

**A Review of a Mass Immunization Campaign in Polio eradication initiative and
Tanzania case in 1996**

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Summary

A mass immunization campaign called "National Immunization Days (NIDs)" is a national program which is supposed to vaccinate all children under 5 years old in one or two days regardless prior vaccinations, in order to interrupt wild polioviruses. NIDs was held in Tanzania in 1996. With the success of NIDs in the Americas, they have been applied to the sub-Saharan African countries. Because the costs of NIDs approximately explain 25% of the fiscal development budget of Tanzania Ministry of Health (1996) and because NIDs had to be implemented intensively, NIDs tended to be donor-driven and coercive. The tactics of campaigns can not help being "top-down" because of its characteristic approach "one size fits all". There has been a controversy over NIDs that they may diverse the limited resources and hamper the existing other immunizations.

On the other hand, it is said the positive effect is limited only when the campaigns are frequently repeated or only where the infrastructure has been installed. In Americas and Asia, some campaigns were done very much like "war" in which children were only "targets" and in which mobilization hardly took place. In remote areas where existing health facilities were not available, out-reach services that vaccine teams went to villages and delivered vaccines were much strengthened. After campaigns, there is also a possibility that mothers no longer come to health facilities far away from their resident only to have children vaccinated. Health workers may get exhausted by the repeated campaigns which requires so much effort in rather short period but annually. Although goal-oriented NIDs can motivate health workers, the motivation for routine immunization may be hampered.

In Tanzania, there has not been a big change in EPI coverage since NIDs installation. NIDs brought millions of money into primary health care which would have not been available without NIDs. The impacts of NIDs on surveillance were very weak. It was suggested that potential and long term impacts on communities, especially mothers and health workers should be considered.

These negative effects may result in the low intention to sustain vaccination activities. There are some documents of EPI failures after mass campaigns. Because these campaigns will be continued after polio eradication, it is crucial to understand the impact on the community and to look for the reasonable solution involving the community.

Introduction

Poliomyelitis is still an important disease which causes a substantial disability through motor-neuron paralysis. World Health Organization (WHO) reported that at least 500,000 cases of paralytic polio could be prevented each year (Bart, 1997). To eradicate Poliomyelitis by the year 2000, WHO has promoted strategic vaccination which is consisted of three stages (Hull, 1997).

In the first stage, routine immunization coverage should be kept high to reduce polio cases. Polio routine immunization is one of the activities of Expanded Program on Immunization (EPI) which also includes measles, neonatal tetanus, DTP, BCG and sometimes Hepatitis B. EPI is provided by existing health facilities periodically. High coverage in polio routine vaccination has been accomplished in many countries in the world.

Second, Mass Immunization Campaigns (MICs), also called National Immunization Days (NIDs) are employed to stop wild polio transmission (Hull, 1997). NIDs are nationwide campaigns where all children under five years are vaccinated regardless of prior immunization status. They are implemented at the same time all over the country for one or two days.

At the third and final stage of eradication, intensive and localized immunization campaigns referred to as "mopping up" are adopted to exterminate any left over wild polioviruses. Mopping up campaigns are supposed to be performed in response to the surveillance results of an identified wild polio virus or continuous AFP outbreaks (Acute Flaccid Paralysis, AFP, which includes other diseases, such as Guillain-Barre syndrome, transverse myelitis, tumor and injury). In terms of cost, mopping up campaigns require

more resources than NIDs on a per capita basis (Tangermann, 1997). Surveillance is indispensable to identify final reservoirs of polio but its implementation is insufficient in many sub-Saharan African countries.

NIDs have a number of unique features, compared with the eradication program of smallpox and guinea worm (Gounder, 1998). First, NIDs involved many more partners in its activities. Second, the NIDs are a generalized strategy that every country is expected to implement at the national level which require a high political and economic concentration. As a consequence, NIDs become a big program and have potential impacts on many sectors. The Americas succeeded in eradicating poliomyelitis through NIDs. However, we do not know how NIDs might affect many developing countries. As Mogedal showed, the NIDs affect political/policy context, resource input, service delivery and service management, organizational capacity, human behavior, and linkage and partnership between the recipient government and donors. I would argue the impacts on the political context, financing policy, organization capacity especially about surveillance and the change of human behavior.

Political/policy context

Polio Eradication Initiative (PEI)

After the success of smallpox eradication in 1960s and 70s, WHO set its sights on at polio as the next target in 1980s. The Americas region of WHO (PAHO) promoted Polio Eradication Initiative (PEI) by implementing NIDs. With the success in the Americas, demonstrating that polio eradication was feasible, WHO decided to take the initiative including NIDs to the rest of the world (Hull, 1997).

However, this agenda lead to considerable debate. The main concern was that the concentration on PEI would divert limited resources that might be spent on other programs such as malaria control, and measles projects (Taylor, 1997). However, there is no objective data to prove the resource diversion (Banerji, 1990, Lee, 1998, Sutter, 1997), Taylor was also concerned the ethical implications of PEI that financial benefits were greater for rich countries. It is obvious that there has been strong pressure from the developed countries, as well as availability of funding from Rotary International, CDC and Japan (Gounder, 1998). Rotarians have claimed to provide \$400 million through 2005 for the PEI.

There has been resistance to installing the totalitarian approach of NID's because the way of implementing NIDs is almost same in any countries regardless their infrastructure and immunization status (Banerji, 1990, Wigton, 1996). In India, there was a sever resistance against NIDs. One Hindu leader expressed the view that vaccination was a tactic to push Christian and destroy their own moral and identity. Malawi did not adopt NIDs in 1999 and Japan declined to implement NIDs because there was no possibility of remaining wild polio virus (Interview with Dr. Kamiya, 1998).

In Tanzania, EPI coverage has been kept over 70%. A cluster survey in Korogwe demonstrated that The government also committed itself to polio eradication in 1988 as a member of World Health Assembly. At the end of 1996, the idea of NIDs was brought by Rotary International. Before the Ministry of Health asked donors for the international cooperation, a representative of Rotary International which is a big NGO in the US contacted JICA (Japan International Cooperation Agency) about a possibility whether we could coordinate in NIDs in terms of the donation (Meeting with the chairman of Rotary International in Tanzania). The following year, WHO set Tanzania as a model country of the East African Region for polio eradication and sent a consultant. On the other hand, DANIDA and Dutch Development co-operation were against NIDs because of the fear of disrupting the regular projects they were running.

NIDs require a high concentration of political, economical, and human resources for only one or two days. For these reasons, NIDs tend to be centralized and in fact, sometimes were conducted very much like a war (Wright, 1995). Although NIDs were successful in the Americas and Asia, it was doubtful whether NIDs would work in African countries where society consists of so many tribes and cultures. However, in practice, it is almost impossible to adjust the vaccination strategy to each cultural condition. As a result, NIDs can have a reverse effect to the decentralization, the impact of NIDs towards the decentralization needs to be

investigated.

In terms of the sustainability, not only immunizations but other public health activities should be based on the understanding and the acceptance of communities. It is also desirable that these activities can raise the community demand. It is reported that the accessibility to health facilities is the biggest determinants for higher immunization coverage in developing countries (Wright, 1995, Nichter, 1995). Therefore, it seems a reasonable solution for the policy makers to promote the infrastructure and primary health care services by building health facilities instead of forcing immunization. However, poor countries cannot afford to establish these facilities and this kind of demand hardly meets the donor's interests because the goal to build the infrastructure is not clear. On the other way round, immunization in developing countries meets the interests to collaborate by many developed countries because communicable diseases do not respect a country border and because NIDs have a concrete goal to finish. NIDs which are obviously donor-driven and goal-oriented programs may be political tools to induce a cooperation with developed countries to promote the infrastructures in developing countries (Gounder, 1998). Although this kind of approach seems pragmatic, it should be considered again that it tends to be coercive and hardly sustainable. The process of the implementation should involve the communities.

Resource Input

Financing of EPI and NIDs

Financing of the EPI varies country by country. In Turkey and the Philippines, the government was responsible for more than 80% of the total EPI cost, while in Burkina Faso and Tanzania, less than 40%. Financing patterns reflect the interests of donor organizations and level of resources, rather than a lack of commitment on the part of national governments (Brenzel, 1989). In Tanzania, EPI costs were mainly supported by DANIDA (Table 1).

Table 1. EPI funding in Tanzania

	Sum(\$1,000)	%
Government	538	8.4%
DANIDA	4,061	63.3%
UNICEF	817	12.7%
JICA	772	12.0%
Rotary International	212	3.3%
WHO	13	2.0%
Sum	6,413	100.0%

EPI implementation report 1995

Polio Eradication Initiative brought millions dollars for general primary care development, which would otherwise have not been available (Gounder, 1998). Although NIDs are part of EPI activities and the financing is supposed to be additional to existing EPI activities, it is impossible to separate the costs NIDs only from the routine vaccination because both are integrated by the MOH/EPI office and because the budget for NIDs come from central and local budgets which are complexly integrated. The possible approach to estimate costs is to use the sum of donor contributions (Mogedal, 1998). Total amount of the NID's budget was calculated based on the contributions of donors and it was approximate \$5.3 million in 1996.

Rotary International is a major donor for PEI. The US and Japanese governments have cooperated in PEI under a policy of African development initiative for Japan and of global common agenda for the US. These two countries are major donors for the polio eradication initiative in Tanzania, although DANIDA has still played an important role in general EPI cooperation.

The principal of the budget policy for the campaigns was that the budget should be apart from the original EPI

budget and should be additional so that campaign might not damage other health programs. Therefore, in 1996, Government contribution was very small, probably less than 6% at most, assuming they paid for training and planning (\$341,000) (Figure 1).

Japanese Government donated \$2 million (16 million does of OPV and 1500 vaccine carrier) in 1997 (Japan International Cooperation Agency Annual Report FY 1998), whereas WHO contributed, \$10,000, USAID, \$635,000, CDC, \$1,35 million, Rotary, \$1.35 million. In Tanzania, costs of vaccines, cold chain equipment, per diem for health workers, kerosene, fuel, social mobilization and per diems for preparatory meeting were supported by donors (Mogedal, 1998). Government contributed mainly to health personnel and voluntaries and the cost of transportation of vaccines. Planning preceded to the implementation which was also supported by the Government. However, many complaints came out after the NIDs, such that allowances for health workers were not appropriately paid and that training did not take place because of the delayed delivery of the budget.

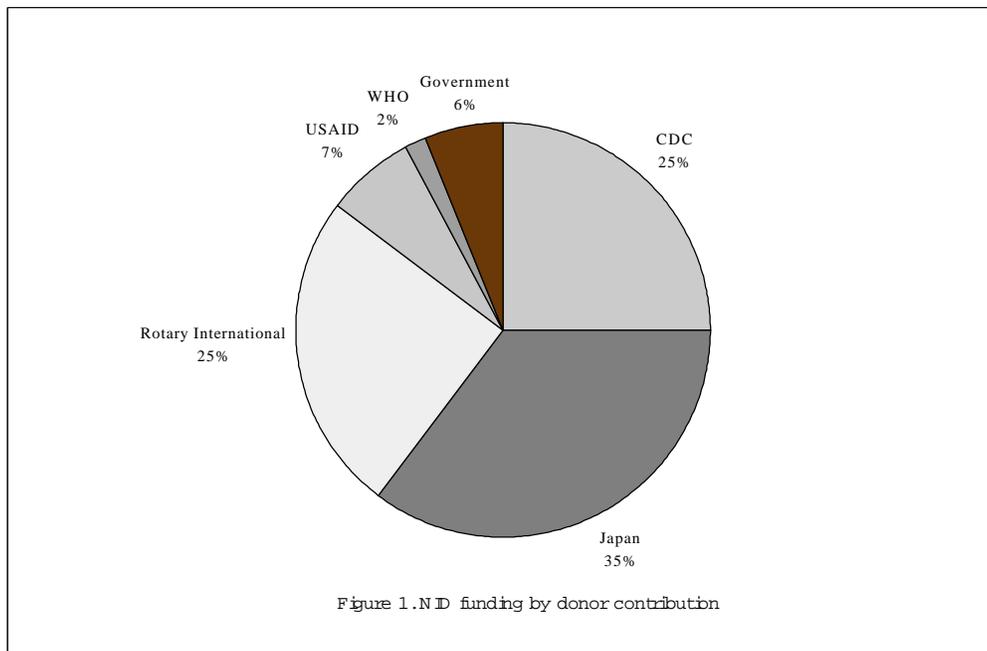


Fig. 1 NID funding in 1996

So far NIDs are run by the donation, it seems that there is less burden on the recipient country. However, even in these cases, the recipient countries are expected to pay the running cost, including health worker allowance, and planning for which there is a big monetary burden for poor countries. For example, Tanzania government tried to contribute 14% of the applying budget for cold chains and vaccines in 1998 (Mogedal, 1998), probably because the Japanese AID required sustainable effort of the recipient.

Figure 2. Preventive services in Ministry of Health development budget

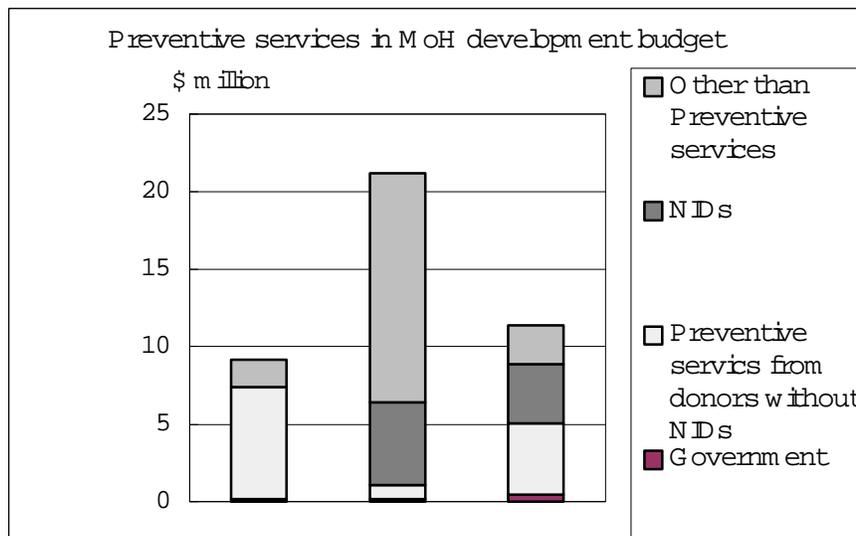


Figure 2 showed that NIDs explained 25% and 33% of the development budget of Ministry of Health in 1996 and 1997, respectively. They were additional budgets which may not have been available without NIDs. On the other hand, the government investment towards other preventive services was very limited.

As a conclusion, NIDs brought additional money which might have not been available without NIDs (Opportunity benefit). At the same time, once donors withdraw their contributions, in Tanzania case, the US and Japan, it will be almost impossible to sustain the polio eradication initiative through NIDs. NIDs also have a potential burden by imposing a subsidy from the recipient side. However, the economic impact seemed to be limited to NIDs and does not seem to last long as followed (see next section).

Cost-effective of NIDs

Vaccinations are considered as one of the most cost-effective child survival interventions. The number of fully vaccinated children (FVC) is one of the most common measures of the effectiveness of immunization programs. FVC has been widely used but it is difficult to compare the impact of NIDs inter-countries because the way of calculating costs is different from each report. However, the total cost of EPI is supposed to include personnel, transportation, supplies, vaccines, maintenance, miscellaneous operating costs, equipment, vehicles and buildings costs (Brenzel, 1989). Sphepard et al showed that NIDs were less cost-effective (the cost per vaccination and per death averted) than routine services, assuming all doses administered during the month of a campaign were campaign doses. Berman also reported that MIC in a maternal tetanus immunization was less cost-effective than routine programs without counting opportunity cost and expenses in Sumatra. On the other hand, Creese showed that the cost-effectiveness of NIDs was higher than routine services in Brazil. Jian reported that average costs per immunization in NIDs in China was \$0.34 including vaccine costs, building and equipment amortization and salaries at all levels, which seemed the cheapest ever reported. Difference in the NID size and the condition made it more difficult to compare reports over countries.

The primary cause of inefficiency includes use of inappropriate technologies, low productivity of health personnel, and mismatches between the distribution of immunization inputs and the needs for EPI (Brenzel and Claquin, 1994).

Although time cost is not calculated in these analysis, it is the most crucial for the woman in developing countries. Travelling and waiting time as well as loss of earnings to spare time for the immunization are essential factors for the drop-out from periodical immunization. Coreil reported that mothers' competing priorities were the most important constraint and the inaccessibility of the post was the most constraint among the priorities (Leslie, 1989).

Service delivery and service management

Cold chain and vaccine wastage

In principal, NIDs are supposed to reduce cold chain problems and vaccine wastage because of the strategy involved in NIDs. Polio oral vaccines (OPV) are temperature-sensitive and are supposed to be transported in a cold box or refrigerators. On the other hand, most countries where wild polio virus still exists are tropical areas. Although NIDs are implemented in the coolest season when the polio incidence is supposed to be low, polio vaccines require strict temperature control (Hull, 1997). The cold chain is one of big targets in NIDs to reinforce and to strengthen. As the result of NIDs, cold chain integrity and vaccine wastage were sometimes improved (Mexico in 1990, Cuba), but sometimes not (Cameroon in 1975, Nigeria in 1989).

In Tanzania, oral polio vaccines (OPV) as well as DTP vaccines are kept in refrigerators and the temperature is monitored in routine services. NIDs deliver vaccines to a huge number of vaccine posts (17,500) including posts where the cold chain is not available. In Tanga region, vaccines were kept of the district level until implementation to avoid the cold chain failure because lower level health facilities could not afford provide room for additional vaccines. A rather short but intensive care of the cold chain was expected to strengthen the cold chains. Cold chain failures were reported in EPI reports 1996, 1997 due to lack of kerosene. Impact on the cold chain was limited or if there, not sustainable.

Wastage is another measure of the impact towards service management. In routine services, a 10 dose vial is used to reduce the wastage, whereas 20 does vial was adopted in NIDs. In terms of the cost of vaccine delivery, NIDs are much more efficient than routine services. However, there have been no change in routine services after NIDs, the impact towards wastage is also very limited. Wastage is a trade off from the coverage. In routine services, health workers are expected to open a 10-dose vial for only a few children. Therefore, wastage might not be a big issue in terms of the polio eradication.

NIDs consistently increases over all Immunization levels?

Coverage of EPI diseases seemed to hit the ceiling and has fallen in many countries after 1990, especially in the poorest, where the impact of vaccine-preventable disease was greatest. Of the fifteen countries in Africa, thirteen reported a decline in coverage. The fall in coverage took place after a consistent rise in coverage between 1986 and 1990 (Poore, 1993).

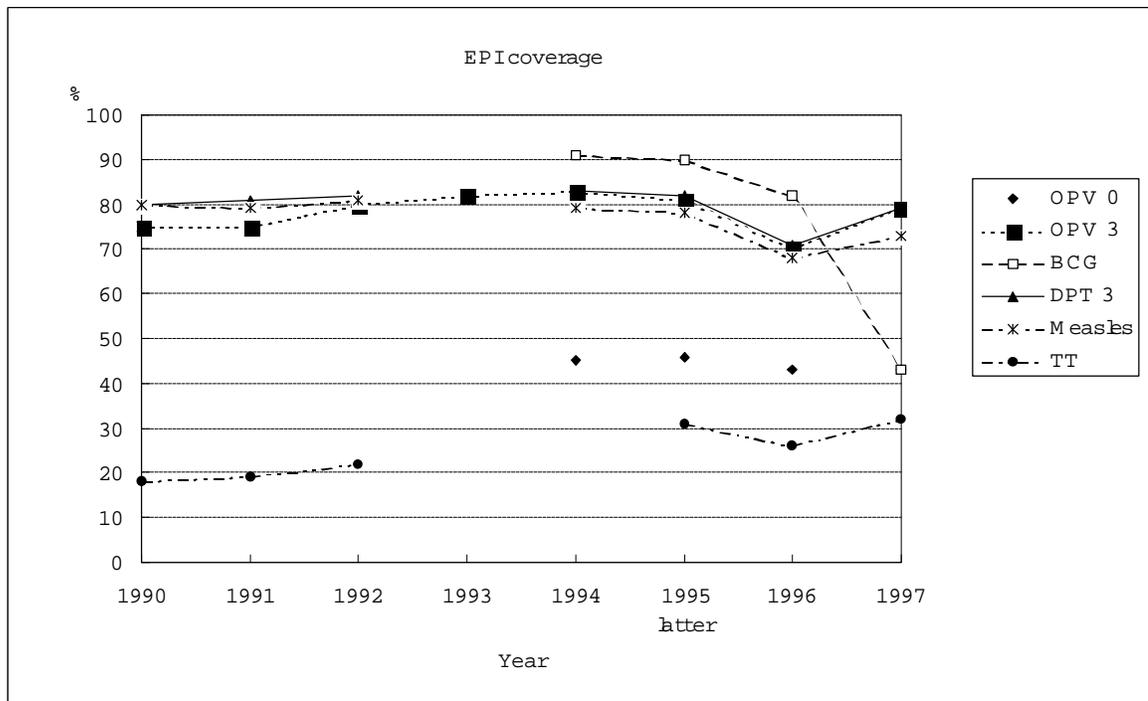
Empirically, NIDs increased the coverage in Americas but increased level varied case by case. Mexico, Ecuador, Nicaragua, and Liberia reported that NIDs could increase coverage. On the other hand, South Africa, Dominican Republic, and Egypt reportedly not only failed to reach the desired coverage but missed children who needed OPV most (Dietz, 1997). Even in case of likely success, the coverage fell down quickly after NIDs to the previous level in Guinea (Cutts, 1990). Because there have been no control study of NIDs, a clear impact of this intervention is difficult to evaluate.

Dietz reported that the gains in raising coverage were short lived unless campaigns were repeated regularly or there was adequate health service infrastructure. Sustainability is a big concern over NIDs in Sub-Saharan African countries where infrastructures are poor. Many countries in Africa have adopted an integrated approach to deliver different vaccines simultaneously (Henderson, 1988). However, in terms of the technical issue of administration, NIDs should be kept as simple as possible to avoid administrative confusion and waiting time (Olive, 1997).

In theory, NIDs should not hamper any other health activities. On the contrary, NIDs can promote routine services by increasing community awareness about the importance of immunization (Dietz, 1997). However, physical and economic constraints sometimes interrupt other health programs. There have been some evidences that Mass Immunization Campaigns interrupted other health activities. In Senegal, other health care activities were stopped during measles mass immunization campaign. Two weeks interruption was reported in Nigeria when equipment was diverted for NIDs (Bryce, 1990). In 1985, needed resources and equipment were diverted from several countries with a requirement for routine supplies to Turkey to be used in NIDs (Poore,1988). Unfortunately, it is difficult to know the real impact of NIDs, because of a lack of controlled studies. Even pre-post comparison will need a rather long observation.

Tanzania, Polio coverage dose not change much after NIDs except BCG. BCG has been vaccinated with OPV0 since 1997 which dropped BCG coverage. There was a dip in 1996 when the first NIDs took place. In that year, a major health reform took place which aimed at integrating services at the district levels. Vaccine procurement, storage and distribution were under the control of Medical Stores Department (MSD). There were a number of recorded constraints and gaps in the supply chain for regular EPI because of the conflicts between MSD and the previous EPI providers. In that year, a major health reform started and it hampered the procurement and the delivery of vaccines. Mogedal reported the negative impact of the health reform overshadowed the impact of NIDs.

Figure 3 EPI coverage in Tanzania



Although one of the important aims of NIDs is to reach the population which would have missed without NIDs, there have not been many reports whether the aim was accomplished. Cuba, Brazil, Mexico reported not only the increase of the coverage but the success in vaccinating children difficult to reach through the existing services.

The coverage itself is one proxy to measure the impact of NIDs. However, it is once aggregated, it may conceal the problems because the situation dramatically varies area by area. It is easily influenced by factors that are completely different from NIDs impact, such as a war or an economic crisis. Furthermore, the

coverage after NIDs seemed sometimes damaged only because of the quiet period of the routine vaccination just after campaigns. On the other hand, the fully vaccinated children, which are sometimes used as an index of the vaccination efficacy, is also a good measure for NIDs. In Ecuador, MIC increased the fully vaccinated proportion, from 43 to 64%. The number of fully vaccinated children can be determined through a survey by examining the children's and mother's vaccination card. (Shepard, 1989)

In Tanzania, vaccination card (Maternal and Child Health Card) were not recorded during NIDs to avoid the confusion and waiting time. Whether a children was fully vaccinated by NIDs or not can be examined orally after NIDs, by asking mothers. The registration card for the MCH services may be a good alternative in further NIDs.

Disease Incidence

Disease incidence is expected to decrease after increased coverage. However, the measure has many confounding. First, there was no control study because disease incidence such as polio and measles varies from year to year even in the absence of control activity. However, the Americas, India and Egypt reported the decreased disease incidence after NIDs. Second, the incidence itself is quite infrequent and difficult to identified in many developing countries. (Dietz, 1997)

To look at the efficacy of NIDs, disease incidence is a straightforward measurement but pragmatically it is very difficult to identify them, when we take the surveillance into account.

Organizational capacity

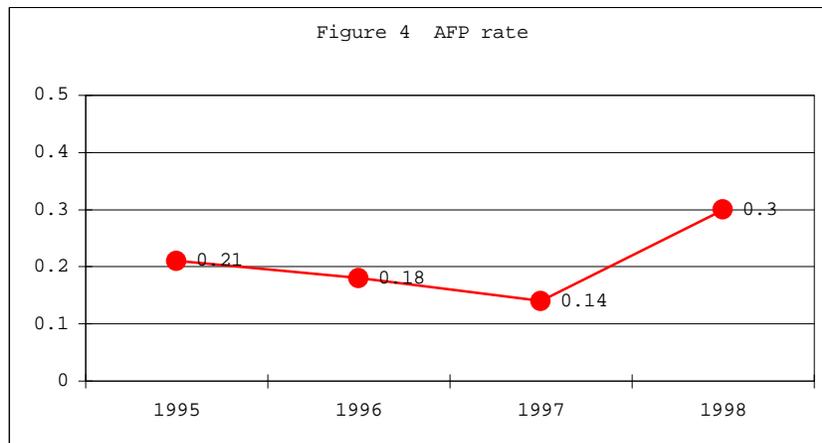
Health systems have been decentralized in Tanzania but the centralized management was hampered by the insufficient communications and transportation between the central government and local governments.

Surveillance

Surveillance is crucial for the proof of polio eradication and problems in surveillance are the major concern in Africa. Poliomyelitis can lead to Acute Flaccid Paralysis, AFP, which may mimic other conditions such as Guillain-Barre syndrome and transverse myelitis. AFP is identified through clinical criteria by the surveillance. AFP ratio is calculated by the number reported as paralysis diseases divided by the number of population under 15 years old. Without poliomyelitis, AFP is expected to take place at least one per 100,000 under 15 years children. When the ratio is under 1, it means the reporting system does not work. However, its ability is insufficient in many sub-Saharan African countries. In Tanzania For instance, AFP rate (AFP cases per 100,000 children under 15 years of age) in 1995 was only 0.21/100,000, while the expected figure was 1.25/100,000. Social mobilization before the MIC is expected to generate more awareness of AFP and the number of the AFP is expected to increase. After NIDs, AFP ratio went down 0.18 in 1996, 0.14 in 1997 and went up to 0.3 in 1998 (EPI annual report, 1996, 1997). Surveillance ability is still less than one third of the expected level.

Figure 4. AFP rate

Because Tanzania does not have the facility to isolate poliovirus, every sample from a suspected case of AFP has been sent to Zambia for the further study. Unfortunately, the reverse cold chain which is for the transportation of temperature sensitive samples are often insufficient because of inappropriate treatment and lack of kerosene. There has been a great gap between the enormous efforts made for NIDs and those for surveillance. After NIDs, a large surveillance was implemented in Tanzania in 1996. Because number of cases of poliomyelitis is small in a small area, the cost of surveillance may be large. (they donated \$87,000). Although the Government cooperated with USAID and DANIDA has made efforts to assist, it does not seem to increase the ability widely. EPI report suggested that health workers still persisted to the way of diagnosing poliomyelitis. (Status of polio eradication in Tanzania, 1997)



Human behavior

Knowledge of immunization, sustainability and Community Demand

Mothers' knowledge about vaccine preventable diseases is said to be correlated with immunization coverage in a population (Rahman, 1995, Quaiyam, 1997). Rahman showed that the knowledge of vaccine preventable diseases did not directly correlate with the literacy. Therefore, the mobilization of vaccine knowledge was the cost benefit way to increase the coverage without expensive education. On the other hand, it is reported that positive attitudes about vaccinations were always low regardless of the education level. This study was done at a high vaccination area in Kerala which was famous for "good health at low cost" and high literacy and low mortality (Kutty, 1989). Another report from Gujarat in India showed that less than 10% of the population received the appropriate vaccination even after the successful NIDs (Nichter, 1995).

These facts demonstrate that knowledge is necessary for high immunization coverage. However, the increased knowledge about vaccine preventable diseases is not necessarily correlated with the demand and the health-seeking behavior resulting in high coverage. Nichter proposed two dimension of demand "active demand" and "passive acceptance of vaccinations". He described in his paper that the force for immunization is mostly comes from the supply side (Government and donors) but the community demand is not so strong. Without the efficient communication with the people, it is difficult to make people understand the meaning of immunization. Community demand is very weak, anyway. He concluded that health education only was not good enough to raise the community demand but social marketing was required as Coca-Cola seems to have done quite well.

NID is expected to promote the social mobilization and strengthen the mothers' knowledge about vaccinations because the social mobilization is one of the tactics employed in the campaigns. NIDs in the Americas were used for community education about cholera control, and for promoting oral rehydration solutions (Diets, 1997). However, because of inappropriate preparation, they sometimes failed to give correct information to mothers and communities.

In Tanzania, misunderstandings and rumor were prevailed in some districts. It was reported that mothers had wrong knowledge about the vaccine, that it caused their children to be infertile (Evaluation of National Immunization Days 1997, Tanga Regional Report). Inappropriate and short preparation for NIDs lead to inappropriate information. Oral polio vaccines were already given in routine services but repeatedly they were delivered to children in NIDs. It is reasonable for mothers to question "Why my child has to be vaccinated more than three or four times?" Rather long periods of education and preparation preceding NIDs will be needed to avoid these rumors.

In terms of social mobilization, NIDs experience in Americas showed that sophisticated communication method did not work for the most targeted people who were difficult to reach. The simplest message

disseminated by local leaders were sometimes the most efficient (Olive, 1997). Involving local leaders is crucial for not only the current mobilization but also the sustainability of immunization program, which means long preparation is dispensable.

Missed opportunities

Another concern over polio eradication initiative is so-called “missed opportunities”, that is, a child who is eligible for immunization and who has no contraindication to immunization fails to receive a needed vaccination (Hutchins, 1993). It is reported that if all missed opportunities were eliminated, immunization coverage would increase by a median of 17 percent of community-wide (range, 3-67 percent) and by 44 percent for clients of health services (range, 0-80 percent) (Diets, 1997). Four main reasons of missed opportunities are; 1) failure to administer immunization simultaneously; 2) false contraindications; 3) negative health workers attitudes; and 4) logistic problems.

In Tanzania, logistic problems were recorded during the health reform. In addition, it is common to keep infants away from the public for the first weeks for fear of the evil eye “jicho baya”. It is one reason for mothers having their children vaccinated late (TADREG Research Report, 1992).

A report from Tanzania showed the reason for incomplete immunization in EPI. (Table 2)

Reason	Singida	Iramba	Total	%
No vaccine at service center	13	25	38	33
No time	18	7	25	22
Child sick	8	10	18	16
Clinic too far	8	3	11	9
Lost card	1	8	9	8
Relatives refused, side effects, Negative staff attitudes, Other	9	5	14	12
Total	57	58	115	100

TADREG Research Report, 1992

A report showed the major reasons for incomplete immunization in routine vaccinations (TADREG Research Report, 1992). They randomly sampled 210 children from two district each whose population was 290,000. Vaccine deficiency and time constraints are the major issues in these districts. However, in addition to these interview, they conducted group discussion with the same mothers which revealed that “negative staff attitudes” was an important factor whether they came to posts to have your children vaccinated. Relationship between mothers and health workers is very important to promote vaccinations.

On the other hand, NIDs potentially supplement the deficit factors by providing outreach services and can raise coverage. In fact, the region accomplished a high coverage, 99% in NIDs in 1996. However, in especially inappropriately planned NIDs, even health workers did not understand its meaning well. The stress to increase coverage may reduce the time available for communicating with the people about the values of immunization. NID is a huge but very short period program which comes from international consensus rather than government or community-based demand. Because the purpose of NIDs is to interrupt the transmission of wild poliovirus, lots of energy is put on increasing coverage not social mobilization. The influence of NIDs tends to be weak. Streefland noted that a national immunization program in Gujarat in India was implemented like a military organization model which dispatched vaccination teams to villages yearly to encourage mothers to bring their children for immunization. The notions of prevention and public health were of little concerned. The operational staff experienced that pressure to immunize all eligible children as a

burden.

In Tanzania, the preparation of NIDs began only 3 months before its implementation. Social mobilization took place only one month before. Nevertheless, almost all mothers who visited vaccine posts in Tanga knew about NIDs through radio and other focus of communications. On the other hand, some districts reported misunderstanding of immunization in the same Tanga region. The deliberate preparation is necessary for the education of the value of NIDs. As health worker's attitude is a big determinant for mother's motivation to take children to vaccinations, NIDs may have a potential risk to hamper the routine vaccinations.

Exhaustion by Mass Immunization Campaigns

NIDs may also influence the motivation of health workers. Because NIDs are so intense and done in short a period of time, they tend to divert health workers from routine vaccination and cause an exhaustion over times. On the other hand, NIDs take a complex problems and try to solve them through fairly simple "hit and go" solutions (Mogedal, 1998). If NIDs are coercively implemented, giving a sense that children are a burden and target, health workers will no longer deal with them properly. A motivation frame work shows that the satisfaction of health workers rarely give rise to the community satisfaction because of a goal oriented strategy. These changes need to be monitored over times.

Impact on the parental responsibility for the health of the child

NIDs provided more convenient vaccination compared with routine vaccination by dispatching many vaccination teams into remote areas. The next question is whether NIDs discourage mothers' motivation to take their children to existing health facilities as the result of out these reach services. In fact, Diets reported that after NIDs, a coverage survey showed that 56% of children in Togo were not fully immunized and that 16% of mothers waited for the out reach services (Dietz, 1997). The assumption is that mothers no longer want to walk miles to get to a facility only for a vaccination. The theory is that once people get accustomed to an easy condition, one no longer makes the same effort as in the past.

Coercive implementation may hamper the mothers' motivation to take children to vaccine posts. Further research is needed to know the impact.

Linkage and partnership between the recipient government and donors

In Tanzania, the Expanded Program on Immunization (EPI) began in 1975 with the support of the Danish International Development Agency (DANIDA). There have been many health development programs run by different donors. However, there had not been integration of vertical health programs because donors lack coordination each other (Mogedal, 1998).

In polio eradication initiative, it was characteristic that Inter-agency Coordinating Committee (ICC) has played an important role to coordinate many donors. An ICC at the national level (Coordination committee) was established for NIDs as an advisory committee for EPI. It was the first ICC in Tanzania, which enabled the government to coordinate the contribution from many donors and to prevent the duplication of contributions to polio eradication efforts and competition between donors. The coordinating committee played an important role not only for building a political commitment but also for the immediate resolution of problems that happened in the preparation by providing additional contribution from donors. During the NIDs, the coordination seemed well between donors and the government.

In addition, many sectors were involved in the NIDs, both government and private ones. Private clinics also provided the place for polio vaccinations. However, some clinicians complained that they were not paid by the officers who asked to provide their clinics. Next year some clinicians refused to provide their facilities because of the problems (Interview with a pediatrician in Dar es Salaam). Miss-administration resulted in the drop of the sustainable efforts, though it is of ten the case.

On the other hand, Dr. Msambichaka, who was the manager of EPI center (Ministry of Health), took her

strong leadership in the preparation and implemented NIDs in a centralized manner. Regional and district administrators had been given a special responsibility for the success of NIDs in their areas and appeared to have taken their duties seriously and committed themselves in the campaign. Because it had been concerned that the responsibilities in administrators were often vague, the Ministry of Health changed the way of administration to give anyone to his own responsibility. A consultant in the government told that the way to implement NIDs. The change of the administration was temporary and did not affect to day-to-day work. Unfortunately, such a close and good relationship was limited only during the preparation period of NIDs (Mogedal, 1998).

Mogedal also claimed that donor-driven activities were important to make the short preparation efficient. Much more efforts were put into NIDs than in the regular health system. Therefore, if eradication requires a particular full-time effort from this staff during a certain period of time, it is likely to disrupt the donor-supported programs.

In Macro level, the donor-driven activities might lead to a tendency for the government no longer to take the responsibility sustaining the program. Although there have been no change in the investment to the development budget by the government, the donor-driven program may hamper the responsibility of the government towards a general public health policy. Because immunizations especially have a long history to have been supported by donors, NIDs which may not be the first priority for the developing countries in terms of the number of deaths averted by vaccines, hardly raise the sustainable efforts.

As NIDs have been already installed in many countries and there may be no change of the strategy for polio eradication, we should deliberate the potential risks of mass immunization campaigns. To make the best use of the NIDs, a well-prepared and community-involved preparation is dispensable. Because poliomyelitis is an endemic disease, NIDs should also be coordinated with neighbor countries (Okwo-Bele 1997). To involve every sector in NIDs is also decisive to minimize the exhaustion. In terms of the eradication of Poliomyelitis, high priority should be put not only on NIDs but also on routine vaccination. Since the Acute Flaccid Paralysis ratio which represents the ability of the surveillance is still low in Tanzania, the surveillance should urgently be strengthened. Only strong cooperation between the Tanzanian government and donors and the community can make polio eradication possible.

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