalent demand forecasts v3.0; the other vaccine forecasts are signed off by GAVI Secretariat

requirement, applications submitted in May and recommended for approval by the IRC will be put forward for funding approval provided that the EVM and the improvement plan is submitted by August.

8.2 WHO assessments of cold chain capacity at the national level show that of the 72 GAVI-eligible countries, 63% – 67% already have sufficient capacity to introduce *either* pneumo or rota vaccines, while 50% of GAVI eligible countries would have sufficient central storage space to introduce *both* vaccines. This readiness is largely due to the efforts by countries over the last 10 years to increase capacity in order to receive the single or two dose vial presentations of pentavalent vaccine which are far more voluminous than the traditional EPI vaccines in multi-dose vials. Due to these efforts around pentavalent vaccines for 63 countries it is quite feasible to launch pneumo vaccines *without any further increase needed in cold chain capacity* even if in some cases this may require relatively simple adjustments such as increasing the frequency of deliveries (assuming there is free capacity in transport infrastructure). Despite this, most countries are increasing capacity for future new vaccine introduction in line with their multi-year plans.

8.3 At the sub national level, free cold chain capacity is methodologically more difficult to assess, because data about *existing* capacity is often outdated, and data about capacity *utilization* isn't generally available. This lack of visibility makes it hard to quantify the challenge to increase capacity at the sub-national and district levels of the cold chain. Furthermore, in many countries, the combination of underperforming information systems on the one hand, with higher capacity utilization of the cold chain on the other, may lead to increased wastage (e.g. stores are utilized beyond their effective capacity) and/or stock outs (e.g. vaccines are not distributed on time to meet demand).

8.4 In the short term, current reporting and monitoring systems will need to be strengthened to ensure rapid notification of cold chain problems at the sub-national and district level. In the medium to long term, more ambitious improvements in country Logistics Management Information Systems (LMIS) have the potential to help streamline supply chains to the extent that countries can manage with lower buffer stock levels, while reducing wastage and improving service levels. The emergence of mHealth, the use of mobile phone technology to strengthen health information systems, holds significant promise in this area.

9. Build a platform - large country implementation programs

9.1 The group of seven "Large Countries," India, Nigeria, Pakistan, Indonesia, Bangladesh, Ethiopia and DR Congo, constitute 65% of the birth cohort of the 72 GAVI eligible countries. Four of these countries (Ethiopia, Pakistan, DR Congo and Bangladesh) were successful in implementing penta and thus are considered early-mid adopters. Introduction plans for pneumo and rota are

progressing. The DRC launched pneumo vaccines this year, with Ethiopia also in line for introduction in 2011 subject to the country meeting conditions for PCV-10. However, India, Nigeria and Indonesia still pose challenges for introduction over the coming years. A Large Country Task Team has been established to evaluate GAVI policy options for India and Nigeria, with consultations being carried out with India (May 2011) and Nigeria (July 2011). WHO, UNICEF and AVI TAC are providing substantive support to this task team, which will also review gender related barriers to access in these countries.

10. Build a platform - global communications and advocacy strategy

10.1 The AVI project provides additional capacity to generate both donor and country support for the introduction of new and underused vaccines. AVI TAC provides access to disease and vaccine expertise that has led to increasing awareness amongst key influencers and stakeholder groups about the burden of pneumococcal and rotavirus disease and the potential impact of introducing vaccines for disease prevention. Quick turn-around of newly generated data is leveraged to bring scientifically accurate information and messaging to decision makers, conveying evidence to build support for both immunisation and the accelerated introduction of new vaccines. Country-based success stories have been used to influence both donor and partner countries. Outreach to parliamentarians, pediatricians, civil society, global health networks, experts and advocates have expanded GAVI's support base.

10.2 Country communications efforts have been stepped up to strengthen informed decision making and raise awareness of GAVI-funded vaccines at a country level. AVI TAC supports the GAVI Programme Delivery Team in the provision of targeted messaging on GAVI policies, procedures and Board decisions to decision makers and other key stakeholders in GAVI countries. Examples include the development of a communication strategy identifying audiences; messaging, timelines and evaluation methods; FAQs on co-financing and graduating countries; standardised presentations for GAVI country visits and sub-regional meetings; a survey on country communications; a 'How to Apply' guide on the Health Systems Funding Platform; and, content for the GAVI web site.

10.3 UNICEF has developed a Communications Framework to support the introduction of new vaccines. The Framework provides guidance for countries to develop and implement communications plans to inform and motivate families to adopt healthy actions – such as breast feeding, hand-washing and care-seeking to prevent, protect and treat pneumonia and diarrhoea. The aim is to use the new vaccine introductions to boost complementary interventions for the cases of pneumonia and diarrhoea that these vaccines cannot

prevent.[13] A critical part of the framework is linking the new vaccines with care-seeking and case management of pneumonia with antibiotics, and for diarrhoea with ORS and Zinc.

11. Build a platform – surveillance

11.1 WHO surveillance is important to vaccine introduction since it provides national data for decision makers on the benefits of disease reduction and allows justification of financial resources in financing and co-financing (especially important if external resources to support vaccine purchase are no longer available). From the planning phase, it has been recognized that strengthening the laboratory network through NUVI surveillance, particularly the relatively weaker bacterial network, has far reaching public health system benefits. These include improving clinical diagnosis, supporting other public health programmes and allowing and supporting the introduction of other new vaccines.

11.2 As with any global program, the establishment of the infrastructure which includes technical experts as well as regional and global reference laboratories is the bulk of the expense. WHO coordinated global surveillance networks for rota and invasive bacterial vaccine preventable diseases (IB-VPD) have been successfully established with 55 and 47 countries reporting rotavirus and IB-VPD data to WHO, respectively, (January to June 2010). Approximately 70% of these countries were GAVI-eligible. A WHO-established network of three global and 20 regional reference laboratories, that also perform genotyping/serotyping, supports countries and reporting sentinel hospitals. Surveillance indicators have been established to monitor programme performance. Information is shared via global bulletins twice a year. (http://www.who.int/nuvi/surveillance/resources/en/index.html).

11.3 Data from the rota network appears relatively robust and, although early in the process of rota vaccine introduction, some interesting data is beginning to emerge. For example, among WHO regions, the lowest rota detection (20%) was reported from the region of the Americas which was the only WHO region with reporting countries that included rota vaccine in their national immunisation programmes (4 of 5 reporting countries had introduced vaccines). In comparison, rota detection ranged from 34% to 46% in the other WHO regions. Further work is needed to improve the quality and consistency of the IB-VPD data, particularly prior to and during vaccine introductions.

11.4 WHO's focus during 2011 and 2012 will thus be to further improve data quality. Global laboratory external quality assurance (EQ) programmes have been established this year to improve laboratory diagnostic capacity. Training of

[13] The Framework also provides guidance on developing a crisis preparedness plan to enable rapid response to maintain trust in the event of rumours, allegations and AEFIs.

laboratory staff is being undertaken using a tiered approach, with the global reference laboratory supporting the regional reference laboratories who in turn train national and sentinel site staff. IB-VPD guidelines are being revised and posters are being developed to provide support to clinical, laboratory and data managers.

Appendix I. AVI Sub-teams

Sub Team	Lead	Role	Status
Strategic Vaccines Supply (SVS)	L. Franzel[14], PATH	• Forecast demand and supply , identify gaps • Run scenarios to identify opportunities and risks • Provide input into critical activities to achieve forecast • Link forecast with operational plan	Fully functioning
Large Countries (LC)	G. Mayers, WHO	• Large countries strategy and operational support • Perform influencer mapping exercise • Develop country specific strategies • Advocate to build in-country support	Sub-team members supporting Large Country Task Team, not reporting to AMT
Cold Chain and Logistics (CCL)	S. Kone, WHO	• Provide in-depth, country-level analysis of CCL status for new vaccine introduction • Identify cold chain expansion needs and logistic constraints within countries • Document best practices in countries regarding management of CCL • Mobilize technical and financial support required to overcome in-country constraints	Last update was presentation to PPC in February 2010
Special Studies (SS)	O. Levine, Johns Hopkins University	• Provide external insight to fill knowledge gaps and avoid overlaps • Assist with technical A&C • Integrate findings into AVI project	Made special presentation to PPC March 2011
Advocacy & Comm. (A&C)	J. Wecker, PATH (a.i)	• Disseminate technical information to countries • Build coalitions/alliances to generate local advocacy • Support GAVI Secretariat ERO at global level • Strengthen communications between GAVI Secretariat and countries	Activities coordinated outside AMT
Ad-hoc Pneumo planning subteam	Johanna Fihman GAVI sec	• Pilot the AVI Dashboard with countries already approved for pneumo • Share relevant information around pneumo introduction among partners and ensure coordination. • Establish a procedure for management of country preferences for pneumo vaccines.	Fully Functioning reporting to AMT
Rota subteam	Sanja Saftic PATH	• Coordination of all introduction activities including country communication across the Alliance • Proactive identification of introduction related risks and definition of plans to mitigate them • Information sharing with all Alliance partners • The RV ad hoc group follows countries from the pre-introduction activities until year 3 after introduction	Fully functioning reporting to AMT
HPV, JE, Rubella, Typhoid	Leads [15]	• To prepare implementation guidelines and implementation strategies for new vaccine introductions. Note: some of these are non EPI vaccines delivered through school settings and campaigns	Set up and running from May 2011

[14] Under Directorship of John Wecker

[15] HPV: Susan Wang (WHO), Vivian Tsu (PATH), JE: Joachim Hombach (WHO), John Wecker (PATH), Typhoid: Pem Namgyal (WHO), Gretchen Meller (BMGF); Rubella: Peter Strebel (WHO), Susan Reef (CDC)

Appendix II. Pneumo Vaccine Introductions

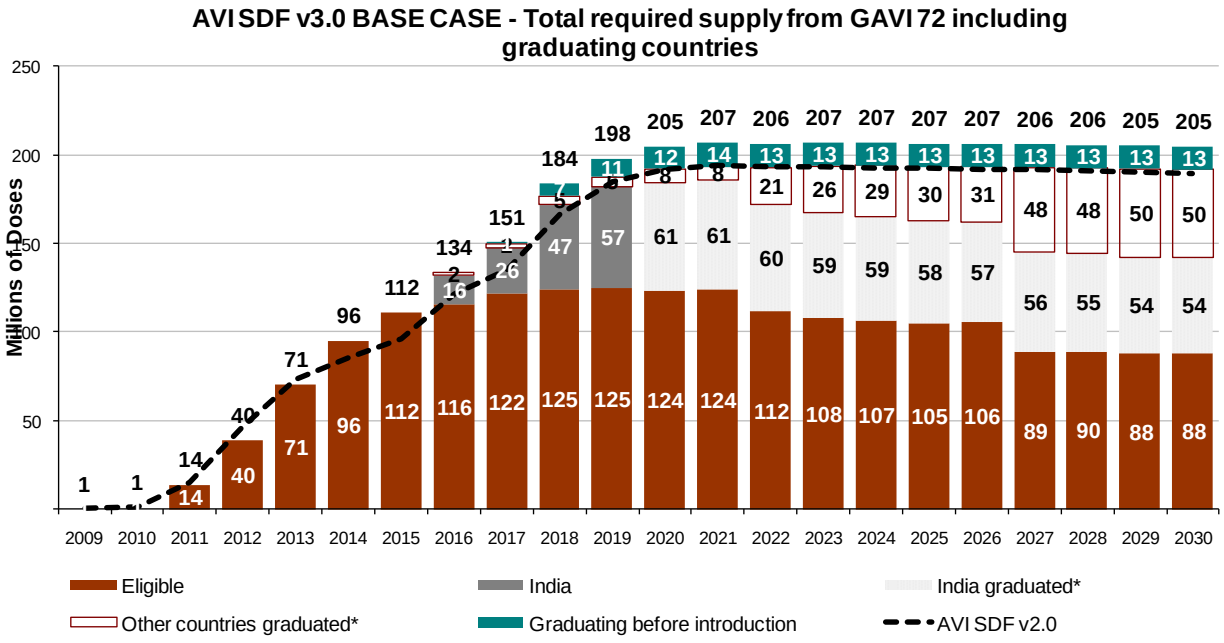
Year	Country	Product	Status	No. of Launches	Cumul No.
2009	**Gambia**	PCV7 (donation)	Switched to PCV13 in June	2	1
	Rwanda	PCV7 (donation)	Switch to PCV13 planned in August		2
2010	**Nicaragua**	PCV13	Introduced December	10	3
2011	**Guyana**	PCV13	Introduced January		4
	Yemen	PCV13	Introduced January		5
	Kenya	PCV10	Introduced January		6
	Sierra Leone	PCV13	Introduced January		7
	Mali	PCV13	Introduced March		8
	Congo, DR	PCV13	Introduced April		9
	Honduras	PCV13	Introduced April		10
	Central African Republic	PCV13	Planned July		11
	Benin	PCV13	Planned July		12
	Cameroon	PCV13	Planned July	5	13
	Burundi	PCV13	Planned July		14
	Ethiopia	PCV10	Planned July - September		15
	Malawi	PCV13	Planned October		16
	Madagascar	Tbc	Under consideration		17
2012	**Congo Rep**	PCV13	Planned January	2	18
	Pakistan	PCV10	Under consideration		19
	10 more introductions	Tbd	Applications being reviewed	10	29
2013	18 more introductions	Tbd	Applications being reviewed with more expected in 2012	18	47

Appendix III. Rota Vaccine Introductions

Year	Country	Product	Status
2008-9	Bolivia Honduras Guyana	2 ds schedule 2 ds schedule 3 dose schedule	Introduced Introduced Introduced
2010	Nicaragua	3 dose schedule	Introduced in 2006 based on a donation from Merck
2011	**Sudan**	**2 dose schedule**	**September[16]**
2012	**3 country introductions**	**Tbd**	**May change**
2013	**13 country introductions**	**Tbd**	**Will be reviewed in light of applications received**

[16] Shipments to begin in July 2011

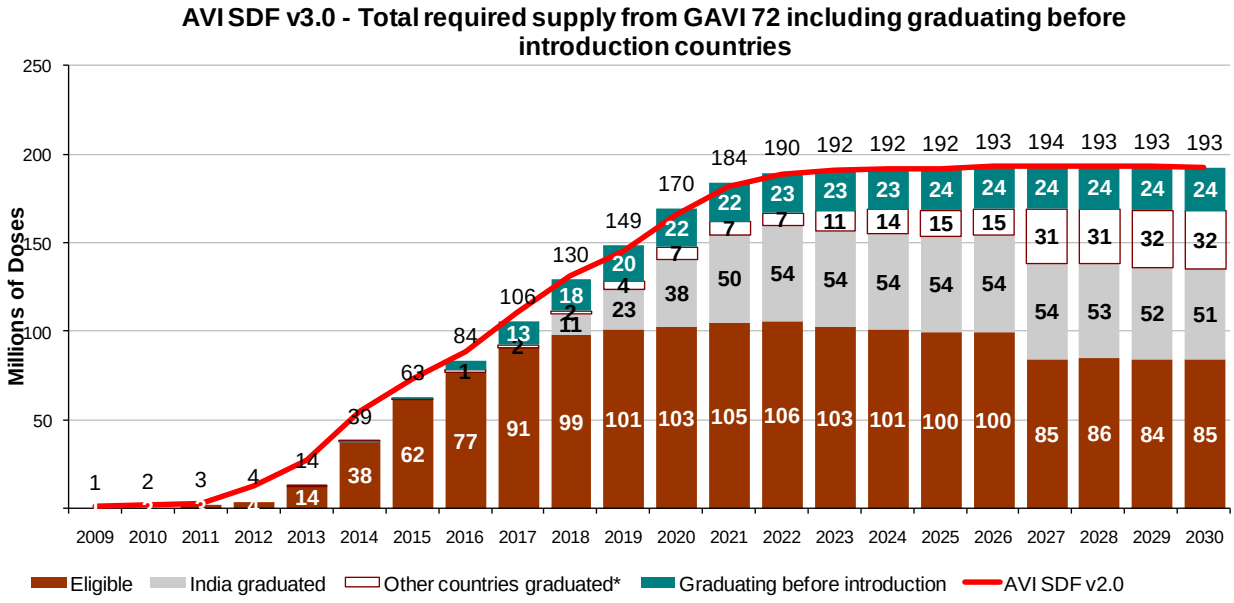
Appendix IV. Strategic Demand Forecast for Pneumo v3.0 [17]



[17] Pneumo Assumptions: Available financing for the entire forecast duration for product purchase and introduction expenses; no changes in eligibility criteria; sufficient production capacity to meet demand; all prequalified products meet or exceed TPP and have suitable presentation.

- Successful cold chain up scaling at central & local level in all countries where required. *Source: SVS sub team*
- Introduction 12 months after application; 5 countries introducing by 2015; 21 countries in 2010 (8 already approved, 3 from May 2009 application, 10 out of applications expected in September 2009).
  Large countries: Pakistan to introduce in second half of 2011; Nigeria to introduce in 2014; India phased introduction starting in 2016; Indonesia introduction in 2018 financed from local government.*Source: WHO New & Underused Vaccine Introduction (NUVI) regional calls and other input*
- Time to match reference coverage aligned with HepB/Penta analogue (Pneumo introduced with same schedule as Penta): 24 months for small countries / 36 for medium/large countries (>1 mln SI) / 48 months for very large countries (>3.5 mln SI) *Source: SVS sub team*
- PCV3 (3rd dose) coverage projected to increase up to 90%. *Source: SVS sub team projection based on DTP3 WHO-UNICEF Best Estimate*
- Wastage = 10% based on WHO guidance (to reflect an unknown mix of presentations ranging from 1 to >2 doses per vial) – for countries introducing Prevnar13 5% wastage assumed; Buffer stocks = 25% of Δ between forecast years. *Source: GAVI Secretariat*
- Population, crude birth rate & infant mortality rates as per medium variant. *Source: 2008 UN population prospect*
- Large country assumptions: India phased introductions financed locally beyond GAVI cap – 11 states (same 10 states introducing Penta + Orissa pilot) to introduce in 2016, remaining states after two years; graduation as country in 2020; Chad and Somalia cannot apply for NVS because of low DTP coverage; Ethiopia to introduce Q3 2011; Pakistan introduction Q4; Nigeria to introduce in 2014 after taking advantage of 50% DTP3 NVS threshold for Penta and Pneumo; Indonesia loses eligibility in 2011 and is not expected to apply after graduating.

Appendix V. Strategic Demand Forecast for Rota v 3.0[18]



- [18] Rota Assumptions: Available financing for the entire forecast duration for product purchase and introduction expenses; no changes in eligibility criteria; sufficient production capacity to meet demand; all prequalified products meet or exceed TPP and have suitable presentationSuccessful cold chain up scaling at central & local level in all countries where required. *Source: SVS sub team*
- Introduction 12 months after application; 5 countries introducing by 2015; 21 countries in 2010 (8 already approved, 3 from May 2009 application, 10 out of applications expected in September 2009).
  Large countries: Pakistan to introduce in second half of 20*11; Nigeria to introd*uce in 2014; India phased introduction starting in 2016; Indonesia introduction in 2018 financed from local government*Source: WHO New & Underused Vaccine Introduction (NUVI) regional calls and other input*
- Time to match reference coverage aligned with HepB/Penta analogue (Pneumo introduced with same schedule as Penta): 24 months for small countries / 36 for medium/large countries (>1 mln SI) / 48 months for very large countries (>3.5 mln SI) *Source: SVS sub team*
- PCV3 (3rd dose) coverage projected to increase up to 90%. *Source: SVS sub team projection based on DTP3 WHO-UNICEF Best Estimate*
- Wastage = 10% based on WHO guidance (to reflect an unknown mix of presentations ranging from 1 to >2 doses per vial) – for countries introducing Prevnar13 5% wastage assumed; Buffer stocks = 25% of Δ between forecast years. *Source: GAVI Secretariat*
- Population, crude birth rate & infant mortality rates as per medium variant. *Source: 2008 UN population prospect*
- Large countries: India phased introduction after graduation fully financed locally – 10 states to introduce in 2018, remaining states after 2 years; Pakistan will introduce in 2014, Nigeria will self-finance; Indonesia will lose eligibility in 2011 and introduce in 2016 with local manufacturer

Appendix VI. AVI TAC Special Studies

No.	Study	Location	Vaccine	Recent Deliverables	End Date*
Optimize dose/delivery					
1.1	Landscape analysis of PCV schedules	Desk based; multiple sites	All pneumo vaccines	Preliminary analysis report 2/2010	04/2010
1.2	Impact of breastfeeding and age of administration on immunogenicity of rota vaccine	Pakistan	Rotarix	Protocol Submitted 11/2009	12/2010
1.3	Mathematical modeling of rota and PCV transmission patterns (also considers herd immunity and safety)	Desk based	N/A	Review of initial analysis and report 3/2010	09/2010
1.4	Global review of rota strain prevalence	Desk based; multiple sites	Live oral rota vaccines	Final Report and draft publication 1/2010	
Herd Immunity Studies					
II.1	Assessment of population and indirect effects of rota vaccine introduction	Bangladesh	Rotarix	Covered under Rota ADIP	TBC
Effectiveness Studies					
II.1a	Assess impact of national introduction of rota & PNC vaccines; case- control studies on PCV effectiveness	Bolivia	Rotarix	Mid-season enrollment report 9/2010	06/2011
III.1b		Nicaragua	Rotateq	Mid-season enrollment report 9/2010	12/2010
III.1.c			Rotarix	Enrollment report first half of 2010 season	02/2010
III.d	Assess impact of national introduction of rota & PCV vaccines; case-control studies of PCV effectiveness	South Africa	PCV	Enrollment of first patients 3-4/2010	04/2012
III.1f	Interrupted time-series analysis of combined PCV/rota vaccine effectiveness	South Africa	PCV/rota vaccines	Delayed	06/2012
III.2	Development of PCV vaccine impact assessment manual and case –control study protocol	Desk based; multiple sites	PCV vaccines	First draft for WHO clearance	12/2010
Demonstration Projects to measure costs and benefits					
IV.1	Assessment of the economic impact of national introduction of rota & PCV vaccines through collection and evaluation of associated health care costs	South Africa Honduras Bolivia, Peru	PCV7 & rota vaccines	Protocol submitted 4/2010	12/2010
Cost Effectiveness					
v.1	Creation, maintenance and training on web-based tools for cost-effectiveness analyses	Desk-based; multiple sites	Not vaccine specific	N/A	12/2010
					Safety
VI.1	Post-marketing safety monitoring – oral rota vaccines	Bolivia, Honduras	Rotateq	Closed	Closed