School Immunization Programme in Indonesia

26 November – 5 December 2007

Table of contents

Acronyms

AEFI	adverse event following immunization
BIAS	Bulan Imunisasi Anak Sekolah (School Immunization Month Programme)
DC&EH	Directorate of Disease Control and Environmental Health (Ministry of Health)
DHO	District Health Office
DT	Diphtheria – tetanus toxoid
DTP	Diphtheria – tetanus – pertussis vaccine
EPI	Expanded Programme on Immunization
GIVS	Global Immunization Vision and Strategy
IEC	information, education, communication
IVB	Immunization, Vaccines, and Biologicals
JSI	John Snow, Inc.
MOE	Ministry of Education
MOH	Ministry of Health
PHO	Provincial Health Office
SEARO	WHO Regional Office for South-East Asia
SUSENAS	National Socio-economic Survey
Td	Tetanus – diphtheria toxoid
TT	Tetanus toxoid
UKS	Upaya Kesehatan Sekolah (School Health Programme)
UNICEF	United Nations Children's Fund
US	United States
WHO	World Health Organization

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1. Background

Among other strategies, the Global Immunization Vision and Strategy (GIVS) of WHO and UNICEF aims to "protect more children in a changing world," including the expansion of "vaccination beyond the traditional target group." School-based immunization is one such strategy with the promise of reaching older children. As many countries have requested information on such school-based immunization strategies, WHO and other partners plan to collect experiences from a few countries with existing school-based immunization programmes. This information can then be shared with other countries that contemplate introducing a similar strategy.

In this regard, since Indonesia has been implementing a nationwide school immunization programme since 1984, it is worthwhile to document this programme, including its organization, results, and implementation experience so as to guide other countries who have not yet established such a programme.

1.1 Terms of reference

- To collaborate with the MOH and other government institutions in documenting the national school-based immunization programme.
- To collect information on the school-based immunization programme at various levels using structured questions, reported data and observation of processes.
- To synthesize the information collected from Indonesia (and in due course other countries) in order to produce a joint collaborative report on documentation of national school-based immunization programmes.

The team stressed that the purpose of the visit was to document the routine school immunization programme and that this was not an evaluation.

1.2 Team composition

The team consisted of Jhilmil Bahl (WHO/IVB,Geneva), Ibu Asmaniar (WHO Jakarta) and Robert Steinglass (JSI/IMMUNIZATIONbasics). On the field trip, the team was joined by Ibu Kartini (EPI, Disease Control and Environmental Health [DC&EH], MOH), Dr. Wibowo (UNICEF Jakarta), and Dr. Melzan Dharmayuli (South Sumatra PHO EPI Manager). Ibu Kartini and Dr. Wibowo departed early for Jakarta due to other commitments.

1.3 Activities and method of work

On the first day, briefings materials were provided to the team in Jakarta and discussions were held with WHO, UNICEF, the School Health Programme (UKS) team at national level, and EPI

sub-directorate. All logistics were ably handled by WHO in Jakarta and by the visited Provincial Health Office (PHO), including introductory letters from the national to Provincial Health Office. The national letter of introduction from the Directorate of DC&EH (MOH) was sent to the Chair of the National UKS Board with copies to the School Health Programme (Community Health Directorate, MOH), Ministry of Education, Ministry of Religious Affairs, Ministry of Internal Affairs, and the South Sumatra Provincial Health Office (PHO).

The team spent the following seven days in South Sumatra Province where they visited the PHO, three District Health Offices (DHOs), and four health centres and observed three school immunization sessions. South Sumatra was selected for the visit by the MOH and WHO because of its consistent implementation of BIAS (School Immunization Month Programme), good performance on BIAS, and strong routine immunization program. In all sites and offices visited, the team focused on routine immunization through schools rather than the use of schools to launch one-time campaigns.

Within the province, the three districts to be visited were selected because they had not yet completed their BIAS activities and were relatively near to the provincial capital (within a four hour drive from the capital, as well as the capital itself). Within the districts, individual schools and their respective health centres were selected based on the existing locally-planned work schedule. Relative to all of Indonesia, South Sumatra reported coverage better than the national average in 2006 for DT (95.5% versus 90.2%), for TT in class 2 (98.7% versus 85.3%), and for TT in class 3 (98.8% versus 87.5%). The three districts visited within the province (OKU, Palembang, and Banyuasin) had reported DT and TT coverage (98.6, 98.7 and 98.8% respectively for DT in class 1, TT in class 2 and TT in class 3) of almost exactly the provincial average. The three visited districts have larger populations that the district average for the province.

De-briefings were conducted at each site visited, including schools, health centres, and at district and provincial health offices. The team returned to Jakarta and spent the final day de-briefing with the MOH, Planning Division DC&EH, UNICEF and WHO.

The team used a structured questionnaire (Annex 1), developed at WHO/HQ in advance of the trip, at each level and site. After the first day of fact-gathering in Jakarta, several modifications were made to the questionnaire to customize it to Indonesia. The findings from the visit largely follow the format of this questionnaire. Also, to focus the most salient questions to the exact location being visited (e.g. a visit to a school to observe a vaccination session), the team made additional lists of questionnaires throughout the visit (Annex 2 as an example). Based on the experience in Indonesia, the team modified the original questionnaire for use in other countries (available from WHO/HQ).

1.4 Products from this visit include

- Provincial de-briefing in Palembang with power point slides
- National de-briefing in Jakarta with EPI Manager, WHO and UNICEF with power point slides

- De-briefing at WHO/Geneva with power point slides
- De-briefing in Geneva with small EPI/IVB group to discuss next steps
- Proposed revision of questionnaire to be used on future country visits
- Suggestions for future country visits to document school immunization programmes

Each of the above products is available upon request.

2. Health system context

Indonesia's population of 220 million lives on more than 16,000 islands. The annual birth cohort is 4.8 million based on a crude birth rate of 21.8 per 1000. Indonesia has undergone an abrupt decentralization process across all ministries since the late 1990s. Decentralization has altered the relations and roles among national, provincial and district levels.

In the health sector, districts are now expected to finance the operational costs of their routine health programmes. Neither the central level nor provinces are permitted to cover operational costs at district level. However, operational costs are still covered from the central level in the case of immunization campaigns against tetanus, measles or polio. Consequently, routine immunization programmes, which are included within the school health programme, must compete for attention and resources in each of the country's 442 districts.

Therefore, skillful advocacy is required at decentralized levels to engage the decision makers and mobilize the required resources. Furthermore, the number of districts has greatly increased in recent years.

3. School Health Programme (UKS)

There are about 175,000 public, religious and private schools in Indonesia, all of which are eligible to participate in the School Health Programme (UKS - Upaya Kesehatan Sekolah). There are about 27 million students in primary school, about one quarter of whom are in religious schools (Madrasah Ibtidaiyah). Both girls and boys generally attend the same public and private schools. The National Socio-economic Survey (SUSENAS), a household survey conducted by the Indonesia Bureau of Statistics (BPS), found that 96.1% of children 7-12 years old were enrolled in school, compared to 79.2% for children 13-15 years old, and 49.8% for children 16-18 years old.

Education is compulsory and provided free of charge in public schools for children from 7 to 15/16 years of age, corresponding to all 6 classes of primary school and 3 classes of secondary school.

The three major UKS programmes include health education, health service delivery through schools, and a healthy school environment. In addition to immunization, the health services delivered include health and nutrition screening for new students; height and weight monitoring; health education, dental care; iron and iodine supplementation; and de-worming in some areas.

The UKS began in 1956. In 1984, school health policy was integrated through formal decrees and memoranda of understanding among four ministries: Health, Education, Religious Affairs, and Internal Affairs. The roles and responsibilities of each Ministry at each level were delineated. A UKS coordinating board exists at national, provincial, district and sub-district levels. A representative of each of the Ministries serves on the UKS Board at each level. Within the MOH, UKS is the responsibility of the Directorate of Community Health. At provincial, district, and health centre levels, UKS falls under the health promotion programme.

A UKS implementation team, led by the school head master and supervised by health staff from the health centre, functions at school level. One or more UKS guru(s) (health teachers), based on workload and personal interest, are appointed by the head master to oversee UKS in each school.

Operational costs for UKS must be covered locally in each district. In the areas visited by the team, individual schools report that they are visited by health staff about 4 times per year as part of UKS.

A national school health competition is conducted each year to select champion schools at each level (kindergarten, primary, secondary, and high schools) from among the schools nominated by each province. A detailed checklist is used to assess the nominated schools according to defined criteria. One of the minimum requirements to be recognized as a champion school is immunization. However, the team discovered that immunization had recently been removed from this detailed checklist.

A national meeting of all of the provincial UKS Boards takes place every two years.

4. School Immunization Month Programme (BIAS)

In 1998, the Ministries of Health, Education, Religious Affairs, and Internal Affairs launched Bulan Imunisasi Anak Sekolah (BIAS), School Immunization Month Programme. When it was introduced in 1998, the purpose of BIAS was stated to be the long-term control of tetanus, specifically to provide lifelong immunity against tetanus to all primary school graduates as well as diphtheria boosters. BIAS was designed to be a sustainable routine activity to eliminate tetanus.

The elements for a successful programme largely exist. There is an official policy, operational guidelines from national level for health workers and teachers, articulated roles and responsibilities for each Ministry, budget at health centre and district levels, and vaccine and supplies provided from Jakarta.

BIAS was introduced in all public and private primary schools nationwide without piloting or phasing. The MOH was given responsibility for policy, service delivery and evaluation. The Ministries of Education and Religious Affairs were to handle social mobilization. The Ministry of Internal Affairs, through its local government and municipality offices, was responsible for covering operational costs. The UKS team leader at each level was to coordinate and monitor implementation of the overall integrated school health programme, including BIAS. Within the

MOH, the staff in charge of health promotion at each level looks after UKS overall; however, the Expanded Programme on Immunization (EPI) is given responsibility at each level to implement BIAS. The UKS guru(s) oversees BIAS within the school.

While BIAS was integrated within the existing UKS structure, most respondents at lower levels indicated that the existence of the UKS structure was helpful but not in fact required for the adoption of BIAS, since the health workers felt they were able to forge good relations with local schools on their own.

The enabling factors in creation of BIAS in Indonesia included:

- Compulsory education, free of charge in public schools
- High enrollment of girls and boys in early primary school (about 95%)
- High density of health centres and health staff
- High infant immunization coverage
- Vaccines and other supplies (auto-disable syringes and safety boxes), financed 100% by the MOH

BIAS is managed, supplied and implemented without the technical or financial involvement of multilateral or bilateral partner agencies. The MOH is proud of this self-reliance and what they have routinely accomplished year after year with BIAS. According to the draft comprehensive Multi-Year Plan (cMYP), reported vaccination coverage in schools through BIAS starting in 2003 has been about 95% each year.

Vaccines, auto-disable and reconstitution syringes, and safety boxes are provided by the central level, and the vaccinations are provided free of charge to the students. Despite some confusion caused by rapid decentralization in the late 1990's and a major economic crisis at the time of roll-out, operational costs were nevertheless covered, and continue to be covered, by local and municipal governments at district levels. This is evidence of good local ownership of this programme and suggests that it will be sustained.

4.1 Evolution of BIAS

As in most countries, the Indonesian vaccination programme's prime focus is infants. No booster doses are provided after infancy until entry in primary school. Until 1997, school immunization had consisted of two doses of DT for male and female students in class 1 of primary school and two doses of TT for girls only in class 6 of primary school. These doses were given throughout the school year. However, the MOH was dissatisfied with the relatively low levels of vaccination coverage achieved in the school programme at that time. Because of its successful infant immunization programme for many years, the extremely high rate of early primary school enrollment of girls (>95%), and the changing epidemiology of diphtheria and tetanus, the MOH began to adjust its school immunization schedule in innovative ways. Also in 1996, the MOH had adopted the WHO policy of five doses of TT-containing vaccines.

Rather than continuing to offer two doses of DT to class 1 as if these students were in need of priming, the MOH decided instead to offer DT and TT vaccines routinely through its 7135 health centres on a single annual visit to each of the 174,000 primary schools each November, on the assumption that for the vast majority if students these would be booster doses. During the annual visit, each boy and girl in class 1 receives one dose of DT and each boy and girl in classes 2 and 3 receives a dose of TT. Thus, a child staying in school for three years receives three annually-spaced tetanus and diphtheria-containing doses. Because the school is visited only one time per year instead of twice per year according to the pre-1998 schedule, the operational costs are lower. And because the interval between successive doses of vaccine are one year, rather than 4 weeks between the two DT's and four weeks between the two TT's, the final immunity levels with the three doses are likely to be higher than with the four doses.

As a transition strategy during 1998, 1999 and 2000, the MOH boosted the immunity of all primary school students by immunizing class 1 with DT and classes 2 through 6 with TT. After the backlog of all primary school students were reached during these transitional years, the "maintenance phase" of the programme began in 2001 in which all primary school children in just the first three classes received either a DT or TT each year during the annual visit in November. The campaign-like nature of this visit in November is credited by the MOH with achievement of higher vaccination coverage rates than when the programme prior to 1998 was implemented throughout the year.

Customizing its commitment to global Maternal and Neonatal Tetanus (MNT) elimination, the MOH designed BIAS as a long-term and sustainable approach to increase population immunity among successive cohorts. Female students receiving the three tetanus-containing vaccines, on top of at least two doses of DTP in infancy, are likely to be protected against tetanus throughout their childbearing years. This school strategy supplements the near-term tetanus elimination campaigns in high-risk villages. The MOH plans to curtail its existing programme of TT immunization of pregnant women and brides-to-be, based on the following strategies: routine infant DTP vaccination, routine school strategy, and campaign sweeps of women 15-39 years old in villages considered to be at high-risk (according to a scoring system based on TT coverage and deliveries by health workers). Because of the interruption of BIAS in some areas, the MOH is considering a temporary introduction of tetanus-containing vaccination (Td) in classes 1 through 5 in 2008 to clear the backlog of unimmunized students.

According to the MOH/EPI, neonatal tetanus is estimated to have been 15 deaths per 1000 live births in 1977, dropping to 11 in 1982, and less than 1 by 1999 (Annex 3). Neonatal tetanus was estimated by the National Health Survey in 2001 to account for 3.5% of all infant deaths, ranking fifth on the list of the top causes of infant mortality.

BIAS continues to evolve and innovate. Starting in 2000, as a transition strategy, all six classes of primary school students (approximately 6-12 years of age) along with similarly aged but non-enrolled children, received one dose of measles vaccine. This was referred to as the "measles campaign for second opportunity," since the first opportunity occurs routinely during infancy. Whereas schools were used as the venue to reach students, the non-enrolled children 6-12 years of age and children 6-59 months old were vaccinated at health centres or posyandu (outreach) sites. These catch-up school campaigns required external funding and were introduced province-

wide on a rolling basis with 3 provinces in 2000, 4 in 2003, 8 in 2004, 2 in 2005, 8 in 2006, and 8 in 2007.

After the completion of the catch-up campaign province by province with reported campaign coverage ranging from 90% to 98% in all classes, a routine measles 2nd dose has been phased in (without a period of piloting) during August at the time of school entry into class 1 in order to maintain herd immunity. In South Sumatra, the routine measles 2nd dose was introduced for primary school enterers in August 2007.

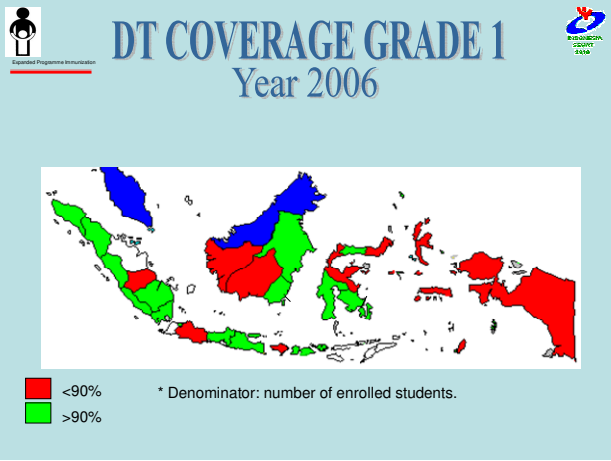
The routine measles 2nd dose was added to the routine school immunization schedule due to a shift in measles incidence to school-aged children and the associated risk of transmission of infection to younger siblings. Serological studies in the late 1990's had found that between 18.6% and 32.6% of primary school students lacked immunity against measles. The decision to introduce a routine measles 2nd dose was taken after piloting the approach in two provinces in 2000 showed a subsequent reduction in incidence in both children of school age and children 1-4 years of age.

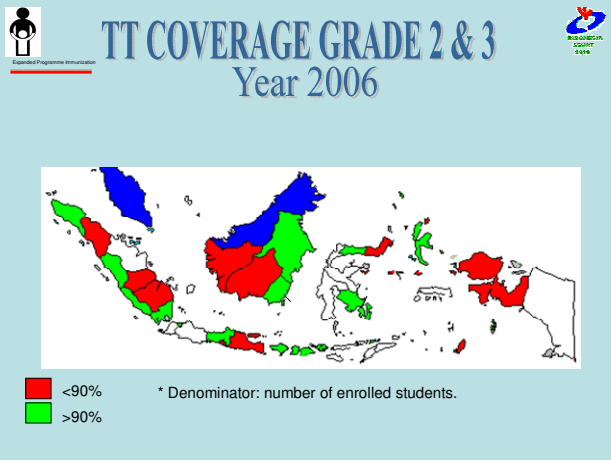
The routine measles 2nd dose at school entry will serve to sustain population immunity by reaching children who may have been missed during infancy or during the campaigns or who failed to sero-convert. In preparation for the addition of this routine measles 2nd dose, the BIAS operational guidelines were slightly revised in 2002, but the processes and instructions were largely unchanged. Following the visit, we were informed that the MOH has started to revise BIAS guidelines for health workers and primary school teachers.

An attractive measles brochure ("tool kit") was prepared for the school-based campaigns and would serve as a good model for any future revision of the BIAS operational guidelines for teachers. The brochure includes learning objectives and has messages to teachers about measles disease and how to track absent students who miss the dose. One copy of the brochure per school was sent to each district for dissemination. However, the brochure does not mention the planned inclusion of a routine measles 2nd dose as a part of BIAS.

In recent years, some countries (e.g., Bangladesh and Nepal) have sent delegates to Indonesia on tours financed by WHO-SEARO to study how BIAS was used as a platform to implement the measles catch-up campaign.

The school immunization schedule and its modifications over the past two decades appears in Annex 4. The dynamic and evolving nature of BIAS is summarized in Annex 5. Nationally reported school immunization coverage by year with DT and TT, shown in Annex 6, is consistently at or above 95% each year. The distribution of DT coverage in class 1 and TT coverage in classes 2 and 3 in 2006, based on the number of enrolled students, is shown province by province in the maps below.





While additional antigens have been added to BIAS, other health interventions that are a part of the overall UKS, such as de-worming, have never been given at the same time as immunization. The team was informed that the immunization work was intense enough that it would be undesirable to add other interventions. Supplies for the other interventions are not delivered at the same time as vaccines and related supplies for BIAS. However, it appears that while immunization is provided through the Directorate of Disease Control & Environmental Health, the other health interventions are the responsibility of a different directorate. The implementation and financing of integrated interventions, with their potential for greater efficiency and cost-savings, would cut across these directorates and require a level of coordination not observed during the field visit.

An overall snapshot summary of BIAS appears in Annex 7

5. Roles of and actions at various levels of the health system

5.1 Role of health centre staff

The health centre collects the enrollment numbers in class 1 (for DT) and in combined class 2 and 3 (for TT) from each school in its catchment area. In one area, the team saw a letter that is carried by the health worker to the school to collect the enrollment data. The letter is then co-signed by the head master and the health worker. On average there are 25 primary schools per health centre in Indonesia. Some schools have both morning and afternoon sessions.

The health centre prepares a work plan, including a timetable specifying which school will be vaccinated on which date by which staff. Required vaccines, syringes and safety boxes are estimated for each school. About one week beforehand, the health centre sends a letter to each school's head master informing them of the date of the school vaccination. According to the operational guidelines, teachers are then expected to inform the students; however, the team did not see evidence that this is done in a systematic way. The health centre collects the vaccine and supplies from the district stores.

BIAS is not considered by health centre managers to be burdensome. BIAS is considered as "routine outreach." The burden of covering all schools within the catchment area is shared among the ample staff within the health centre (range of 10-30 professional health staff per health centre) so that other activities are not adversely affected. The health workers are provided with transport allowance, sometimes calculated per school and sometimes per worker. Health staff arrive at the school by about 8:00 AM and vaccination is completed in about 2 to 3 hours, depending on the size of the team and the number of students. Health staff cover two or more smaller schools on the same day. In the health centres visited by the team, all schools within the catchment area were covered in from 4- 10 days. No additional contract staff were hired by the health centre. Health centre managers explained that other activities were not dropped during the school vaccination days.

5.2 Organization of BIAS at the school

Vaccinations are given either in the class rooms with the health staff moving from class room to class room; or a single class room is used to vaccinate more than one class of students; or a room is designated as the vaccination site and batches of students are brought. All students are vaccinated with TT-containing vaccines and on a separate visit with a routine measles 2nd dose vaccine without reference to past vaccination histories. Teachers and health workers expressed reluctance to vaccinate children with more than one injection on the same day. Teachers sometimes hold the child and provide comfort. The class teacher uses her daily attendance register to identify students in batches. Students who are absent for any reason are noted by the teacher on the attendance register. The teacher is to refer any children suffering an adverse event following immunization (AEFI) to the health centre. At the end of the session, the health staff and head master prepare and co-sign a report on the number of students vaccinated in the school. The health centre sends a consolidated report to the District Health Office (DHO).

While overall BIAS is a well-designed programme, the team observed in the few areas visited that the following features in its design, as described in the operational guidelines, are not being implemented. Whether or not this is the case elsewhere is unclear.

- In the first year of BIAS implementation and in subsequent years of implementation for new students, head masters are supposed to request that parents fill a form for their enrolled children, noting the dates of previous DPT, DT or TT vaccinations, and attach the vaccination card or a photocopy.
- Then, using a screening guide to interpret the current TT status of each student based on the number of DTP doses received during infancy, the teacher with help from the health worker is supposed to transfer the information on each student into a registration book which is maintained at the school. The registration book is supposed to be kept at the school as a record of the students' names, past DTP vaccinations, current DT or TT status, and the vaccinations they received during the school vaccination sessions. In subsequent years of BIAS implementation, the register book is supposed to be used to track each student's vaccination history.
- The teachers are supposed to fill the identity (top) portions of TT cards for each student.

- The health workers are supposed to check the register book and fill TT cards, which are supposed to be maintained at school for each of the students. If the child moves to another school, the card is supposed to be given to the child.
- Reporting from each school to the health centre is supposed to use a standardized form indicating by class the number of enrolled students, number vaccinated, and number of vials consumed. The school is supposed to keep a copy and send one to the health centre.

5.3 Role of District staff

Based on requests from health centres, the DHO is responsible for ordering and collecting vaccines and supplies from the provincial level. The DHO budgets for the transport costs required by each health centre and provides these funds. School immunization was included as a line item in the district's annual budget in the districts visited by the team. The team was informed that health promotion programme in some districts arranges radio talk shows and public service spots to announce the school vaccination days. The DHO sends a consolidated BIAS report to the PHO and to local and municipal government at district level.

5.4 Role of Province and central staff

Based on district requests, the PHO orders and receives vaccines and supplies from Jakarta. The central level has already forecast the vaccine requirements based on previous years' requirements and entered into contracts with Bio Farma. Bio Farma sends the vaccines directly to the provinces according to the vaccine ordered by the PHO through EPI-MOH. The vaccine required for BIAS is sent at the same time as the other vaccine required for the routine infant and maternal program. The PHO sends a consolidated BIAS report to the MOH in Jakarta and shares it with the local provincial government. The annual progress review, which occurs both at the PHO and in Jakarta, includes a review of BIAS performance data. The PHO and MOH in Jakarta were concerned that some entire districts had skipped BIAS for one or more years and planned to catch-up the missed classes in the following year.

6. Cold chain management and logistics

The vial sizes for BIAS are the same as used during routine infant and maternal vaccinations. The vaccine usage rate per 10-dose vial of DT and TT increased from 6.2 vaccinations in 1997/98 (during the previous schedule of two dose of DT in the first class and two doses of TT in the sixth class) to 7.8 vaccinations in 1998/99 during the transition year in which all primary school students received either DT or TT. Now, during the maintenance phase, an estimated 8.2 doses are provided per 10-dose vial. For ordering purposes, the team was informed that the provinces and districts receive vaccine based on the number of targeted students times a 1.25 multiplier (assuming that 8 children will be vaccinated out of every ten-dose vial) times 1.1 to allow for a buffer, minus the stock on hand. During the measles catch-up campaign when students in classes 1 through 6 were targeted, measles vaccine was provided in 20-dose vials. The routine 2nd dose of measles is provided, as is the first infant dose, in 10-dose vials.

The greatly increased vaccine requirements for BIAS are said to be stored for a very short time at district levels (typically one week) before being collected by health centres. The team did not have time to determine whether storage capacity at provincial levels was adequate to handle this huge surge in vaccines. In the one district where the team was able to enquire, the net storage space needed for BIAS vaccines was about 375 liters. The district had five working refrigerators and stated that storage space was not a problem. Health centres are equipped with refrigerators and did not indicate any lack of storage capacity to accommodate the BIAS surge.

For the most part, the vaccine carriers used on the school visits contain 4 cool packs. Indonesia has discontinued use of frozen ice packs to protect toxoids from accidental freezing. Sufficient numbers of safety boxes were observed at the school vaccination sessions. The safety boxes were returned to the health centre, where staff stated that they were buried or burned.

The team was unable to observe the vaccine handling procedures upon return to the health centre. The team was informed that opened vials of DT and TT that had left the health centre for field use were discarded and that properly-handled unopened vials were returned to the refrigerator. As measles vaccination was not done during the team's visit to schools, handling of measles vaccine was not observed.

7. Budget and finance

The central level develops standards and guidelines, monitors and evaluates the programme, and provides all vaccines, syringes, and safety boxes. The provincial and district level are responsible for maintaining the cold chain, supervising activities at lower levels, and conducting advocacy and social mobilization. The required operational costs for BIAS are received by the DHO from the local government and municipality budgets at district level. The DHO sends the funds to the health centres. Provinces and the central level are prohibited from covering district-level operational costs except for national immunization days (NIDs) and supplementary immunization activities (SIAs). At district levels and some health centres, the team found budget lines specifically identified for BIAS in the form of transport allowances for the health staff. Costs for fuel also come from the health centre budgets. In some areas visited, a stipend was provided to the school head masters to come to the health centre for BIAS orientation. Expenditures are reported from health centres to DHO and from DHO to local government.

The team did not find evidence of competition between BIAS and posyandus (integrated delivery of health services at community level) for funding to cover operational expenses at district or health centre levels. Funding for posyandus comes from a separate budget controlled by the community health program.

While there was insufficient time to systematically calculate the operational costs involved in each place visited, it appears that the additional operational costs borne locally are quite modest. Health centres provide funds to transport health staff to visit the schools. When compared to the high number of children vaccinated, the operational cost from local government budgets per vaccinated student appeared to be less than US ten cents. This does not include staff time, vaccines or supplies.

8. Non-compliance, absenteeism, tracking missed students, and reaching the non-enrolled

The team was informed that very rarely some entire schools refuse to participate. A few entire districts in South Sumatra Province had skipped BIAS for one or more years.

Within some schools there are also rarely some children who refuse vaccinations. Apparently, the occasional refusals tend to occur among higher socio-economic groups (e.g., in private schools) who prefer to be vaccinated through their private providers, who are able to buy vaccines on the private market. Absenteeism rates of about 5% to 10% on the day of the vaccination sessions in the few schools visited did not appear to be any higher than on previous days, although such information is not systematically recorded or tracked. If such absenteeism rates are typical, then a considerable number of students could miss one or more of the three doses of DT or TT or the routine measles 2nd dose during the course of their first three years of schooling.

The operational guidelines indicate that the teacher is supposed to escort the students who were absent on the school vaccination day to the health centre. The team was informed that, if there were many absent children, the health workers would return to do a mop-up. However, there was no additional transport money budgeted for such a return visit.

If only a few children were absent, the team learned that no special effort was planned other than to inform the teachers to accompany the missed students to the nearest health centre to receive the vaccination. Many methods are supposedly used to inform the parents of the missed students such as cell phoning, text messaging, communicating through booklets maintained by each student, etc.

It does not appear that name-based identification and tracking of absent students is systematically performed. Appointment slips to refer the missed children to the nearest health centre are not used. The UKS "Little Doctors", students in upper grades of primary school, or scouts do not participate in mobilizing the missed students or tracking the completion of missed vaccinations.

The BIAS operational guidelines do not articulate strategies to reach and vaccinate non-enrolled children of the appropriate ages. The team did not find evidence that reaching these children was systematically done in association with BIAS activities or otherwise. Teachers said it would be "confusing" to invite non-enrolled children to be vaccinated at the school. The expectation is that community-based "kaders" will mobilize non-enrolled children of the appropriate ages to go to health centres or posyandus for vaccination. A single school serves many villages and parts of villages that are covered by different kaders. Communication between kaders and schools is not institutionalized.

9. Consent

The student's presence in school on the day of vaccination is interpreted as parental consent. This is known in Indonesia as "public consent." However, this presupposes an active systematic effort to notify individual parents in advance and the public at large about the planned vaccination day at school. The team saw no evidence that this is the practice. In one school, the team observed a notice board announcing the school vaccination day. In another school, the team was told that the children in classes 1 – 3 are expected to inform their parents about the upcoming vaccination day.

The operational guidelines for health workers give no guidance on how parental consent is to be obtained. The operational guidelines for teachers do request teachers to inform parents during normal parent-teacher meetings about the vaccination day. The letter from the head master to the parent which enquires about the child's past vaccination history makes no mention of the school's intent to vaccinate the child and does not seek consent. There is apparently no systematic effort to obtain individual consent.

While community groups, traditional leaders, religious leaders, scouts and kaders are used to mobilize the population during posyandus and disease-specific supplementary immunization campaigns, these community-based resources do not play a role in the routine BIAS activity. While health promotion staff are present in all health centres and have overall responsibility for UKS, in the areas visited they do not attend the school vaccination day; and they do not provide IEC on diseases and vaccines on non-BIAS days. The teachers were mostly unaware of the names of the diseases against which the students were receiving protection.

The MOH is concerned about the appropriate balance between individual choice and collective good. Programmes which require parents to "opt in" invariably result in lower coverage. But programmes which permit parents to "opt out" presuppose a systematic effort is in place to inform parents. For example, at the start of the school year at the time of enrollment, all parents could be informed verbally and in writing that during such and such a month their schoolchildren will be immunized against such and such diseases, unless they inform the head master that they wish to decline this service.

A systematic effort to explicitly inform parents would provide health workers and teachers with the necessary assurance that, by correctly following the guidelines, they do not have to be concerned with issues of personal liability.

10. Monitoring

According to the operational guidelines, the following indicators are monitored:

$$\frac{\text{Number of DT given in class 1}}{\text{Number of students in class 1}} \times 100$$ as a measure of access.

$$\frac{\text{Number of TT given in class 3}}{\text{Number of students in class 3}} \times 100$$ as a measure of completion.

$$\frac{\text{Number of schools conducting BIAS}}{\text{Number of schools}} \times 100$$

However, the team did not find any data on the number of schools participating as a percent of the number of existing schools. The assumption is that all schools participate. Similarly, the team did not find any data on the number of districts conducting BIAS by year by province.

In addition to the above indicators, the team saw data at every level on the number of TT given in class 2.

At each level, the denominator is the number of students enrolled. The team was informed that the denominator used in the visited province to calculate vaccination coverage was the number of enrolled students in only the schools that actually implemented BIAS. This would lead to over-reporting.

While high BIAS coverage was reported everywhere, the denominator is number of enrolled students. But since enrollment is not uniformly high in every district of every province, use of enrolled students as the denominator over-estimates population coverage.

For ease of operation, numerators and denominators are generated by class, not by age. The high consistency in numerator and denominator data from schools to health centre to DHO and PHO is remarkable. However, the difference between the South Sumatra Provincial denominator used in 2006 at national level and the denominator used by the province itself is very large. Similarly, the South Sumatra Provincial denominator used at national level of the MOH in 2006 versus the denominator used by the Ministry of Education at national level is also very large.

The variation in number of enrolled students in classes 1-3 for South Sumatra Province in 2006 by source is evident below:

-according to PHO	506,109
-according to the MOH, Jakarta	342,435
-according to the Ministry of Education, Jakarta	675,937

For most other provinces, the variance in national-level data between MOH and MOE estimates of students enrolled is not so large as it is in South Sumatra.

At various levels visited by the team, it was difficult to reconcile the annual estimated number of births with the considerably larger size of each class cohort. The presence of older children in some classes, historical fertility rates and historical fertile-aged populations could explain only

part of the difference. For example, in OKU district there were an estimated 6816 births in 2006 but 8358 students were enrolled in class 1.

The National Statistical Bureau conducts an annual socio-economic household survey (SUSENAS) that provides school enrollment data (absolute and per cent) for each district of the country by age, gender, and single-year age cohorts. The enrollment data are organized by whether the student is not (or not yet) in school, is in school, or has quit school. These data could serve as denominators for BIAS to calculate population-based, age-specific vaccination coverage rates by district and province, as a complement to the class-specific vaccination coverage rates. An age would have to be assigned for each class (say, e.g., that "7 year olds" means "class one").

The survey data for South Sumatra Province show that enrollment percentages are uniformly over 92% for each age cohort from 7 to 10 years of age and also for each gender (and over 95% for each gender in the older age cohorts). These survey data show that 422,392 children from 7 through 9 years of age are enrolled in school, with another 167,905 aged 10 years also enrolled.

On the school vaccination day, a tally sheet is not used. Instead, the daily attendance register is used to call students for vaccination. This attendance register shows boys and girls in different color ink, so BIAS could also potentially record and report the numbers vaccinated by gender. Neither the total number nor names of un immunized students (due to absence or refusal) is reported by school to the health centre. No records are kept on the number of AEFI during BIAS. It was unclear how much supervision is provided specifically for BIAS at any level. The team sensed at each level that health staff assumed that BIAS was a mature programme capable of running on auto-pilot without much oversight.

The annual progress review, which occurs both at the PHO and in Jakarta, includes a review of BIAS performance data. BIAS performance data are shared by PHO with DHOs, but DHO staff were unaware how their performance ranks with other districts.

Despite the scale, intensity, duration, and evolution of BIAS, the team learned that BIAS has never been formally and systematically assessed.

11. Conclusions

The purpose of this visit was to document the organization, results, and implementation experience of the Indonesian school-based immunization programme, so that other countries might benefit from the enormous experience and lessons learned in expanding immunization beyond the traditional target groups. The team focused on the “how:” the operational, programmatic and epidemiological challenges that have been faced and the practical choices in programme design and implementation that have been made.

This report documents how the school-based immunization programme is organized and situated within the larger school health program; the evolution of the school immunization programme over time; programme achievements; roles of and action at various levels of the health system; cold chain management and logistics; budget and finance; how such issues as non-compliance,

absenteeism, tracking missed students, reaching the non-enrolled, and consent are handled; and programme monitoring.

Indonesia has been implementing a nationwide school immunization programme since 1984. The country took advantage of its successful infant immunization programme for many years and the extremely high rate of early primary school enrollment of girls (>95%) to address the changing epidemiology of vaccine-preventable diseases.

When it was introduced in 1998, the purpose of BIAS (School Immunization Month Programme) was the long-term control of tetanus, specifically by providing lifelong immunity against tetanus to all primary school students as well as diphtheria boosters. BIAS was designed to be a sustainable, routine activity to eliminate tetanus. During the month of November, all primary schools are visited by local health centre staff to provide DT and TT vaccination. This school platform has more recently been utilized for the routine measles 2nd dose to sustain population immunity by reaching children who may have been missed during infancy or during the campaigns or who failed to sero-convert.

The elements for a successful school immunization programme largely exist in Indonesia: an official policy, operational guidelines from national level for health workers and teachers, articulated roles and responsibilities for the several Ministries that are involved, finances available at health centre and district levels, and vaccine and supplies provided from Jakarta.

The enabling factors in creating the school immunization programme in Indonesia included:

- Compulsory education, free of charge in public schools
- High enrollment of girls and boys in early primary school (about 95%)
- High density of health centres and health staff
- High infant immunization coverage
- Vaccines and other supplies (auto-disable syringes and safety boxes), financed 100% by the MOH

The school immunization programme in Indonesia continues to dynamically evolve and innovate. While it is functioning quite well, its continued high performance cannot be taken for granted. The programme requires continuous oversight. There is evidence of good local ownership of this programme, which suggests that it will be sustained.

Annex 1: Draft Questionnaire

To be administered at all levels (as appropriate)

Background Information

1. What is the over-all organization of health services in the country (e.g. is it controlled from the national level or is it decentralized)?

2. Is there a school health program in the country? If yes, what are the components of this program?

3. More specifically: is the school-based immunization part of a larger health program? If yes, please describe.

4. Are there other (integrated or separate) health programs or interventions that are school-based? If yes, please list these, and describe how (and if) they fit together.

5. What is the funding mechanism of this programme? (e.g. is it entirely government funded or donors provide funds too)

6. When was the school-based immunization introduced? Have there been any interruptions or adjustments since then?

7. What were the reasons behind the introduction of a school-based immunization program / a school-health program?

Service delivery

8. Is a school based immunization programme in operation throughout the country or only in some places? If only in some places, please specify the places.

9. Is the approach used only in areas where primary school enrolment rates for girls are above a certain defined level? Or is it nation-wide? Or any other criteria used to decide where to implement school-based immunization?

10. Are both public and private schools included in the program? If yes, is there a different approach for both? If no, how are children in the schools that are not covered immunized?

11. What vaccines are given in the school-based program?

12. What is the vaccination schedule (e.g., which grades are eligible to receive how many doses of which vaccines with what intervals?)

13. Were other (different) grades targeted in the first few years of start-up (e.g., to "catch up") compared to later years? If so, please specify which grades and which vaccination schedules were used.

14. Was the approach phased-in over geographic areas or over the years, or was it implemented everywhere at once?

15. What other services, if any, are offered in school? Are this other interventions offered on the same day as immunization?

16. Who makes the workplan? (i.e. who decides when which schools are to be visited

17. Who does the immunization work? (e.g. school health workers, a mobile team from provincial level, a local health worker,…)

18. Are extra staff employed to do this exercise? (if not, what activities are "dropped" when school immunization is done)

19. How many times in one year does the team visit the same school for vaccination?

20. Are services provided during the entire academic year or only during a designated month or two?

21. Are both girls and boys targeted?

22. Are non-enrolled children from the surrounding community also vaccinated at the school or is there a different approach to vaccinate this group? If yes, how are they informed? If no, is anything done to vaccinate later those that were missed? How?

23. Are data collected on the per cent of non-attendees on the day of the visit? Is anything done to vaccinate later those that were missed? How? (This may prove difficult.)

24. [NOTE: collect examples of immunization cards, tally sheets, reports,…]

Vaccine supply, quality, logistics, cold chain

25. Who orders and pays for the vaccine? Differentiate between vaccine in the routine immunization program, and vaccine used in schools.

26. Who provides the syringes? Who pays for them? (differentiate between school and non-school immunization)

27. Who pays for the operational costs? (transport, per diems,…) (differentiate between school and non-school immunization)

28. How is the calculation of requirements for vaccine, syringes, safety boxes, staff,…made? (e.g.: schools give the number of students; or a % of the population is used…)

29. Where is the vaccine stored (e.g. in the health center near the school, in the district or province,…)

30. Is additional cold chain equipment needed to be able to do the school-based program? (If yes, what kind? Is this equipment idle (not used) in the periods without school-based

31. How is waste dealt with? (i.e. used syringes etc)

Linking services with the community and communications

32. Are community groups, mechanisms, or leaders systematically engaged at any point in the school immunization program? If yes, please describe.

33. What messages have been prepared to communicate the program/services to headmasters, teachers, community groups, and parents?

34. Are parents informed in advance? Are students advised in advance?

35. Is parental consent needed? If yes, how is it obtained?

36. How do the schools cooperate?

37. What is the role of the teachers? Of the Head Master?

Surveillance and monitoring

38. How are doses recorded? (e.g. do you use a tally? A register?... Ask for a copy, or at least to see the forms). How are results tallied?

39. What is the link with infant vaccination records? (are the doses recorded on the child's immunization card? If absent, are new cards given?

40. Who monitors coverage?

41. How is performance measured? what indicators (numerators and denominators) are used? Is coverage monitored? How?

42. What has been coverage is past years? (ask for a copy of coverage results, which mention numerator and denominator. Compare denominator to birth cohort and enrolment/attendance numbers)

43. Do teachers receive information from health workers about possible adverse events? How are adverse effects handled? What is the reaction of students to the immunization?

Programme management

44. How is the policy/schedule established?

45. Who has overall responsibility for the programme at central and peripheral levels? (e.g. EPI Manager, School Master,…). What programs / ministries are involved in planning and delivering the program?

46. What kind of report is made? How frequently? Who receives the report?

47. Is there any attempt to react to performance reports? (i.e. to improve things if the report shows problems)

48. Has any formal or informal assessment /description of school-based program been done? If so, can we have a copy?

49. Are there any plans for expansion of the school-based immunization or of the school health program? When would this happen? What interventions?

50. How is the supervision organized? (who supervises, how frequent, impact, feedback,..)

51. What are the lessons learned?
52. What are the main challenges?

Annex 2: Question list prepared for sub-national level/site being visited

1) Observations at vaccination site:

1. Cold chain maintained?
2. Sufficient quantity of vaccines, syringes?
3. Safe Injection practices (re-capping, waste)?
4. Counseling/health education?
5. Register book and cards used?
6. Tally sheet used?
7. Individual cards in use?
8. Reporting format from school to health centre?
9. Any supervisory checklist in use by health staff?
10. Other services provided today?
11. How is consent considered to have been given?
12. Role of classroom teacher?
13. Reaction of students, refusals?

2) Interview with Guru UKS or headmaster at school on day of vaccination session:

1. When did you learn that today was vaccination day?
2. Number students registered in class 1-3?
3. Average number of absentees each day and today?
4. Appointment slips or referrals for absentees?
5. Number of refusals today?
6. How is consent considered to have been given? Consent letters on file?
7. Any non-enrolled school-aged kids at session today?
8. How are children screened and registers filled/used?
9. Were students ever screened and why was it stopped?
10. Is a vaccination card given to student (at school leaving or before?)
11. How many times does health worker visit school during year? To do what on each visit?
12. Do health workers provide health education to students about vaccination or related diseases before BIAS?
13. Coverage last year and versus other schools?
14. Abscesses? AEFI?
15. Would you agree to allow students to receive two shots today?
16. Satisfied with BIAS?
17. Know the purpose of BIAS, names of vaccines and diseases?
18. If mothers encountered:
    -Would you agree to allow students to receive two shots today?
    -When did you first learn that today was vaccination day?
19. Ask the children : how they came to know about the BIAS activity and when, what kind of vaccine they got and for what?

3. Visit to HC to interview head and see some data:

1. Number and type of health staff?

2. Any micro-plan (number and line listing or map of schools, number of students by school, supplies required, visiting schedule, and who will visit each school)?
3. Information letter sent to school with scheduled date of visit?
4. See BIAS school visiting schedule for tomorrow and yesterday
5. % of schools that don't agree to participate?
6. What BIAS services each month done throughout year? (De-worming in separate month?)
7. Are health workers and chief satisfied with BIAS? Are they familiar with the BIAS guidelines?
8. Burden on staff (what gets dropped?)
9. How many times per year do your health workers visit the same school? What happens if students miss their vaccinations on the BIAS day?
10. Are health promotion staff involved in BIAS? How?
11. BIAS coverage last year and versus other districts? Compare their district data to data provided for this district at provincial level.
12. What operational costs must be covered to make BIAS a success?
13. Separate budget for school health programme or BIAS? Which budget used for BIAS transport?
14. Budget for BIAS operational costs enough? Budget for posyandu (outreach) enough?
15. How much spent per health worker on BIAS (per school or per day? On what?)
16. How much spent for posyandu on transport or stipend (competes for resources?)
17. Can he afford to send staff back to same school for catching absentees?
18. What data are shared with whom?
19. How to mobilize resources within sub-district to cover operational costs for BIAS?
20. Local IEC, media, community volunteers/groups for BIAS?
21. What do you do with the used syringes after the session?
22. Do you have a supply of TT cards in your health center?
23. Would you agree that health workers could vaccinate students with two shots on same day?

4) At MOH district office:

1. Work planning
2. Workload issues
3. Presence of and familiarity with BIAS guidelines
4. Ask all surveillance and monitoring questions from master questionnaire. (#38-43)
5. Who data are shared with and what type?
6. Supervisory checklist and schedule?
7. Ask budget questions above for health centre.
8. How to mobilize resources within sub-district to cover operational costs for BIAS?
9. Local IEC, media, community volunteers/groups for BIAS?
10. Have there been any meetings to review BIAS with other health programmes or sectors (health promotion, religious affairs, home affairs, education)?

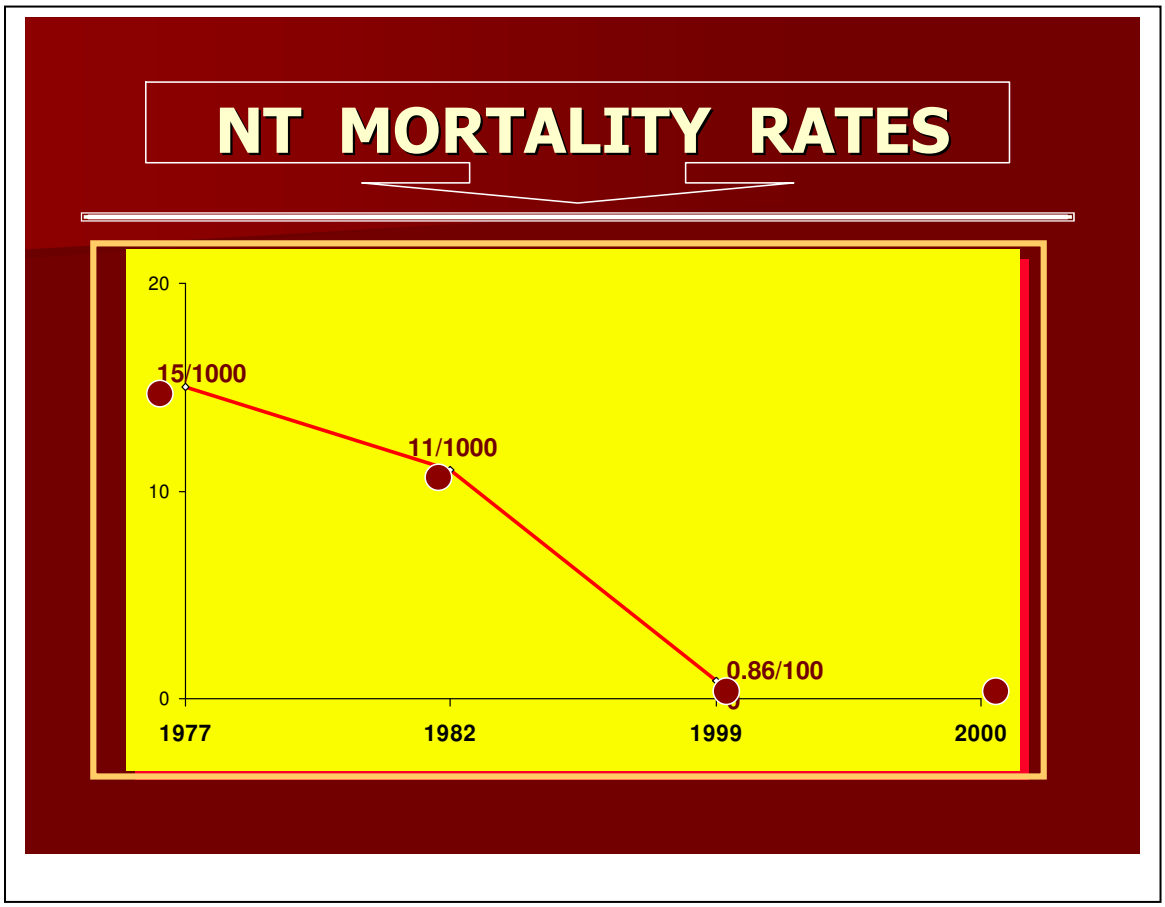
5) At district MOE:

1. number of students enrolled by school (how determined? public, private, religious?) and sex

2. How is the overall district budget for MOE determined? (based on number of students?)
3. How was their performance on BIAS last year?
4. Headmasters and district officials satisfied with BIAS?

Annex 3: Neonatal Tetanus mortality rates (1997-1999)

Source: MOH Indonesia



Annex 4: School immunization schedule in Indonesia

School immunization schedule in Indonesia

	1984-1997	1998-2000	2001	2002
Grade 1	DT 2x	DT 1x	DT 1x	DT 1X, Measles
Grade 2		TT 1x	TT 1x	TT 1x
Grade 3		TT 1x	TT 1x	TT 1x
Grade 4		TT 1x		
Grade 5		TT 1x		
Grade 6	TT 2x	TT 1x		
ELIGIBLE TARGET	9 MILLION	29 MILLION	15 MILLION	

Note: Measles was introduced in 2002 in 3 provinces and all provinces in 2008.

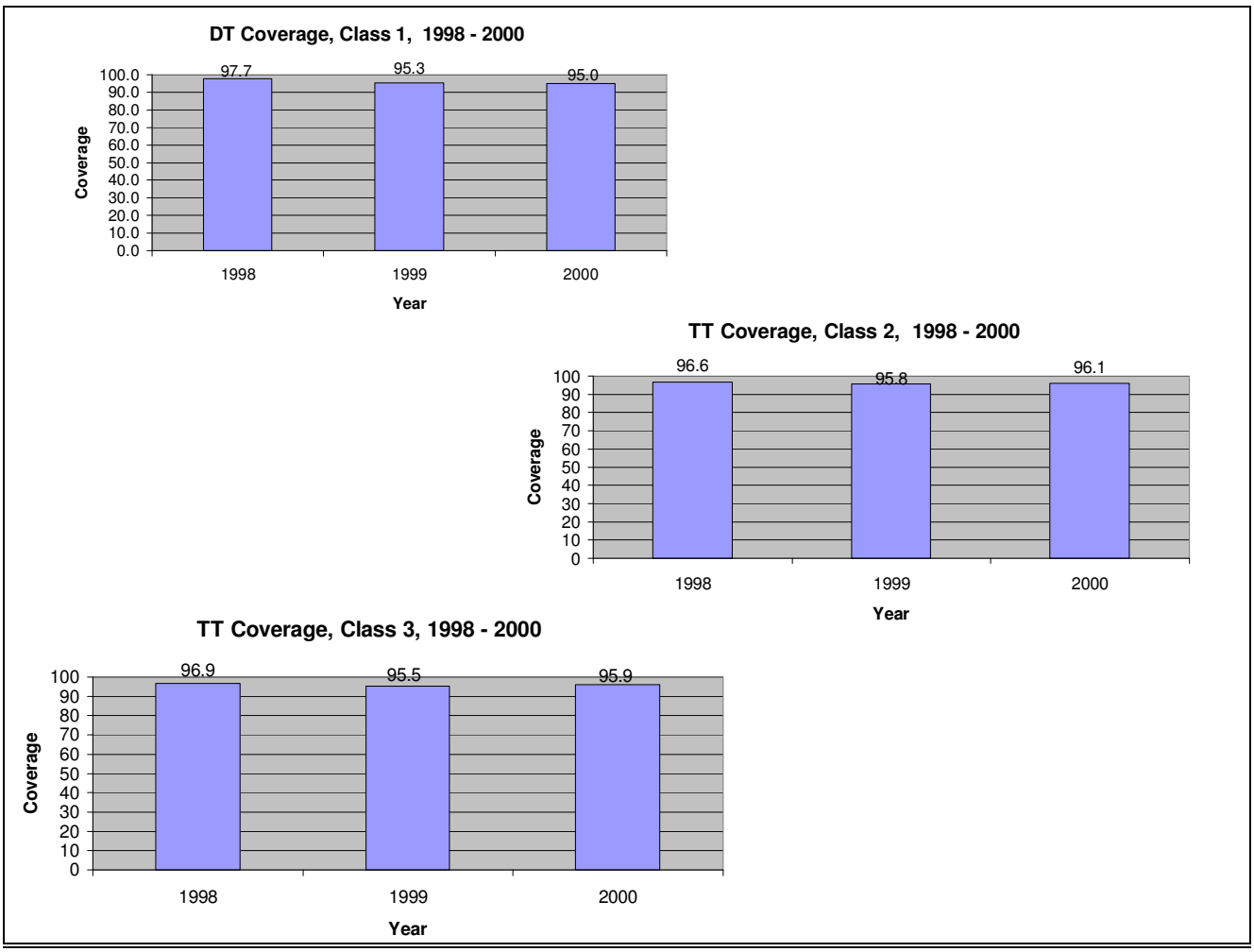
Annex 5 : Changes in BIAS programme over the years

BIAS: dynamic and evolving

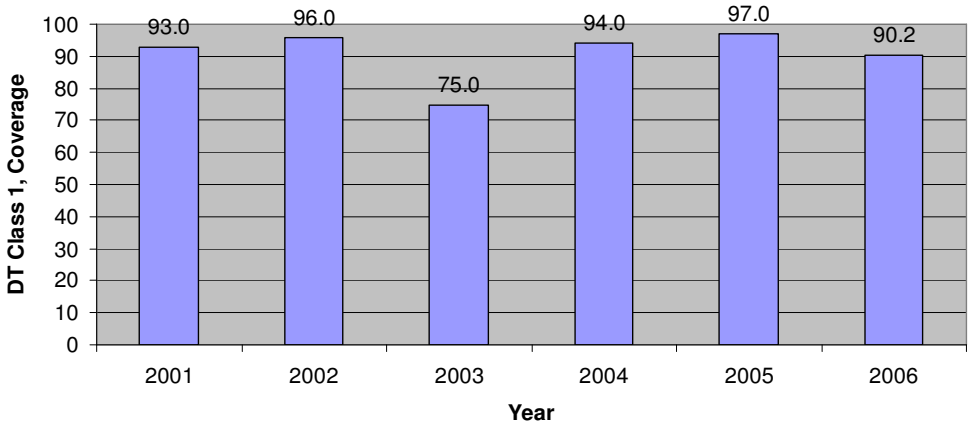
- 1984-1997: Pre BIAS schedule throughout the year
  - 2 DT in class 1 for boys & girls
  - 2 TT class 6 girls only
- 1998-2000: BIAS transition with annual visit in Nov.
  - one DT in class 1 for boys and girls
  - one TT in classes 2- 6 for boys and girls
- 2001: "maintenance" in November during annual visit
  - one DT in class 1 for boys and girls
  - one TT in classes 2 and 3 for boys and girls
- 2002 onwards: inclusion of routine second dose measles in class 1 in all provinces (in 2002, only 2 provinces and by 2008 all provinces introduced Measles 2nd dose)

Annex 6: School immunization coverage by year with DT and TT, 1998-2006

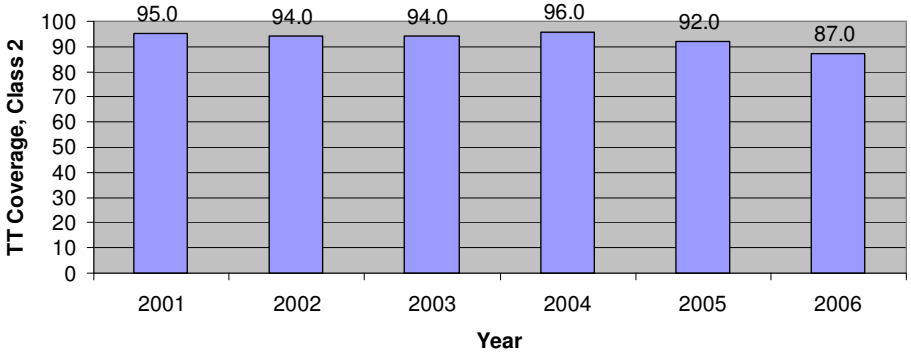
DT and TT coverage 1998-2000



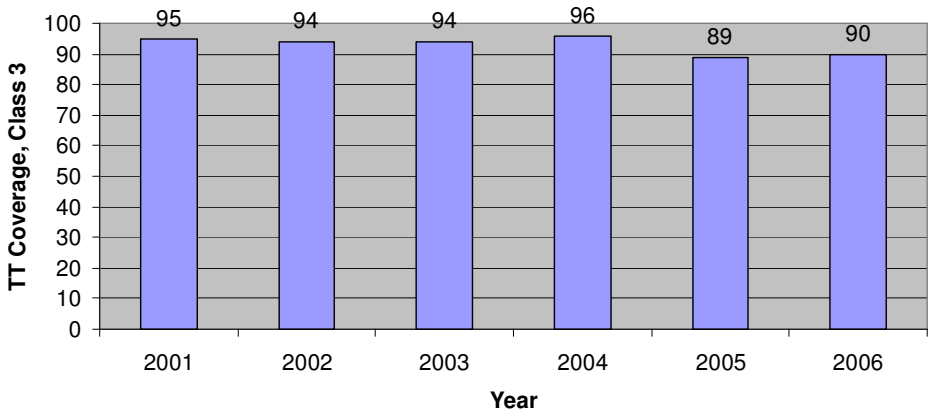
DT coverage in Class 1, 2001 - 2006



TT coverage in Class 2, 2001 - 2006



TT coverage in Class 3, 2001 - 2006



Annex 7: Summary of Indonesia's school immunization month programme

Summary of Indonesia school immunization month programme (BIAS)

1. inter-ministerial coordination exists through formal School Health Programme (UKS)
2. introduced school-based TT-containing vaccination nationwide without pilot
3. rolling province-wide intro of routine measles 2nd dose at school entry (approx. 6 years) after campaigns
4. girls and boys targeted for all vaccinations
5. single dose DT/TT in first 3 primary classes (public, private, religious)
6. two visits/year to each school: measles for class 1 and DT/TT in November
7. "public information" (individual consent assumed)
8. other interventions are not integrated with vaccination

Summary of Indonesia school immunization month programme (BIAS) (contd.)

9. non-enrolled students not reached at school venue
10. GOI pays 100% vaccines, supplies and ops costs of "routine" school vaccination
11. Implemented entirely by local health center staff (no additional staff hired)
12. Name-based enrollment records used in each school to target students
13. Very few refusals by present students, no increased absenteeism on day of vaccination
14. Numerators/denominators generated locally by class
15. Denominators differ between national and provincial levels, and between MOH and MOE at national level
16. Existing household survey school enrollment data in each district by gender and age are not currently used to calculate vaccination coverage of individual age cohorts
17. Name-based tracking of absent students (5-10% per day) and identification of non-enrolled not done systematically