**IPV Introduction Plan**

**Annex A**

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# Executive Summary

The last case of wild poliovirus was detected in Cambodia in 1997, and the Western Pacific Region was certified polio-free in 2000. Since 2000, due to the efforts of the National Immunization Program, Cambodia has successfully maintained its polio-free status. In 2005-2006, three cases of circulating vaccine-derived polioviruses (cVDPV) were detected in Cambodia. Immediately following detection, an OPV campaign was conducted and the transmission of the cVDPV was stopped. This event underscores the reality of the risk posed by cVDPVs.

In May 2013, the World Health Assembly (WHA) endorsed the *Polio Eradication & Endgame Strategic Plan 2013-2018*. The intent of the plan was to ensure a polio-free world through the eradication of both wild and vaccine-related polioviruses. Unlike previous global plans that focused on stopping transmission of wild poliovirus in targeted endemic areas, the most recent global polio plan includes strategic objectives relevant to countries in polio-free regions. Specifically, the Endgame Plan calls for all countries to strengthen routine immunization, introduce at least one dose of IPV into the routine immunization schedule, replace trivalent Oral Polio Vaccine (tOPV) with bivalent OPV (bOPV) in 2016, initiate the bio-containment of all polioviruses, and help develop the polio legacy for years to come.

In the past 5 years, 98% of the global cases of cVDPV have been related to the type 2 vaccine strain. Recognizing the risk of type 2 cVDPV, the Strategic Advisory Group of Experts on Immunization (SAGE) recommended the phase withdrawal of OPV, starting with type 2 strains. In November 2012, the Strategic Advisory Group of Experts on Immunization (SAGE) recommended that before the switch from trivalent to bivalent OPV: all countries introduce at least one dose of Inactivated Poliovirus Vaccine (IPV) into their routine immunization schedule. There are two major benefits to introducing one dose of IPV in Cambodia. First, it will reduce the risk of type 2 vaccine-derived paralytic polio outbreaks in Cambodia after the switch from trivalent OPV ( serotype 1,2,3) to bivalent OPV (serotype 1&3). Second, a dose of IPV will increase immunity against types 1 and 3 polioviruses. This will ensure the children of Cambodia are protected in the case of an importation of wild poliovirus. In June 2013, the technical advisory group for immunizations in the Western Pacific Region (TAG) recommended that all countries initiate the development of a national polio endgame with specific plans for IPV introduction in all exclusively OPV-using countries.

Following SAGE and TAG recommendation, the government of Cambodia initiated discussion about the introduction of IPV. In 22 April 2014, the government of Cambodia submitted an Expression of Interest to GAVI regarding IPV introduction. In 7 August 2014, the Technical Working Group for Health (TWG-H) reviewed the rationale for IPV introduction and endorsed the introduction of IPV and supported Cambodia’s application to the GAVI alliance for financial support for the introduction.

In October 2015, IPV will be introduced nationally in Cambodia. Preparation of documents and revision of immunization cards will take place during the third and fourth quarter of 2014 in combination with PCV and JE. During the beginning of 2015, the training curriculum and materials will be developed. The trainings will take place the four months before introduction (June-September 2015). Following introduction, post-introduction monitoring and evaluation will take place.

Cambodia has experience introducing other new vaccines including pentavalent vaccine (2010) and a second dose of MR vaccine (2012). Key lessons learned during these introductions were considered during the planning for IPV introduction.

In addition to IPV introduction, PCV and JE will also be introduced in Cambodia in the next few years (January 2015 and early 2016 respectively). Some preparatory activities for these three vaccine introductions (such as revision of the immunization cards and forms) will be combined. After discussion, it was decided that in order to avoid confusion of health care workers, trainings for each vaccine will be conducted separately. Training for PCV will take place at the end of 2014. Lessons learned from these training sessions will be used to improve the training plan for IPV.

Given the high wastage that is expected with a 10 dose vial in routine immunization, Cambodia prefers the five dose IPV vial presentation. The total expected IPV requirement for the Oct 2015-Dec 2018 is around 1.8 million doses. The Government of Cambodia has estimated that the total cost of IPV introduction (including potential contributions from GAVI, WHO, and UNICEF) will be $797,577. This estimate includes the cost of reprinting and distributing new immunization cards ($ 315,400) which will be paid by the government and is a joint activity with PCV and JE. In addition, Cambodia is requesting a vaccine introduction grant from GAVI of $312,000 for IPV. Additionally, WHO and UNICEF have proposed potential support of $55,000 and $50,000 respectively to provide technical assistance, monitoring support, social mobilization, cold chain investments and other support to IPV introduction. Finally, the remaining amount ($65,000) is expected to be supported by HSSP funds and government funds. As per the GAVI co-financing policy for IPV, the Government will not be providing funds to finance the cost of IPV procurement.

The cold chain capacity analysis at different levels has shown sufficient capacity to accommodate the introduction of IPV in five dose vials. Cambodia will procure IPV through UNICEF, and the vaccine will be registered with the Department of Drugs and Food (DDF). NIP and the Technical Working Group for Health (TWG-H) will provide oversight over implementation of new vaccine introduction activities and monitoring and supervision.

In line with the SAGE recommendation, a single dose of IPV will be given in addition to OPV, Penta, and PCV at 14 weeks of age. For children who miss immunization sessions and therefore start the immunization schedule late, IPV will be given at the first immunization contact in which the child is older than 14 weeks.

The four major expected challenges are: (1) fear of caregiver of three injections to be given at one visit, (2) difficulty communicating the complex rationale and need for IPV, (3) potential higher than estimated wastage, and (4) inadequate funding to cover all costs of new vaccine introductions. To mitigate the first two challenges, an emphasis will be placed on communication about IPV introduction at all levels. This is reflecting in the budget and need to ensure information is disseminated to all levels. Additionally, caregiver acceptance will be monitored after the introduction to better understand caregiver’s attitudes. To address the challenges of high wastage, Cambodia will collect data on wastage following introduction and request changes in the dose allocation if needed based on the evidence. Finally, to ensure adequate funding, NIP will advocate the importance of new vaccine introductions and try to secure government funding.

The Government of Cambodia is committed to polio eradication and ensuring a polio-free world. The introduction of IPV will be used as an opportunity to strengthen routine immunization and getting additional experience with the introduction of new vaccines.

# Justification for introduction of IPV and national decision-making process

## Rationale for the introduction of IPV

In 1988, all WHO Member States, including Cambodia, committed to eradicating poliovirus so that no child in the world would ever be paralyzed by this preventable disease again. In 1994, Cambodia began polio eradication activities and in 1995, a polio eradication team was established to further intensify polio eradication. The last confirmed case of poliomyelitis in Cambodia was detected in March 1997. In November 2000, Cambodia and the entire Western Pacific Region was declared polio-free.

Although Cambodia has been polio-free for over 15 years, the risk of wild poliovirus importation will remain until polio is eradicated globally. The reality of this risk has been illustrated in recent years by the importation of wild poliovirus into countries near Cambodia such as the importation into China in 2011 which resulted in 21 confirmed paralytic cases. Therefore, it is critical that high immunization coverage with vaccines that protect against polioviruses is maintained.

In recent years, significant progress has been made towards eradicating poliovirus globally. However, an additional issue has become increasingly important. It is known that in extremely rare circumstances, the attenuated vaccine virus strains in the oral polio vaccine (OPV) can mutate and become transmissible and pathogenic viruses, referred to as circulating vaccine-derived polioviruses (cVDPVs). cVDPVs occur in areas with chronically low OPV immunization coverage. cVDPVs have been detected in multiple countries throughout the world, including Cambodia. In 2005 and 2006, two cases of cVDPV were detected in Cambodia. After detection, a rapid response was initiated, and the cVDPV outbreak was stopped. However, the risk of having another cVDPV emergence remains.

Because of the risks presented by cVDPVs, in 2008 the World Health Assembly declared that eradicating polio would require not only eradicating wild polioviruses, but also vaccine-related polioviruses. In order to accomplish this, the WHA concluded that following the interruption of the transmission of wild poliovirus, all OPV vaccines would need to be withdrawn and replaced with IPV.

However, in November 2012, the Strategic Advisory Group of Experts (SAGE) endorsed a new strategy: the phased OPV serotype withdrawal, starting with OPV vaccines containing serotype 2 OPV viruses followed by total OPV cessation. This means that all countries will switch from using the trivalent OPV (containing serotype 1 OPV, serotype 2 OPV, and serotype 3 OPV) to bivalent OPV (containing only OPV serotype 1 and OPV serotype 3). The primary reason for stopping the use of OPV serotype 2 before OPV serotype 1 and OPV serotype 3 is that OPV serotype 2 seems to have the greatest risk of mutating into a VDPV. For example, in the past five years, 98% of all VDPV cases were associated with VDPV2. In order to operationalize this new policy, all OPV serotype 2 will be withdrawn, destroyed and replaced by an OPV vaccine that contains only type 1 and type 3 strains (known as bOPV). This process is referred to as the “tOPV–bOPV switch”.

During and immediately after the switch, if children have no type 2 immunity they will be vulnerable to being paralyzed by cVDPV2. To decrease the risk of cVDPV2 cases following the withdrawal of serotype 2 OPV, in November 2012, the Strategic Advisory Group of Experts (SAGE) recommended that at least one dose of IPV should be introduced into the routine immunization program of every country by end-2015. The main purpose of adding IPV to the routine schedule is to provide immunity against type 2 polioviruses in case individuals are exposed to a cVDPV type 2 or wild poliovirus 2 (if accidently released from a manufacturing or laboratory facility). Additionally, adding IPV to the schedule will boost immunity to type 1 and type 3 polioviruses, providing further protection against wild polioviruses if an importation were to occur.

In order to prepare for the global switch from trivalent OPV to bivalent OPV tentatively scheduled for April 2016, Cambodia will introduce IPV in October 2015.

## Decision making process for the introduction of IPV

Following the TAG recommendation in June 2013 and the SAGE recommendation in November 2013, Cambodia initiated discussion among immunization partners regarding the introduction of IPV. Following consultation, the Ministry of Health in Cambodia decided to introduce IPV into the routine immunization program in October 2015.

The IPV introduction plan, introduction timeline, and introduction costs (budget) were presented to the Technical Working Group for Health (TWG-H) meeting in 7 August 2014. In the meeting, the plan, timeline, budget and proposed application to GAVI were endorsed.

## Technical and operational feasibility of introducing IPV

A single dose of IPV will be introduced into the routine immunization schedule. Therefore, unlike some other new vaccines, IPV does not call for additional campaign planning or specialized delivery to a new target population. For this reason, IPV introduction is expected to be technically and operationally feasible by using the existing system for all routine immunization.

Cambodia has experience introducing other new vaccines including Pentavalent vaccine (2010) and a second dose of MR vaccine (2012). Key lessons learned during these introductions were considered during the planning for IPV introduction.

Additionally, in January 2015, three doses of the pneumococcal vaccine (PCV) will be introduced into the routine immunization schedule. The experience gained from the introduction of PCV will be used to assist the implementation of IPV introduction. Additionally, because PCV, IPV, and JE will all be introduced in the next two years, opportunities to capitalize on these concurrent introductions and combine activities will be taken. For example, the immunization cards, tally sheets, and immunization registry will all be revised at one point in time for PCV, IPV, and JE.

# Situational analysis of the immunization program

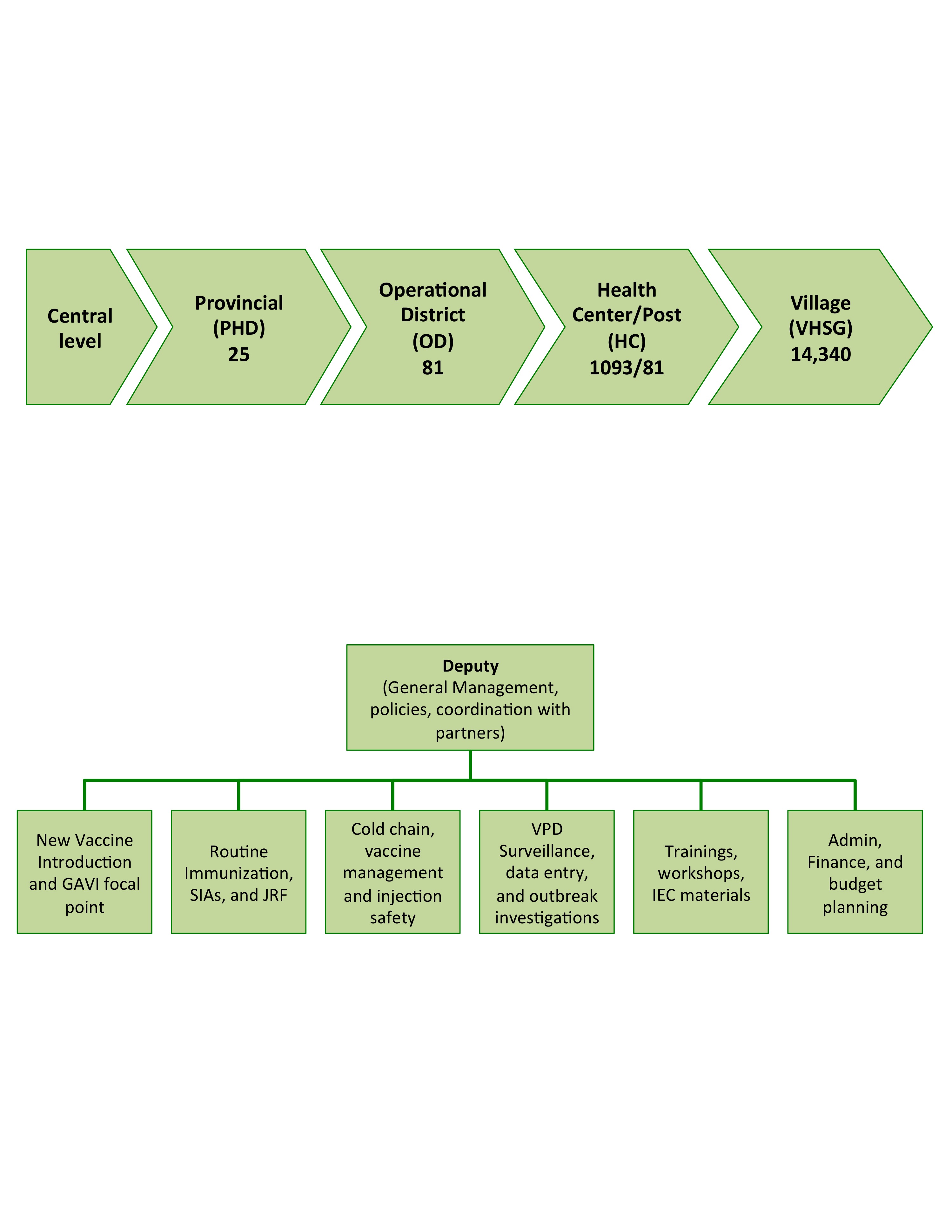
## General context of the country

**Structure of Health System:** The health system in Cambodia is divided into three levels: Central, Provincial Health Districts (PHD) and Operational Districts (OD) including health centers (HC), Health Posts (HP) and referral hospitals. At the central level, there are eight national hospitals. The Provincial level consists of 25 Provincial Health Departments and four regional training centers. There are 81 Operational Districts with 86 referral hospitals, which manage 1,093 Health Centers (HC) and 87 health posts (HP). Lastly, there are 14,340 village health support groups (VHSG) served by the health centers and health posts.

**History of National Immunization Program:** In 1986, the government of Cambodia started expanded program for immunization (EPI) activities in some provinces. The immunization program was expanded to the entire country in 1988. Polio eradication activities started in 1994, and in 1997 a polio eradication team was established to intensify the activities. The Ministry of Health also established the national immunization program (NIP) in order to integrate the expanded program for immunization and the polio eradication into a single structure.

Following the NIP’s success with polio eradication, attention was turned to reducing the burden of measles, maternal and neonatal tetanus, primarily through expanding the reach of routine immunization services and conducting TT and measles campaign that targeted infants/children, pregnant and child bearing age women (15-44 year of age) throughout the country. In 2001 auto disposable syringes and safety boxes were introduced into the immunization program, three doses of hepatitis B vaccine was introduced in 2001 and then a birth dose was added to the schedule in 2006. In 2010, the country introduced the pentavalent vaccine (DPT-Hib-HepB), which meant children were now being protected against an additional vaccine-preventable disease—Haemophilus influenzae B (Hib). In 2012, a second dose of measles containing vaccine (MCV2) was added to the routine immunization schedule to be given at 18 months.

**Structure of National Immunization Program:** At the central level, the National Immunization Program (NIP) staff are responsible for the oversight and implementation of all activities. The responsibilities of each officer are shown below.



At the Provincial level, central supervisors interact with the Provincial Health Director (PHD) and the EPI manager. At the OD level, programs are managed by the OD Director and District EPI manager. At the service delivery point, immunization services are provided by healthcare workers as part of a Minimum Package of Activities (MPA) that include maternal and child health services and communicable disease control activities. Health center staff (midwives and nurses) are under the direction of the health center chief. The majority of immunization services (80%) are provided in villages through outreach services, often in collaboration with VHSG, local authorities, and NGOs.

## Trends in immunization coverage

WHO-UNICEF estimates of coverage, 2006-2013.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Coverage of traditional EPI vaccines** | | | | | | | | |
|  | **2013** | **2012** | **2011** | **2010** | **2009** | **2008** | **2007** | **2006** |
| **BCG** | 93 | 99 | 97 | 94 | 96 | 98 | 90 | 87 |
| **DTP1** | 95 | 97 | 96 | 93 | 99 | 95 | 87 | 85 |
| **DTP3** | 92 | 95 | 94 | 92 | 94 | 91 | 82 | 80 |
| **HepB3** | 92 | 95 | 94 | 92 | 92 | 91 | 82 | 80 |
| **Pol3/OPV3** | 77\*\* | 95 | 94 | 92 | 95 | 91 | 82 | 80 |
| **MCV** | 90 | 93 | 93 | 93 | 92 | 89 | 79 | 78 |
| **Introduced since 2006** | | | | | | | | |
|  | **2013** | **2012** | **2011** | **2010** | **2009** | **2008** | **2007** | **2006** |
| **HepB Birth dose** | 58 | 65 | 68 | 57 | 55 | 46 | 25 |  |
| **Neonates protected at birth (PAB) against neonatal tetanus** | 91 | 91 | 91 | 91 | 91 |  |  |  |
| **Hib3 (as pentavalent)** | 92 | 95 | 94 | 92 |  |  |  |  |
| **MCV2** | 63 | 41 |  |  |  |  |  |  |

\*\* Low coverage is due to a national OPV stock out in 2013.

Source: WHO vaccine-preventable diseases: monitoring system 2014 global summary. Available at: http://apps.who.int/immunization\_monitoring/globalsummary/timeseries/tswucoveragedtp1.html

## Findings from EPI Review (2010) including geographical, economic, policy, cultural, gender and social barriers to immunization

In 2010, a review of the Expanded Program on Immunization (EPI) in Cambodia was conducted. The following are the conclusions and actions to be taken from this review:

**Communities still not receiving vaccination:** Communities can still be found throughout Cambodia where infants and women are still not accessing any immunization services. The EPI review (2010) found they could be described under the following categories, which are not mutually exclusive:

* Mobile populations moving to find the best opportunities for employment, including garment factory workers, rice farmers, construction workers, fishing families.
* Ethnic Vietnamese and other minorities with different language and culture and who may not be included in the local population data.
* Urban poor and the poorest within communities who struggle to survive and for whom there are high opportunity costs to take children for vaccination, and for whom there is weak volunteer support.
* Geographically remote areas where the cost of regular outreach may be too high, and unofficial or new settlements which are not included in the HC or OD plans.
* Those that fear vaccination, usually because of the perception of associated pain or fever.

**Why Children and mothers in these communities continue not to be immunized:** During the 2010 EPI review, over half of the mothers interviewed stated that the main reason why they or their children remained under-immunized was because they were ‘’too busy’’ or ‘’mobile’’. Since almost all the respondents can be described as ‘poor’ these reasons express their perception that immunization is not a priority over the need to earn a living from day to day. Fear of vaccination was a significant reason of around 20%, but lack of knowledge was much less of a factor at around 12%. These findings and the fact that 83% of mothers held cards reflect a widespread knowledge of immunization, though some misunderstandings of the benefits still need to be corrected. It was noted that distance, lack of outreach visits, and cost together amounted to 15% of reasons. While the review teams did not have time to visit very remote areas, this finding may reflect the great improvements that have been made in road construction.

**What should be done?** Although the EPI review found that beyond the fine tuning improvements to the immunization system (such as ensuring improved quality of vaccine management, cold chain systems, surveillance, reporting quality etc.) there are some “critical elements” that are required for scaling up access and utilization of services for the underserved populations. These include the following:

* Putting in a place a planning system that detects the under-served communities at the village level
* Establishing a community based monitoring system that quantifies the level of service access and utilization or lack thereof, with more required accountability for the vaccination coverage within the community (e.g. village chief)
* Ensuring adequate costing and financing of the actions that will be required to improve service access and utilization for the under-served
* Elaboration of communication strategy that enables providers to adjust service delivery according to the special needs of special population groups

**Action points from the EPI review (2010):**

1. All levels of the MOH should commit to reaching the under-served as a means to achieve national goals and improve equity in immunization. This implies political commitment to recognize the problems of access and provide the required additional funding.
2. The community support system, including VHSG, village chief and commune council should be revitalized by HC and OD levels to recognize those within their communities who are unimmunized and who need support to improve their access to immunization sessions.
3. Health Centers should identify underserved communities in direct collaboration with the communities, provide appropriate immunization services and monitor immunization status in each community regularly.
4. The OD and PHD should incorporate new strategies according to the outreach guideline in order meet the needs of under-served communities.
5. The NIP should collaborate with partners to develop a new strategy for reaching every community which will build upon the existing strengths of the immunization system. Such a strategy can build upon the successful use of the Reaching Every District strategy (see below).
6. Every occasion to reach the children, such as special immunization activities (for example national measles campaign) or integrated outreach activity (jointly with antenatal care, vitamin A, deworming, malaria etc.) should be an opportunity to pay attention in finding under-immunized children and providing them with missed-vaccination, through adequate micro planning

## Update on EPI activities 2011-2013

**Measles SIA (2011) and identification of high-risk community strategy:** In 2011, a nationwide measles campaign was conducted in two rounds. During the first round in February, measles vaccine was provided to infants and children 9 to 59 months. Additionally, other vaccines and health services were given to children during the campaign including OPV in select high risk community groups, vitamin A to children 6-59 months, and mebendazole to children from 12 to 59 months. During this phase, high-risk communities were identified based on socio-economic data.

In November 2011, the second round of the measles SIA was conducted. During this phase, measles was provided to older children (5-9 years). Additionally, during this round, a new approach was taken in order to identify high-risk communities for future activities. During this round, all children 0 to 23 months had their immunization cards checked. Children were categorized as “fully immunized”, “partially immunized”, or “no yellow card”. Based on these results, communities with a high proportion of unimmunized children were identified. These high-risk communities were then prioritized for targeted actions in 2012. One key finding from this exercise was that a large proportion of unimmunized children were living in new villages and annex villages.

**Reaching every community strategy (2012): Pilot high-risk implementation in 3 provinces**

Based on the results of the high-risk identification in the measles SIA, some health centers were selected for special high-risk training. These trainings used a new micro planning guideline. Prior to this, micro-planning was being done at the district level but not at the HC level. Additionally, training was conducted with VHSGs to improve community support and utilization of immunization sessions in High Risk Communities. Additionally, a budget was allocated to the HC to use mobile phones to contact the VHSG. However, no money was given for outreach to new villages and annex villages.

**Findings from an evaluation of 2012 High Risk Communities (HRC) activities:**

**Successes:** There were many successes of the HRC strategy. First, the activities helped develop and strengthen links between HC and HR communities. Additionally, the regular phone communication from HC to VHSG helped to mobilize children and mothers for immunization session. Additionally, the immunization registers was updated in many VHSG with more relevant information. Finally, monthly meetings were held between HC and VHSG.

**Challenges**: Despite the many successes, there were also some challenges with the HRC strategy. Firstly, no funding support was given to conduct outreach activities in new and annex villages where a high proportion of unimmunized children live. Additionally, no support was allocated for supervision for PHD and OD visits to HC and HR villages. Data management at OD level is weak, and some HC did not make high-quality micro-plans.

**Measles SIA (2013): Identifying communities for the high-risk list**

In 2013, another measles SIA was conducted and the opportunity was used again to help identify high-risk villages. Yellow cards were checked through the country, and communities with the highest percentage of unimmunized children were designated as “high-risk”. A list of high-risk communities was made, and special activities were planned for these communities to increase coverage both during the SIA and to improve routine immunization.

**Key conclusion found scaling up the High-risk strategy (2012-2013)**: The high-risk strategy has worked well for SIAs. However it has been less effective in routine immunization.

**Strategy for 2014-2015:** In order to try and improve the use of the high-risk strategy for routine immunization, the “Implementation guideline for high risk communities” was produced in 2014. This strategy will be the focus of strengthening routine immunization in coming years.

## Progress report on EVM Improvement Plan (2014)

In 2012, an assessment of the Effective Vaccine Management (EVM) was conducted in Cambodia. In early 2014, a progress report was made on the status of the recommendations. The following is a summary of the current status of the implementation of the recommendations included in the cold chain improvement plan.

**Recommendation #1 (E5): Include EVM maintenance items (buildings, equipment and transport) on annual Government expenditure budget at all levels**

Status of Implementation: In progress. There is no information about the access to the National budget for this activity because the budget is decentralized to the sub-national level. Recommendation has been made to all Provincial EPI focal points through regular national and sub national immunization meetings/workshops. The government is deciding on whether or not to add a network of a technician (one technician per province or number of refrigerators per technician) and outsourcing. Additionally, there is a need to develop a national policy on cold chain performance indicators such as acceptable downtime of equipment, routine reporting on functional status. This activity requires securing budget for maintenance and other logistic requirements in Annual Operational Plan (AOP).

**Recommendation #2 (E2): Conduct a Temperature Monitoring Study of the cold chain distribution system in Cambodia, including a pilot of "cold" water packs in two additional provinces.**

Status of implementation: Study is in the planning phase. Four provinces will be selected for study and 2 additional provinces for the chilled water pack portion. The timeline is expected to be 6 months.

**Recommendation #3 (E7): Make decision on change from “conditioned ice-packs” to “cold water packs” for transportation.**

Status of Implementation: This decision is pending the results from temperature monitoring study. There is high level of interest in testing and adopting the chilled water pack policy based on findings from study.

**Recommendation #3 (Policy): Modification of stock management policy and vaccine distribution frequencies.**

Status of Implementation: Discussion ongoing.

**Recommendation #4 (E3): Review available cold chain storage space at all levels for future needs to introduce new vaccines, and review options including procurement of new equipment.**

Status of implementation: The National Immunization Program undertook an update of the cold chain inventory throughout Cambodia in the last quarter of 2013, and this report and the inventory listing was finalized in April 2013. Storage space was then reviewed for both PCV13 and IPV vaccine introduction and will be further developed as part of the cMYP update in 2014. Funds for the additional requirements for both IPV and PCV vaccines have been included in the Vaccine Introduction Grants (VIG) costs. This includes $130,000 for PCV introduction and $50,000 for IPV introduction.

**Recommendation #5 (E9): Establish a National Cold Chain Manual that includes SOP and guidance documents**

Status of implementation: The SOP or national quality plan was revised for national level and translation is ongoing. The SOP for other levels needs to be developed. This should include policy of using 30-Day Temperature Recorders (30DTR) for temperature monitoring and vaccine distribution practices

**Recommendation #6 (E2): Conduct training at all levels on priority items in temperature management identified by EVM Assessment**

Status of implementation: The current training programs for HC staff include specific sections on vaccine diluents, vaccine vial monitors and multi-dose vial policy (MDVP). These topics will be included in training package of implementing 30DTR at all levels. Fridge-tag-2 training will be implemented in phased manner. First phase will include two provinces of Phnom Penh and Kratie; and all the sites within these two provinces. An extensive one to one training of health workers to be conducted using the fridge tag. This will be done though one Training of Trainers (ToT), followed by 12 health worker level training programs. Pilot implementation will require procurement of 200 fridge-tag-2 (PQS code: E006/020) devices and training support to fund 13 training programs. The second phase of training and implementation shall be from 2015, preferably along with introduction of PCV and IPV (requirements to be computed). Additionally, the national policy of temperature monitoring using WHO Performance Quality Service (PQS) approved 30DTR will be adopted at all the levels.

**Recommendation #7 ( E2) Move the old compound cold room and freezer room to the new compound and integrate the vaccine store on one site**

Status of implementation: Completed

**Recommendation #8 (E2): Conduct temperature mapping study of all cold rooms and freezer rooms at the CMS.**

Status of Implementation: Completed. Report is available. Study was conducted by NIP and UNICEF in 2013 using 20 Logtag trix-8 loggers. The cold rooms at national level do not have continuous temperature monitoring system. This could be improved by installing computerized (wireless) temperature monitoring system. This system is highly recommended by WHO for monitoring of cold chain at national level.

**Recommendation #9 (E3):** Review available and needed storage space at PHD level for current vaccines, redeploy excessive cold chain equipment to cover current shortfalls, and integrate additional needs into NIP cold chain equipment replacement plan.

Status of implementation: Discussions to purchase of walk-in cold room (WIC) has been going on for further expansion of cold chain capacity at the national level.

Cold chain assessment conducted along with the PCV and IPV GAVI proposals and procurement order for refrigerators for Provinces and ODs already given to UNICEF. Discussions for purchasing more equipment from HSS grant is going on.

Recommendations#10 (E7) Current training programs for HC staff include specific sections on vaccine diluents, VVM and MDVP

Status of implementation: Completed

**Next Steps for the improvement of the cold chain in 2014-2015:**

* Fridge tag pilot in 2 provinces
* Training of HW including cold chain and vaccine management topics
* Temperature monitoring study
* Decision on using chilled water pack or conditioned ice pack *(policy decision)*
* Decision on scaling up use of Fridge-Tag country wide *(policy decision)*
* Decision on improving capacity or increasing distribution frequency *(policy decision)*
* Procurement of equipment *(policy decision)*
* Decision on maintenance *(policy decision)*
* Strengthening supportive supervision

## Vaccine management

In the current routine immunization system, vaccines are distributed from the central level to the provincial level every three months, and from there supplied to the operational district level every month.

**IPV Storage conditions:** IPV is sensitive to heat and freezing and must be kept and transported at the correct temperature range at all points along the way from manufacture to administration. Proper storage of IPV at every stage of the cold chain is essential for avoiding loss of potency. Once vaccine potency is lost, it cannot be regained. Any damaged vaccines must be destroyed. This could result in a stock out.

**IPV is FREEZE SENSITIVE**: Liquid vaccines, including IPV, must not be frozen or placed on a frozen icepack. If frozen, liquid vaccines lose their potency and provide no protection against the disease. Because stand-alone IPV is not an adsorbed vaccine (i.e., no aluminum adjuvant), the "shake test" is ineffective in determining whether IPV has been frozen. If there is doubt or suspicion that vaccine was frozen, the vial must be discarded.

**IPV is HEAT SENSITIVE:** IPV loses potency when exposed to high temperatures. Heat impact on vaccines is cumulative. The Vaccine Vial Monitor (VVM) on IPV indicates whether the vaccine has been exposed to a combination of excessive temperature over time and whether it is likely to have been damaged. It clearly indicates to health workers whether a vaccine can be used.

In respect to above, vaccine management training will be conducted before the introduction of IPV at all levels.

# Overview of IPV: Vial size, licensure, dose requirements, and safety

## Vaccine preference

Ideally, the preferred presentation for IPV in Cambodia would be the single dose vial. The single dose vial would be the best way to limit the high wastage associated with multi-dose vials. However, it is recognized that the supply for single dose vials of IPV will be very limited in 2015. For this reason, Cambodia will preference five dose presentation and all calculations in this application (dose requirement, cold chain, etc.) were performed using the five-dose presentation. The single-dose vial would therefore be the second most preferred preference. The ten-dose vial is strongly not preferred due to the very high expected wastage.

|  |  |  |  |
| --- | --- | --- | --- |
| Preferred IPV vaccine | Month and year of first vaccination | Preferred second presentation | Preferred third presentation |
| 5 dose vial | October 2015 | 1 dose Vial | 10 dose vial |

It is noted that the five and ten dose IPV are preserved with 2 phenoxy-ethanol, which does not meet WHO requirements for an effective preservative. Thus, IPV needs to be treated as if it does not contain a preservative, which means that any open vials of this vaccine must be discarded at the end of the immunization session or six hours after opening, whichever comes first.

## Country licensure status

**Licensure and pre-qualification**: Vaccines used in the National Immunization Program are only to be vaccines that have been pre-qualified by the World Health Organization as “Prequalified vaccines for United Nations Supply”. IPV is pre-qualified and will be procured through UNICEF, and as a result the registration process is simplified. To register the vaccine, the necessary documents will be sent to the Department of Drugs and Food (DDF).

**Local customs regulations, requirements for pre-delivery inspection**: The NIP will ensure necessary steps for customs clearance and other related matters for IPV arrival in country.

## Target population and dose requirements for vaccine supply

**The vaccine requirement was calculated using the formula:**Yearly total vaccine requirement= (birth cohort as given by UN population estimate with a 2.36% increase every year)\*(92% DTP3 coverage in 2013) + Wastage + reserve stock (25% of total dose requirement for first year from Oct 2015 to Sept 2016). For the year 2015 the calculation is for only 3 months (total surviving infants divided by 4), as IPV will be introduced in Oct 2015.

**Annual doses of IPV required total assuming five dose vial:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Number in Birth Cohort** | **Doses needed (92% DTP3 coverage)** | **With wastage (plus 30%)** | **Reserve (25% for 1 year)** | **Annual Total** |
| 2015 | 97,487 | 89,688 | 128,254 | 32,063 | **160,317** |
| 2016 | 399,151 | 367,219 | 524,598 | 98,362 | **622,960** |
| 2017 | 408,571 | 375,885 | 536,979 | - | **536,979** |
| 2018 | 418,213 | 384,756 | 549,651 | - | **549,651** |

**Note on wastage**: For the single dose vial, data from Cambodia has shown that wastage in routine immunization is approximately 3%. For the five-dose vial, GAVI has instructed to use a maximum of 30% wastage. However, data from the use of ten dose measles vaccine vials in routine immunization in Cambodia has shown that the wastage is approximately 62%. This raises a concern that the wastage for the five dose vial might be above the 30% maximum. Following IPV introduction, Cambodia will collect data on wastage in order to determine the true wastage.

**Note on reserve stock**: Each level of the supply chain will maintain a reserve stock, to safeguard against stock out if new supplies are delayed or if there is a sudden increase in demand. In accordance with the national policy, there should be 4 months of reserve stock available (25%). This is equivalent to 2 months at the central level, 1 month at the provincial level, 2 weeks at the Operational District, and 2 weeks at the health center. An amount of reserve stock (25%) was added to the calculated doses required for the first year of IPV introduction from October 2014 to September 2015 (3 months in 2014 and 9 months in 2015).

**Note on target population**: As specified in the “Additional information on GAVI support for IPV”, the UN population data was used for calculation of IPV dose requirements. However, it should be noted that when calculating coverage in the future, in order to be consistent with the way that coverage estimates are calculated in Cambodia for all routine vaccines, the target population estimation from the Government will be used.

## IPV safety information and contraindications

**Safety information on IPV:** IPV is safe and very well-tolerated. Severe adverse reactions are extremely rare. Redness at the injection site is reported in 0.5% to 1.5%, swelling in 3% to 11%, and soreness in 14% to 29% of infants. Other, mild side effects such as transient fever have also been reported but fever >40°C has only been reported in <0.1% of infants.

**Use in children with Immunodeficiencies**: IPV can be safely administered to children with immunodeficiencies (e.g., HIV, congenital or acquired immunodeficiency, sickle cell disease). Furthermore, because of the elevated risk of vaccine-associated paralytic polio after the use of OPV in patients with immunodeficiencies, IPV is universally recommended in these children.

**Contraindications**: IPV should not be administered to infants with known or documented allergy to streptomycin, neomycin, or polymyxin B, which are inactive components of the vaccine, or a history of an allergic reaction following a previous injection of IPV.

# Introduction and implementation considerations

## IPV Introduction date

IPV will be introduced nationally in October 2015.

## IPV Schedule, Route of administration, injection site, and order of immunizations

**IPV Schedule:** IPV will be introduced into the routine immunization schedule at the first immunization contact ≥ 14 weeks as recommended by the Strategic Advisory Group of Experts on Immunization (SAGE). The policy and rationale for selected age is give below:

**Administer one dose of IPV 14 weeks of age or later**

The immune response to IPV is lower if the dose of IPV is given when the child is <3 months. For this reason, SAGE recommended that the dose of IPV be administered at or after 14 weeks of age to get the best immunogenicity possible at an early age. This might be at Penta1, Penta2, or Penta3 depending on whether or not the child has received his/her other immunizations according to the routine schedule.

It is important to highlight that OPV will be given in addition to IPV. Until polio is eradicated globally, the three doses of OPV will be critical to ensuring children have immunity against wild poliovirus. Thus, IPV is recommended in addition to OPV and does not replace OPV.

The new routine infant immunization schedule including other new vaccine introductions in the upcoming years (PCV and JE) schedule will be as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vaccine | Age | | | | | |
| At birth | 6 weeks | 10 weeks | 14 weeks | 9 Months | 18 Months |
| BCG | √ |  |  |  |  |  |
| Hep-B birth dose | √ |  |  |  |  |  |
| OPV (Oral polio) |  | √ | √ | √ |  |  |
| DTP-HepB-Hib (Penta) |  | √ | √ | √ |  |  |
| PCV 13 (pneumococcal) |  | √ | √ | √ |  |  |
| IPV (Inactivated polio) |  |  |  | √ |  |  |
| MR (Measles and Rubella) |  |  |  |  | √ | √ |
| Japanese Encephalitis (JE) |  |  |  |  | √ |  |

**Note on children coming in for immunization late**: In line with the Strategic Advisory Group of Experts on Immunization (SAGE) recommendation, children starting the routine immunization schedule late (coming in for the first visit at age ≥14 weeks) should receive IPV at the first immunization contact.

Example schedule of a child coming in for immunization late:

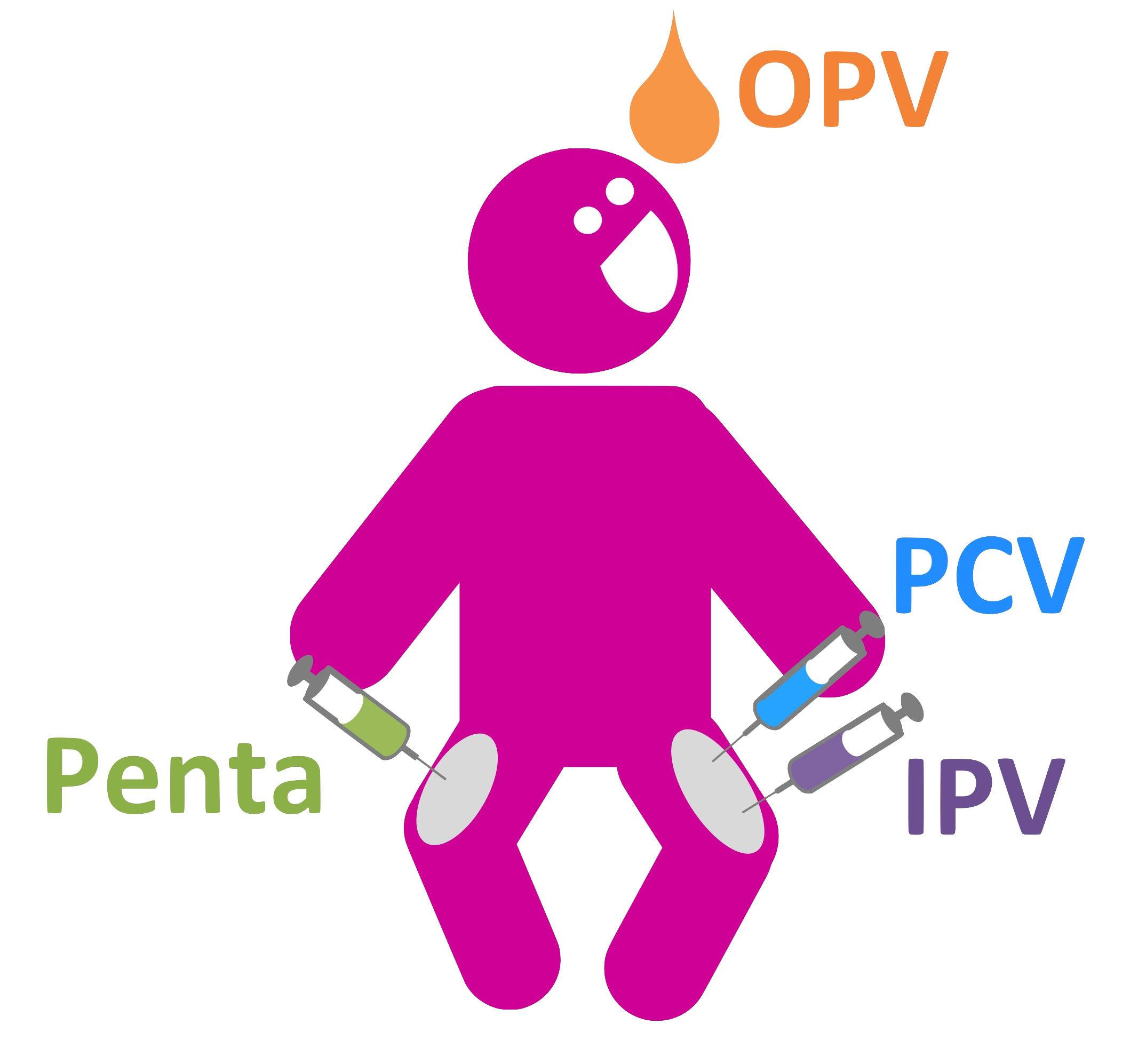
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vaccine | Age | | | | |
| At birth | 6 weeks | 10 weeks | 14 weeks | 5 months |
| BCG | √ |  |  |  |  |
| Hep-B birth dose | √ |  |  |  |  |
| OPV |  | missed | √ | √ | √ |
| DTP-HepB-Hib (Penta) |  | missed | √ | √ | √ |
| PCV 13 |  | missed | √ | √ | √ |
| IPV |  |  |  | √ |  |

In alignment with the national Policy on immunization, IPV should be given by the first birthday, but if a child over one year is not fully immunized, doses may be given up to the second birthday.

**Route of administration and injection site**: IPV is licensed for use as a 0.5 ml dose administered intramuscularly. After the introduction of PCV and IPV into the routine infant immunization schedule in 2015, children will receive three injections during a single visit (Penta, PCV, and IPV). The WHO recommends that Penta, PCV, and IPV should be administered intramuscularly into the infant’s thigh (if the child is 14 weeks of age).

When Penta, PCV, and IPV are to be given during the same visit, it is decided that IPV will be given with Pneumococcal vaccine in the left thigh at least 2.5 cm apart; the Pentavalent vaccine should be given as usual in the right thigh. Following is the revised injection site which will also be reflected in the national immunization policy.

|  |  |  |
| --- | --- | --- |
| **Vaccine** | **Route of administration** | **Injection site** |
| HepB (Birth Dose) | Intramuscular | Right mid-thigh |
| BCG | Intradermal | Upper left arm |
| DPT-HepB-Hib | Intramuscular | Right mid-thigh |
| OPV | Oral | Mouth |
| PCV | Intramuscular | Left mid-thigh |
| IPV | Intramuscular | Left mid-thigh |
| MR | Subcutaneous | Upper left-arm |
| JE | Subcutaneous | Upper right arm |
| TT | Intramuscular | Right, upper arm |

**Figure 1. Order of injections and injection sites for vaccines given in the routine schedule at 14 weeks.**

1st injection: Penta

2nd injection: PCV

3rd injection: IPV

2nd (left)

3rd (left)

(right) 1st

## National coordination mechanism to ensure the successful introduction

The Technical Working Group on Health (TWG-H) will be the primary oversee body monitoring the implementation of IPV introduction at the high level. The National Immunization Program (NIP) will be responsible for coordinating, planning, and implementing IPV introduction.

## Affordability and financial sustainability

From 2006-2011, Gross National Income (GNI) in Cambodia increased from $520 to $830 per capita. The national budget allocation for health has increased from 110.9 Million US dollars in 2008 to 223.7 Million US dollars in 2013. Government expenditures on routine immunization increased from $5 per infant to $7 during the first half of 2006-2011.

The comprehensive multi-year plan for 2008-2015 for immunization programme developed by NIP also included the expected costs of the program each year. Each year, the NIP develops an annual operational plan with a budget for approval of Ministry of Health. The Ministry of Health allocates the funds. The NIP also receives funds from partners. The NIP shares financial information to partners annually through the joint reporting form (JRF).

Ministry of Health, Cambodia procures the traditional vaccines and injection supplies through UNICEF procurement services. Ministry of Health provides portion of funds (co-finance part) for new vaccine. Ministry of Health also provides funds for other immunization activities. The funding support from Ministry of Health is increasing every year (figure 2). The Ministry of Health is committed to strengthening the routine immunization programme and co-financing part of vaccine cost for Pentavalent and PCV.

**Figure 2. Government funds spent for vaccines comparing to total cost of vaccines, 2010-2013**



Source: JRF 2010-2013

Cambodia is requesting funds from the GAVI Alliance to cover the cost of the vaccine doses and additional costs associated with a new vaccine introduction through the Vaccine Introduction Grant (VIG). A detailed budget on how the funds requested for the new vaccine introduction grant will be spent is available in Annex D. When creating the budget, the funds requested for the recent PCV and JE applications were considered in order to avoid overlap of areas.

The total estimated budget for IPV introduction is $797,577 USD. The funds requested from GAVI through the vaccine introduction grant is $311,177. Additionally, there is proposed partner support from WHO and UNICEF for $105,000 USD. Below is a summary of the funds requested by category and proposed partner support:

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Funds requested to GAVI** | **Potential partner support** | **HSSP funds and government contribution** |
| Planning and Preparations | 4,500 | 5,000 WHO |  |
| Communication, social mobilization, advocacy | 51,000 | 30,000 UNICEF | 1,000 |
| Other trainings | 147,268 | 10,000 WHO | 55,000 |
| Document Production | 29,162 |  | 315,400 |
| Human resources and supervisory visits | 18,000 |  |  |
| Cold Chain equipment | 49,455 | 20,000 UNICEF |  |
| Distribution of vaccine (one-time introduction) | 10,000 |  | 10,000 |
| Waste management | 1,793 |  |  |
| Surveillance and monitoring |  | 10,000 WHO |  |
| Evaluation |  | 15,000 WHO |  |
| Technical Assistance |  | 15,000 WHO |  |
| **Total** | **311,177** | **105,000** | **381,400** |

## Overview of cold chain capacity at central levels, provincial, and operational district levels

An assessment of the additional cold chain requirements for both PCV and IPV introduction was conducted in March 2013. The findings showed that at the central level, the net storage volume of the Central Medical Store (CMS) at +2 to +8C is sufficient to handle both vaccine introductions. At the provincial (PHD) level, it was determined that 65 new refrigerators would need to be bought to meet the requirements. At the OD level, an additional 32 new refrigerators would be required. At the health center level, an additional 250 cold boxes and 500 vaccine carriers would be needed. Additionally, there are several refrigerators that need to be repaired.

As part of the vaccine introduction grant requested to GAVI for the introduction of PCV, funds were requested to cover the costs of the 65 refrigerators needed at the PHD and 32 refrigerators needed at the OD level. The application also requested funds to cover the additional 250 cold boxes and 500 vaccine carriers for the Health center level.

Recognizing these funds, as part of the GAVI application for IPV, Cambodia will be requesting an additional $49,455 to ensure the cold chain is functioning and able to handle these new vaccines. These funds will specifically cover:

* **Spare parts for all levels of the cold chain:** Spare parts will be ordered in order to replace non-functional parts in broken refrigerators at all levels. A detailed description of all the parts that will be procured can be found as an additional sheet in detailed budget (Annex D).
* **Cold boxes**: Cold boxes are being ordered for transportation from OD to HC. This has been recognized as an important need for the program because currently some HC are using vaccine carriers to transport vaccine. The capacity of these carriers is not large enough to accommodate all vaccines, especially after PCV and IPV are introduced.

**IPV cold chain calculation of costs ($49,455):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Need** | **Units** | **Cost per unit** | **Total** |
| Spare parts for refrigerator | 1 | $ 45,555 | $45,555 |
| Cold Box (7L) for transportation | 200 | $ 20 | $4,000 |
| **Total Cold chain equipment costs IPV** |  |  | **$49,455** |

## Waste management and injection safety

The National Immunization Policy developed in 2012 includes information on waste management and safe injection practices.

**Waste management**: Sharps waste can cause serious health and environmental problems. Unsafe disposal can spread some of the very same diseases that we are trying to prevent. Leaving used syringes and needles in the open puts the community at risk. Most frequently, the unfortunate victims of needle-stick injuries from haphazard disposal of needles are children and health workers.

An incineration waste management system was introduced in most provinces. Additionally, waste management facilities have been established in some operational districts. The national policy states that all used injection equipment must be incinerated in safety boxes. Immediately after an injection, the used syringe, with its needle still attached is placed directly into the safety box, without replacing the cap of the needle. At HC level the filled safety boxes are taken to the OD together with the monthly report and vaccine order. If the OD has an incinerator the waste is incinerated there. If there is no incinerator at the OD, the filled safety boxes should be transported to the nearest incinerator at OD or PHD level. High temperature incinerators used are to be approved by the Ministry of Health

**Injection Safety:** In 2001, a safe injection policy and strategy was introduced. Auto disposable syringes and safety boxes are now used for all vaccinations. The National Policy states that intramuscular injections (IM) should be given with the needle at a 90° angle to the skin and the skin should be stretched, not bunched. It is not necessary to aspirate the syringe after the needle is introduced into the muscle.

## Risks and challenges

**Caregiver fear of multiple injections**: After the introduction of PCV and IPV, children will be receiving three injections at the 14 week visit. There is concern that healthcare workers and caregivers might not be accepting of multiple injections. Strong messages about the benefits of multiple injections need to be included in each training. Healthcare workers need to be able to explain to caregivers that the benefits of being protected by multiple vaccines in one visit outweigh their fear of multiple injections.

**High wastage**: If five or ten dose vials are the only available presentation, there is concern that the wastage rate will be high and exceed the maximums of 30 and 50% for five and ten dose vials respectively.

**Difficulty in communicating need for IPV**: Since polio eradication began, OPV has been the main vaccine used for polio. Caregivers and Healthcare workers might wonder why a new vaccine for polio is needed. Key messages will be be developed for all levels

**Updating the Health Information System (HIS):** The HIS needs to be updated to include the new vaccines to be added in routine immunization. The HIS is under the responsibility of another department at the Ministry of Health (not NIP). The system is updated every 3-5 years, and the last update was in 2014. Therefore, it might be difficult to update it in 2015 for PCV and IPV introduction.

**Ensuring adequate funding**: In order to introduce IPV successfully, the government and partners need to support IPV both technically and financially. There is always concern that the estimated budget will not cover all costs associated with the new vaccine introduction.

## Health worker training and supervision

For the introduction of IPV, the training of staff will take place over the course of four months prior to IPV introduction (June-September 2015). The training plan proposed takes into account the key lessons learned from the trainings conducted prior to the introduction of the second dose of measles vaccine in 2012. One of the key findings from the implementation of these training activities was that supervision from the NIP was critical to ensuring both that (1) all trainings were conducted as planned and (2) trainings were high-quality. For this reason, in the training plan for IPV, the trainings will take place in a staggered manner across four months. This approach is also being used for the trainings being conducted prior to PCV introduction.

**Training of Trainers (ToT)**

1. **Training of NIP staff (at national level)**: Training will begin with a one-day training with the NIP staff at the national level. NIP staff will be prepared to train PHD and OD staff.
2. **Training of PHD and OD staff (at four different provinces):** Once NIP staff have been trained, they will be responsible for training the staff at the PHDs and ODs. This will consist of four separate trainings conducted in four provinces. The trainings will be step-by-step (not simultaneous) so that supervisors from NIP can be present at as many trainings as possible.

**Cascade trainings**

1. **Cascade training of HC and HP staff (at OD)**: Following the completion of the training of trainers (TOT), cascade trainings will take place at the OD for the HC. HC staff will travel to the OD to learn about IPV introduction. The main purpose of the HC trainings will be to emphasis the importance of receiving IPV. This will help to address potential concerns healthcare workers and caregivers might have about multiple injections. Convincing healthcare workers and the community of the importance of multiple injections will be critical to achieving high coverage. These training sessions will also be designed to clearly communicate the policy of giving IPV to any child ≥ 14weeks, regardless of his/her previous immunizations. Different examples for children coming in for immunization at ages not in line with the routine schedule will be presented to help illustrate how this policy will be operationalized.
2. **Cascade training with the VHSG**: Cascade trainings will also take place with the VHSG levels. The main purpose of the VHSG trainings will be inform the community that IPV will be introduced. During these sessions, immunization staff can address questions from community about IPV issues such as why two vaccines for polio are needed, are multiple injections safe, etc.

**Supervision**: Following introduction, supervisory visits will be conducted to monitor the status of IPV introduction. These visits will be conducted by NIP to the PHD, OD, and HC level.

# Monitoring and evaluation

## Updating of monitoring tools

In the next few years, several new vaccines (PCV, IPV, and JE) will be introduced into the routine immunization system. As a result, the recording and reporting forms will be revised to include these new vaccines. The immunization card will also be revised to add these new vaccines. These revisions will be done in third and fourth quarter of 2014. Additionally, as previously discussed, the Health Information System (HIS) will also be updated to include new vaccines.

## Post Introduction Evaluation

A small-scale post-introduction evaluation will be conducted following the introduction of IPV.

## Adverse Event Following Immunization (AEFI) monitoring and reporting

**Adverse event following immunization (AEFI):** In 2010, a national guideline of adverse event following immunization (AEFI) for national immunization officers of NIP at central level and provincial level was developed. This guideline provides information on the AEFI surveillance system in Ministry of Health (MoH) Cambodia. The guideline will be updated to include information on AEFI for PCV, IPV, and JE. Following the development of the guideline, the National Immunization Safety Committees for AEFI was established.

NIP is in the process of strengthening the AEFI system. NIP will focus on the following AEFI related activities in upcoming years:

* Operationalize the national AEFI Committee
* Update the national guideline for AEFI surveillance and response
* Build management capacity for AEFI through improving skill of managers through supervision and training
* Establish and operationally provincial AEFI Rapid Response Teams
* Develop improved communication with Drug Control Committee MOH & WHO Reference laboratory in relation to issues surrounding vaccine quality

# Communication, advocacy, and sensitization of health staff

## Importance of emphasizing communication during IPV introduction

Communication during a new vaccine introduction consists of more than just social mobilization at the community. Communication also should include plans to sensitize health staff and partners at all levels to make sure all stakeholders are aware of IPV introduction.

A strong communication strategy is important to the success of any vaccine introduction—but communication for IPV will be even more important. While many of the operational aspects of introducing IPV will be similar to those for other injectable vaccines, there are some unique aspects of IPV which differentiate it from other vaccine introductions. These include:

* **IPV introduction is part of the global commitment to polio eradication**: Unlike other new vaccine introductions, the purpose of IPV introduction is NOT to decrease the mortality and morbidity of childhood deaths associated with polio in Cambodia. Polio was eradicated in 2000 and there is no longer a disease burden associated with polio in Cambodia. However, IPV introduction is part of a larger global commitment towards polio eradication. In 1988, all WHO member states committed to the global eradication of polio. The introduction of IPV is an essential element of this overall vision for a polio-free world. It is the first step towards eradicating ALL polioviruses—wild and vaccine-related. This unique purpose of IPV introduction must be clearly communicated to all audiences to address individuals who might be skeptical about the purpose of IPV introduction.
* **IPV is not a new vaccine and it has been used effectively in many countries**: IPV has been used safely and effectively since the 1950s. IPV is known to be very effective in preventing paralysis due to poliovirus. Unlike other vaccine introductions, it is not a new vaccine. It is important that the long history of positive experience with IPV is communicated.
* **Two vaccines for the same disease will be given one visit**: First the first time, two vaccines against the same disease (polio) will be given at one immunization visit. Healthcare workers should clearly understand that IPV will not replace OPV, but it will be given as an additional dose. This has the potential to cause confusions and therefore should be clearly communicated at all levels.
* **Single dose, age specific (not contact specific) recommendation**: IPV is recommended for a specific age regardless of immunization contact (i.e. a single dose of IPV should be given to all children at 14 weeks of age regardless of whether or not it is the first, second, or third immunization contact)
* **Three injections on one visit, and two into same thigh**: For the first time in Cambodia, a child will receive three injections during a single visit. Furthermore, two vaccines will be injected into the same injection site (thigh) on the child. Clear messages targeted towards both healthcare workers and mothers explaining the need for multiple injections will be needed.

**Some key messages for IPV introduction:**

* As per WHO SAGE recommendation in November 2012 and the polio end-game strategy, all OPV-only using countries should introduce in their routine immunization schedule at least one dose of IPV by Oct 2015. The dose of IPV should be given at the age of 14 weeks together with Penta, OPV3, and PCV3 (again SAGE recommendation in Nov 2013).
* The use of specific OPV serotypes will be phased out globally from all immunization activities and programmes, beginning with the withdrawal of OPV2 and the replacement of all tOPV with bOPV (types 1 and 3) in global routine immunization programmes by mid-2016.
* The WHO SAGE recommended that at least one dose of IPV be introduced into all routine immunization programmes prior to the switch from tOPV to bOPV (i.e. in 2015).

## Strategies for communication for IPV

**Communication plan:** A communication plan explaining how the need for IPV will be communicated at all levels will be developed. This will include explaining the need for IPV to high-level decision makers and also for health care workers and mothers. Furthermore, communication will be a key focus of training of trainers and the case trainings for IPV introduction at all levels.

There are many existing regular meetings that can be used to disseminate information about IPV and other new vaccine introductions. These meetings can be categorized into two classifications: administrative and health and their structure is detailed in Figure 3. In the administrative sector, there are three regular monthly meetings: Provincial Governor Board Meeting, District Meeting, and Commune Meeting. In the health sector, there are four regularly held meetings: provincial TWG-H (monthly), district TWG-H (monthly), Health Centre Management Committee (quarterly), and Village Health Support Group (VHSG). Each of these meetings should be seen as an opportunity that can be used to increase awareness about IPV and new vaccine introduction more broadly. To capitalize on this opportunity, NIP will create a small booklet containing key messages about IPV introduction and other new vaccines (PCV and JE). These booklets can be distributed at the different meetings. Due to differences in audience, it is likely NIP will create two booklets, one for PHD and OD and one for the HC and VHSG. It should be noted that the idea to create a booklet originate from the feedback NIP received following the introduction of the second dose of measles. During the evaluation, many health care workers said that the booklet was one of the most useful and effective aspects of the introduction.

**Figure 3. Regular meetings conducted within the administrative and health structures**

