



WHY THEY WORK: AN ANALYSIS OF THREE SUCCESSFUL PUBLIC HEALTH INTERVENTIONS

Vitamin A supplementation
programs in
Ghana, Nepal and Zambia



The USAID Micronutrient Program



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public health interventions**

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Acknowledgments



The successes highlighted in this document represent the dedication and idealism of a multitude of people, with the real heroes and heroines being the community workers and volunteers who have had such an impact on the lives of children.

Writing about these successes is the easy part, but it still would not have been possible without the wonderful support and guidance from those integrally involved: Ram Shrestha and Dr. Penny Dawson and their dedicated staff in Nepal; Roseanne Agble and Esi Amoafu and their staff in Ghana; Priscilla Likwasi, Freddie Mubanga, Ward Siamusantu, and others in Zambia. It has been a privilege to work with these colleagues, and hopefully their work will help others achieve equal successes. Thanks are also extended to Marianne Lown for her editorial work on the document.

Preface



This paper analyzes three national programs—in Ghana, Nepal, and Zambia—that have used supplementation as the initial intervention for correction of vitamin A deficiency in children. Each of these programs has demonstrated success as measured by the key indicator of coverage with vitamin A supplements. Yet, success for a public health intervention goes well beyond any specific indicator for the program. Regardless of the final impact, success also includes other factors, such as the building of partnerships, confidence, and expertise among those involved; as well as building trust in the health infrastructure, in the interventions themselves, and in the ability to resolve health issues in families, among those being provided care. Thus, the design and management of a public health effort are important, and the spirit with which the effort is implemented contributes to its lasting effect. It is unlikely that a program will demonstrate success with the more measurable indicators without this successful design.

Analysis of these three programs reveals a great deal of common ground between them, both in terms of process for implementing strategy and, perhaps more importantly, in some of the other “unmeasurable” results and observations that are common to each program. The conceptual simplicity of vitamin A supplementation allows a review of this intervention as a process, with the potential of providing important lessons for other public health interventions.

USAID, primarily through the MOST project, has provided substantial support to these programs, which have helped shift the perspective of supplementation from an immediate short-term measure, to a program that may be better seen as an addendum to regular childhood immunization programs, as well as providing a mechanism to address preventive services in older preschool children.

Abbreviations



FCHV	Female community health volunteer
IDRC	International Development Research Centre
NFNC	National Food and Nutrition Commission
NID	National Immunization Day
NTAG	Nepal Technical Assistance Group
WHO	World Health Organization

Overview



Historically, vitamin A was always perceived as a vitamin to protect the eyes. This perspective changed in the 1980s with increased evidence of the association of excess mortality in populations with clinical eye disease and the demonstration of reduction in mortality with supplementation. From that point forward, correction of vitamin A deficiency has been seen as a critical preventive measure, with an impact as powerful as most other public health efforts. Correction of vitamin A deficiency has a direct impact on child mortality.

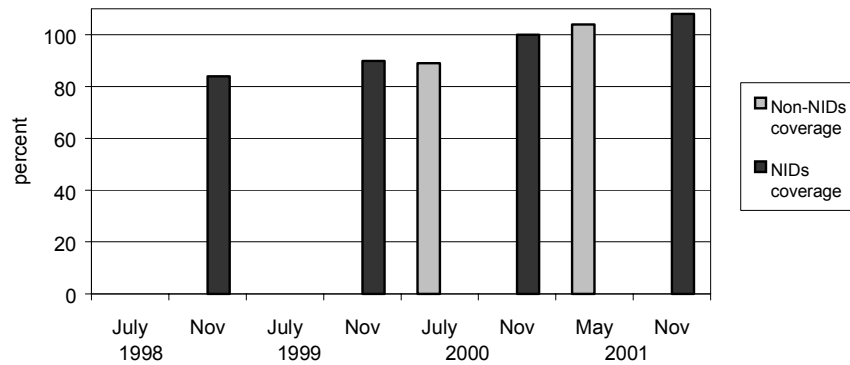
Ideally the diet should provide adequate vitamin A, and public health efforts continue to address dietary improvement as an intervention for vitamin A deficiency. Yet over the past decade, nutrition education, social marketing, and other programs have been unable to change access and intake of vitamin A-rich foods among the most vulnerable in the presence of chronic food insecurity. In addition, because of difficulties with dietary absorption and the complex interaction with infectious disease, it has been hard to demonstrate a sustained improvement in vitamin A status from dietary measures, in part because of the difficulty of measuring dietary change.

Similarly, fortification of staple foods offers a mechanism to correct vitamin A deficiency simply and cheaply, with relatively simple behavior change on the part of consumers. However, countries with significant vitamin A deficiency are also countries with significant limitations in dietary diversity, use of processed food, and availability of centrally milled staple food vehicles suitable for fortification. Thus, while fortification can improve status and is likely to make an increasing contribution over the next decade, to date it has been difficult to demonstrate correction of vitamin A deficiency among those at highest risk through fortification alone.

Supplementation, the somewhat scorned “magic bullet” approach, has therefore been the default intervention in many countries with high levels of vitamin A deficiency since this method offers a relatively rapid mechanism for correction in children. While posing some logistic difficulties, twice-yearly supplementation has been successful in a number of countries.

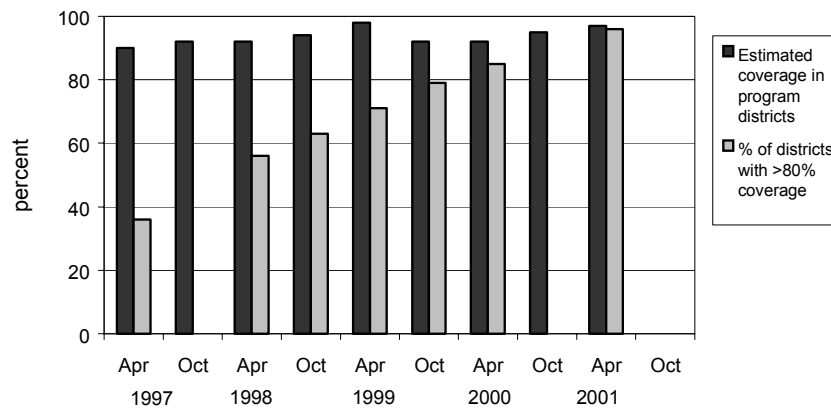
The national programs in Ghana, Nepal, and Zambia have used supplementation as the initial intervention for correction of vitamin A deficiency in children and, as shown in the graphs on the next page, have progressively expanded supplementation coverage.

Supplement coverage in Ghana 1998–2001*



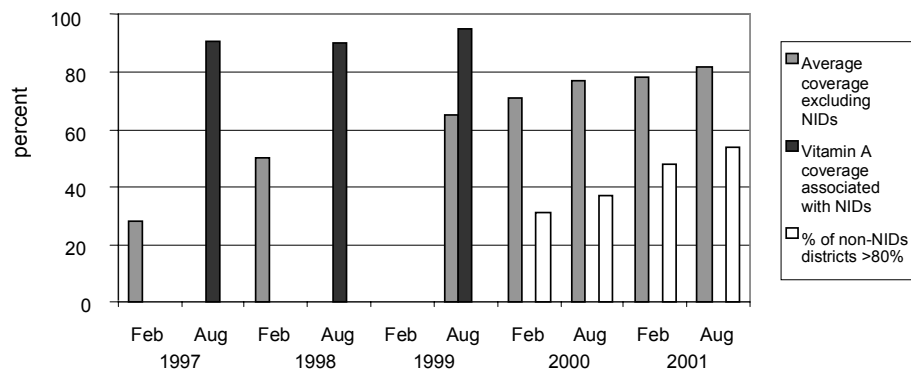
*Based on nationally aggregated tally figures and census data

Supplement coverage in Nepal 1997–2001*



*Based on a weighted average of multiple representative district surveys applied nationally
§Data are from non-NIDs vitamin A supplementation efforts in Nepal

Supplement coverage in Zambia 1997–2001*



*Based on nationally aggregated tally figures and census data

Each country has chosen active distribution at two defined times during the year. The three programs have used different approaches to expand supplementation coverage. The Nepal program chose a phased-in implementation carried out by a Nepali non-governmental organization, and uses female community health volunteers to distribute the vitamin A supplements. In Ghana, the program began in a decentralized environment with districts trying different approaches and has evolved toward an extended outreach model. In Zambia, the program began with a periodic vitamin A promotion approach encouraging caregivers to get vitamin A supplementation for their children; supplements are now distributed during Child Health Weeks.

A number of elements have contributed to the success of these programs. These include clearly defining the problem, the operational target groups, and coverage goals; developing client-focused delivery mechanisms using a twice-yearly distribution approach; building community support; providing support for implementers; advocating for support and building demand for the program; providing ongoing support to keep the program running; and measuring, presenting, and using program results. This paper reviews the three programs for each of these elements, highlights similarities and differences, provides data on results, and comments on additional benefits an element may have contributed to child health programs.

Different program approaches

Ghana

- Districts evaluated different approaches
- Evolving toward extended outreach model

Nepal

- Phased-in implementation by Nepali NGO
- Use of existing cadre of female community health volunteers

Zambia

- Initiated as periodic vitamin A promotion
- Supplementation now part of Child Health Week

Elements of success

- Clearly defining the problem, the operational target groups, and coverage goals
- Developing client-focused delivery mechanisms using a twice-yearly distribution approach
- Building community support
- Providing support for implementers
- Advocating for support and building demand for the program
- Providing ongoing support to keep the program running
- Measuring, presenting, and using program results

Defining the Problem and Program Objectives

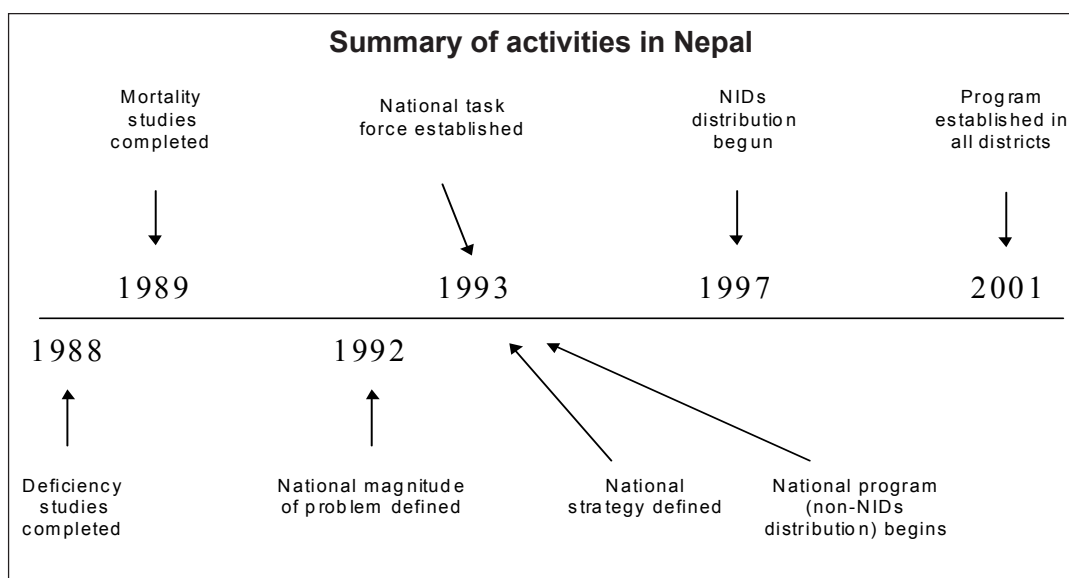


Word of the mortality impact from correction of vitamin A deficiency spread rapidly through the public health community, although it took a decade of trials to amass sufficient experimental evidence in different populations to convince the scientific community of this public health benefit. It has taken another several years for this information to have an impact among the more political higher-level ministerial appointments. Furthermore, most countries had only scattered information on prevalence. Several things needed to be done: policy makers needed to understand the new data on mortality; the magnitude of the problem needed to be defined; and program managers needed to define specific program objectives designed to eliminate vitamin A deficiency nationally by achieving high supplement coverage.

In all three programs, a national task force was established. Data on mortality—either from studies in country or in the region—were used by the task force to highlight the importance of vitamin A. As awareness grew, historic data were used to stimulate an assessment of the full magnitude of the problem in the country, establishing an estimated baseline prevalence. In Zambia and Ghana, NIDs offered the opportunity to achieve high supplement coverage and helped establish the supplementation strategy. In Nepal, NIDs followed the establishment of the supplementation program in target districts and was used to get once-yearly coverage in non-program districts until the program was established in those districts.

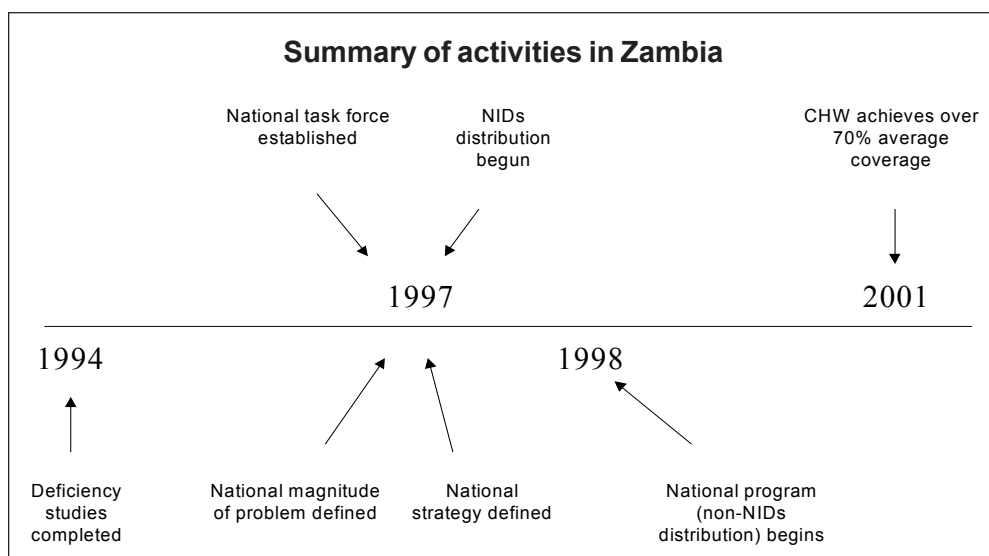
Nepal

Nepal benefited from the fact that several of the initial mortality studies in the 1980s were completed there: two in the flat Terai region and one in a more remote mountain district. The studies demonstrated a mortality reduction from supplementation, confirming similar findings from studies in Indonesia, India, and Ghana. Since these studies were done in Nepal, it was possible to generate concern among policy makers. In addition to these studies, a number of prevalence studies were completed, demonstrating severe deficiency with Bitot spot prevalence from 2–8 percent (the WHO cut-off level is 0.5 percent). The clear high prevalence of deficiency and demonstrated impact from vitamin A supplementation provided the stimulus for a National Vitamin A Workshop in 1992, which set the stage for establishing an intervention program. Prevalence estimates were used to define high-priority areas, and supplementation began in these districts well before its inclusion with National Immunization Days (NIDs) in 1997.



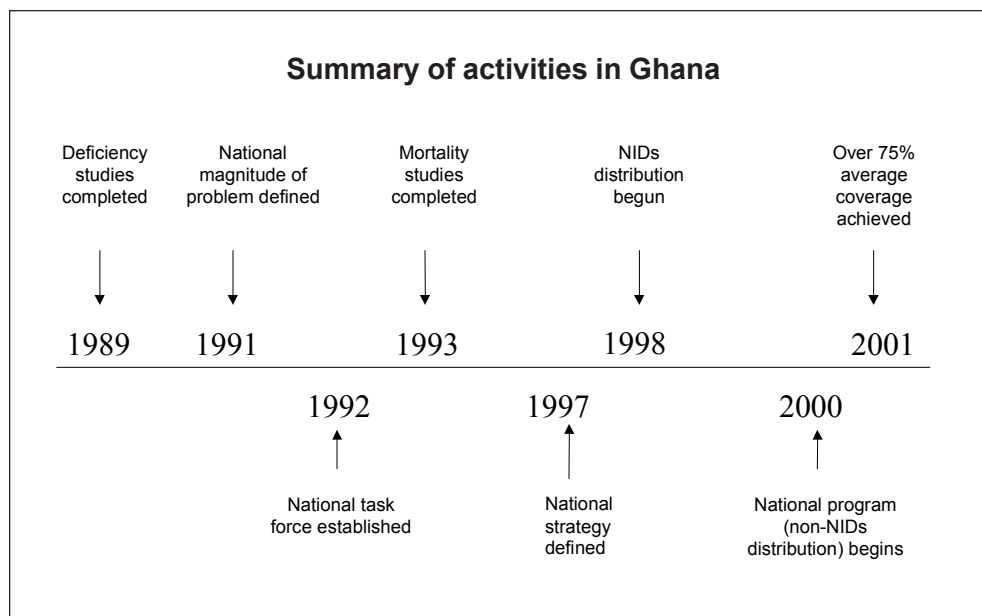
Zambia

In Zambia, the program began somewhat later, after the relationship between deficiency and mortality was well established. Specific mortality studies were not done in Zambia, but the results of studies in Ghana and elsewhere were influential in generating support for studying the magnitude of the problem in Zambia through a national vitamin A survey in 1997. A national task force was established, and supplementation was included in the NIDs in August, 1997. Recognizing the need to protect children for the full year, a vitamin A promotion strategy was launched in February, 1998, with subsequent improvement in supplement coverage for non-NIDs distribution. From there, the program rapidly evolved into an integrated Child Health Week program designed to deliver a package of preventive services.



Ghana

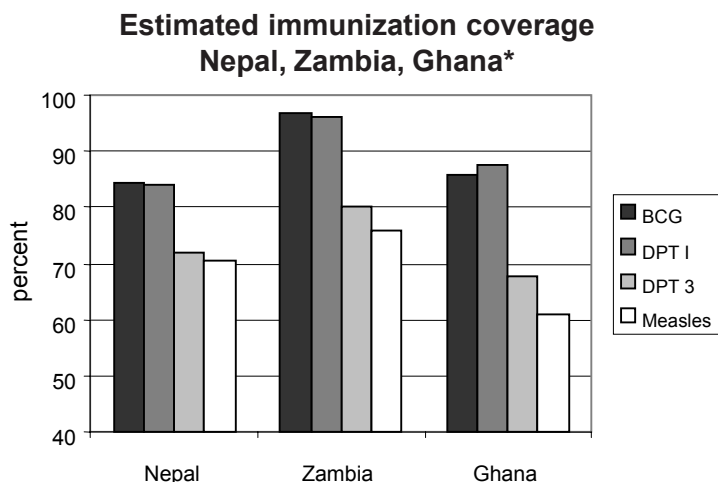
Ghana also benefited from the mortality studies done in the northern part of the country and hosted the West African Regional Conference on vitamin A in August, 1993. As the mortality studies were progressing, the government established a micronutrient task force and soon completed a review of the magnitude of the problem. Stand-alone vitamin A supplementation was implemented in 1997 in the three northern regions of Ghana. In 1998, vitamin A supplementation was included with NIDs, and strategies were developed to address the second-dose needs. Several models were tested, with districts trying different approaches to improve supplement coverage. By 2000, supplementation was done twice yearly—once through NIDs and once as an extended outreach. (Extended outreach in Ghana involves using health facilities and the normal outreach sites for monthly immunization and other clinics, as well as a number of additional distribution sites for vitamin A supplementation.)



Developing Delivery Systems

The early mortality studies made it clear that for certain illnesses, such as measles, vitamin A deficiency contributed significantly to the risk of death and that supplementation could have a major impact. This established the need for vitamin A supplementation to be part of clinical services provided in health facilities as an adjunct for treating those diseases, beyond the vitamin's well-established role in curing xerophthalmia. With the findings of higher mortality also associated with sub-clinical deficiency, supplementation of all children as a preventive measure was recommended by WHO for countries where deficiency was defined or likely. Thus, the concept of health facility-based supplementation was fairly rapidly included in national health plans.

Relying only on health facility-based distribution of supplements had some known difficulties, however. First, logistic supplies, particularly for a “new” addition to essential medical supplies provided to health facilities was difficult, so vitamin A was not always available in clinics. Second, information systems were evolving and did not include vitamin A dosing, making monitoring of both supplies needed and coverage achieved difficult. Third, the importance of vitamin A had not been included in basic training for health workers and upgrading their knowledge and practice took some time. Finally, and perhaps most important, health facility attendance for preventive services declined for older children, making it difficult to achieve adequate coverage in the 1–5 year old group. For these reasons, each of these countries looked at alternative mechanisms to improve supplement coverage in preschool children.



*Based on the most recent reported coverage through 2001

Each country approached supplement distribution differently, building on its existing infrastructure and finding efficient mechanisms to achieve adequate coverage. In each country, NIDs were useful in providing one dose per year with good coverage. In each country, a mechanism was developed to provide the critical second dose above and beyond NIDs. In each country, UNICEF and IDRC provided millions of capsules, and other partners helped with program strategy development and implementation.

Nepal

The Nepal program had two unique aspects that contributed to testing alternative mechanisms for supplementation. First, the government had already created a mechanism to provide community-based services by establishing a cadre of female community health volunteers (FCHVs) in 1988. Second, the government expanded the capacity of the Nutrition Section of the Ministry of Health by allowing a Nepali NGO, the Nepal Technical Assistance Group (NTAG), to take responsibility for program implementation. This provided both a mechanism to bring services closer to the community and an approach that stressed support at all levels. In addition, the program received significant support from USAID and other donors, which gave it resources for extensive supervision and monitoring.

The Nepal strategy included provision of supplements for clinical conditions through health facilities and twice-yearly distribution of vitamin A to all children (age 6–60 months) using FCHVs. The services were free and included health education about the importance of vitamin A and of dietary sources of the vitamin. Recognizing the importance of training to ensure that quality service was provided by FCHVs, the government decided to build the program over time and initiated distribution in 32 “high-priority” districts. The program provided substantial support for training, logistics, and community mobilization to districts prior to the first distribution. For the second distribution, the program assisted with the refresher training managed by district staff and provided some logistical support. After the first two distribution rounds, a district was expected to manage the subsequent distributions with minimal additional input from the program, which went on to support new districts. This phased-in approach laid the foundation for the vitamin A program over an eight-year period. Currently, the program covers all but three politically unstable districts.

The Nepal program started in 1993, before NIDs began. Once NIDs began in Nepal, they included vitamin A distribution; but rather than disrupt the ongoing program, NIDs included vitamin A only in districts where the vitamin A program had not yet begun. In this way, the vitamin A pro-

In each country...

- Supplement distribution approaches built on the existing infrastructure.
- NIDs provided one dose per year with good coverage.
- A mechanism was developed to provide the critical second dose above and beyond NIDs.
- UNICEF and IDRC provided millions of capsules, and other partners helped with program strategy development and implementation.

gram continued to become well established as a routine periodic means to eliminate vitamin A deficiency without dependence on NIDs, which were envisioned as a shorter-term measure.

Zambia

In Zambia, the approach was quite different. Survey work provided reliable coverage estimates (28 percent) for delivery of preventive doses through health facilities, defining the need to improve service delivery. NIDs were seen early as an opportunity to provide a mechanism to improve vitamin A supplement coverage by bringing services closer to communities. Yet NIDs were costly, due to be reduced in scope and ultimately end, and provided only one dose per year. In August, 1997, NIDs included vitamin A distribution. In February, 1998, a promotion campaign was launched to encourage caregivers to get vitamin A supplementation for their children (age 6–72 months) in order to provide the second dose following the NIDs round. This promotion improved coverage to an estimated 50 percent. NIDs continued to include vitamin A in August, 1998, although a cholera epidemic prevented the second-dose vitamin A promotion in February, 1999. By August, 1999, NIDs were reduced to only half the country, though they continued to include vitamin A. Further promotion and support activities were done in non-NIDs districts, which boosted vitamin A coverage to an estimated 65 percent .

Although these data showed clearly that coverage improved by bringing services closer to caregivers, there were continued concerns in Zambia about sustainability and about how such an approach fit with the current efforts at decentralization. The vitamin A program, with its periodic promotion approach, was seen as too “vertical”; i.e., not adequately integrated in routine activities.

In response to these concerns, the program in Zambia evolved from a vitamin A program into a strategy to improve a variety of preventive services for preschool children, with vitamin A serving as the spearhead. Unlike Nepal, where an NGO played a key implementation role, implementation in Zambia was done through the government National Food and Nutrition Commission (NFNC). As an organization somewhat separate from the MOH and with a nutrition policy-making mandate, NFNC had limited staff to devote to establishing this new approach. Zambia also elected to expand service delivery nationally rather than taking the phased-in approach used in Nepal. While there has been both technical and financial donor support to the program and to districts, this has been limited and has not always provided the program adequate ability to give the necessary support to districts.

Since Zambia does not have the equivalent of Nepal’s FCHV, districts rely on an extended outreach model using health staff and a variety of volunteers to provide preventive services in clinics, schools, and other outreach sites. Each district determines the best mix of community support and mobilization, the priority interventions (which may include growth monitoring, immunizations, deworming, and health education in addition to vitamin A capsule distribution) and ensures that supplies reach the outreach sites. The program provides an orientation to district staff and assists with logistics, funding, and technical support. There is variation in success across the different districts,

in part reflecting different constraints (such as serious accessibility issues during the rainy season for some districts) and levels of effort. The program is designing a strategy to address problems in districts having difficulty achieving high coverage.

Ghana

In Ghana, the program has had the benefit of good consensus among policy makers, with less concern about either the “vertical” nature of the program or about exploring alternatives to a strict health facility-based approach. In addition, decentralization was more firmly established, with districts having more control over their resources. NIDs included vitamin A supplementation by 1998. Following NIDs, it was clear that a mechanism to bring services closer to communities was needed, and districts were given a mandate to try a number of models. In one region, a school-based model was tested, allowing pupils to identify eligible siblings, and the Ministry of Education worked with teachers to complete a register and deliver the supplements. In another region, supplements were to be delivered during routine health facility contacts, with annual orientations for district staff. In a third region, an extended outreach program was developed, using volunteers and outreach sites. Districts monitored their distribution activities, and several found that neither the strict school-based approach nor relying only on clinic contacts achieved adequate coverage. Most district programs have thus evolved toward the extended outreach model, with varying degrees of utilization of schools, house-to-house supplementation for those not reaching outreach sites, and use of community mobilizers and volunteers.

The program in Ghana is implemented by the Nutrition Unit, which though different from the Zambian National Food and Nutrition Commission, is also within the MOH. However, the decentralization process has been going on longer in Ghana, and districts have been able to take on program responsibility rapidly. Districts themselves adjusted their strategies based on difficulties achieving coverage using only a school-based approach. In some districts, outreach sites still did not reach an adequate number of households and house-to-house follow-up visits were made—all based on district self-assessments of their progress.

All three programs have brought services closer to communities through a variety of extended outreach mechanisms at fixed times during the year.

Thus, the approach in each country has been different, with each facing different opportunities and constraints. In each country, observation interviews and qualitative data from caregivers has helped define the

strategy and ensure a “client focus.” In each case, the program has evolved in such a way that caregivers are not expected to remember the dosing schedule for vitamin A for all their preschool children or to take healthy children to clinics specifically for vitamin A supplementation. Instead, programs have attempted to bring services closer to communities through a variety of extended outreach mechanisms at fixed times during the year, and this has been successful in improving coverage.

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In Nepal, the FCHVs represent a formalized volunteer network that has additional responsibilities beyond vitamin A distribution. In fact, the FCHVs originally provided primarily health education and had limited resources for treatment, relying instead on referral to health facilities. There is some evidence to suggest that with the advent of vitamin A supplementation (as a well-accepted and appreciated intervention) the FCHVs have become more confident, empowered, and anxious to take on more responsibility. Currently, in 14 districts, FCHVs provide community-based pneumonia treatment and have increased the proportion of expected cases receiving treatment from about 20 percent to over 60 percent in some districts. This would suggest strong community appreciation for bringing services closer to the community.

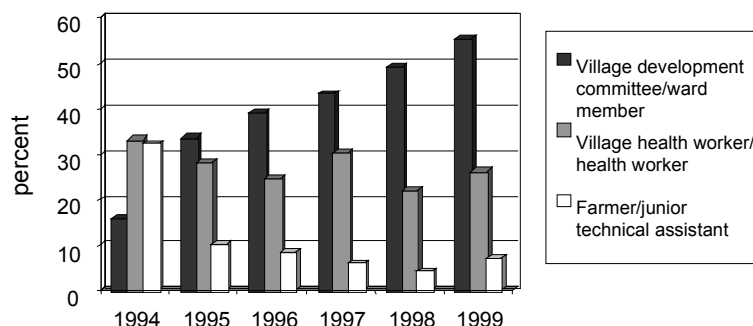
In all three programs, volunteers—who come from the communities served and represent a degree of community commitment—have been critical to success.

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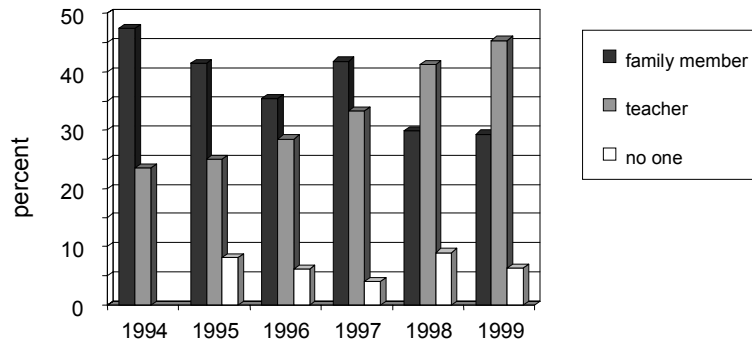
been relatively successful since there have been adequate clinic staff and a manageable number of outreach sites. In spite of this, many districts have continued to do some house-to-house visits to ensure high coverage. In Zambia, it has been more difficult to recruit community volunteers, and the clinic staff have been stretched to cover outreach sites. Since districts provide a number of services (including immunizations) during Child Health Week, logistics are more complex and trained staff are required for immunization outreach sites. This has made it difficult to establish the optimal number of outreach sites and to have services provided there, and districts have struggled with scheduling to give all communities the benefits from the interventions provided. Districts in Zambia have very limited transportation budgets, and the addition of some supplemental funds to cover these costs has been critical in assisting districts in the completion of Child Health Weeks.

Aside from volunteers, communities support the vitamin A effort in other ways. In Nepal, there has been a great deal of community support for promotion efforts. These have included school parades, magic shows, plays, and other activities to highlight the “event” of the distribution. Most districts now do these activities routinely, without additional input from the national program. Furthermore, there is growing support from communities for their volunteers. The FCHV population is relatively stable, and communities know who their FCHVs are. The national program has been a strong advocate for FCHVs and has encouraged communities to provide some show of support for them. Support has increased, with an increasing number of village development committees providing tea or snacks, additional helpers, and even in some instances, creating an endowment so there will always be a small fund to provide some token of appreciation.

FCHVs reporting being helped by various community members in Nepal



FCHVs reporting being helped by various community members in Nepal



In Ghana, there has been good support from local community leaders, including church groups. Since there is not a “fixed” group of volunteers, there is not the same kind of support as in Nepal. However, communities support the distribution effort by helping with promotion, community mobilization, and to establish the outreach sites. In Zambia, the situation is similar to Ghana, with community involvement in promotion and organization of Child Health Week.

Recently, some work was done to try to understand constraints in districts in Zambia that had been unable to achieve coverage over 65 percent. A series of interviews were done in selected districts, with district staff asked what they felt were critical elements to achieving good coverage. From these interviews, the impression was that the higher number of community outreach centers, the better the coverage, suggesting that bringing services close to communities may be critical. Districts receive funding based on population, but not based on the number of outreach sites supported—something these districts would like changed. Health workers also noted that the higher number of volunteers available to work at the outreach posts, the more successful the Child Health Week (meaning higher percentages, less error, more women seen, happier health workers). All of those interviewed mentioned that volunteers are used at outreach posts in these districts in Zambia.

For each country, generation of community support, as represented by provision of volunteers and support for those volunteers, is seen as instrumental in achieving success. Perhaps more difficult is the ability of the limited staff at the national level to gain this community commitment, particularly in Zambia and Ghana where the program was established in all districts at once.

Supporting Program Implementers



While ministries of health define health policy, and thus the policy on vitamin A interventions, it is the districts that implement these policies. For each of these countries, support to districts and the volunteers they use has been important and has been done in different ways. In each, there has been support for training and orientation of key health staff. In each, there has been support for IEC and community mobilization efforts. In each, there has been support for supplies and logistics. In some, there has been direct financial support.

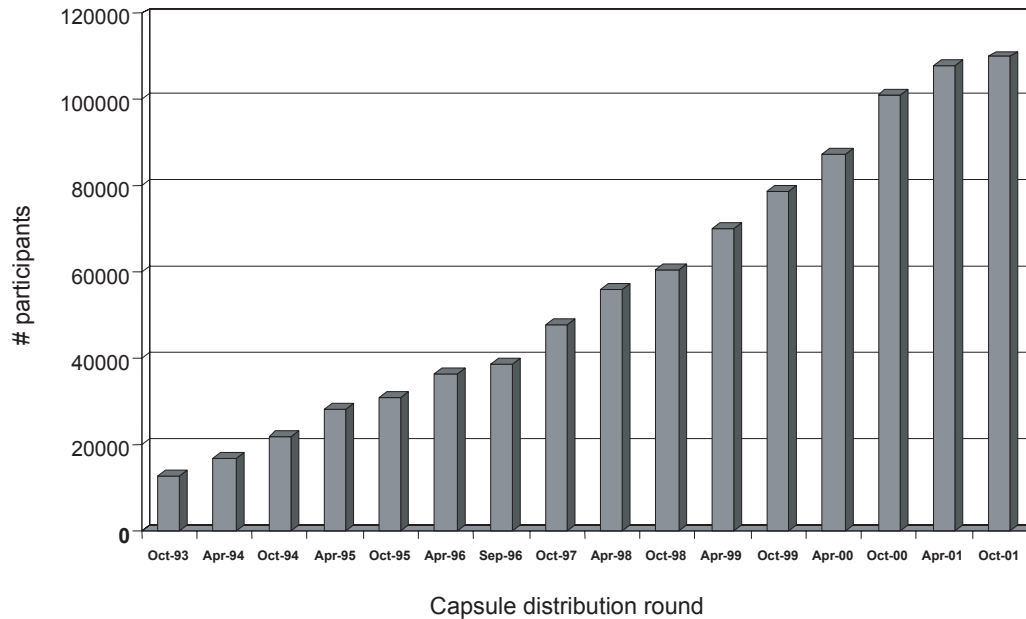
Training

Training has been done differently in each country. In some, district staff have been trained and expected to train health facility staff and volunteers—the “training of trainers” model. In others, the central program staff have had more hands-on involvement with training at a variety of levels. In spite of these differences, there are some common elements that may have been critical. First, training has emphasized quality of service—from accuracy in dosing, to accuracy in health education, to politeness and appreciation for clients. Second, the training has been participatory, with participants given an open forum for asking questions and raising issues of concern. The training at all levels was planned in this way, and the materials used designed accordingly. In each country, there is a manual used in training and provided to district staff as a resource. Thus, training has been seen as a support mechanism for the implementers.

- Each country provides support for
- training and orientation of key health staff,
 - IEC and community mobilization efforts, and
 - supplies and logistics.

In Nepal, each district added to the program receives a package of support activities that includes training. The training is tiered, with multisectoral involvement at all levels. For example, for district-level training, while most participants are within the MOH, there are participants from the Ministries of Home, Education, Local Development, and Agriculture, as well as from women’s groups and NGOs. The national program staff supports this district training and also health post-level training, and ultimately, training at the community level that involves the FCHV as well as the ward chairman, farm leaders, and other prominent community leaders. Once this foundation of training is completed, prior to the first distribution round, district support diminishes. Thus, prior to the second distribution, the national program only provides some assistance to these trainings, which are basically managed by the district staff. Following this, districts receive support on an as-needed basis, with the national program doing occasional support visits.

**Nepal National Vitamin A Program
Number of multisectoral participants trained
1993–2001**



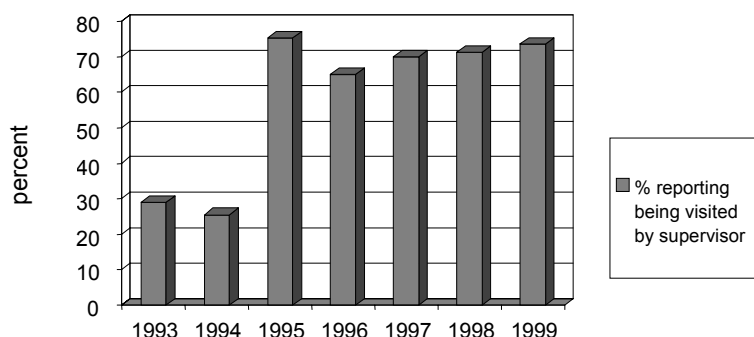
In Zambia, the national program has done an annual district-level training/orientation involving all districts. This training originally was designed to increase awareness and skills pertaining to vitamin A supplementation—both for prevention and for clinical case treatment. With the inception of Child Health Weeks, the training became an integrated effort between the NFNC and the MOH, including the Central Board of Health and the Immunization Division. The training offered an opportunity to address logistics, and districts were provided with the supplies needed for that particular Child Health Week. In addition, it provided a forum for district staff to raise concerns and to discuss ways around common obstacles. The training is evolving toward a provincial-level training where provincial staff will work with national staff to bring district staff to a central location in each province prior to each Child Health Week. The partners at the national level have developed an extensive handbook covering the various Child Health Week interventions.

In Ghana, there were national workshops to review the findings from the initial intervention models. With the results of these workshops, regions submitted proposals for future rounds, which were then compiled into a national plan. The MOH then held regional workshops to review the approaches being used. The national program continued to provide orientation to regional and district staff and developed training manuals and other support materials for district use. As in Zambia, district staff have been integrally involved in problem solving. This participatory model has gained remarkable enthusiasm for this program even though it requires substantial effort on the part of district staff.

Observation and supervisory visits

In addition to training, the national program provides districts with other support. In Nepal, NTAG has paid a great deal of attention to listening to those implementing the program. This has been done through an ongoing series of visits to districts during the distribution, the orientation sessions, and in the course of visits for other purposes. Some of these visits have been formalized, using common checklists or observation questionnaires, and the data then analyzed and used to improve the program. The value of this approach is not just in the direct support to the district and health post staff, but also in solidifying program awareness—each visit serves to heighten understanding of the program at the community level. Such support visits are also done in Zambia, drawing on other agencies to help. For example, both UNICEF and the USAID Zambia Integrated Health Project have had staff visit districts during Child Health Weeks, along with the NFNC staff. In addition, in some districts, local NGOs have been mobilized to observe Child Health Week activities, and each year NFNC completes a report on these observation activities. Ghana also has included similar support visits to districts, formalized in its work plan as advocacy meetings with political leaders and monitoring visits.

**FCHVs reporting being visited
by supervisor in Nepal**



Logistical support

Each country has had to manage the logistics of capsule distribution twice yearly for a very large number of children. Since most medicine for clinical facilities uses a monthly distribution, or a distribution based on district orders, the vitamin A effort has required somewhat different approaches. In each country, the national team helps both facilitate and troubleshoot logistic supplies. In Nepal, the central office phones district facilities to make sure supplies have arrived. In addition, the office responds to emergencies, often finding imaginative ways to fill gaps in supplies. In Zambia, the annual district orientation has served as a mechanism to provide district staff with their supplies. The central staff put a package of materials together for each district, based on population figures. In Ghana, the central staff help with distribution from central stores to provincial and district centers. In each country, this extra effort has become more efficient with each dis-

tribution, becoming more routine as time goes on. Cost estimates completed in Nepal and Ghana, and being undertaken in Zambia, suggest that these additional efforts are valuable in improving coverage and in reducing costs per child dosed.

Advocating for Support and Building Demand



Policy makers

Any successful public health program has required the support of the political leadership, and vitamin A supplement programs are no exception. In none of these three countries has advocacy been easy. In each, successful advocacy enabled the programs to begin, and in each, an ongoing effort has been necessary.

In all of these programs there has been good use of program data for advocacy purposes. Supplement programs lend themselves to simple data presentation, since coverage is an easy indicator to understand and since the early research data on mortality are so impelling. This use of data has been particularly useful in sustaining donor support for programs.

Successful advocacy has enabled the programs to begin, and in each, an ongoing advocacy effort has been necessary.

In both Zambia and Ghana, there has been an understandable focus on HIV/AIDs, which has made it somewhat more difficult to focus full attention on vitamin A program successes. However, in each country there has been an advocacy strategy—more formally spelled out in Ghana, more focused on field activities and support for FCHVs in Nepal, and requiring more review in Zambia. In none of these countries has the advocacy strategy been particularly unique. In each, a strategic approach was used that required planning, research, implementation, and evaluation, with ongoing efforts to maintain political commitment.

In Nepal, it has proven to be exceptionally valuable to have senior officials from the ministries and donor agencies observe Vitamin A Week. This has served to underline the commitment of the FCHVs and to verify the high coverage figures reported, as observers find it difficult to identify any child who has not been dosed. In Zambia, it has been valuable to create a sustainability committee to review the advocacy strategy and improve it to gain better support among key groups of donors and ministry staff. The Nepal program has been innovative in its ability to involve government functionaries and communities alike.

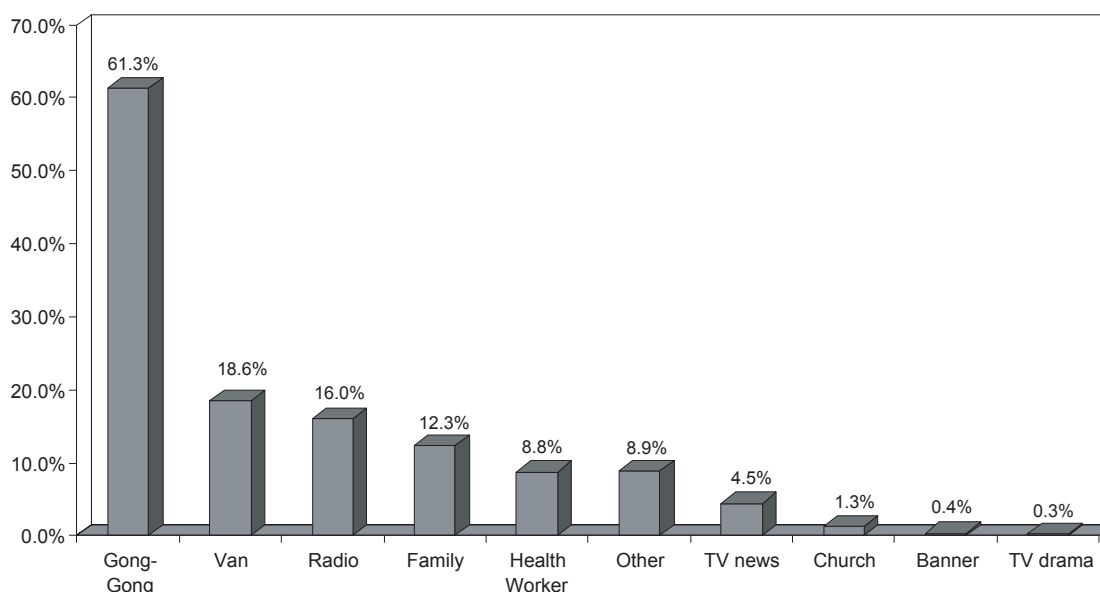
Community members

Each program has devoted substantial resources and time to development of a behavior change and communication strategy to increase awareness among caregivers, support among community members, and participation in the supplementation effort. This has not been a simple undertaking of creating posters and leaflets, but rather a process whereby formative research is used to develop a communication strategy, which is then tested. The process identifies different stakeholders and develops and tests strategies for each and carries out evaluations that result in improvements in the strategy.

Each program has devoted substantial resources and time to the development of a behavior change and communication strategy.

In Ghana, following formative research, church groups were targeted and church leaders were solicited to assist with the implementation. Initial evaluation showed that few caregivers got information about the distribution from churches, and the strategy was revised. Similarly, the traditional method of passing messages in communities, the gong-gong or town crier, was found to be a very effective method for building awareness about the event but not as good for education about the importance of vitamin A—innovative ideas understood by following a process.

Sources of information about vitamin A supplementation, Ghana
July 2000
(n=2377 multiple answers accepted)



In Nepal, the communication strategy has evolved over a number of years and has focused more on support for community efforts such as parades, involvement of schools, magic shows, and involvement of local political leaders. The central program collected data from focus group discussions and key informant interviews and developed a strategy based on these results. Districts were then encouraged to review their own situation, determine the best methods to use, and were supported by central staff in implementing their strategy. Today, the program is so well known that once the distribution dates are known, districts do some promotional activities, but caregivers need little prompting to participate.

In Zambia, the program was assisted by the USAID Zambia Integrated Health Project in developing its strategy. This involved extensive research for a variety of health message development, with the Child Health Week activity included. A mass media campaign, the Better Health Campaign, was developed; a distance learning program for health facility staff was developed and implemented; and an assessment of low-coverage districts was undertaken in order to develop a strategy to address issues in these districts. The low-coverage assessment brought out some interesting observations:

- All health workers interviewed used volunteers, whom they trained themselves, for the distribution. Most the volunteers were recruited by the community, and most of them were community health workers or those involved with neighborhood health committees.
- These volunteers were seen as trusted sources of information, even more than churches, about the Child Health Week (perhaps because most were in the health field), and most helped with promotion activities.

Health workers felt that these volunteers were critical for the program, and that the more effective the communities were at recruiting volunteers, the more likely coverage would be adequate.

Providing Ongoing Support to the Program



Each of these programs has gone through a process of developing and testing a strategy for distribution, building capacity among health workers, addressing advocacy issues, and building awareness and demand for the program among caregivers. Each program has also matured considerably, assessing progress and undertaking activities to understand and address constraints. The Nepal program has reached a point where the ongoing support is now relatively limited, compared to the resources needed to establish the program in each district. Similarly, the Zambia program also has a number of ongoing activities that are becoming more and more “routine” with each distribution round.

- As the programs have evolved
- efforts of national and district staff have diminished,
 - activities have become well understood and more efficient, and
 - distribution efforts have become somewhat routine.

A common criticism of these programs has been the effort required for such a “campaign” approach. Vitamin A programs have been compared to NIDs campaigns or to other programs that have required a massive effort over a short period. It is true that these programs require a significant flurry of activity on the part of the national program staff prior to each distribution and a significant effort on the part of district staff to achieve high supplement coverage. As these programs have evolved, however, these efforts have diminished, activities have become well understood and more efficient, and in each, the distribution efforts have become somewhat routine. Thus, the efforts required need to be analyzed not just in the short run, but also over a longer period to assess how they evolve in comparison to the potential impact achieved. With maturation, the ongoing support needed falls into several categories.

Refresher orientation for district staff

As described earlier, each country developed a training process that established capacity among health workers. However, health workers have multiple responsibilities and need some ongoing support in order to maintain their enthusiasm for the program. In Nepal, a refresher orientation is done primarily for FCHVs but with involvement of health staff and community leaders. In most instances, districts themselves manage this annual orientation and use it as a mechanism to address logistics issues and to stimulate community-level promotion activities. In Ghana, health staff require very limited additional training, although this may change with the potential addition of other pre-

ventive services. Instead, central and provincial staff provide support to the districts, which provide their own orientation to sub-health post staff. In Zambia, the provincial offices are becoming increasingly involved with providing support to districts for each distribution. While there have been annual district orientations, this is becoming decentralized and ultimately may be done primarily by provincial and district offices themselves. Thus, the effort spent in training has diminished over time in all countries, with some refocusing of support and refresher activities (e.g., to the provincial level in Zambia).

Adequate capsule supplies

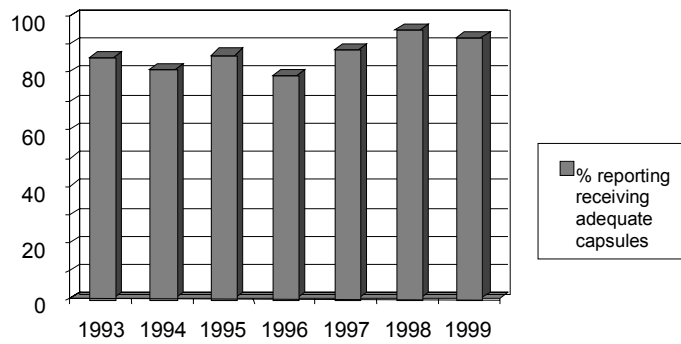
Capsule supply has required that significant attention be given to logistics in each country because the normal distribution mechanisms supplying drugs to districts did not immediately accommodate supply of massive amounts twice yearly. In each country, national procurement has been assisted by UNICEF and other organizations, and in most instances there have been adequate national supplies. However, getting the correct number of capsules from the capital to districts and from district centers to distribution sites has required significant effort on the part of national and district staff. In all three countries, the national program staff have assisted with calculations for amounts needed and with getting capsules to district centers. Districts then take responsibility for getting capsules distributed onward, using various means. Although this continues to take some time, the process is becoming easier. In Zambia, the national staff provided districts with their allocation during orientations and are now working with provincial staff to have them do the same during provincial orientations of district staff. In Nepal, the national staff assist with backstopping—addressing emergency needs—by contacting districts to see if their needs are met. In Ghana, districts themselves have taken responsibility for ordering their supplies. In all of these countries, capsule supply to districts has required a system beyond the routine distribution of medications to clinics. However, in each, this twice-yearly logistics issue is becoming incorporated as part of a process of support to districts and in that way is becoming more routine. In none of these countries has lack of capsule availability been a significant problem—as reported by distributors or their clients.

Reasons for child not having received a capsule in Nepal

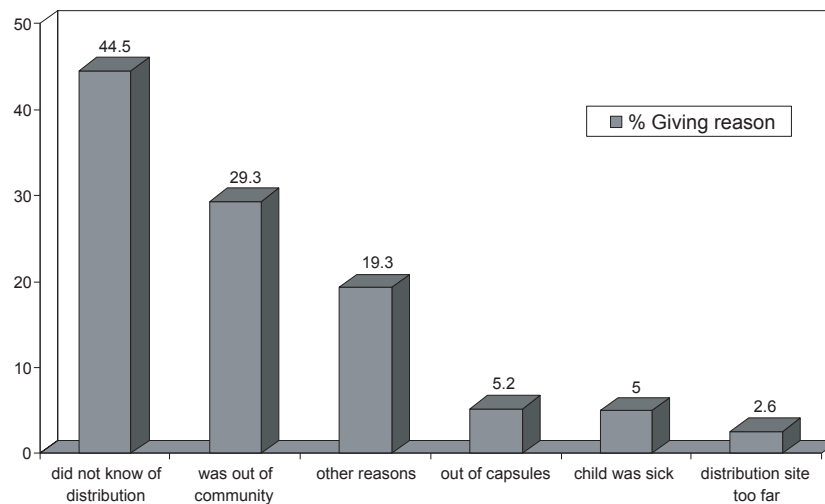
- 44.3 percent—caretakers did not know of event
- 28.7 percent—child was out of the village
- 2.6 percent—there was a capsule shortage

(average %, 1995–1999)

FCHVs reporting receiving adequate capsules in Nepal



Reasons for not receiving a vitamin A capsule, Ghana July 2000 (n=191)

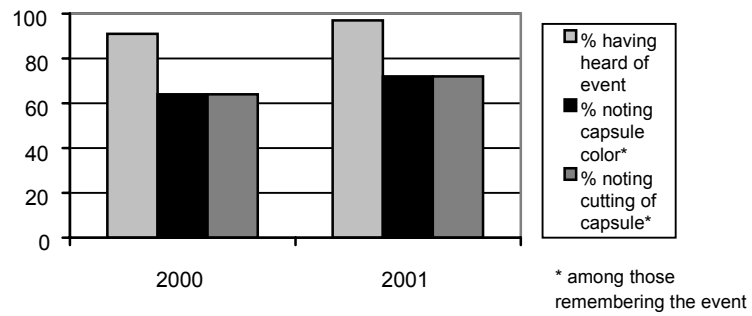


Assistance with promotion and community mobilization efforts

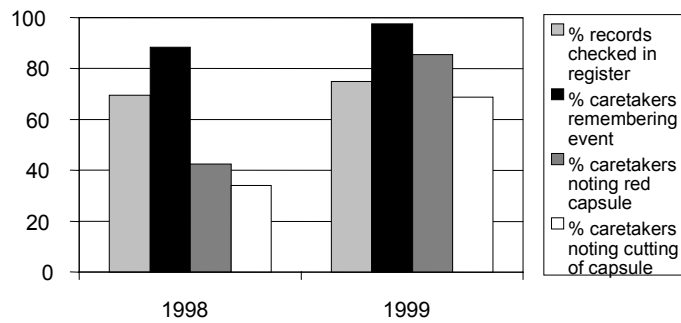
Adequate coverage can only be achieved by ensuring that the population is aware of the need for vitamin A and is motivated to bring children for the distribution. Each country has devoted significant energy to promotion and to community mobilization during the distribution, as described above. Clearly, this has required further significant effort on the part of both national and district staff, and much is repeated prior to each distribution.

Populations become educated over time, however, and in each country more and more information is spread from person to person within communities, with less effort needed on the part of program staff. In Nepal, in districts where the program has been running for several years, it is difficult to find a caregiver not aware of the vitamin A distribution, and what is needed is a reminder of when the event occurs. Central program staff help coordinate the dates for the distribution and alert districts. Districts initiate promotion activities, which at this point serve primarily as a reminder for communities. While this has taken some time to establish, once established, it now takes little effort to maintain that awareness and participation. In Zambia and Ghana, awareness has also improved; and, as evidenced by the high coverage achieved, caregivers are responsive to promotion efforts. Program managers again help coordinate the timing for the distribution and support districts in initiating their promotion activities. In Zambia, this has required close work with those implementing NIDs, since NIDs have had special timing needs related to cross-border coordination and management of refugees. Yet, as in Nepal, once the distribution dates are fixed, the promotion activities are becoming routine. This implies that once the initial effort is completed, the time and energy needed for continued participation decreases, with caregivers mostly needing a reminder for them to participate. However, there are many public health programs that began well yet were not sustained because of complacency about the need for maintenance activities, and each program will require continued support and close monitoring to sustain the high coverage achieved.

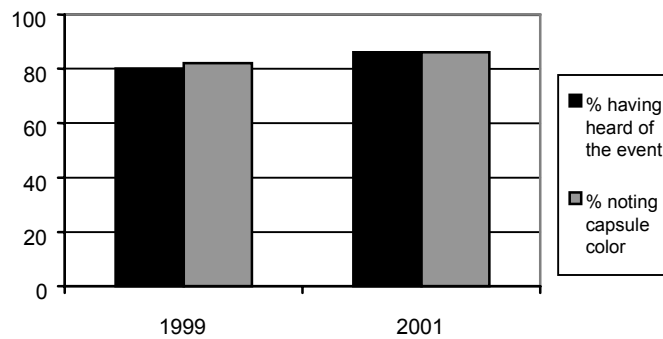
Elements of program maturation in Ghana



Elements of program maturation in Nepal



Elements of program maturation in Zambia



Measuring, Presenting, and Using the Results



The scientific evidence for reduced child mortality with correction of vitamin A deficiency is sound, and accepted by most countries. In addition, there is a sound scientific background for the correction of vitamin A deficiency with supplementation, with an accepted duration of effect between four and six months, depending on the level of infection, nutritional status, and other factors affecting the population. With these underpinnings, the most critical indicator for national programs becomes coverage—the proportion of children receiving supplementation twice each year.

Nepal, Zambia, and Ghana have all achieved impressive coverage, and one would expect that over time, this will have a substantial impact on child mortality. These countries have chosen to accept coverage as a surrogate indicator of program success, recognizing that mortality is difficult and costly to measure, with a variety of other factors that influence mortality; and recognizing that measuring vitamin A status is also costly, with many variables affecting serum retinol and other status indicators. These countries also have used several mechanisms to review coverage and have critically reviewed estimates reported by districts. In each case, the usual health indicator reporting system, the health management information system (HMIS), has not been able to provide coverage estimates for a twice-yearly effort, and efforts have been made to modify this system to accommodate the supplementation program. Each country also has developed mechanisms to review a variety of other process indicators helpful in overall program management.

Estimation of coverage

In Ghana and Zambia, the principal mechanism for coverage estimation is by aggregation of tally sheet data originating at the distribution sites. Distributors mark the total capsules distributed, by age category (6–11 months and 12–60 or 72 months for Ghana and Zambia, respectively). This numerator is then applied to the denominator for the district, which is based on corrected census information or district-specific population figures. Districts aggregate the data from distribution sites and report to the national program, thus making district coverage available and comparable over time. This mechanism is similar to that used for NIDs, making it easier to get coverage for all districts whether they are part of NIDs that year or not.

In Nepal, tally sheets are not used. Instead, FCHVs record the number of individuals dosed in a register and, knowing their communities, do follow-up on children missed. Since many FCHVs are semiliterate, husbands or community members commonly help with this recording. However, there is not a mechanism currently to move these data to health posts and upward to districts. As

a result, it has not been possible to get a coverage estimate from the registers. Instead, district-level “mini-surveys” have been used to get district coverage estimates, and from these, a national estimate has been derived following each distribution. In order to get a reasonable national estimate, 8–10 districts are surveyed for each distribution round. These data are now in an aggregate dataset which provides information on coverage trends for districts with multiple surveys over time, as well as other programmatic information. In Ghana and Zambia, mini-surveys have also been used, although in smaller numbers, as a means to validate coverage estimates from tally sheets. In this way, concerns about the accuracy of census information and about reporting and recording errors are addressed.

Process indicators

Adequate coverage suggests that the process indicators must also be adequate, since coverage would drop if capsules weren’t available, or if caregivers weren’t bringing children to be dosed. Each country program has reviewed these other process indicators using a variety of mechanisms. In Zambia, districts are requested to complete a review form following each distribution, and this form has included questions on capsule supply, on funds used, and on different IEC methods used. In Nepal, program staff complete a large number of interviews during routine visits to districts for other purposes. With support from NGOs and other organizations, these interviews provide a great deal of information about the program, caregiver awareness and health center staff knowledge and activity. In Ghana and Zambia, the mini-surveys provide information on the impressions of caregivers about the program, and constraints to their participation. In all three countries, observers complete forms that are summarized following each distribution. These different mechanisms to monitor program activities have provided a great deal of insight, and have helped make each program more efficient.

Presentation and use of results

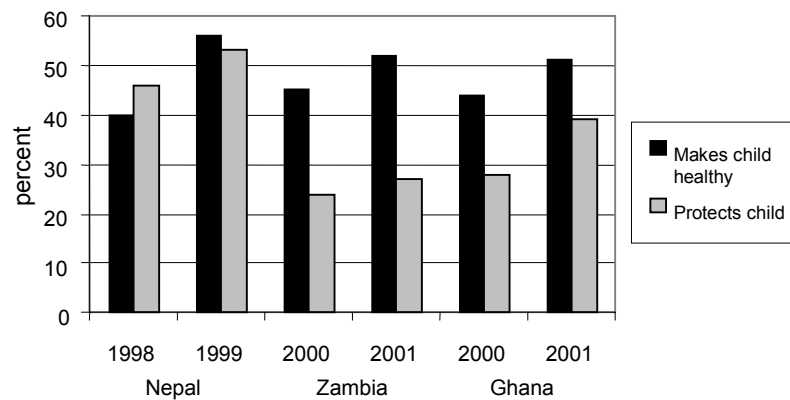
It has been said that the success of a public health program depends on the ability to measure results and use those data appropriately. For these countries, demonstration of improving coverage has strongly helped advocacy efforts. In addition, critical review of these data, and attention to data quality has strengthened confidence in the program at all levels. In Nepal, at least 3 independent surveys have been completed, validating the program’s own coverage

data. Independent observer reports have also confirmed some of the mini-survey process findings, such as the proportion of distribution sites with inadequate capsules. In Zambia, supervisory visits to districts with data quality or coverage problems are done to strengthen district staff management of these data, and to uncover problems specific to the district. In Ghana, mini-survey information

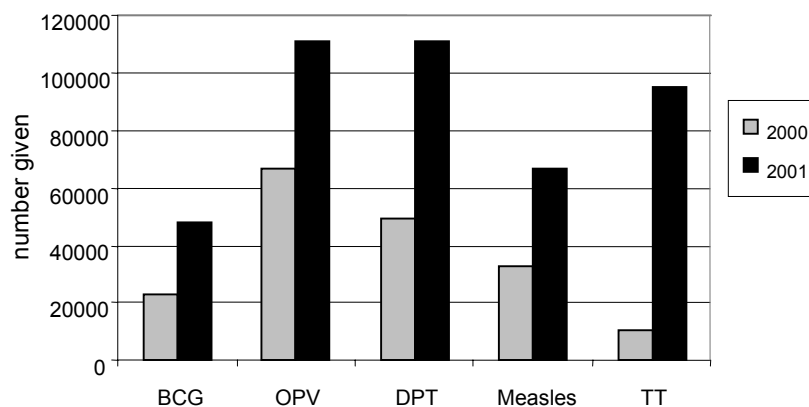
- Demonstration of improving coverage has strongly helped advocacy efforts.
- Critical review of coverage data and attention to data quality have strengthened confidence in the programs at all levels.

on caregiver information sources helped modify promotion activities, but only after investigation to ensure that the data were accurate. In each program, attempts have been made to monitor activities using a number of different methods, collecting data from differing sources, and looking at a wide variety of program indicators. In all cases, national staff have involved district staff in data collection and management, trying to empower all those involved with an understanding of the strengths and weaknesses of their program, based on sound data.

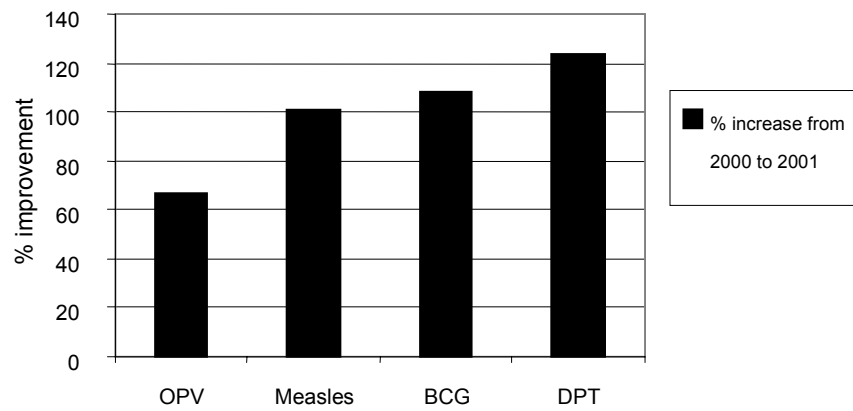
Improvement in knowledge



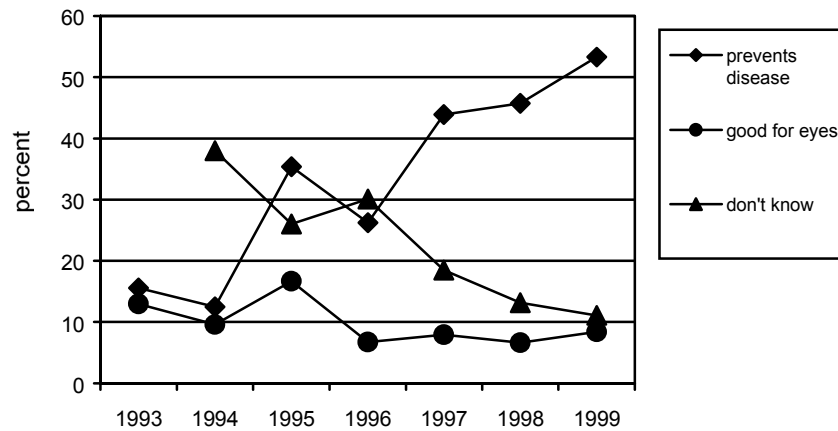
Number of immunizations given, Zambia 2000 and 2001



Improvement in immunizations given during CHW in Zambia 2000-2001



Caretaker opinion about usefulness of vitamin A in Nepal



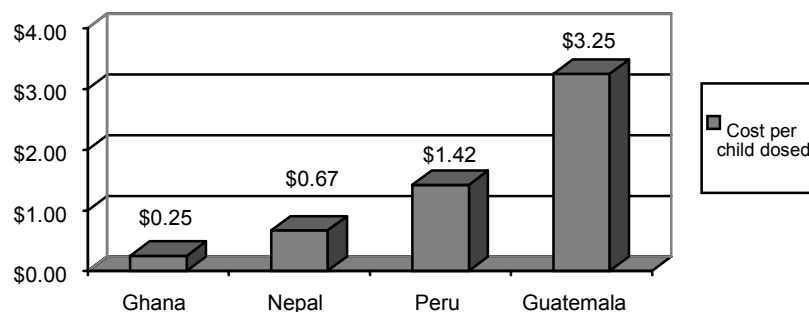
Cost Analyses



A great deal can be accomplished with adequate resources, and a key question for supplement programs is their cost-effectiveness. In addition, some understanding of the longer-term resources needed to sustain high coverage is also important. The Nepal program has had two cost analysis studies completed, separated by about five years. The recent study included a review of the minimum resources needed to sustain coverage. Similar work has been completed in Ghana, with additional work being undertaken to assess more efficient integration and sustainability. Data is currently being collected in Zambia for a similar, though more complex assessment of their Child Health Week approach.

The results are impressive in both Ghana and Nepal. The average annual cost per child dosed is \$0.25 in Ghana and \$0.67 in Nepal.* These figures compare favorably with estimates for other countries. For instance, average cost per child dosed is \$1.42 in Peru and \$3.25 in Guatemala. Reports on these analyses include some breakdown of these costs for different program activities, including promotion and logistic supply, suggesting significant benefit from the focus on these activities.

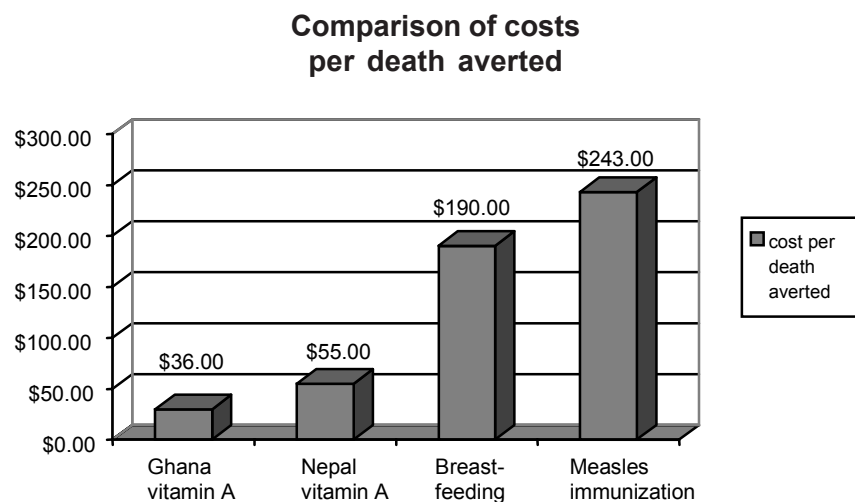
**Vitamin A supplementation costs
per child dosed**



* These are program-specific costs (in year 2000 prices) and do not include shared government personnel and capital costs.


The estimated cost per death averted as a result of the vitamin A program is about \$30 in Ghana and \$55 in Nepal. These figures compare favorably, or are in line, with estimates for other countries. Based on data for 10 countries in 1998 and 14 countries in 1999, cost per death averted was estimated at \$72 (with a range of \$36–\$142) in 1998 and \$64 (with a range of \$32–\$126) in 1999.

The vitamin A programs in Ghana and Nepal are highly cost-effective relative to other primary health care interventions. When measured in terms of cost per death averted, vitamin A supplementation (at \$30–\$55) is, for instance, 3 to 7 times more cost-effective than breast-feeding promotion (\$190), 4 to 9 times than measles immunization (\$243), 20 to 50 times than malaria vector control (1411) and more than 100 times more cost-effective than cholera immunization (\$3,405) and oral rehydration therapy (\$3,835).



Further analysis of the Nepal program suggests that once established in a district, the costs to sustain high coverage decrease. The estimated minimum costs of maintaining the program after it reaches full national scale are \$450,000. This amount covers the cost of a package of six activities that Nepal program senior staff believe must be maintained indefinitely if the program is to remain effective in sustaining its high rates of coverage. These are: coordination, promotion, supervision, IEC, re-supply of Female Community Health Volunteers, and purchase and distribution of vitamin A capsules. Assuming a 90 percent coverage in any one distribution round and that 97 percent of the children dosed in round one are again dosed in round two, so that 87 percent of Nepali children would be dosed in both distributions, the average minimum annual cost of dosing a child twice would be \$0.17. Additional data will be available from both the Ghana and Zambia programs.

Summary



It has been clearly shown that vitamin A deficiency contributes significantly to premature child mortality, and that correction can reduce mortality significantly. The successes with supplementation programs in these three countries demonstrate that it is possible to address this problem, and achieve remarkable coverage. A number of program activities have contributed to these successes—each somewhat different for each country, and each perhaps a bit subtle in its expression. The growth of community support in Nepal, and the interplay between the FCHV and her community carries implications for numerous other public health programs. The integration of activities in Zambia, with coverage and number of children served with other interventions increasing with each distribution suggests an entirely new approach to provision of preventive services. The use of extensive and carefully tested behavior change and communication methods in Ghana, with a remarkable coverage result in a short period of time underlines the importance of this element of public health programs. Cost analyses suggest that these programs are more cost-effective than most other public health interventions.

These supplementation programs have not competed with other efforts to improve vitamin A status—in fact for each, dietary means are stressed, including fortified foods. In Nepal, FCHVs bring examples of vitamin A rich foods, and they may become involved with addressing vitamin A deficiency in pregnant women. In Ghana, awareness of vitamin A is done hand-in-hand with discussion of vitamin A rich foods.

It appears likely that these supplementation programs are sustainable. In Zambia, fortification of sugar may play an increasing role in reducing deficiency, and modifications for each program may be possible as other means increase their contribution. Yet it is likely that supplementation will be needed for some time, until there is ample evidence of a population-wide shift in vitamin A intake and status. Thus the perception of supplementation programs needs to shift from a quick short-term measure, to an integral part of government preventive services—and these programs demonstrate that such a service can be successful. Costs for a minimum package of activities to sustain high coverage are small in comparison to the improvement in mortality.

Countries will need to be diligent with continued support for these programs. This will need to include continued advocacy, at all levels from political advocacy to community promotion. Countries will need to demonstrate cost effectiveness, and continue to monitor both program processes and coverage as well as program costs. Future advocacy for continued program support will depend

on such analyses. Countries will need to continue monitoring activities, partly to ensure that coverage does not drop, but also to review ways to improve program efficiency, and to capitalize on new opportunities. Success with the supplement program can be used to help with other preventive services, as has been clearly demonstrated in Zambia.

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About the Author



Dr. Robin Houston has worked in international public health since 1983, following general medical practice in Alaska. After getting his MPH at the University of Washington, he was resident in Nepal for six years working as Peace Corps physician and later with the USAID child survival project implemented by John Snow, Inc. He later worked for the Centers for Disease Control in Atlanta on a UNICEF-funded micronutrient project based at Emory University, which focused on the elimination of micronutrient deficiencies. He has worked in all three countries represented in this document, and now divides his time between continued work with CDC colleagues and work with the USAID-funded MOST project.

