GROWTH MONITORING: SOCIAL, ENVIRONMENTAL AND INSTITUTIONAL FACTORS WHICH INFLUENCE SUCCESSFUL IMPLEMENTATION
(A Report on an Analysis of Indonesia)

Interim Report #2:
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(This interim report is an internal document which represents a portion of the first phase of the overall project: "Contextual Analysis of Growth Monitoring")

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PREFACE

This report details in-depth analysis of the effect of various contextual factors on the success of growth monitoring conducted during phase 1 of the "Contextual Analysis of Growth Monitoring" project. The analysis was conducted using data from the Indonesian *KB-Gizi* (integrated nutrition/family planning) program, of which growth monitoring is a component. Analysis on this dataset and others will continue during phase 2 of the project.

The purpose of this interim report is to present statistical findings from the first phase analysis. During the second phase, a determination will be made as to the extent which the findings can be generalized to other settings. This will be accomplished through less intensive statistical inquiry and discussions during site visits to other projects and to WHO in Geneva. In addition, this report will be used to guide discussions and analysis during the second phase in the formulation of general policy recommendations. General findings and policy recommendations will be presented in the final report.

EXECUTIVE SUMMARY

This report details findings from the analysis phase of a 20 month study funded by the Agency for International Development. The purpose of the project is to determine the contextual and program design factors that influence the effectiveness of growth monitoring. Findings from a detailed analysis of growth monitoring in Indonesia will provide a framework for discussions and analyses during site visits to selected projects in the second phase of the project. It is expected that these second phase discussions will establish the extent to which the Indonesian findings apply elsewhere. Policy and growth monitoring design implications will be formulated and tested during the second phase.

A review of the literature shows that there is support for the idea that there are threshold levels of certain program elements that are necessary (but not sufficient) for effective growth monitoring. Program design factors examined in this study include support of community leaders, the number of health workers trained, growth monitoring intensity (number of weighing stations, frequency of weighings, consistency of weighings, food distribution, etc.), the number of weighing posts per population, and the distance between home and weighing post. Worldwide variation in design factors and contextual settings is of course greater than occurs in Indonesia. Consequently, this phase of the study focuses on the interaction between program design factors and contextual factors, as they relate to household participation in growth monitoring in the Indonesian setting.

This analysis utilizes data from Indonesia on 3400 children in 2500 households in 93 communities. It builds on previous study of the dataset which was conducted by Community Systems Foundation for the purpose of evaluating the Indonesian Integrated Nutrition and Family Planning Program (*KB-Gizi*), of which growth monitoring is a component. Analysis methodology incorporates chi-square tests of the relationships between design factors and contextual factors, analysis of variance tests to determine interaction between program and contextual factors with respect to household factors, and covariance structure models estimated using maximum likelihood to examine differences in household-level relationships between program and contextual settings.

The Effect of Design Factors in Indonesia

First the effect of program design factors on the operations of growth monitoring is examined. It is found that local support, program intensity, and the number of eligible children per weighing post do not influence the accuracy of SKDN statistics and immunization

coverage of attenders. Staffing, on the other hand, is important to accuracy of SKDN statistics. Communities where the level of staffing is moderate (1 health worker to 23-39 households) record the most accurate SKDN statistics.

All program design factors influence attendance. Attendance is highest where levels of local support are moderate, levels of staffing and intensity are moderate to high, and levels of children per weighing post are low. Quality of growth monitoring execution (as measured by accuracy of SKDN statistics and immunization coverage of attenders) also affects attendance, as well as knowledge and practice indicators. Overall nutritional status is not significantly related to program design, probably because of intervening factors, low malnutrition prevalence in Indonesia, and inaccuracy of age data which result in imprecise nutritional status indicators.

It is found that the relationship between growth monitoring attendance and practice is is strongest where local support is low, and staffing and intensity are high. The number of children per weighing post appears not to influence growth monitoring effectiveness as measured by practice. In addition, differences in effectiveness are due to variation in effectiveness of transferring knowledge. Less effective communities are those where the relationship between attendance and knowledge is weak, suggesting that inadequate levels of design factors reduces the effectiveness of the educational component of growth monitoring.

The Effect of Modernization

Households in communities where modernization is high are better off in terms of average education, wealth and nutritional status, but growth monitoring is effective in all communities regardless of modernization. Attenders in communities where the level of modernization is low acquire as much knowledge and practice as attenders where modernization is high. Well executed programs (where accurate SKDN statistics are kept and immunization coverage of attenders is high) are better attended regardless of modernization. Interestingly, well executed programs in communities where modernization is low are the best attended of all programs.

The program design factors included in this analysis have no effect on accuracy of SKDN statistics or immunization coverage of attenders. Though adequate levels of design factors are necessary to maintain attendance under all levels of modernization, there is little interaction between modernization and design factors except in the case of local support. Communities where levels of local support are low have high rates of attendance in less

modern communities, and communities where level of local support is high have high rates of attendance in communities where modernization is high.

The Effect of Government Intervention

In Indonesia, communities where there are high levels of government intervention display relatively low levels of wealth and education, but significantly higher levels of nutritional status. As the level of intervention increases, growth monitoring staffing decreases suggesting that there is competition for staff among programs. At the same time, there may be a synergistic relationship between government programs in terms of attendance. People that live within 500 meters of the weighing post attend growth monitoring at higher rates in communities where intervention is high.

The difference in practice between growth monitoring attenders and non-attenders is greater in communities where the level of intervention is low. This may be a result of non-attenders learning messages outside of the growth monitoring sessions where intervention is high. Adequate levels of program factors are important to attendance at all levels of intervention. At the same time, there is an interaction between intervention and modernization is relation to attendance. As the level of intervention increases, high levels of staffing are needed to achieve high levels of attendance. Low levels of children per weighing post and high levels of staffing are necessary to maximize attendance in communities where intervention is medium to low.

The Effect of Community Organization

As the level of community organization increases, average wealth, education and rate of attendance increases. There is also a strong relationship between organization and attendance suggesting that active community organizations encourage growth monitoring attendance. Though there is no relationship between community organization and design factors, both accuracy of SKDN statistics and immunization coverage of attenders increase as level of organization increases. Further, as accuracy of SKDN statistics increase, attendance increase. This effect is strongest where the level of organization is low. There is also a positive relationship between immunization coverage of attenders and attendance, and this relationship is strongest where the level of organization is high.

Highly organized communities are able to maintain accurate SKDN statistics and immunization coverage of attenders under conditions of high crowding, unlike communities

where the level of organization is low. Adequate levels of design factors are important to attendance at all levels of intervention, but highly organized communities appear able to achieve high attendance rates under crowded conditions better than communities where the level of organization is medium to low.

The Effect of Average Education

Not surprisingly, the level of average education is positively related to knowledge, practice and nutritional status indicators. Attendance rates are also significantly lower in communities where the level of average education is low. There is no relationship between level of average education and design factors, but there is a correspondence between level of education and immunization coverage of attenders. Programs where immunization coverage of attenders and accuracy of SKDN statistics are high are significantly better attended in communities where the average level of education is low or high. This difference does not exist in medium education communities.

Growth monitoring is most effective at transferring knowledge and practice where the level of average education is low, even though growth monitoring is not as well attended in these communities. The relationship between attendance and knowledge/practice is not high in communities where the average level of education is medium/high, probably because people in these communities have better knowledge and practice to start with. Appropriate levels of design factors, especially staffing, are important to growth monitoring attendance in communities where the level of average education is low.

The Effect of Acceptance of Modern Medicine

As one would expect, communities where the level of acceptance of modern medicine is high have higher average levels of education, wealth, attendance, knowledge, practice and nutritional status. There is no relationship between acceptance of modern medicine and program design, but immunization coverage of attenders is better where acceptance is high. Immunization coverage of attenders has a positive effect on attendance regardless of the level of acceptance.

The effectiveness of growth monitoring when measured in terms of knowledge/practice is high in communities where acceptance is medium, moderate where acceptance is high, and non-existent where acceptance is low. Children per weighing post has a negative influence on attendance in communities where acceptance is medium, and no

effect when acceptance is high. Staffing has a positive effect on attendance in medium acceptance communities.

Analysis will continue during the second phase of this project.

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I. PROBLEM SETTING

1.1 Definition of Growth Monitoring

Growth monitoring is the term used to describe the activity of observing systematically the growth of preschool children and/or pregnant women. In the case of children in the developing world, growth retardation is often, but not always, a result of poor nutrition and, therefore, growth monitoring is a tool applied to the detection and measurement of malnutrition in both individuals and communities. Similarly, in women, a lack of proper weight gain during pregnancy is often, but not always, due to inadequate nutrition. Consequently, measurement of change in weight is a tool for detecting and measuring malnutrition in mothers-to-be.

As defined above, growth monitoring is not, by itself, a nutrition intervention. In the absence of related interventions, the act of monitoring the growth of a child or the change in weight of a pregnant woman cannot improve the nutritional well-being of the child or woman observed except through teaching the mother the relationship between good food, growth and child health. Yet, growth monitoring is an essential component of many nutrition and health programs. The activity is included in such programs most frequently as a device to enhance the effectiveness of the other, curative and preventive interventions.

To illustrate this role of growth monitoring, consider Figure 1-1, a model of a typical nutrition program. Growth monitoring does not appear in the figure as a distinct intervention because of its unique nature. Unlike all of the other interventions in the figure, growth monitoring is not related to only one sub-objective. Instead, growth monitoring operates through the other interventions as a device to make each one work better. For example, growth monitoring is often the rallying point for community organization. It is the forum for one-to-one nutrition education and the glue for many group education sessions. Immunizations, oral rehydration therapy and curative treatment of many kinds are often linked to growth monitoring sessions. Targeting for supplementary feeding is often done through growth monitoring and, finally, the motivation for participation in a number of other agricultural interventions like home gardens is generated through the growth monitoring program.

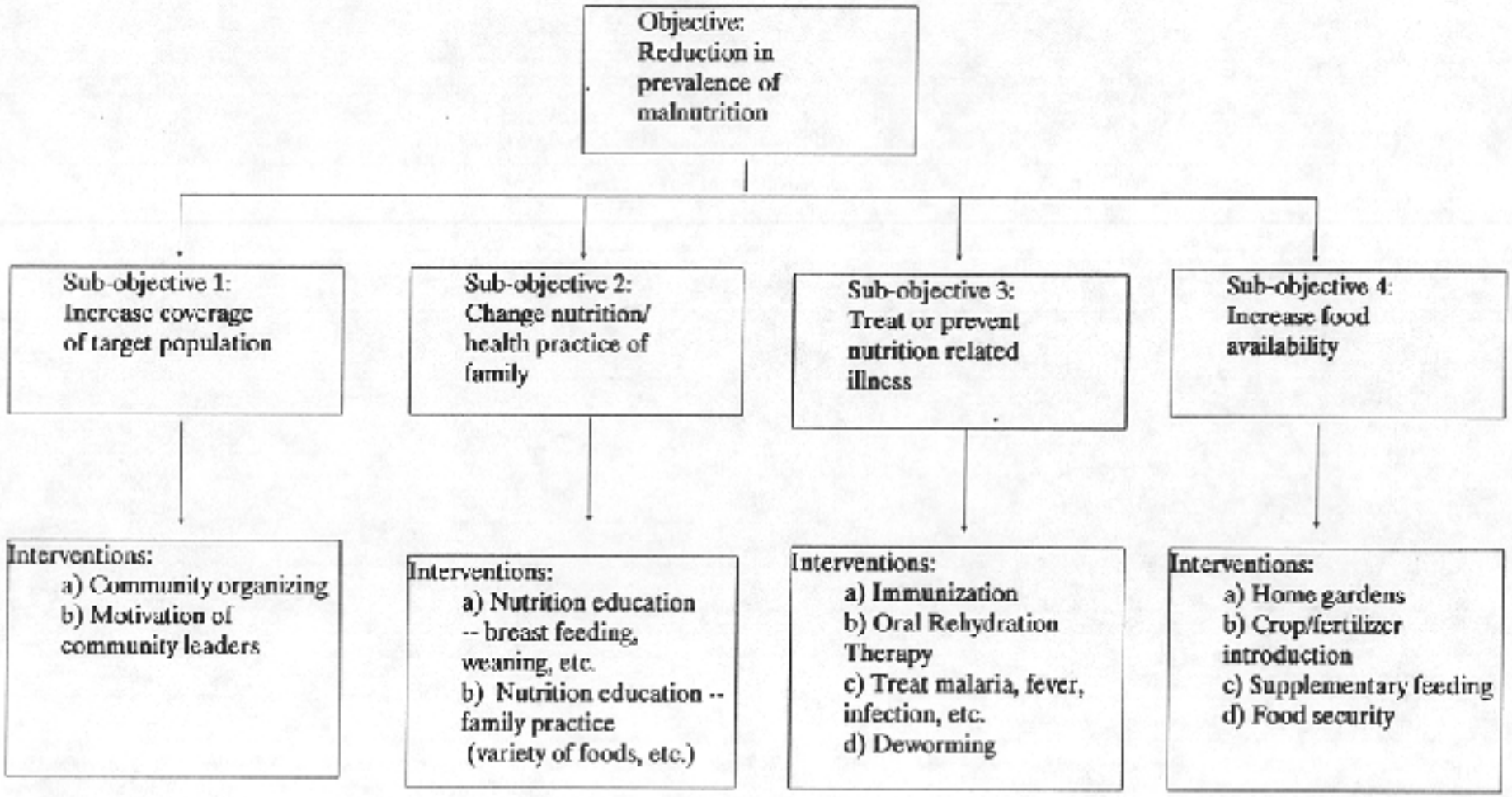

FIGURE 1-1: MODEL OF A NUTRITION PROGRAM

1.2 Measuring Growth Monitoring Effectiveness

Any effort to measure either the effectiveness or efficiency of the growth monitoring component of a nutrition program should first identify precisely the role that that component is to play in the larger program. Effectiveness or efficiency of the component can then be determined relative to that role and the importance of that role in the overall program can then be assessed. (Note that, in this context, effectiveness and efficiency are defined differently in that effectiveness refers only to whether the activity is working while efficiency includes the notion of whether the costs for making it work are justifiable.) Simply put, change in the nutritional status of a population is not, by itself, an appropriate indicator of the effectiveness or efficiency of growth monitoring as growth monitoring is usually a necessary but not sufficient input to a program designed to change nutritional status.

It is possible for the growth monitoring component of an intervention to be carried out well but, due to weaknesses in the selection, design, or execution of the interventions with a direct bearing on health, neither the primary nor the sub-objectives will be met. In fact, one of the criticisms of growth monitoring today is that the time investment required to make the component work is so great that making it work becomes an end in itself and growth monitors forget that it is only a means to a larger end. How, then, can one define an effective or efficient growth monitoring program?

First, the specific role of the growth monitoring component in the larger intervention program must be defined. Generally, this role can be defined in terms of the chain of events to be triggered by the growth monitoring component in order to achieve the sub-objectives and primary objectives of the larger program of which growth monitoring is a component.

Consider a typical case. Children are to be weighed monthly with the specific objective of identifying those whose growth is faltering prior to their falling into a state of nutritional risk. Mothers of children whose growth is faltering are to receive special nutrition education in a one-on-one (health worker to mother) environment. The children themselves are to be given a more complete clinical examination to search for disease-related causes of malnutrition. Relative to the nutrition program model in Figure 1-1, this case operates only on sub- objectives 2 and 3. Neither coverage nor food availability will change in response to this program.

To evaluate this typical case, it is useful to partition "success" into three components:

a) are the mechanical aspects of the growth monitoring being executed well?

b) are the nutrition education and treatment being given well? and,

c) are the causes of malnutrition likely to be reduced through nutrition education and treatment of disease?

Each of the above questions needs to be posed and answered separately and in sequence in any serious effort to determine whether the growth monitoring activity is successful within the context of the larger program.

For example, the mechanical aspects of the program can best be assessed by determining what percentage of the children are weighed every month; what percentage of the mothers of the children whose growth is faltering receive special education; and what percentage of the children receive in-depth clinical examinations. Inadequate execution of these mechanical steps might result in the failure to make progress towards the sub-objectives of the program. But, even when the mechanical part of growth monitoring is done well, children may not regain normal growth patterns due to the inadequacy of the education and/or the inability of the health professionals to treat the illnesses detected during the clinical examination. This inability, in turn, might reflect weaknesses in training of the health staff or, more likely, break downs in the logistical support systems such as drug distribution. Independent assessments of both the education component and the medical treatment component can be made but these do not necessarily reflect upon the growth monitoring. Finally, the ancillary services, such as the education and treatment, may be executed well along with the growth monitoring but, due to the fact that the entire package fails to address the key factors contributing to malnutrition, the major nutritional status objectives of the program may not be achieved.[1]

This approach to defining success in terms of a chain of conditions which must be met for an activity to be judged successful is generalized in Figure 1-2.

An additional issue needs to be considered in defining the role of growth monitoring in a larger program. Growth monitoring is often initiated to prevent children who are at-risk from

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[1] Of course, it should be mentioned that there are factors which influence nutritional status which fall outside the domain of growth monitoring and the nutrition program. Agricultural and sanitation projects are two cases in point.

MECHANICS OF EXECUTION

If the mechanics of weighing children and identifying risk are done well, growth monitoring may be successful. If not, growth monitoring will be unsuccesful.

COMPLEMENTARY ACTIVITIES

If complementary activities (other interventions) are effective and children show improvement as a result of referral, then growth monitoring may be successful. If not, growth monitoring will be unsuccessful.

OVERALL DESIGN

If network of interventions is effective in reducing prevalence of nutritional deficiency, then project is successful. If not, project is unsuccessful due to the fact that it does not address the real problem.

FIGURE 1-2: COMPONENTS OF GROWTH MONITORING SUCCESS

becoming malnourished. Prevention is more difficult to measure than cure. It is easier to determine that a sick child was cured by a certain action (though not necessarily easy) than it is to determine whether a child who did not get sick remained healthy due to a particular action.

Consider by way of illustration, a program which introduces a growth monitoring component through an already functioning health delivery system. Prior to the introduction of growth monitoring, cases of diarrhea were treated at the health post or clinic with oral rehydration therapy. As part of the growth monitoring, mothers were counseled to use oral rehydration therapy at home prior to bringing their child to the clinic. The objective was to rehydrate children earlier in the course of their diseases to prevent such serious dehydration that treatment by the health-sector personnel was necessary. In order to determine whether the broadly defined growth monitoring project was working, including the training of mothers in the use of oral rehydration therapy, one would need to know how many cases of diarrhea were treated effectively at home. This is far more difficult than counting the number of cases responding to treatment in a clinic or at a health post.

Once a clear statement of the role of a growth monitoring component in a larger nutrition program is made, it is possible to seek sets of indicators which might measure the degree to which the growth monitoring component is being realized.

II. LITERATURE REVIEW

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III. PROBLEM STATEMENT

3.1 The Global Context

The environments within which community-level interventions operate are dynamic. They vary between communities as well as within communities over time. The uniqueness of a single community at any time influences, to an often unknown or indeterminable extent, the outcome of the intervention. In the case of growth monitoring, it is certain that conditions as diverse as geographic features, modernization and other program activities affect program operations such as the mother's decision to attend the weighing sessions.

The influence of the context should be of great interest to program planners. To know, for example, that in less modern villages the distance between the home and the weighing post influences program attendance, would give the planner information relevant to program design and implementation. In this case, he or she might consider increasing the number of weighing posts in order to increase the rate of weighing post attendance or accelerate outreach efforts.

3.2 The Indonesia Setting

Since the ultimate goal of the project is to provide guidelines that can be generalized outside of Indonesia, the analysis was set up in such a way that Indonesian findings can guide less in-depth inquiries into growth monitoring in other countries. It is clear that there is considerable variation in the implementation of the *KB-Gizi* program between communities in Indonesia. This variation is due, in part, to variation between community-level factors external to the program. The fundamental question this study addresses is the extent to which various community-level contextual (non-program) factors influence household conditions in the community, as well as the operations of growth monitoring in the Indonesian *KB-Gizi* program. Because this project strives to provide decision-makers with guidelines relevant to growth monitoring planning and implementation, the focus of the study is on those factors which can be manipulated by the program, and have adequate variance in the Indonesian case.

At the same time it must be recognized that there are limitations inherent in the case study approach when there are expectations of generalizing the findings outside the case study area. This is not to say that the approach is a poor one, but rather caution must be

exercised in interpreting results in a global context. This is the reason that researchers have developed and adopted approaches to research such as "Reflection-In-Action".[1]

There are some constraints which must always be true when utilizing a case study in this way. These should be identified here so as to lay the groundwork for the use of the Indonesian findings into Phase II of this project. First, the government of Indonesia has its own specific set of goals and objectives with respect to growth monitoring which may or may not be shared by other countries. Consequently, the criteria by which the effectiveness of growth monitoring is evaluated in Indonesia is probably different than the criteria used elsewhere.

Second, since the study is designed such that the topic of interest is the interaction between design factors and contextual factors, much of the analysis is centered around the effect of design factors. In Indonesia, as in many other countries, these factors are highly standardized across communities. Consequently, the design factors which could be used in this study were those which had some variance across communities. This means that in the analysis itself, questions regarding the effect of *kader* (health worker) training, for example, could not be examined.

In addition, because a case study is always restricted to one study area, certain contextual factors do not vary enough across communities to allow meaningful analysis. The nutrition profile of participants is a case in point. In Indonesia, the prevalence of malnutrition is relatively low. This fact influences the objectives and design of growth monitoring and related activities, as well as the criteria for evaluation.

Such questions are better answered by making comparisons across countries where the objectives of growth monitoring are similar, but the design and related components are different. A review of the literature which deals with such questions is outlined in Chapter II,

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[1] Reflection-In-Action (R-I-A) conceives of evaluation as an integrated program activity. Whereas rigorous experimental design generalizes intervention-oriented results by using the logic of the experimental design to interrelate general features of context, intervention, controls, and outcomes, R-I-A treats experimental results as always context-specific, generalizable only as elements of a repertoire or themes that can identify or construct for program planners problems and theories or strategies to be tested to improve the program or others to follow.

See Drake, William D., Roy I. Miller and Donald A. Schon. *The Study of Community-Level Nutrition Interventions: An Argument for Reflection-In Action.* Human Systems Management 4 (1983), pp. 82-97.

and will provide some of the framework for the in-country visits which will occur in the next phase of this project.

3.3 Measuring Growth Monitoring "Success" in Indonesia

Indonesia is a country which has made good progress towards the installation of a uniform growth monitoring program on a nationwide basis. However, in large parts of the country, the growth monitoring program, as part of a more broadly defined nutrition program, is linked to a well-established family planning program. As one might expect, among the people responsible for the program, one finds that priority objectives vary regarding the intended contribution of the growth monitoring.

Managers of the family planning program saw nutrition as a means to induce households not yet coming to the family planning clinics to make an appearance at the clinic. Once in the clinic, it was hoped that exposure not only to the nutrition component of the project but also to the family planning component would increase accepter rates for family planning. Thus, from the perspective of the family planning personnel, the success of the growth monitoring would be measured according to the degree to which family planning acceptance rates increase among receivers of nutrition services.

Managers of the nutrition program saw the possibility of linking their program to that of the family planners and utilizing existing infrastructure as an opportunity to promote better nutrition throughout Indonesia. Thus, from their perspective, the success of growth monitoring would be measured by its contribution to the overall nutritional objectives of the nutrition component of the project. Ultimately, then the success of growth monitoring should contribute to the improvement of the nutritional status of Indonesia's preschool children and women of child bearing age.

However, due to the fact that so many factors influence the nutritional well-being of a population, the use of nutritional status data as a measure of the effectiveness of a single component of a larger health program which touches on only a few of the causes of malnutrition in children and women is questionable. In Indonesia, the role of growth monitoring is relatively well defined so it is possible to seek other measures of success.

First, growth monitoring is intended to lead to the referral of children who are at risk to the health establishments capable of dealing with the source of that risk. Thus, growth monitoring should be associated with an effective referral system. Second, growth monitoring is the major mechanism for delivery of nutrition messages to the population. Thus growth

monitoring should lead to greater knowledge, improved attitudes and changed practices regarding nutrition. Third, immunization is a part of growth monitoring in Indonesia; therefore, vaccination coverage might well be indicative of the effectiveness of the growth monitoring component of the health program.

In technical terms, the indirect indicators of the success of growth monitoring--referrals, nutrition knowledge, and vaccination coverage--are sensitive but not specific. That means that a good growth monitoring program will have positive effect on each of the complementary programs but that the indicators of the success of those programs may change in response to many factors other than the growth monitoring program. Thus, differences in any of the indicators among geographical locations may be linked to the growth monitoring but, equally likely, those differences may be linked to other factors as well. This creates problems in using any single indicator as a proxy for a successful growth monitoring component. However, if one were able to demonstrate that the collection of indicators measuring performance of the direct interventions were higher in geographical zones where growth monitoring execution was good, one's confidence in the positive contribution of growth monitoring would increase.

In sum, the success of the growth monitoring component of the Indonesian nutrition program must be evaluated at three different levels. The first addresses the execution of growth monitoring itself. Are children being weighed properly and weights correctly recorded on the growth charts? Are malnourished children being identified? Are the attenders being immunized, receiving oral rehydration therapy when appropriate, etc.? These questions all related to the execution of the basic growth monitoring service in Indonesia.

The second level of evaluation addresses the quality of the related activities. Since growth monitoring in Indonesia is, among other things, the center for other activities, the effectiveness of these activities must be evaluated. Are children who were referred recuperating? Is the level of knowledge higher for mothers who received education?

The third level of measuring success involves looking at the nutritional well-being of the population served. Unfortunately, because nutritional status is determined by many factors outside the domain of growth monitoring and related activities, it is not expected that this relationship is a strong one. Furthermore, there are additional factors which make it unlikely that significant relationships will emerge. First, age data in Indonesia is very inaccurate as evidenced by age heaping. This, of course, results in imprecise nutritional status indicators.

Second, the prevalence of malnutrition in Indonesia is low thereby reducing variance in nutritional status indicators.

IV. A GROWTH MONITORING MODEL

The first step of the analysis is to determine a general model that describes "successful" growth monitoring. After this general model is described, we can then go on to examine the influence of contextual factors. The specification of the model is difficult because, as outlined in the section on measuring success, growth monitoring can fill a variety of functions. Consequently, as universal a model as possible is specified. Figure 4-1 portrays this conceptual model.

Next, the model is made specific to Indonesia. Figure 4-2 shows the growth monitoring program portion of the model and available measures. It is this model on which analysis in this report is based.

The first set of factors in the model are the design elements. In the end, it is these factors about which statements will be made. The interaction between the design of the growth monitoring component and contextual factors is of ultimate interest in this report. However, at this stage of the analysis, the hypothetical link between design factors and quality of execution is presented.

In a general sense, these design factors should include elements not shown in the model. The level and type of kader training, and the means of program introduction into the community are among the growth monitoring design factors that have been thought to be important to successful implementation. However, in the Indonesian program these factors are held constant making meaningful analysis impossible. In fact, a high level of program standardization exists even in the elements included. So, although there is some variance, it may be that determining threshold levels of design variables will be impossible because communities below the threshold do not exist in Indonesia.

The second stage of the model is growth monitoring execution. The issue of concern here is whether the various growth monitoring activities are carried out accurately. These activities include the weighing of balita and accurate charting of weight on KMS cards, provision of related services including immunization and oral rehydration therapy (ORT), detection of at-risk children and referral to the appropriate place, and nutrition/health education.

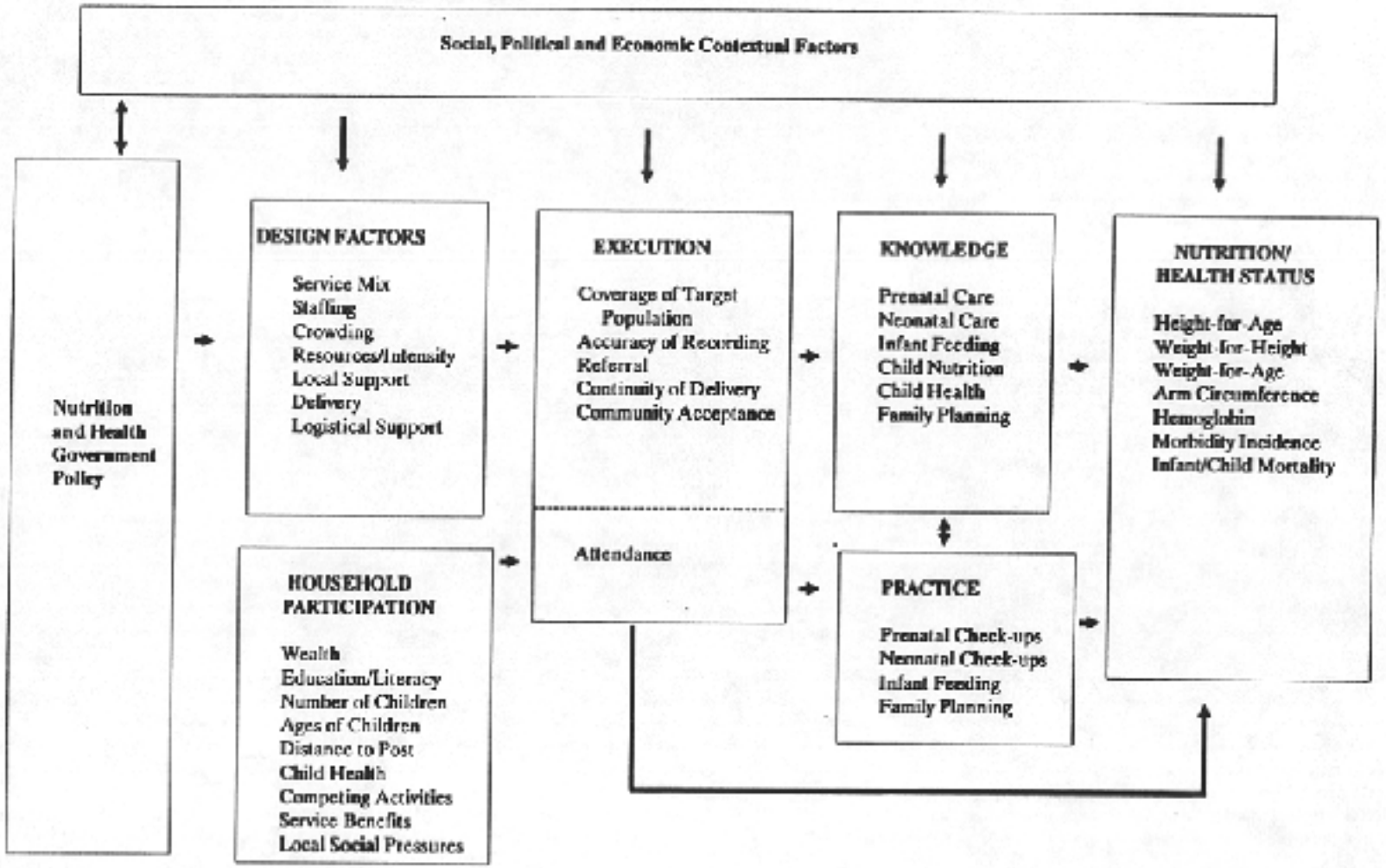

FIGURE 4-1: GENERAL PROGRAM PARTICIPATION EFFECT MODEL

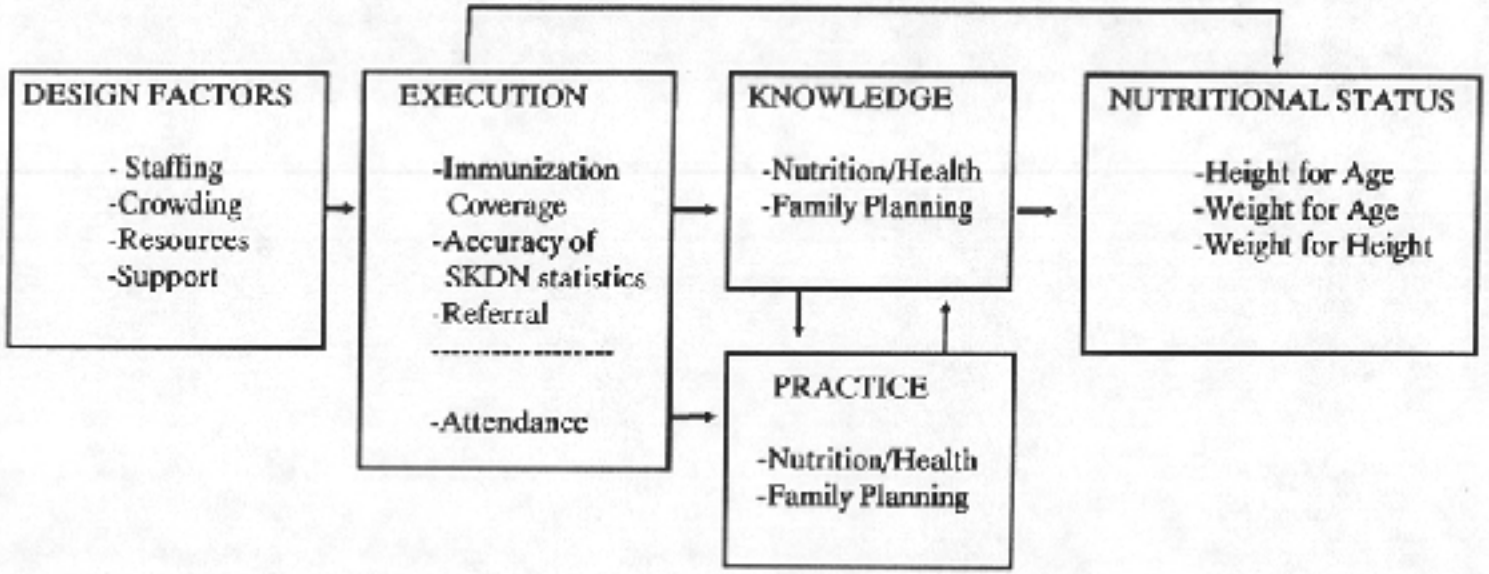

FIGURE 4-2: INDONESIAN PROGRAM PARTICIPATION ANALYSIS MODEL

Quality of execution is a very important factor in this model. If program design elements are appropriate, and quality of execution is good, then we might judge growth monitoring to be successful. On the other hand, if no one attends, it is probably the case that the package of growth monitoring and related programs do not meet the needs of people in the community. Consequently, attendance is portrayed here as a component of program execution. If the program is executed well and is designed to meet a real need, then attendance will be good.

Since the question of attendance is a critical one, some of the factors which go into the household's decision to attend the weighing post are included in the model. These factors must be considered for two reasons. First, it is important to control for, or at least accurately characterize the influence of, household demographic characteristics which have bearing on the decision of whether or not to attend. It is important to know the relative influence of contextual factors and household factors such as education.

Second, it is important to be able to characterize the relative weight given to the costs and benefits of attending the weighing post under the various contextual conditions. The interaction of program design factors and contextual conditions relative to the decision to attend is a question of great interest.

The third major link in the model is that between attendance and knowledge/practice. The focus of the program is that people who attend are given information on proper nutrition practice. If these practices are followed, nutritional status is improved. We have found in previous analysis that knowledge does not always precede practice. In fact, it seems to be that the practice reinforces the knowledge, and visa versa. Consequently, we show knowledge and practice in a symbiotic relationship.

Finally, changes in nutrition/health knowledge and practice will lead, we expect, to a positive change in nutritional status of the children. At the same time it must be recognized that there are factors outside the program which will influence the nutritional status of the child. Consequently, it is not expected that the analysis will show a significant relationship between practice and nutritional status.[1]

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[1] There are additional reasons why significant relationships are not expected with respect to nutritional status indicators. First, the indicators are inaccurate. Many of the respondents did not know the age of their child. Consequently, "heaping" on seven- and twelve-month intervals is evident in the dataset. Second, malnutrition prevalence is very low in Indonesia which means there is limited variation in nutritional status indicators.

V. DATA AND METHODOLOGY

5.1 Data Collection Procedure

The data were collected in summer of 1985 as part of an evaluation of the Integrated Nutrition and Family Planning Program (*KB-Gizi*) in Indonesia. The survey was conducted to investigate household knowledge, attitude, behavior and characteristics related to family planning and health and nutrition of *balita* (children under five years old).[1] 1200 households in the province of Bali and 1378 households in the province of East Java were surveyed.

Because the much of the focus of the KB-Gizi evaluation was the effect of the program on pregnant and lactating women, and children under five years of age, a proportionate sampling scheme was used in conducting the survey. The household behavior survey used proportionate samples such that seventy-five percent of women interviewed had *balita* and twenty-five percent were without *balita* whether married or unmarried.

This study makes use of the data from Bali and east Java. The two datasets were combined in order to generate a dataset with a sufficient number of observations to test for differences between contextual conditions. As a result, data on 3400 balita from 2500 households in 93 communities were used in the analysis.

5.2 Construction of Indexes Used in Analysis

Some of the indexes used in this analysis were developed and tested during the KB-Gizi evaluation.[2] Others were developed specifically for the growth monitoring analysis. Following is a summary of each of the composite indexes used in the growth monitoring analysis.

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[1] Community Systems Foundation, *Survey Design: Final Sampling Scheme*. Working Document 11: January, 1986.

[2] National Family Planning Coordinating Board (BKKBN), the Universities of Udayana, Brawijaya and Airlangga and Community Systems Foundation, *KB-Gizi--An Indonesian Integrated Family Planning, Nutrition and Health Program: The Evaluation of the First Five Years of Program Implementation in West Java and Bali*. October, 1986.

5.2.1 Program Design Factors

Support by Various Leaders at Weighings -- This composite index was formed on the basis of a series of questions asking whether each of nine different community leaders and program officials attend the weighing post regularly.

- PLKB (village family planning field worker)
- PLKB Supervisor
- Kelian (sub-village headman)
- Village Mayor
- Secretary of Village Mayor
- Midwife
- Immunizer
- Doctor
- Kader (health worker)

A value of 1 was given for each that regularly attends. Communities were then assigned to three groups of equal size corresponding to relatively low, medium and high levels of support.

Program Staffing -- The number of *balita* (children under 5) in the community was divided by the number of trained, active *kader* (health workers) to determine a measure of program staffing. Communities were then assigned to three groups of equal size corresponding to relatively low, medium and high levels of staffing as shown below. The communities ranged from an average of 4.9 households per trained *kader* to 842 households per trained *kader*. There were even some communities which had no trained *kader* which were placed in the low group.

Measure of Staffing: Households per Trained Kader

Assignment in Index	Number of Communities	Range of Households per Trained *kader*
LOW	30	40-242
MEDIUM	32	23-39
HIGH	30	5-22

Program Intensity -- A composite index was calculated where each of the following were given equal weight:

- Staffing (see above)
- Number of weighing stations in the community
- Whether weighings were consistent
- Whether weighings held monthly
- Whether food distributed at weighings

Communities were then assigned to three groups of equal size corresponding to relatively low, medium and high levels of program intensity.

Balita per Weighing Post -- The number of balita was divided by the number of weighing posts in the community to determine a measure of crowding at the weighing post. The communities ranged from an average of 18 *balita* per weighing post to 322 *balita* per weighing post. Communities were then assigned to three groups of equal size corresponding to relatively low, medium and high levels of crowding.

Measure of Crowding: Balita per Weighing Post

Assignment in Index	Range of Balita per Weighing Post
LOW	18-56
MEDIUM	57-99
HIGH	100-322

5.2.2 Household Factors

Family Wealth Index (WLTH) -- Since no direct inquiry was made concerning family income, a composite index was constructed on the basis of family ownership of the following eleven items:

1. Radio
2. Watch/clock
3. Sewing machine
4. Mattress
5. Kerosene lamp
6. Kerosene stove
7. Television
8. Furniture
9. Bicycle
10. Motorcycle
11. Automobile

The survey contained a series of dichotomous questions, where the family answered "yes" or "no" to ownership of each of the eleven items.

The composite index was constructed applying a statistical technique called *cumulative stochastic scaling* (CSS).[3] The underlying assumption of this technique is that the probability of ownership of a given item is conditional on prior ownership of other items that most households would need or desire before acquiring the given item. Thus a scale and weighting are determined based on the frequency of ownership of each item in the dataset under study. Furthermore, if a particular item does not fit well into the sequence of acquisition (e.g. people do not necessarily acquire a radio prior to acquiring a watch), it is dropped from the composite.

There are two advantages to using this technique in constructing the measure of wealth in the case of the Indonesia data. First, by using the data, it is possible to give a relative weight to each of the items based on the observed frequency (probability) of ownership. This is a more accurate technique than merely giving each item a weight of 1. Consequently, CSS provides a continuous, interval measure of wealth. Second, it enables us to make the index comparable between the two provinces. This is important because availability of goods, and consequently the sequence of ownership, follows different patterns on Bali and East Java. In the end, the scales and items used to determine the wealth index in each of the provinces turned out to be somewhat different (and thus comparable).

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[3] Clyde H. Coombs, Lolagene C. Coombs and James C. Lingoes. *Cumulative Stochastic Scales.*

Scalable Items for the Wealth Index, East Java

Item	Weight
kerosene lamp	0.31
furniture	0.50
radio	0.62
watch	0.77
bed	0.77
stove	0.80
motorcycle	0.92
television	0.96
automobile	0.99

Scalable Items for the Wealth Index, Bali

Item	Weight
mattress	0.22
kerosene lamp	0.55
furniture	0.76
stove	0.79
motorcycle	0.84
sewing machine	0.91
automobile	0.97

Variable	Mean	Std Dev	Minimum	Maximum	N
WLTH	15.31	13.23	0.0	90.0	2505

Woman's Education Index (EDWO) -- The highest grade completed by the woman was used as a measure of her education. The index was coded as follows:

Highest grade in school

Variable Value	Code Value
>=7	4
5-6	3
3-4	2
1-2	1
0	0

0 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 830
1 XXXXXXXXXXXXX 306
2 XXXXXXXXXXXXXXXXXXXXXXXX 629
3 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 1008
4 XXXXXXXXXXXXXX 371

Valid Cases 3144 Missing Cases 14

Distance to Weighing Post (TDIST and ZDIST) -- The interviewer was asked to observe and estimate the distance between the respondent's house and the weighing post (in meters). The accuracy of these estimates is somewhat suspect, given the heaping that results when histograms are generated. At the same time, accuracy to the nearest meter is not important to this analysis, especially since it makes more sense at times to recode the response into broader categories.

Variable	Mean	Std Dev	Minimum	Maximum	N
TDIST (meters)	690.51	894.47	0	7500	3044

Two such measures were generated. The first was calculated in such a way that the number of attenders in each of the groups were of significant size, and substantial distance breaks occurred between each of the groups. A histogram was generated for all the households, and a fairly subjective method of looking for groups was used. Following are the six groupings that were generated:

Zone	Range (Meters)	Midpoint	Balita Ever Attend
1	0 - 60	30	380
2	61 - 106	83	363
3	107 - 325	216	693
4	326 - 550	438	590
5	551 -1100	825	538
6	1101-7500	4300	479

			3043

This variable was used in generating the distance to weighing post charts in the analysis chapters.

30 XXXXXXXXXXXXXXXXXXXXXXXX 380
82 XXXXXXXXXXXXXXXXXXXXXXX 363
200 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 693
425 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 590
825 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 538
4200 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 480

Valid Cases 3044 Missing Cases 114

A second recoding of this variable was also calculated. The reason for creating the second measure was that a measure with a greater number of groups was needed for some of the analysis, and groups based on some of the guidelines in the literature were preferred. Following are the groups generated in this fashion:

Zone	Range (Meters)
1	0-49
2	50-99
3	100-199
4	200-499
5	500-999
6	1000-1499
7	1500-1999
8	2000-2999
9	3000-7500

Variable	Mean	Std Dev	Minimum	Maximum	N
ZDIST	3.94	1.92	1.00	9.00	3044

1.00 XXXXXXXXXXXXXXXXXX 375
2.00 XXXXXXXXXXXXXXXXXX 365
3.00 XXXXXXXXXXXXXXXXXXXX 414
4.00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 862
5.00 XXXXXXXXXXXXXXXXXXXXXXXXXX 536
6.00 XXXXXXXX 156
7.00 XXXXXXXX 167
8.00 XXXXX 100
9.00 XXXX 69

Valid Cases 3044 Missing Cases 114

5.2.3 Quality of Program Execution

Accuracy of SKDN Statistics (SKDNA) -- Analysis was performed in order to determine the determinants of a "successful" program, where success is measured by quality of execution. The first way in which "quality of execution" was measured was by comparing the SKDN statistics submitted by the community, with the sample data obtained through the survey.

The SKDN monitoring system in Indonesia has four principal indicators:

S: The number of *balita* (children under five years of age) in the *banjar* (community);

K: The number of *balita* in the *banjar* registered in the program;

D: The number of *balita* weighed in the previous month;

N: The number of *balita* exhibiting weight gain in the previous month.

These four indicators are used by the banjar to measure program coverage (K/S), program participation (D/K), and program effectiveness (N/D). The Indonesia dataset contained the SKDN statistics that the *banjar* reported in the previous month.

The following indexes were also created at the household-level. EVAT is a binary index which measures whether the household had ever attended the weighing post. PERAT measures the percent attendance in the last 12 months. If the balita were younger than 12 months of age, PERAT was appropriately adjusted.

It was reasoned that K/S should be approximately the same as the percentage of *balita* in the sample that had ever attended the weighing post as measured by EVAT. Further, D/K is analogous to the mean rate of attendance for the community of those that have ever attended as measured by PERAT. Though the match is not an exact one due to the fact that the survey is based on a sample, where the SKDN statistics are based on all balita in the community, the two measures should be approximately equal.

The logic of the approach was to compare the survey statistics to the weighing post statistics, and use the discrepancy as a measure of quality of execution. In communities where execution is poor, the SKDN statistics are likely inaccurate. The total discrepancy was calculated, and communities were split into two groups corresponding re relatively "good" execution (upper 50% of the communities) and relatively "poor" execution (lower 50%) .

Immunization coverage of Attenders (IMMX) -- Immunization coverage of ever attenders was also used as a measure of program execution. Immunization coverage was selected because immunization is one of the "tangible" benefits of program participation. In communities where a high percentage of the ever attenders had been immunized, the program was probably well-executed. The measure was determined by calculating the percentage of ever attenders who had been immunized within each community. Then, communities were classified in two groups of equal size corresponding to relatively "good" and "not good."

Rate of Attendance at Weighing Post (TOTRATE) -- The rate of attendance over the last 12 months was calculated, and adjustments made for *balita* younger than 12 months of age. If the *balita* had never attended the weighing post, his rate of attendance was designated to be 0. The same value was given to *balita* who said they had ever attended, but had not done so in the last 12 months.

Variable	Mean	Std Dev	Minimum	Maximum	N
TOTRATE	.33	.42	0.0	1.00	2130

5.2.4 Program Outcomes -- Knowledge

Nutrition Knowledge (NKA) -- This index was calculated using the following variables and weights:

Variable	Code Value
Know purpose of weighing	0-1
IFKA (see below)	0-17
Know age for immunizations	0-5
Total Possible	23

0 1
2 1
3 3
4 XXXX 24
5 XXXXXX 41
6 XXXXXXXXX 67
7 XXXXXXXXXXXX 96
8 XXXXXXXXXXXXXXXXXXXXXXX 185
9 XXXXXXXXXXXXXXXXXXXXXXXXXXX 218
10 XXXXXXXXXXXXXXXXXXXXXXXXXXXX 241
11 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 295
12 XXXXXXXXXXXXXXXXXXXXXXXXXX 216
13 XXXXXXXXXXXXXXXXXXXXXX 191
14 XXXXXXXXXXXXXXXX 133
15 XXXXXXXX 65
16 XXXXXX 37
17 XXX 12
18 XX 4
19 1

Valid Cases 1831 Missing Cases 674

Health Knowledge (HKA) --

This index was calculated using the following variables and weights:

Variable	Code Value
Knowledge of Vitamin A supplements	0-2
Knowledge of Immunizations	0-19
Knowledge of symptoms of diarrhea and rehydration	0-4
Knowledge of the use of Oralite	0-14

Details on the formation of the index are available in the KB-Gizi evaluation.[4]

Variable	Mean	Std Dev	Minimum	Maximum	N
HKA	21.04	9.39	0	50	2497

Infant Nutrition Knowledge (IFKA) – An index of knowledge of infant nutrition was calculated by summing values associated with knowledge of the following:

Variable	Code Value
Food Groups	
staple	0-1
vegetable	0-1
meat	0-1
fruit	0-1
Breast Feeding	
colostrum	0-1
breast vs. formula	0-1
age for breast feeding	0-2
Weaning	
age for first food	0-1
age for mashed food	0-1
age for soft food	0-1
age for adult food	0-1

[4] National Family Planning Coordinating Board (BKKBN), the Universities of Udayana, Brawijaya and Airlangga and Community Systems Foundation, p. 93.

Feeding Frequency	
age 0-3 months	0-1
age 4-6 months	0-1
age 7-12 months	0-1
age 13-14 months	0-1
feeding ill child	0-1

Total Possible	17

0 1
1 3
2 XX 10
3 XXXXX 43
4 XXXXXXXXXXXXX 108
5 XXXXXXXXXXXXXXXXXXXXX 184
6 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 295
7 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 355
8 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 344
9 XXXXXXXXXXXXXXXXXXXXXXXXXXXX 260
10 XXXXXXXXXXXXXXXX 140
11 XXXXXXX 58
12 XXX 18
13 XXX 12
14 1

Valid Cases 1832 Missing Cases 673

5.2.5 Program Outcomes -- Practice

Nutrition Practice (NP) -- An index of current nutrition practice was formed by evaluating the food eaten by the child the previous day, based on the age of the child. The index has a range of 0 to 10. Details on the formation of the index are available in the KB-Gizi evaluation.

0 XX 17
1 XX 16
2 XX 22
3 XXXX 68
4 XXXXXX 130
5 XXXXXXXXXXXX 289
6 XXXXXXXXXXXXXX 343
7 XXXXXXXXXXXXXXXXXXXXXXXXXXX 636
8 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 1086
9 XXXXXXX 152
10 XXXXXXX 141

Valid Cases 2900 Missing Cases 258

Infant Nutrition Practice History (NPH) -- The nutrition practice history index was formed on the basis of when the child was weaned.

0 XX 9
1 XXXXXX 36
2 XXXXXXXXXXX 86
3 XXXXXXXXXXXXXXXXXX 162
4 XXXXXXXXXXXXXXXXXXXXXXXXXXXXX 254
5 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 371
6 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 387
7 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 325
8 XXXXXXXXXXXXXXXX 139
9 XXX 16

Valid Cases 1785 Missing Cases 1373

Family Planning Practice (FPP) -- This index was used because of the interest in seeing whether participation in growth monitoring affects family planning accepter rates. The index is based on the following variables:

Variable	Value
Contraceptive ever used	0-3
Type of contraceptive current	0-3
No. of children when family planning started	0-3

0 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 676
1 3
2 XXXXX 62
3 XXXXXXXXX 123
4 XXXXXXXXXXXXXXX 233
5 XXXXXXXXXXXX 197
6 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 509
7 XXXXXXXXXXXXXXXXXXXXXX 355
8 XXXXXXXXXXXXXXXXXXXX 333
9 7

Valid Cases 2498 Missing Cases 7

5.2.7 Contextual Factors

Level of Community Modernization (MODERN) -- The measure of community modernization is made up of the following variables:

- Type/quality of roads
- Percentage of households with television sets
- Market activity
- Schools
- Recreational facilities
- Availability of electricity

A summary index was formed by weighting each of the above equally, and three groups corresponding to high, medium and low were formed using cluster analysis. Because cluster analysis was used, the size of the three groups is not equal. Following is the distribution:

```
LOW     1 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 37
MEDIUM  2 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 39
HIGH    3 XXXXXXXXXXXXXXXXX 17

Valid Cases     93   Missing Cases  0
```

Government Intervention Activity in the Community (OPROGSX) -- The survey asked which of 22 types of programs currently or ever existed in the community. The "yes" answers were summed to obtain a measure of other program activity. The communities were then assigned to three groups of equal size corresponding to high, medium and low levels of intervention activity.

Acceptance of Modern Medicine by the Community -- The survey asked the health center doctor how the people of the community accept modern medicine -- low, medium or high. This variable was used directly.

Average Level of Household Education in the Community -- Average level of education was determined by averaging the household education index (same as woman's education index, outlined above except values are summed for husband and wife) over the community.

5.2.6 Program Outcomes – Nutritional Status

Nutritional Status (HAZ, WHZ, WAZ) – Weight, height and age data from the survey were used to determine nutritional status by using NCHS/CDC standards to assign height for age, weight for age and weight for height expressed as z scores.

These indicators are not accurate due to the fact that the measurement of age was difficult to obtain accurately (the sample distribution of ages shows severe heaping), despite the use of very reliable measurement protocol. Consequently, it is likely that tests of significance are affected. This inaccuracy and associated problems are well documented in the KB-Gizi evaluation.[5]

Variable	Mean	Std Dev	Minimum	Maximum	N
HAZ	-1.43	1.43	-3.99	3.91	2768
WHZ	-.39	1.25	-5.08	3.93	2962
WAZ	-1.28	1.18	-3.99	3.73	3016

[5] National Family Planning Coordinating Board (BKKBN), the Universities of Udayana, Brawijaya and Airlangga and Community Systems Foundation, p. 59.

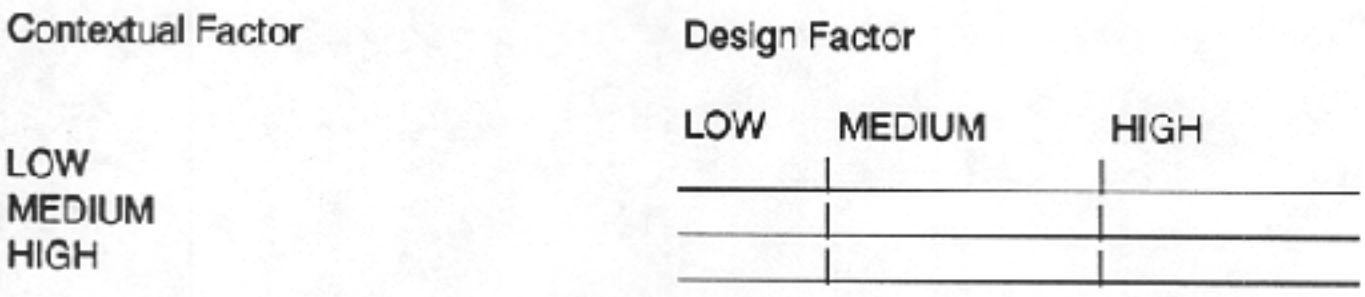
Other Community Organization Activity (COMORGSX) – The survey asked which of sixteen community groups exist and meet regularly in the community. The "yes" answers were summed to obtain a measure of organization activity in the community. Communities were assigned to three groups of equal size corresponding to low, medium and high.

5.3 Overview of Methodology

As mentioned above, communities were split into three groups corresponding to high, medium and low for each of the program design and contextual factors. To begin, analysis of variance was employed to test for significant differences in household-level and child-level factors. The Kruskal Wallace nonparametric analysis of variance test was used. Though this is a relatively weak test, it is valid when used with ordinal data. In addition, cross tabluations and chi-square tests of significance were employed to test for relationships between design factors and contextual factors at the community level.

Subsequently, analysis was conducted to test for the effect of program design factors and contextual factors on household/child participation in growth monitoring. This was done first by employing a covariance structure model which describes growth monitoring participation. The model was tested using the structural equations program EQS. Data was then grouped according to program design or contextual factors, and the model run on each subset of data. Comparisons could then be made between path coefficients in order to determine the effect of the community-level factor on the strength of relationships hypothesized in the model.

The final step of analysis was to test for interaction between program design factors and contextual factors. Data was partitioned into nine groups for each pair of factors:



Analysis of variance was conducted to check for significant differences between groups controlling for household education and wealth.

VI. HOUSEHOLD PARTICIPATION MODEL ANALYSIS

The first stage of the analysis consists of verifying the model described in Chapter IV using the Indonesian data. Various statistical tests are performed in order to estimate the strength of the associations hypothesized in the model. In later chapters, analysis will be performed on particular subsets of the data in order to estimate the strength of the same relationships in specific contextual settings.

6.1 The Relationship Between Design Factors and Execution

Analysis was performed in order to determine the determinants of a "successful" program, where success is measured by quality of execution. The first way in which "quality of execution" is measured is by comparing the SKDN statistics submitted by the community, with the sample data obtained through the survey (see Chapter V). Crosstabulations between the various design factors and quality of execution as measured by accuracy of SKDN statistics are shown in Table 6-1.

The fact that only one of the Chi-Square tests is significant is probably due to the fact that design characteristics are relatively standardized within the Indonesian program. Consequently, relatively small changes in these characteristics are unlikely to make a significant difference in success rates.

The relationship between staffing and quality of execution is significant. The fact that medium to highly staffed communities are better executed than communities where staffing is low suggests that adequate levels of staffing are important to program execution. It appears that the other program factors do not affect quality of execution, though it is important to remember that the range of these factors is limited due to standardization at the national level. If there were greater variation in the program design factors, it is likely that more significant relationship would emerge.[1]

[1] This is a hypothesis that will be pursued in during second phase site visits.

TABLE 6-1
Relationship between Program Design Factors and Quality of Growth Monitoring Execution as measured by Accuracy of SKDN Data

	Percent of communities in upper 50%[2] (N)	SIG
Support		NS
Low	47.6 (21)	
Medium	50.0 (26)	
High	51.7 (29)	
Staffing		*
Low	30.4 (23)	
Medium	69.2 (26)	
High	50.0 (26)	
Intensity		NS
Low	56.3 (16)	
Medium	52.6 (38)	
High	40.9 (22)	
Children per Post		NS
Low	54.2 (24)	
Medium	38.1 (21)	
High	43.5 (23)	

Chi-square significant at .05 (*), .001 (**).

A similar analysis was conducted where immunization coverage of ever-attenders was used as a measure of quality of program execution. Immunization coverage was selected because immunization is one of the "tangible" benefits of program participation. The findings from the analysis are shown in Table 6-2.

[2] Crosstabulation of quality of execution as measured by accuracy of SKDN data and each design factor. Quality of execution is coded "good" if accuracy falls in the upper 50% of all communities. Refer to Chapter V for details of index construction.

TABLE 6-2
Relationship between Program Design Factors and Quality of Growth Monitoring Execution as measured by Immunization Coverage of Ever Attenders

	Percent of communities in upper 50% (N)	SIG
Support		NS
Low	44.8 (29)	
Medium	51.6 (31)	
High	54.5 (33)	
Staffing		NS
Low	40.0 (29)	
Medium	53.1 (31)	
High	56.7 (33)	
Intensity		NS
Low	37.5 (24)	
Medium	52.3 (44)	
High	60.0 (25)	
Children per post		NS
Low	66.7 (27)	
Medium	45.8 (24)	
High	55.6 (27)	

Chi-square significant at .05 (*), .001 (**).

Here, none of the Chi-square tests are significant, though similar patterns emerge with respect to staffing and crowding. Once again, if there were more variation in the program design factors, it is likely that significant relationships would emerge.

Next, the relationship between program design factors and attendance and participation indicators is examined.

TABLE 6-3
The Relationship Between Program Design Factors and Attendance Indicators

	Percent Ever Attend	Avg. Rate Attendance
Support		
Low	56	29
Medium	65	39
High	54	31
Staffing		
Low	43	23
Medium	72	39
High	56	36
Intensity		
Low	46	25
Medium	65	37
High	56	31
Children per Post		
Low	69	42
Medium	60	34
High	52	29

ANOVA controlled for woman's education and household wealth. All tests significant at .001.

Table 6-3 shows the percent of *balita* that have ever attended the weighing post and the average rate of attendance in each of the groups.

Note that children per weighing post is the only program design factor where attendance percentages are consistent. As the number of *balita* for which the weighing post is responsible decreases, the percent that have ever attended and the average rate of attendance increases. This probably has to do with crowding at the weighing posts, which adds to the time which it takes the mother to complete all activities.

In the cases of support, staffing and intensity, the low level of each produced the lowest rates of attendance. One explanation is that there is a threshold level of each--that beyond a certain level, the program design factor need not be increased because attendance will not continue to increase. A second possibility us that there are confounding factors that

explain the differences. The fact that attendance does not increase as the level of design factor increase from medium to high suggests that there are factors outside those being examined that limit the rate of attendance.

6.2 The Relationship Between Execution and Outcome Variables

Next the effect of quality of execution on attendance, knowledge, practice and nutritional status is examined. It is hypothesized that a well executed program will be a well attended program.

TABLE 6-4
The Relationship between Quality of Execution as Measured by Accuracy of SKDN Data and Program Attendance, Knowledge, Practice and Nutritional Status

OUTCOME INDICATOR	SIG
PROGRAM:	
Percent ever attend	**
Avg. rate of attend	**
KNOWLEDGE:	
Nutrition	(*)
Health	**
Infant	(*)
PRACTICE:	
Nutrition	(**)
Nutrition History	**
Family Planning	**
NUTRITIONAL STATUS:	
HAZ	NS
WHZ	(*)
WAZ	NS

Kruskal-Wallace Analysis of Variance
* Significant at .05
** Significant at .001
( ) No longer significant when controlled for woman's education and family wealth.

This analysis is reassuring in that it shows that a well-run program is significantly related to attendance, as well as to high nutrition-related knowledge and practice. The model is less clear cut when the relationship between good program execution and nutritional status is examined. However, as mentioned earlier, there are many intervening variables which can influence nutritional status outside the bounds of the program.

Table 6-4 shows that family wealth and mother's education are confounding factors to some extent. However, at the same time it is clear that quality of execution is still significantly related to attendance variables. What is reassuring is that quality of execution remains a significant factor, even when these other factors are statistically controlled.

The same analysis was performed using immunization coverage as the measure of quality of execution. The results are shown in Table 6-5.

TABLE 6-5:
The Relationship between Quality of Execution as Measured by Immunization Coverage of Ever-Attenders and Program Attendance, Knowledge, Practice and Nutritional Status

OUTCOME INDICATOR	SIG
PROGRAM:	
Percent Ever Attend	**
Avg. rate of attendance	**
KNOWLEDGE:	
Nutrition	**
Health	**
Infant	**
PRACTICE:	
Nutrition	**
Nutrition History	**
Family Planning	(*)
NUTRITIONAL STATUS:	
HAZ	(*)
WHZ	NS
WAZ	**

Kruskal-Wallace Analysis of Variance
* Significant at .05
** Significant at .001
( ) Not significant when controlled for mother's education and household wealth.

By comparing Tables 6-4 and 6-5, it is clear that immunization coverage of ever attenders is a stronger determinant of effectiveness as measured by knowledge, practice and nutritional status indices. The strong findings in both cases indicate that well executed growth monitoring and related programs have more impact on their communities.

6.3 The Influence of Attendance

Quality of execution is clearly an important factor in growth monitoring success. Another way of examining the relationship between program design characteristics, quality of execution and attendance is to look at the effect of distance to weighing post on attendance under various program-related conditions.

It is well known that the further the family resides from the weighing post, the less likely it is to have ever attended, and the less frequently it is likely to attend. This is due to the fact that the further from the post the family resides, the more effort the mother must make to attend. Consequently, distance becomes a surrogate for effort, which also in reality includes factors such as the number of children, waiting time at the post, the quality of roads, etc. Moreover, because the household must make a decision with respect to the costs and benefits of attendance, the distance it is willing to travel becomes a measure of the benefit of the program.

Figures 6-1 and 6-2 are constructed by classifying households into six distance zones based on the number of attenders within each zone.

TABLE 6-6
Distance Zones Used in Analysis on Effect of Distance to Weighing Post

ZONE	RANGE (Meters)	MIDPOINT	*Balita* Ever Attend
1	0-60	30	380
2	61-106	83	363
3	107-325	216	693
4	326-550	438	590
5	551-1100	825	538
6	1101-7500	4300	479

			3043

THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-1

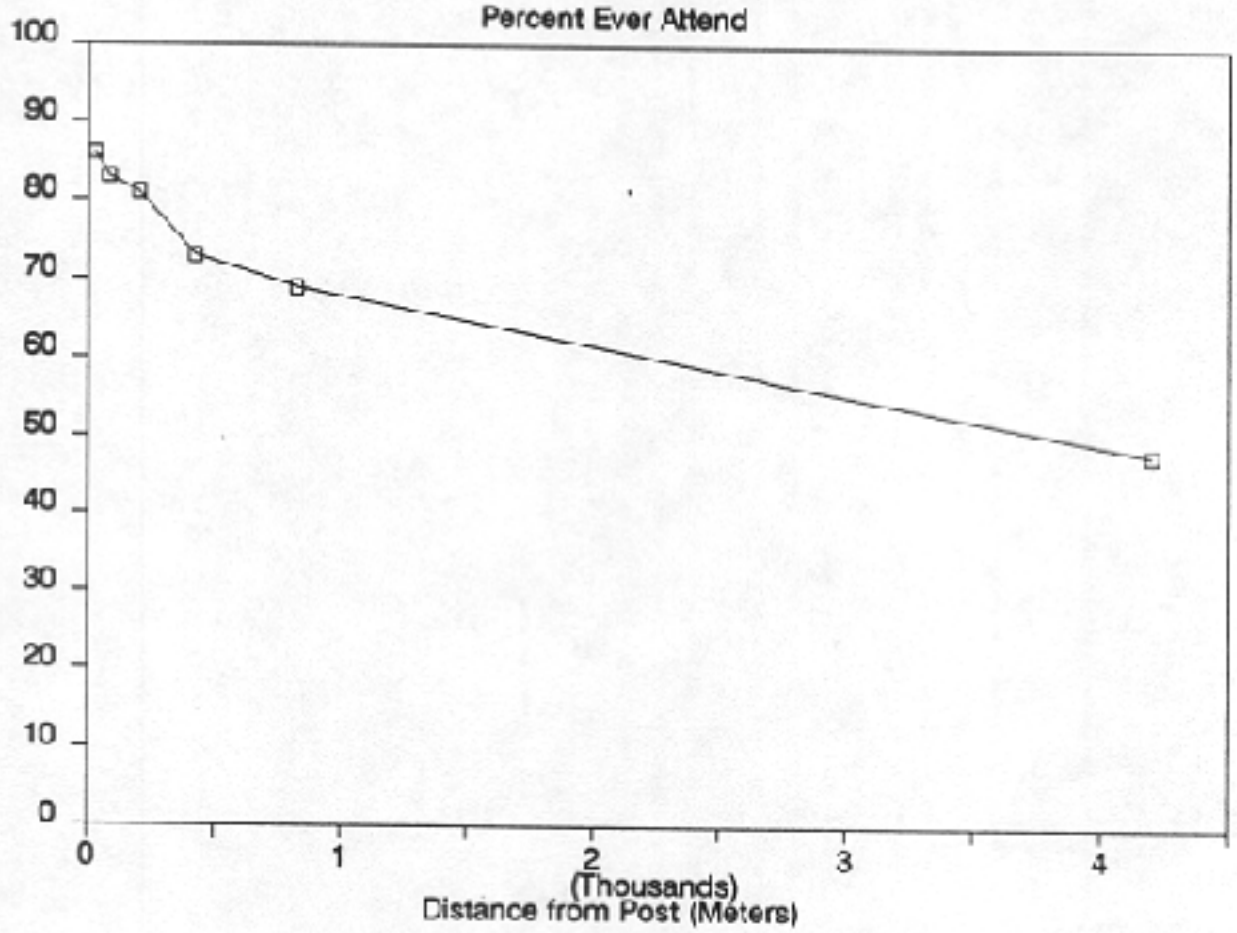
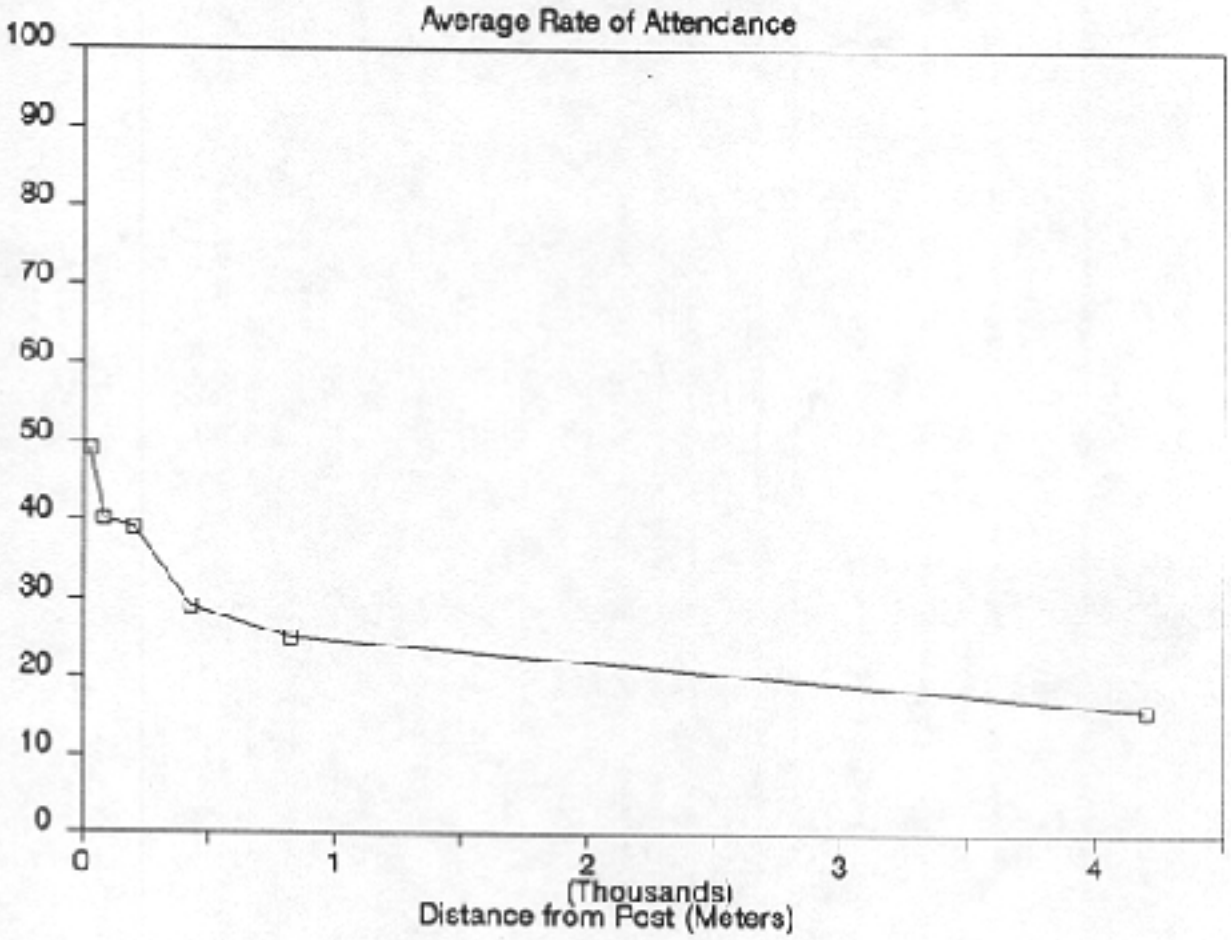


FIGURE 6-2



The percent who had ever attended the weighing post and the average rate of attendance was calculated for *balita* within each zone. These values are then plotted on an graph. The reader should note however, that this graph does not represent a scatter plot, rather depicts the effect of distance, where households are aggregated into distance zones, on mean weighing post attendance within each zone. The results of this process for all data are shown in Figures 6-1 and 6-2.

Similar figures were constructed which show the influence of the various program design factors on the efforts that households were willing to make to attend. Though it was impossible to perform tests to determine significant differences between the groups, the lines generated are telling.

Figures 6-3 and 6-4 show the influence of support of leaders on the relationship between distance and attendance. These Figures actually show that level of support has almost nothing to do with the relationship between distance to weighing post and attendance. This finding is somewhat surprising since, in Indonesia, community and program leaders are thought to have influence on program attendance. But it may also be that support for the program may be shown in ways other than attending the weighings.

Figures 6-5 and 6-6 show the influence of program staffing on the relationship between distance and attendance. The figures show that in general, people are less likely to attend programs where staffing is low. It is also clear that attendance rates are higher in communities with moderately staffed programs -- a confirmation of the finding in Table 6-3. In communities with programs with high levels of staffing, people that live close to the weighing post have high rates of attendance, yet that attendance drops off more quickly than moderately staffed programs as one moves away from the weighing post.

Figures 6-7 and 6-8 show the influence of program intensity on the relationship between distance and attendance. The level of program intensity seems to make little difference in ever attenders. Figure 6-8 reinforces the findings in Table 6-3, that moderately intense programs have the best rates of attendance over all distances.

Figures 6-9 and 6-10 show the influence of crowding on the relationship between distance and attendance. These figures show a significant finding--that distance makes less difference to attendance through the first 100 meters in communities where crowding is low, than where it is medium or high.

THE EFFECT OF LOCAL SUPPORT ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-3

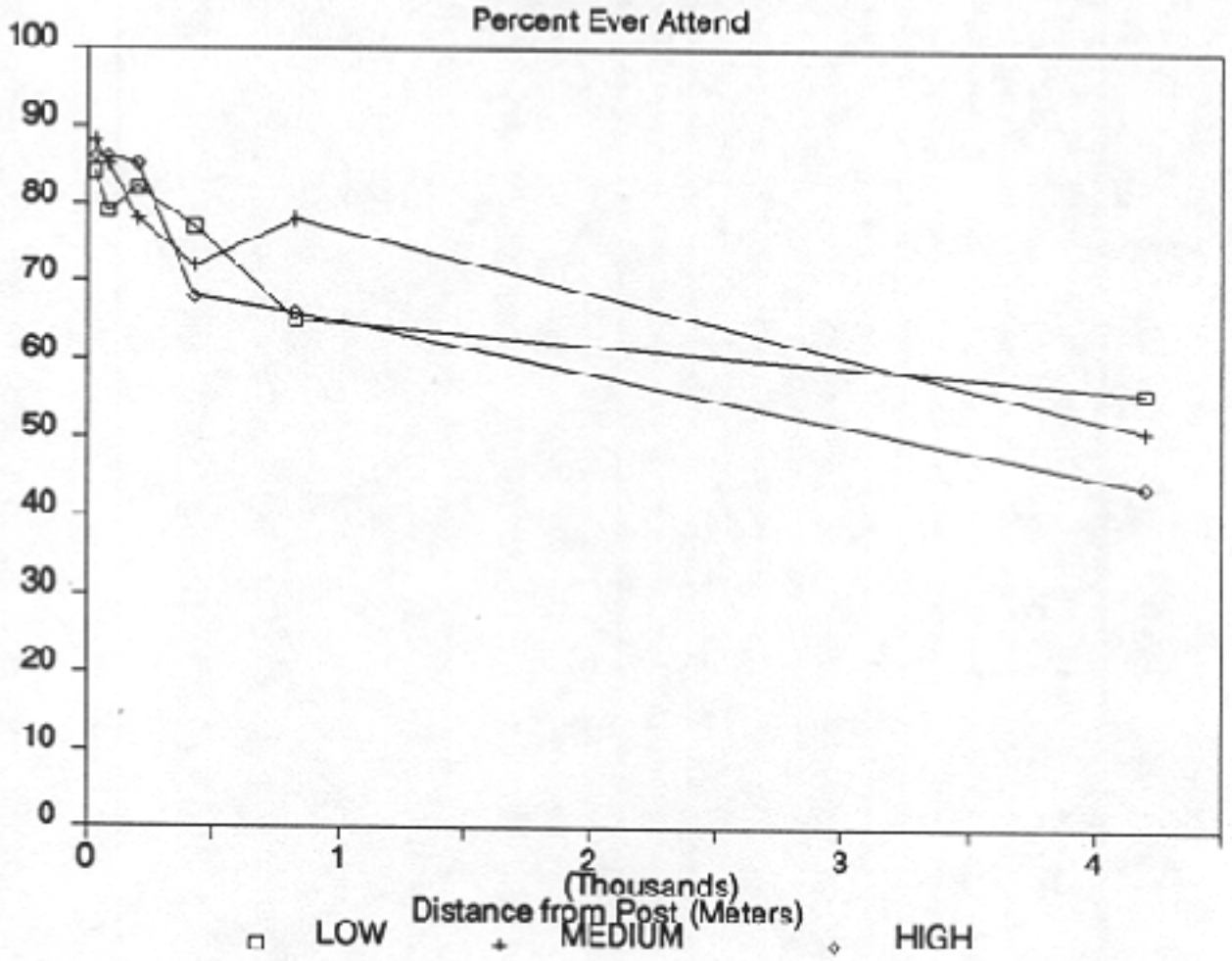
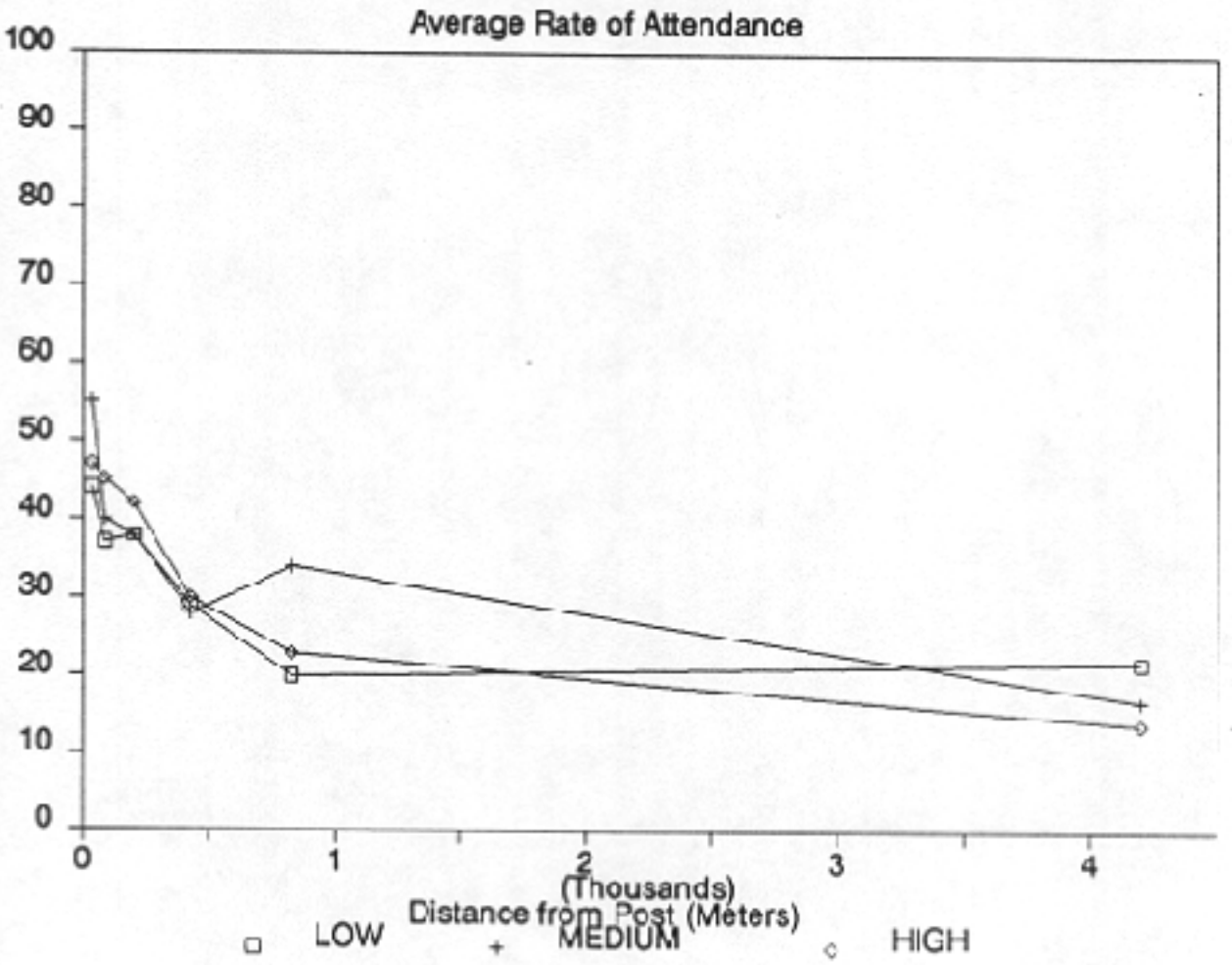


FIGURE 6-4



THE EFFECT OF STAFFING ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-5

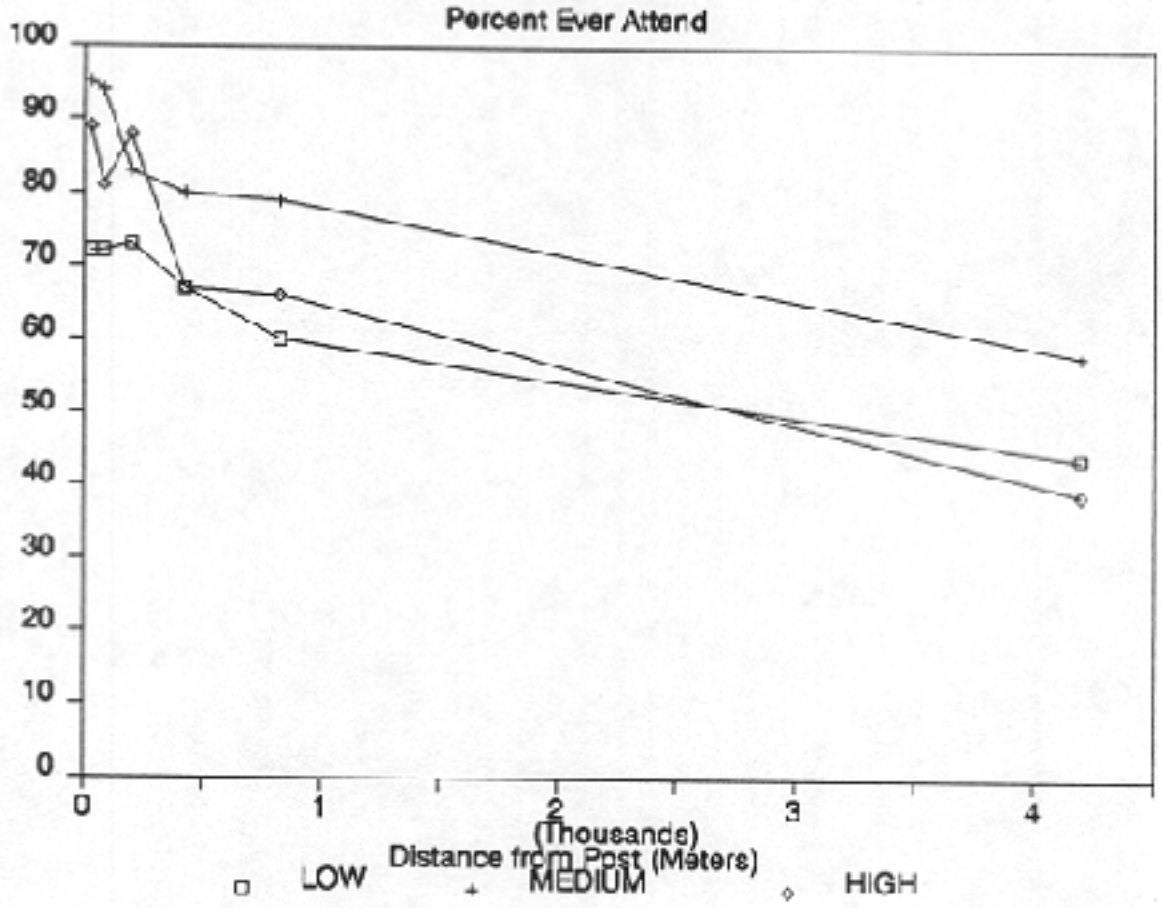
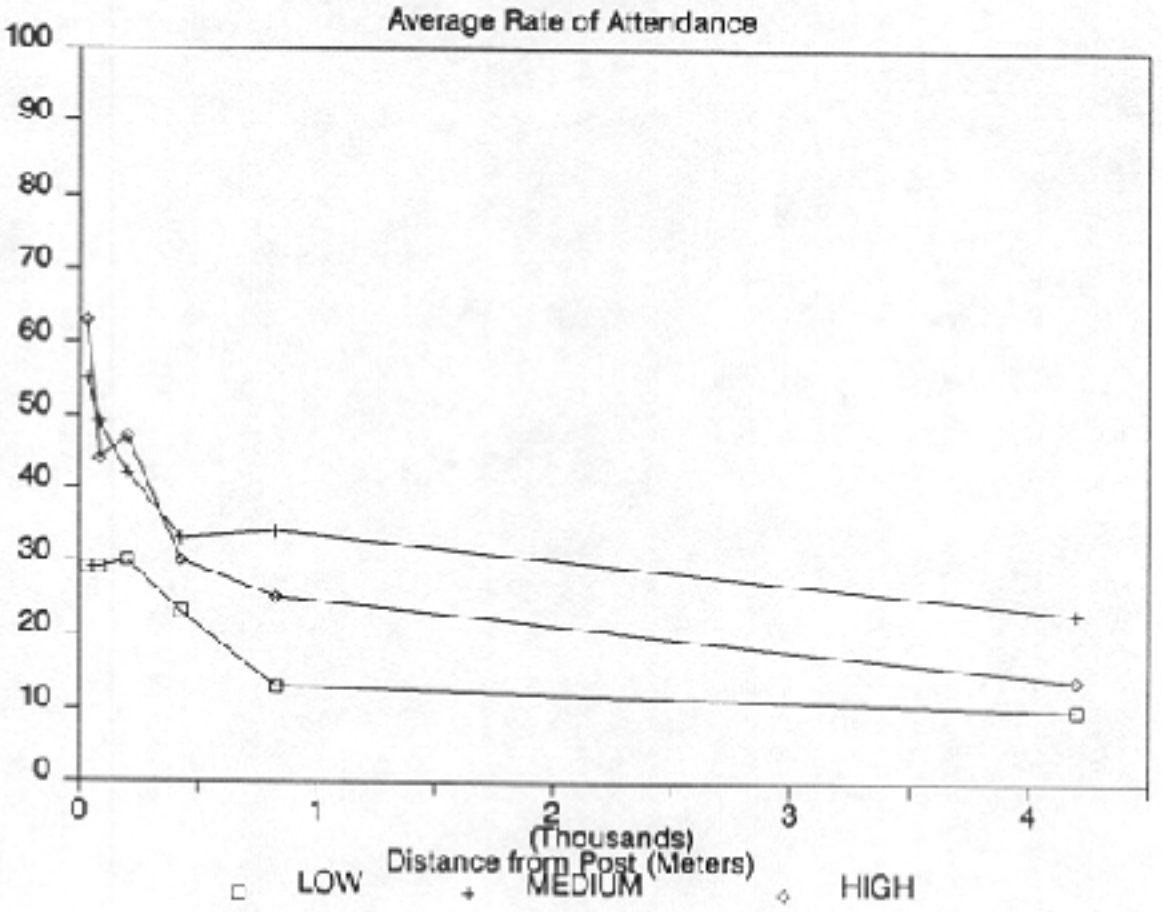


FIGURE 6-6



THE EFFECT OF PROGRAM INTENSITY ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-7

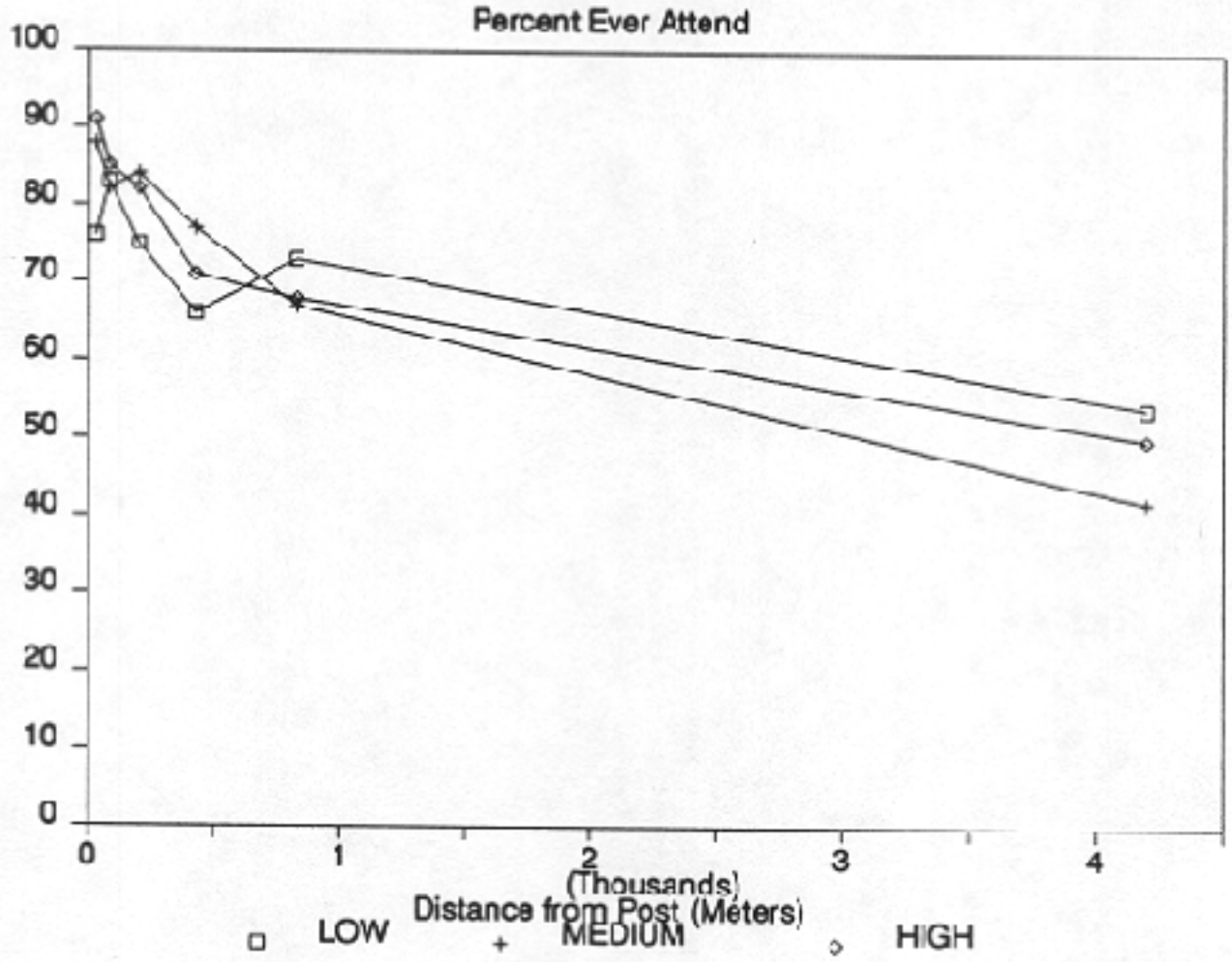
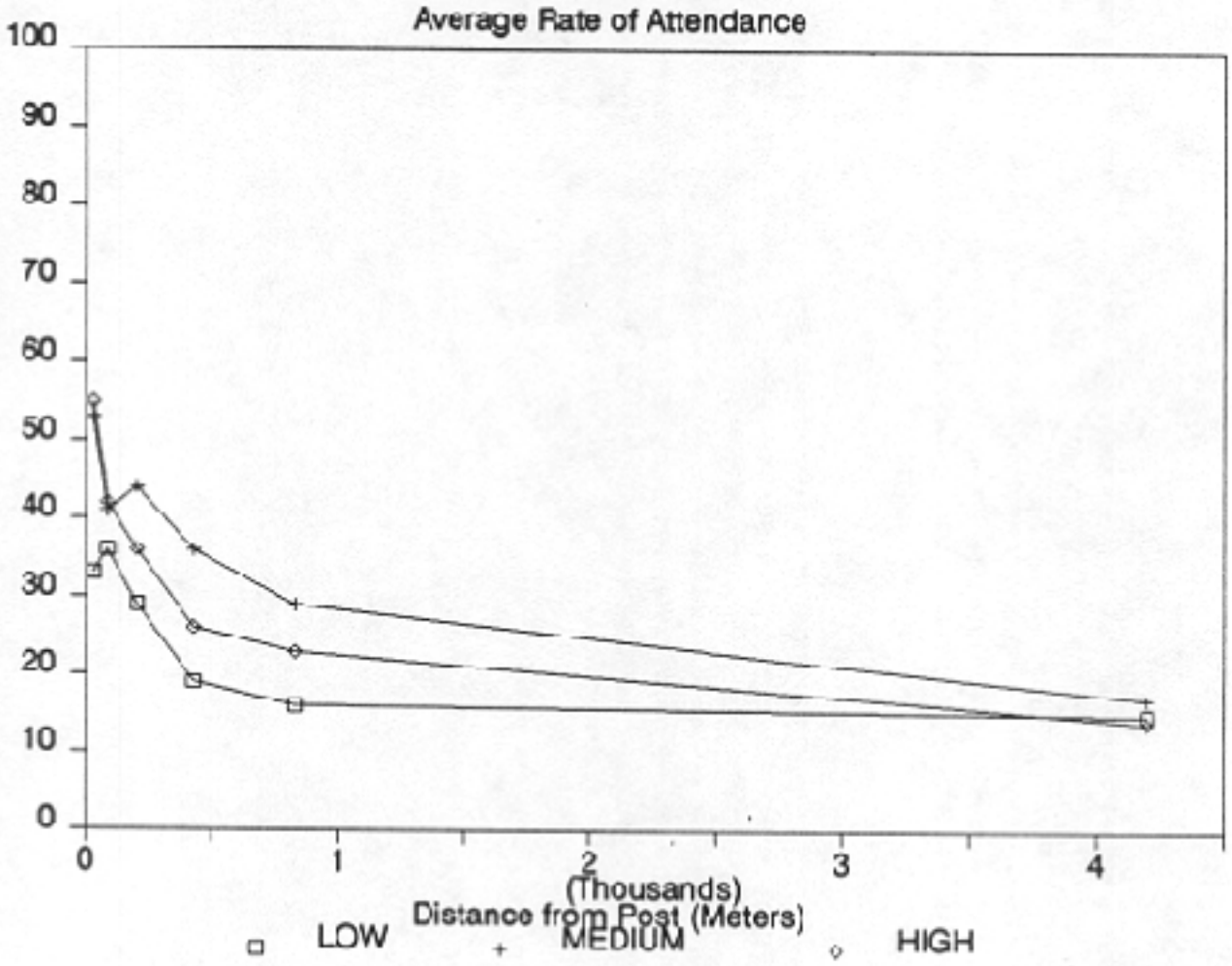


FIGURE 6-8



THE EFFECT OF CHILDREN PER WEIGHING POST ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-9

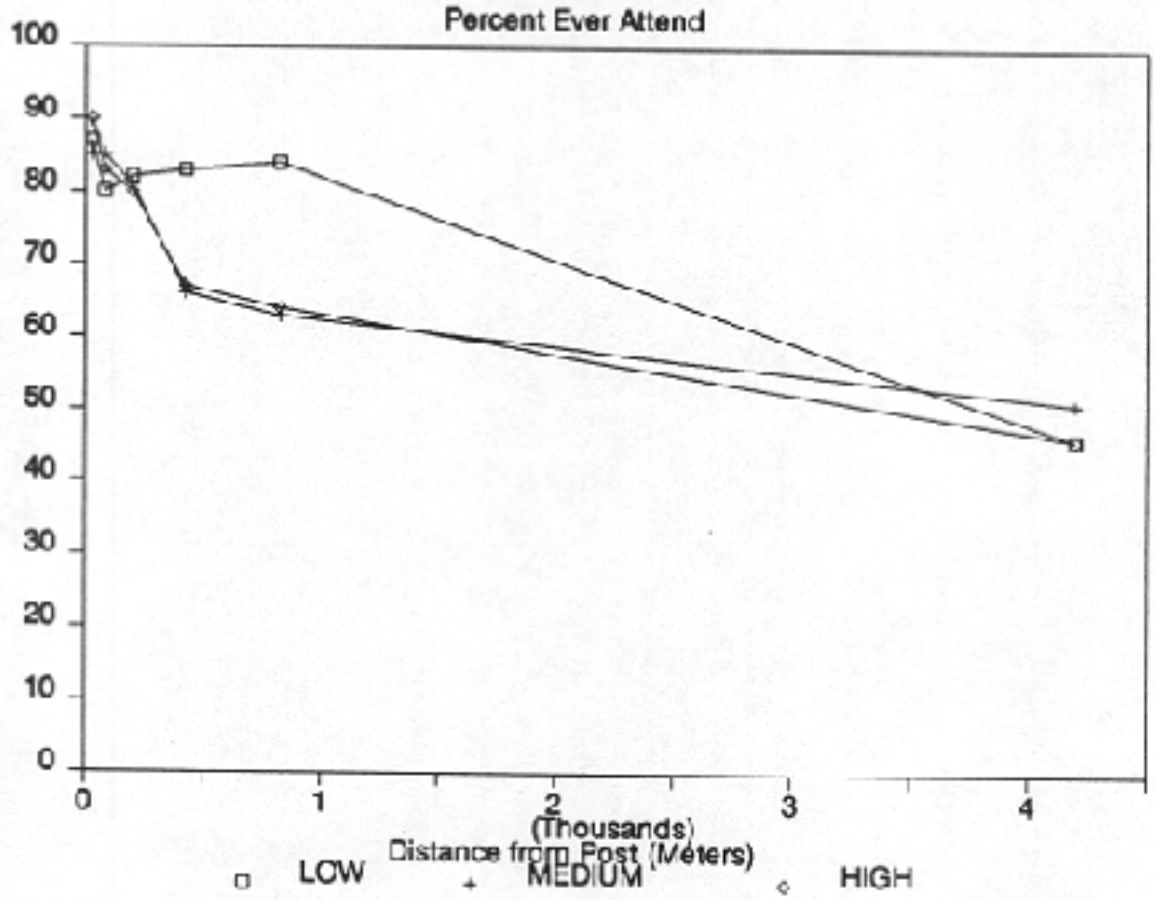
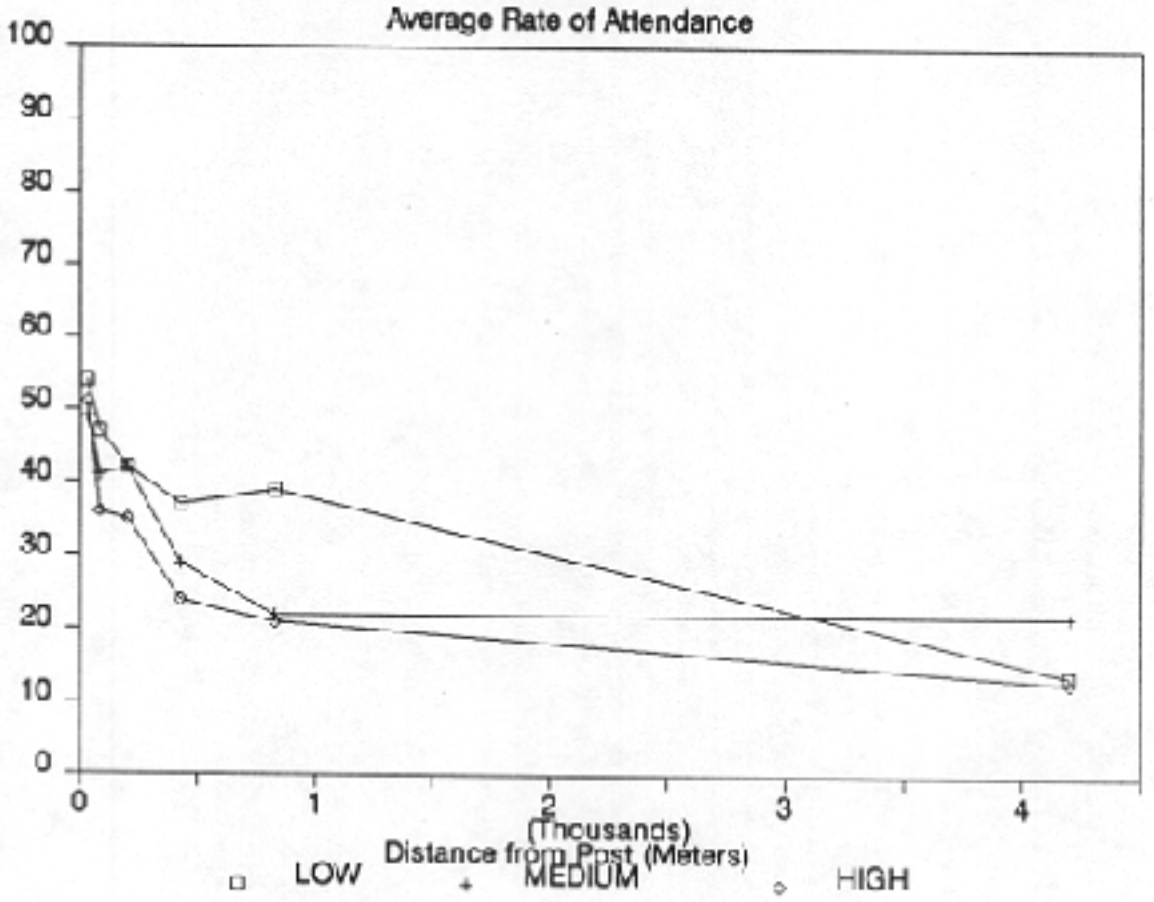


FIGURE 6-10



THE EFFECT OF ACCURACY OF SKDN STATISTICS ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-11

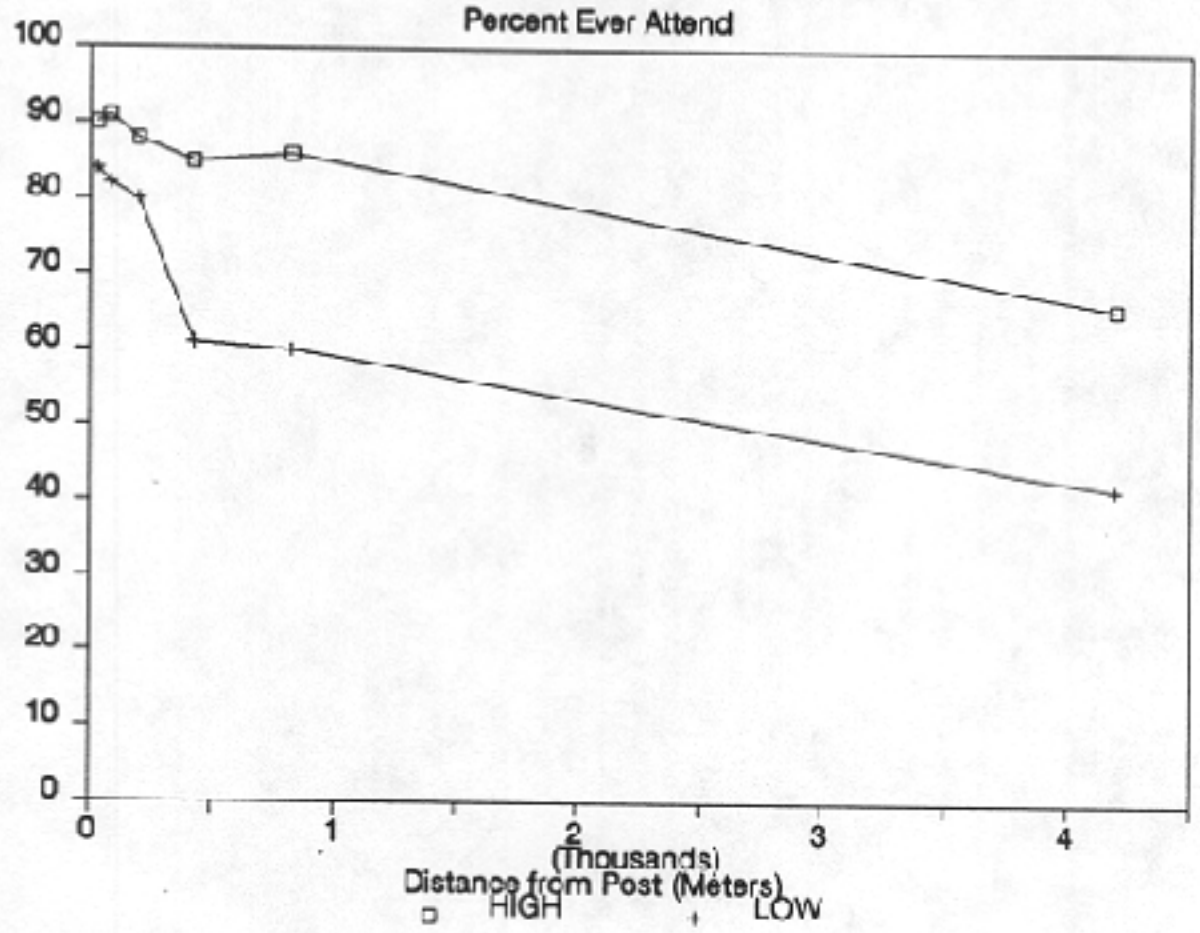
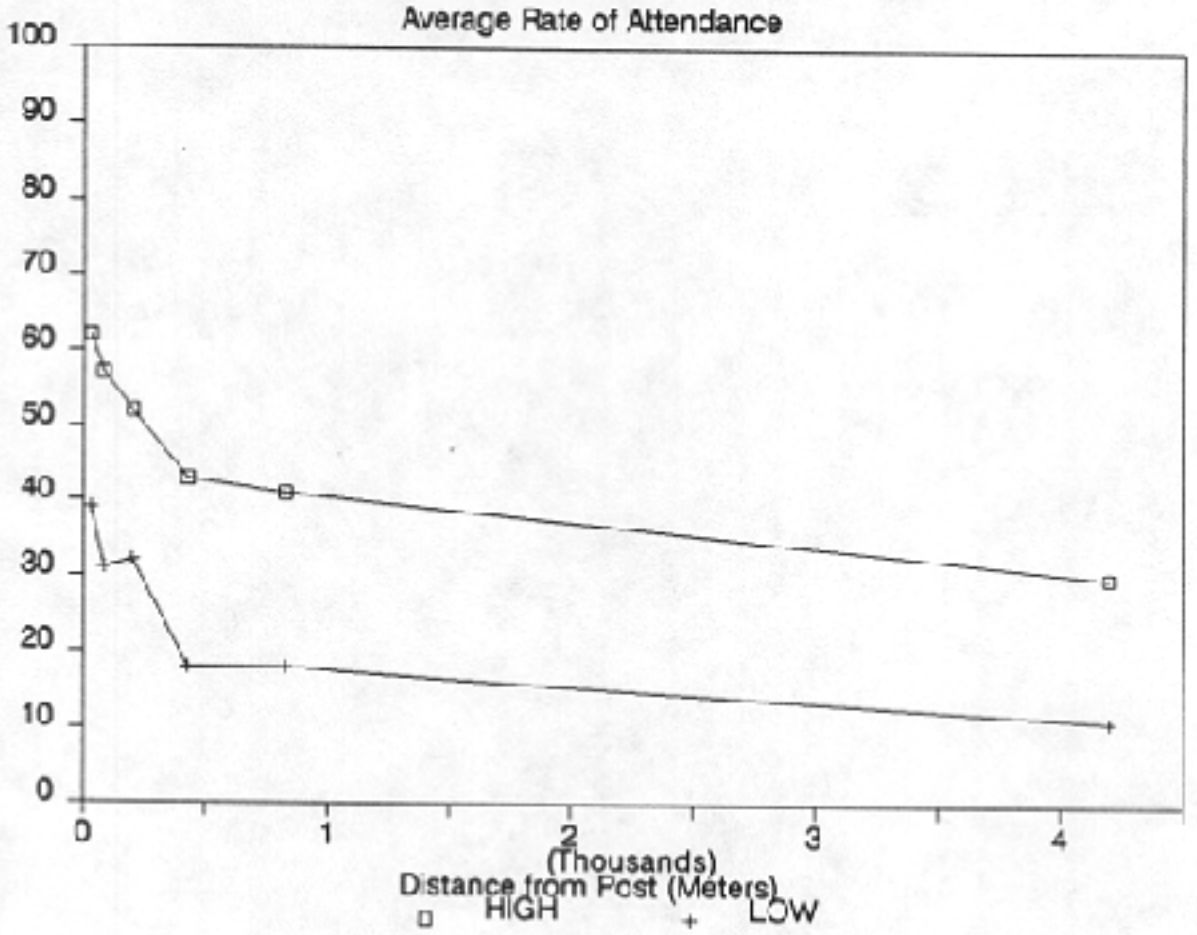


FIGURE 6-12



THE EFFECT OF IMMUNIZATION COVERAGE OF ATTENDERS ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 6-13

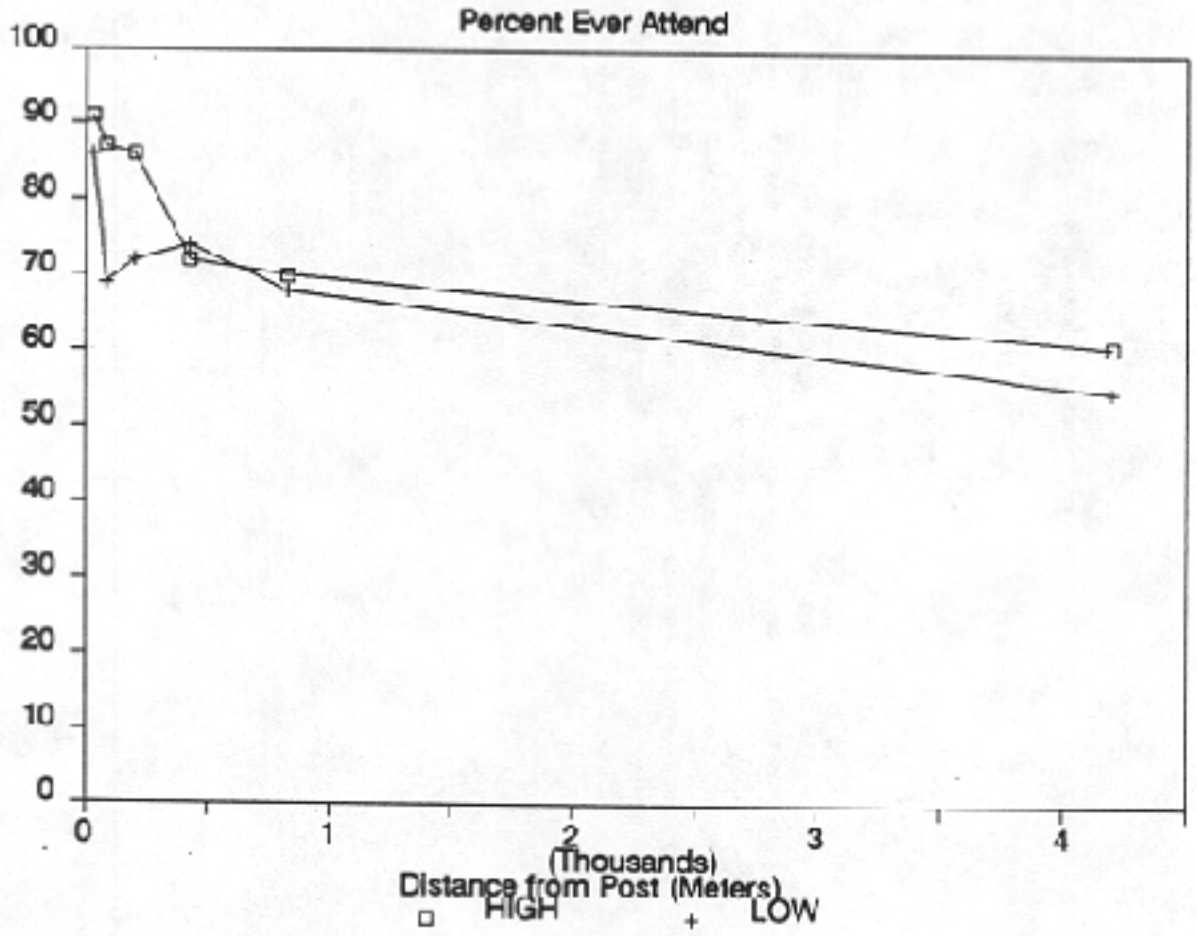
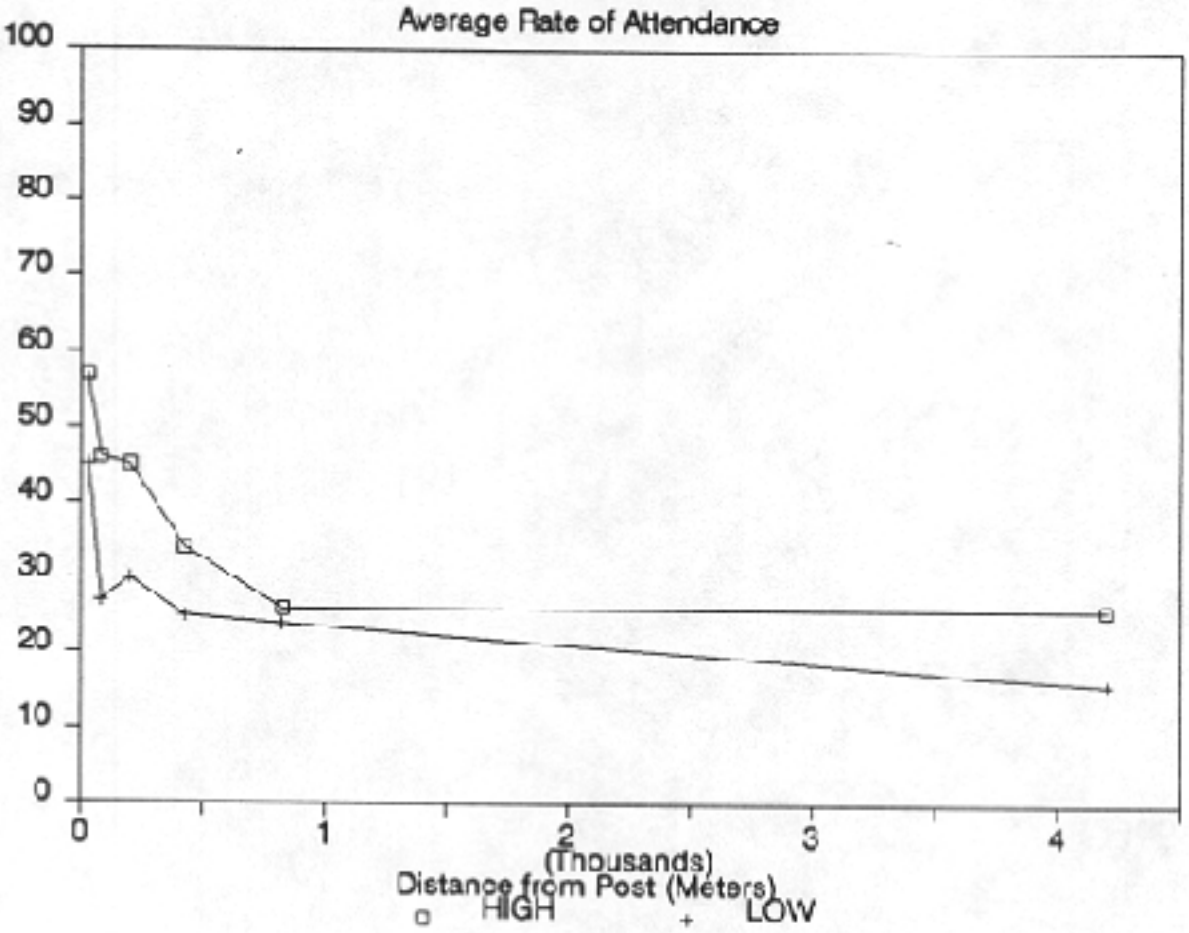


FIGURE 6-14



Figures 6-11 and 6-12 show the influence of quality of execution as measured by accuracy of SKDN statistics on the relationship between distance and attendance. Here we see that attendance is generally higher in well executed programs, and that distance has a stronger effect on ever attendance in programs where quality of execution is relatively low.

When the same analysis was conducted using immunization coverage of ever attenders as a measure of quality of execution, Figures 6-13 and 6-14 show somewhat different findings. First, we see less difference in ever attenders overall, though we see that distance (within 100 meters) has a stronger negative effect in poorly executed programs. The same pattern holds up in rate of attendance.

Next, the relationship between program attendance and knowledge, practice and nutritional status variables was examined. To do so, *balita* are split into three groups -- those that had not attended over the last 12 months, those that had attended less than half the time, and those that had attended more than half the time. The results are very encouraging, and are summarized in Tables 6-7.

TABLE 6-7
The Relationship between Program Attendance and Knowledge, Practice and Nutritional Status

OUTCOME INDICATOR	SIG
KNOWLEDGE:	
Nutrition	**
Health	**
Infant	**
PRACTICE:	
Nutrition	**
Nutrition History	**
Family Planning	**
NUTRITIONAL STATUS:	
HAZ	NS
WHZ	NS
WAZ	NS

Kruskal-Wallace Analysis of Variance
* Significant at .05
** Significant at .001

All significant relationships shown above, are found to be highly significant when controlled for woman's education and family wealth.

6.4 The Household Participation Model

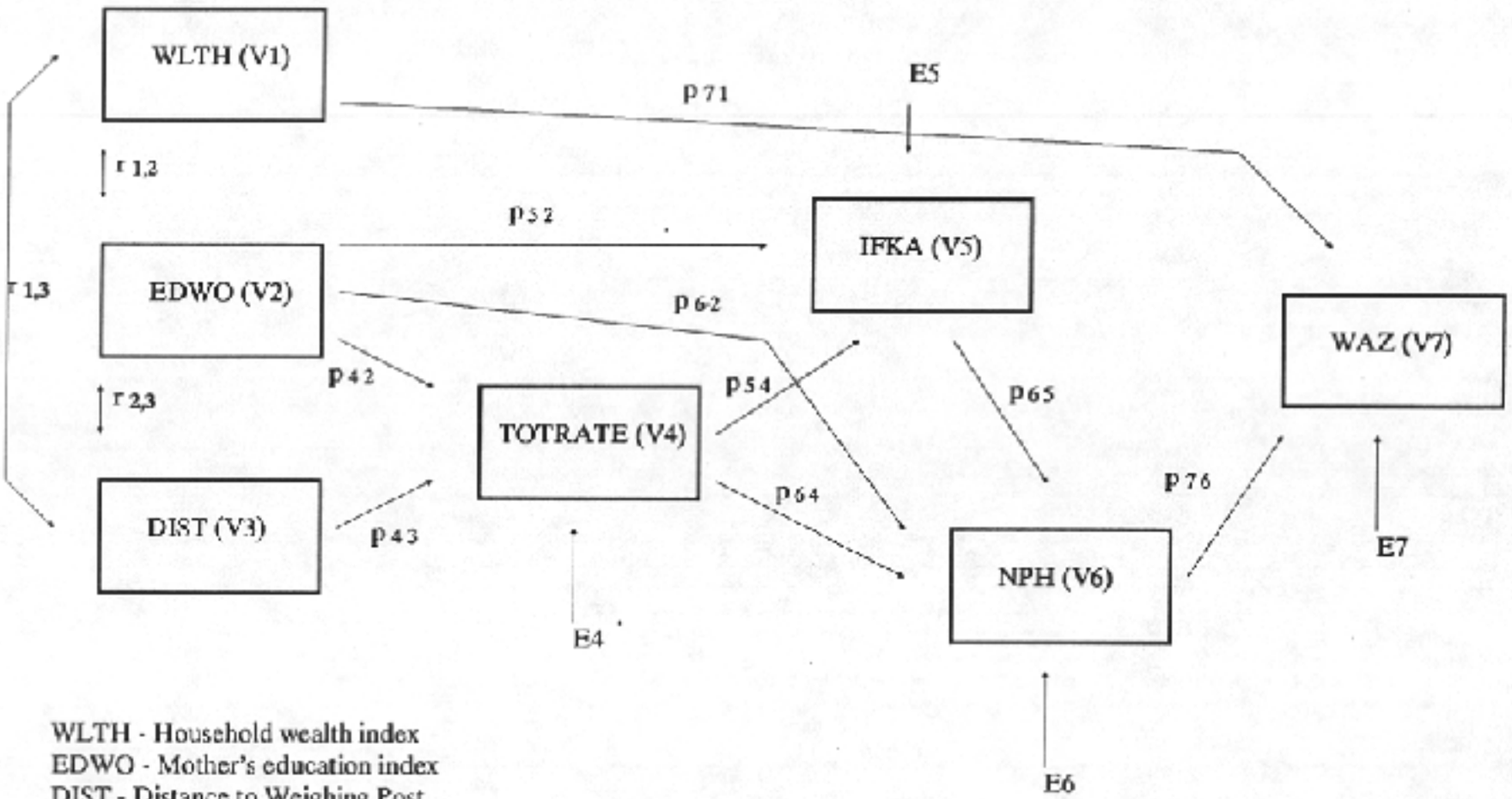
The final step in the analysis is to incorporate the findings up to this point, with factors which influence the household's decision to attend. A path diagram of this model is shown in Figure 6-15. Path analysis was used to estimate the parameters of the model using data from all households.

Much of the justification for the model has been outlined earlier (see Chapter IV). The model presents household wealth and mother's education as being important background factors. Note however, that the hypothesis is that mother's education effects program participation (rate of attendance, infant nutrition knowledge, and infant nutrition practice history), while family wealth influences the nutritional status of the child. Single indices are selected to represent knowledge, practice and nutritional status so as to simplify the model. Additional information would not result from incorporating multiple measures of these concepts into the structural model.

At the center of this model are the three important legs of the program: rate of attendance, infant nutrition knowledge and infant nutrition practice history. By using indices which reflect past activities (rate of attendance, nutrition practice history, and nutrition knowledge which is determined based on the mother's knowledge of when solid foods should be introduced, etc.) longitudinal information is introduced into the model. Finally, the relationship between nutrition practice history and nutritional status is depicted as the last link in the model. Analysis up to this point suggests that this final association will not be a strong one.

The model represented in Figure 6-15 can be defined in terms of structural equations. Each uni-directional arrow represented in the diagram can be thought of as a path which can be represented by a coefficient. Each bidirectional arrow represents a correlation, which must be taken into account when the path coefficients are determined. Where an arrow does not appear in the path diagram (for example between household wealth (WLTH) and rate of attendance (TOTRATE)), it is implied that the path coefficient is equal to zero.

FIGURE 6-15: PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

The path coefficients are determined on the basis of the covariance matrix of all variables included in the model. This model is over-identified, which means when the structural equations, variances and covariances are used to determine the paths, there are more equations than unknowns. The model has 15 free parameters which must be estimated, and 21 degrees of freedom.

There are a number of statistical methods which have been developed which estimate the coefficients. An advantage of using an over-identified model is that a solution can be reached, and an assessment can be made as to the goodness of fit. The estimation of coefficients in an over-identified model must be done using some method which uses an appropriate criterion for minimizing error. When a just-identified model is employed, a solution can be determined, but no goodness of fit assessment can be made. If the model is underidentified, no unique solution can be found.

The model in Figure 6-15 can be expressed as the following structural equations:

$$V_4 = p_{42}V_2 + p_{43}V_3 + E_4$$

$$V_5 = p_{52}V_2 + p_{54}V_4 + E_5$$

$$V_6 = p_{62}V_2 + p_{64}V_4 + p_{65}V_5 + E_6$$

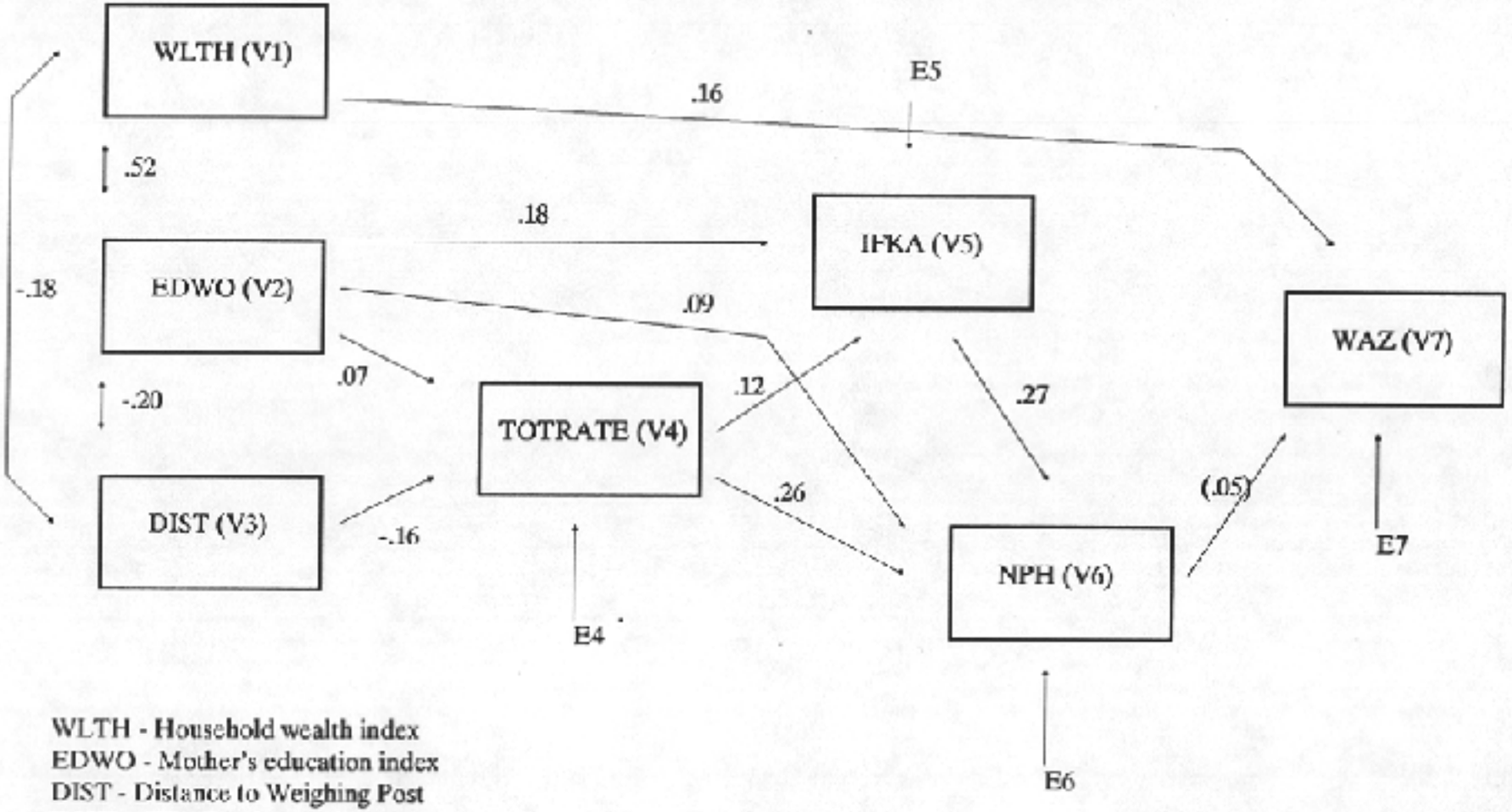
$$V_7 = p_{71}V_1 + p_{76}V_6 + E_7$$

Furthermore, as represented in the path diagram, V_1, V_2 and V_3 are correlated with each other.

The Structural equations program EQS [3] was employed to estimate the path coefficients using the maximum likelihood method. The results of the analysis are shown in Figure 6-16. Note that the path coefficients represented in the diagram are standardized. This was done so as to reduce the problem of scale determination.

[3] Version 2.0, (c) 1985, BMDP Statistical Software, Inc. 1440 Sepulveda Boulevard, Los Angeles, CA 90025 USA. See Bentler, P.M. "Theory and Implementation of EQS -- A Structural Equations Program." BMDP Statistical Software, August, 1985.

FIGURE 6-16 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

These path coefficients, like standardized regression coefficients, can be thought of as a measure of the strength of a relationship (or the percent of variance in the dependent variable explained by the independent variable). Thus, in the overall model, a relatively strong relationship between household wealth (WLTH) and nutritional status (WAZ) appears. At the same time, a relatively weak relationship between woman's education (EDWO) and rate of attendance (TOTRATE) exists. Not surprisingly, the data reveal a strong positive correlation between woman's education (EDWO) and household wealth (WLTH), and a relatively strong negative relationship between distance to weighing post (DIST) and rate of attendance (TOTRATE).

It should be mentioned at this point that there are some limitations in using structural analysis with this type of model. First, like all regression-related analysis, there are assumptions regarding the variables used in the model. The first is that all variables are interval scale and normally distributed. As discussed in Chapter V, many of the variables in this model are indices based on responses to a number of survey questions. These indices are probably more appropriately thought of as ordinal scale variables. This adds to the imprecision of model estimation.

Second, the assumption that all relationships are linear must be met. This assumption cannot be met in its strictest sense. Analysis has already shown that the relationship between distance to weighing post (DIST) and rate of attendance is not a linear one (TOTRATE), nor is it expected to be.

Third, it is not expected that the data fit the model well due to intervening factors which are not represented in the model, and consequently, the limitations of endogenous variables to explain a high percentage of the variance of outcome indicators. Thus, the percent of variance that is explained by factors in the model may seem low when compared to natural science models where there is a stronger foundation of causality.

At the same time, when compared to other social models, the fit is quite good. Two tests of significance are performed on goodness of fit. The first, a chi-square statistic, suggests that there is a low probability that the model is a correct one (.001). This is probably due to the relatively large sample size. Bentler[4] has pointed out the limits of the chi-square statistic as a goodness-of-fit test with large samples.

[4] "In very large samples, the most trivial discrepancy between model and data will require rejection of a model by the [chi-square] test. This test has drawbacks, since it is affected by the extent to which crucial assumptions such as multinormality and linearity are violated."

The second test, the Bentler-Bonett fit indicator, compares the model against the null hypothesis of complete independence. A Bentler-Bonett value of 9.7 was calculated for this model, well above the standard cutoff of 9.0. Consequently, though the model is not a perfect one, it is very good for a social science model, and will be useful to us here.

All path coefficients are found to be significantly different than zero, except p_{76}, the path between nutrition practice history (NPH) and nutritional status (WAZ). This comes as no surprise, given the large number of intervening variables in this relationship, and findings up to this point regarding the link between nutrition practice and nutritional status. This finding also fuels the argument for using more immediate indicators of growth monitoring effectiveness such as knowledge and practice indices.

To examine the influence of program design factors, this same analysis is run, using subsets of data, thereby controlling for the program design factor under examination. The methodology employed was to compare the upper third of the communities to the bottom third, by looking at differences in the path coefficients. Though the analysis was run on the entire model, only output related to program factors (TOTRATE, IFKA, NPH) is examined here. Distance to weighing post has not been included in this output because a more in-depth analysis on the relationship between distance to weighing post and attendance was completed above.

The differences in the relationship between rate of attendance (TOTRATE) and infant nutrition knowledge (IFKA) (p_{43}) are consistent and positive. In all cases, rate of attendance has a stronger positive influence on knowledge in communities where design factors are high. This confirms findings presented in Table 6-7.

The opposite is true for the relationship between infant nutrition knowledge (IFKA) and nutrition practice history (NPH). That is, though the relationship is strong in all cases, it does not vary according to the program design factors. These two findings suggest that the relationship between knowledge and practice is a strong, positive one, but is not affected by the design of the program. The crucial link here seems to be that between attendance and knowledge.

Bentler, P.M. *Multivariate Analysis with Latent Variables: Causal Modeling*. Annual Review of Psychology, 1980. 31:419-56.

TABLE 6-8
The Influence of Program Design Factors on the Household's Participation in Growth Monitoring and Related Activities

DATA	p_{54}	p_{65}	p_{64}	$p_{65}p_{54}+p_{54}$
All (n=803)	.12	.27	.26	.29
Support				
low (n=244)	(.10)	.23	.42	.44
high (n=292)	.19	.25	.29	.34
Staffing				
low (n=233)	(.02)	.32	.25	.26
high (n=222)	.30	.33	.34	.44
Intensity				
low (n=136)	(.01)	.24	.20	.20
high (n=250)	.18	.23	.40	.44
Crowding				
low (n=164)	.24	.27	.25	.31
high (n=332)	.08	.29	.25	.27

p_{54} TOTRATE --> IFKA
p_{65} IFKA --> NPH
p_{64} TOTRATE --> NPH
$p_{65}p_{54}+p_{54}$ Total effect (direct and indirect) of TOTRATE on NPH

( ) indicates not significantly different from zero.

The third column lays out the differences in the relationship between attendance and nutrition practice history, controlled for knowledge. This path coefficient reflects changes in practice not related to (or controlled for) infant nutrition knowledge. Though it is hard to explain these differences using cross-sectional data, intuitively this path would represent changes in nutrition practice history due to social pressure (deference to authority), or perhaps direct training (demonstration) with no educational component. This coefficient represents, in part, the synergistic relationship between knowledge and practice -- the notion that knowledge reinforces practice, which reinforces knowledge, etc.

The fourth column represents the total effect of attendance on nutritional practice history. This value is calculated by adding the direct influence (p_{64}) to the indirect influence -- ($P_{65}P_{54}$). These coefficients are important because they reflect the total effect (direct and indirect) of growth monitoring attendance on nutrition practice history.

If the network of relationships are examined with respect to each of the design factors, some interesting findings emerge. When program support is high, variance in nutrition practice history is explained through both infant nutrition knowledge, and direct participation in the program. When support is low on the other hand, all explained variance in practice is explained through direct participation in the program--none of the explanation occurs through knowledge. Surprisingly, however, the total effect of attendance on nutrition practice history is stronger in communities where support is low -- due to the much stronger direct effect (controlled for education) of attendance on practice. This last finding is a difficult one to explain, and perhaps it is due to some intervening variable.

When staffing is high, variance in nutrition practice history is explained through both infant nutrition knowledge, and direct participation in the program. When staffing is low on the other hand, explained variance in practice is explained only through direct participation in the program. Here it appears that programs that are not well staffed do not successfully educate mothers. Overall, the total effect of attendance on nutritional practice history is stronger in communities where staffing is high.

When intensity is high, variance in nutrition practice history is explained through both infant nutrition knowledge, and direct participation in the program. When intensity is low, explained variance in practice is explained only through direct participation in the program. Here it appears that low intensity programs do not effectively educate participants. Overall, the total effect of attendance on nutritional practice history is stronger in communities where program intensity is high.

When crowding is low, variance in nutrition practice history is explained through both infant nutrition knowledge, and direct participation in the program. When crowding is high, all explained variance in practice is explained only through direct participation in the program. Here it appears that crowded programs do not do an effective job of education. Notice here that crowding has no effect on the direct relationship between attendance and practice (controlled for education). Overall, the total effect of attendance on nutritional practice history is slightly stronger in communities where staffing is high.

6.5 Findings with Respect to the General Model

(1) The accuracy of SKDN statistics is best in communities where the level of staffing is moderate to high.

(2) Local support has little effect on attendance.

(3) Communities where the level of staffing is medium to high have the highest levels of attendance.

(4) Communities where the level of intensity is medium to high have the highest levels of attendance.

(5) Communities where the level of eligible *balita* per weighing post is low have the highest levels of attendance.

(6) Quality of execution is important to all outcome indicators. This quality of execution is more significant when measured by immunization coverage than by quality of SKDN statistics. This suggests that quality of related services, especially tangible services, are important to growth monitoring success.

(7) Crowding and quality of execution clearly influence the distance a household is willing travel to participate in growth monitoring. Other design factors do not appear to influence this relationship significantly. In any case, it appears that to maximize attendance, weighing posts should exist within one kilometer of the majority of households.

(8) Program attendance is significantly related to all knowledge and practice variables, but not to any nutritional status indicators. The combination of relatively high nutritional status and a large number of intervening variables may mask relationships between nutrition programs and nutritional status. One policy implication in this regard may be to avoid using an indirect indicator such as nutritional status as a measure of program effectiveness under certain conditions. Instead, evaluators might focus on more direct indicators such as knowledge of program messages, attendance rates, and immunization coverage.

(9) The relationship between program attendance and nutrition knowledge and practice is a relatively strong on in Indonesia, as exemplified by the path coefficients generated through path analysis. This analysis shows that the relationship between knowledge and practice is a consistent one under all levels of program design factors (we would expect this intuitively). Yet, there is great variation in the relationship between attendance and knowledge suggesting that the strength of the educational component of growth monitoring in Indonesia

is dependent on adequate levels of support, staffing, intensity and low levels of crowding.

(10) In general, when program design factors are adequate, there appears to be substantial education which, in turn, is strongly related to practice. In addition, these well designed programs also appear to have significant impact on nutritional practice outside of education. On the other hand, weaker programs appear to have ineffective educational components, and all change in nutritional practice comes directly through participation in the program, and not through education.

VII. THE EFFECT OF COMMUNITY MODERNIZATION

7.1 The Effect of Modernization on Household-Level Factors

To begin, it is important to describe the differences in household conditions according to the level of community modernization in order that the influence of the modernization and the influence of the program can each be isolated.

TABLE 7-1
The Effect of Level of Community Modernization on Household Factors

	MEAN	SIG
Household Wealth Index		*
Low Modernization	14.9	
Medium Modernization	15.0	
High Modernization	16.9	
Woman's Education Index		**
Low Modernization	1.8	
Medium Modernization	1.9	
High Modernization	2.4	
Distance to Weighing Post (Meters)		**
Low Modernization	836	
Medium Modernization	663	
High Modernization	421	

ANOVA significant at .05 (*), .001 (**).

It is not surprising to find that there are significant differences in household background factors. The average household wealth and average level of woman's education is significantly lower in less modern communities. In addition, the average distance to the weighing post is significantly greater in less modern communities. This is probably due to the fact that many of the less modern communities are agricultural communities, where settlement is less dense.

Next, differences in program factors are presented.

TABLE 7-2
The Effect of Level of Community Modernization on Growth Monitoring Attendance

PROGRAM ATTENDANCE	MEAN	SIG
Percent Ever Attend		*
Low Modernization	55	
Medium Modernization	62	
High Modernization	58	
Average Rate of Attendance		NS
Low Modernization	30	
Medium Modernization	35	
High Modernization	33	

ANOVA significant at .05 (*), .001 (**).

The pattern in "percent ever attend" of communities that are moderately modern having the highest attendance is worth comment. This may be due to the fact that in less modern communities, the distance and difficulty of travel reduces attendance, and in more modern communities, people are wealthy enough to not need program services. At the same time, modernization alone appears to have no significant effect on the average rate of attendance. Given the differences in the households described above, this finding is surprising.

TABLE 7-3
The Effect of Level of Community Modernization on Growth Nutrition-Related Knowledge

KNOWLEDGE	MEAN	SIG
Nutrition Knowledge Index		*
Low Modernization	10.4	
Medium Modernization	10.5	
High Modernization	10.9	
Health Knowledge Index		**
Low Modernization	21.2	
Medium Modernization	23.5	
High Modernization	29.1	
Infant Nutrition Knowledge Index		NS
Low Modernization	7.3	
Medium Modernization	7.2	
High Modernization	7.2	

ANOVA significant at .05 (*), .001 (**).

When the influence of modernization on knowledge indices is described (Table 7-3), a clear and significant pattern emerges – knowledge is greater in the more modern communities. On the other hand, modernization appears to make little difference with regard to infant nutrition knowledge. This may have to do with the tendency to bottle feed in more modern communities.

TABLE 7-4
The Effect of Level of Community Modernization on Nutrition Practice

PRACTICE	MEAN	SIG
Nutrition Practice Index		**
Low Modernization	7.1	
Medium Modernization	7.3	
High Modernization	7.5	
Nutrition Practice History Index		**
Low Modernization	5.4	
Medium Modernization	5.4	
High Modernization	4.8	
Family Planning Practice Index		**
Low Modernization	4.4	
Medium Modernization	4.5	
High Modernization	5.1	

ANOVA significant at .05 (*), .001 (**).

Table 7-4 illustrates the effect of community modernization on nutrition-related practices. As in the case of knowledge, it appears that people in highly modern communities have better nutrition and family planning practices than people in less modern communities. The reverse is true in the case of nutrition practice history. Once again, this may be due to the tendency to bottle feed in more modernized areas.

TABLE 7-5
The Effect of Level of Community Modernization on Nutritional Status

NUTRITIONAL STATUS	MEAN	SIG
Height for Age		**
Low Modernization	-1.9	
Medium Modernization	-1.7	
High Modernization	-1.2	
Weight for Height		NS
Low Modernization	-.2	
Medium Modernization	-.3	
High Modernization	-.4	
Weight for Age		**
Low Modernization	-1.4	
Medium Modernization	-1.3	
High Modernization	-1.1	

ANOVA significant at .05 (*), .001 (**).

Finally, analysis is conducted to determine the effect of modernization on nutritional status. Table 7-5 shows that nutritional status as measured by height for age and weight for height is significantly better in more modern communities. This is not surprising given the significantly higher average levels of wealth and education in these communities. Weight for height is not significantly different.

7.2 The Relationship Between Modernization and Program Factors

TABLE 7-6
Crosstabulation Between Level of Modernization and Program Design Factors (expressed as percentages)

Level of Modernization	LEVEL OF SUPPORT Low	Medium	High	SIG
Low	20.5 (8)	33.3 (13)	46.2 (18)	*
Medium	29.7 (11)	35.1 (13)	35.1 (13)	
High	58.8 (10)	29.4 (5)	11.8 (2)	
Level of Modernization	**LEVEL OF STAFFING Low**	**Medium**	**High**	**NS**
Low	23.1 (9)	33.3 (13)	43.6 (7)	
Medium	38.9 (14)	33.3 (12)	27.8 (10)	
High	41.2 (7)	41.2 (7)	17.6 (3)	
Level of Modernization	**LEVEL OF INTENSITY Low**	**Medium**	**High**	**NS**
Low	20.5 (8)	43.6 (17)	35.9 (14)	
Medium	27.0 (10)	45.9 (17)	27.0 (10)	
High	33.3 (6)	58.8 (10)	5.9 (1)	
Level of Modernization	**LEVEL OF CROWDING Low**	**Medium**	**High**	**NS**
Low	37.5 (12)	31.3 (10)	31.3 (10)	
Medium	31.3 (10)	37.5 (12)	31.3 (10)	
High	35.7 (5)	14.3 (2)	50.0 (7)	

Chi-square significant at .05 (*), .001 (**)

The only significant relationship that emerges here is between modernization and level of support. It appears that a higher percentage of programs in less modern communities have high levels of support. The communities where the level of modernization is high have a high percentage of programs where the level of support is low. Though there is no significant relationship, and the following is very speculative, it appears that the majority of programs are better designed (with respect to program design factors) in communities where the level of modernization is low.

Table 7-7 shows how well these programs perform in terms of quality of execution.

TABLE 7-7
Crosstabulation Between Level of Modernization and Quality of Execution (expressed as percentages)

	QUALITY OF EXECUTION	
	Upper 50% -- Accuracy of SKDN Statistics	Upper 50% -- Immunization Coverage
Level of Modernization		
Low (N=39)	48	41
Medium (N=37)	46	63
High (N=17)	67	83
Significance	NS	NS

Chi-square significant at .05 (*), .001 (**)

Neither of these chi-square tests are significant, which means that there is no significant relationship between modernization and quality of execution. At the same time, a relatively higher percentage of well executed programs are located in communities where the level of modernization is high.

7.3 The Effect of Modernization on the Household

The third part of the analysis is to examine the effect of community modernization on the household's participation in growth monitoring and related activities. An analysis of the relationship between distance to weighing post and attendance under the various levels of modernization is conducted.

THE EFFECT OF MODERNIZATION ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 7-1

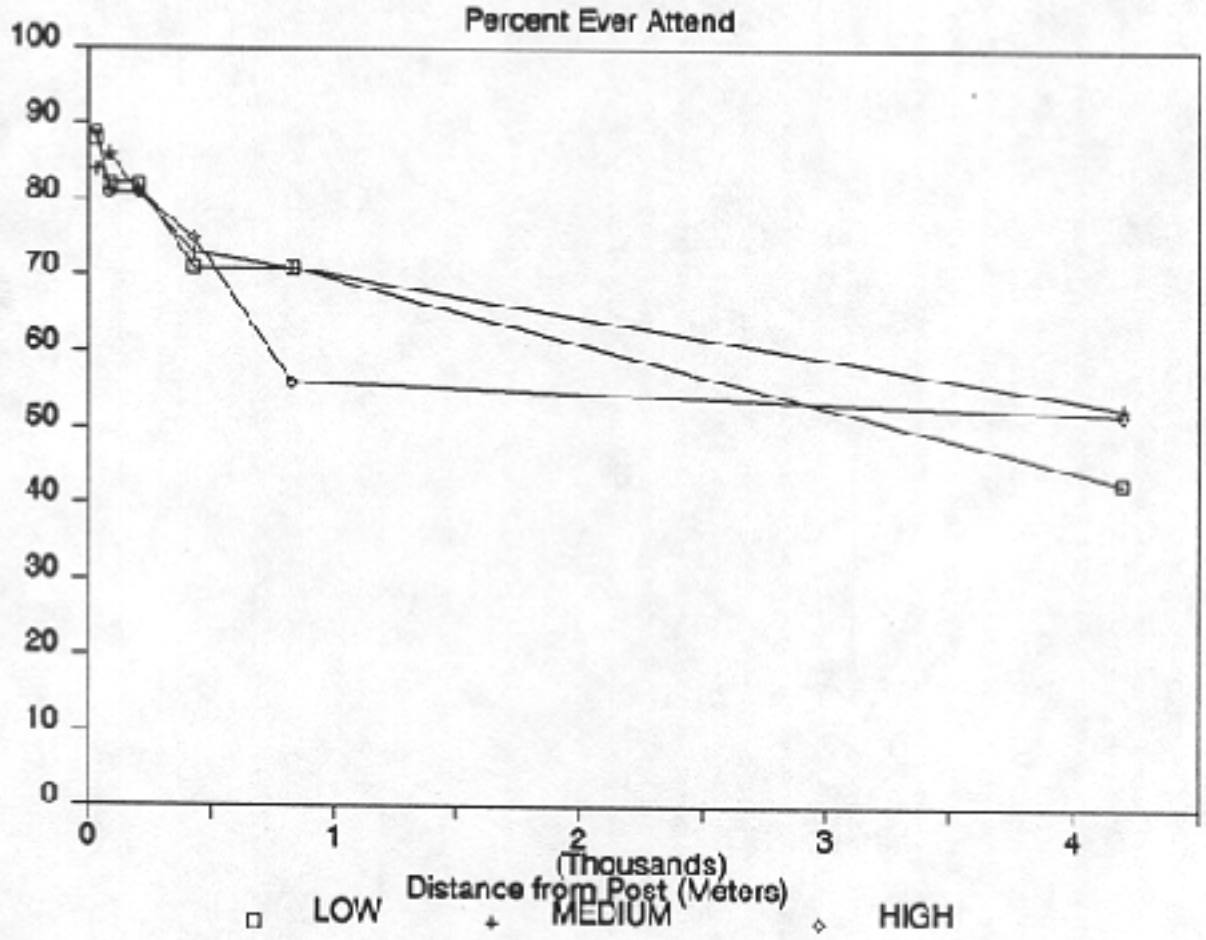
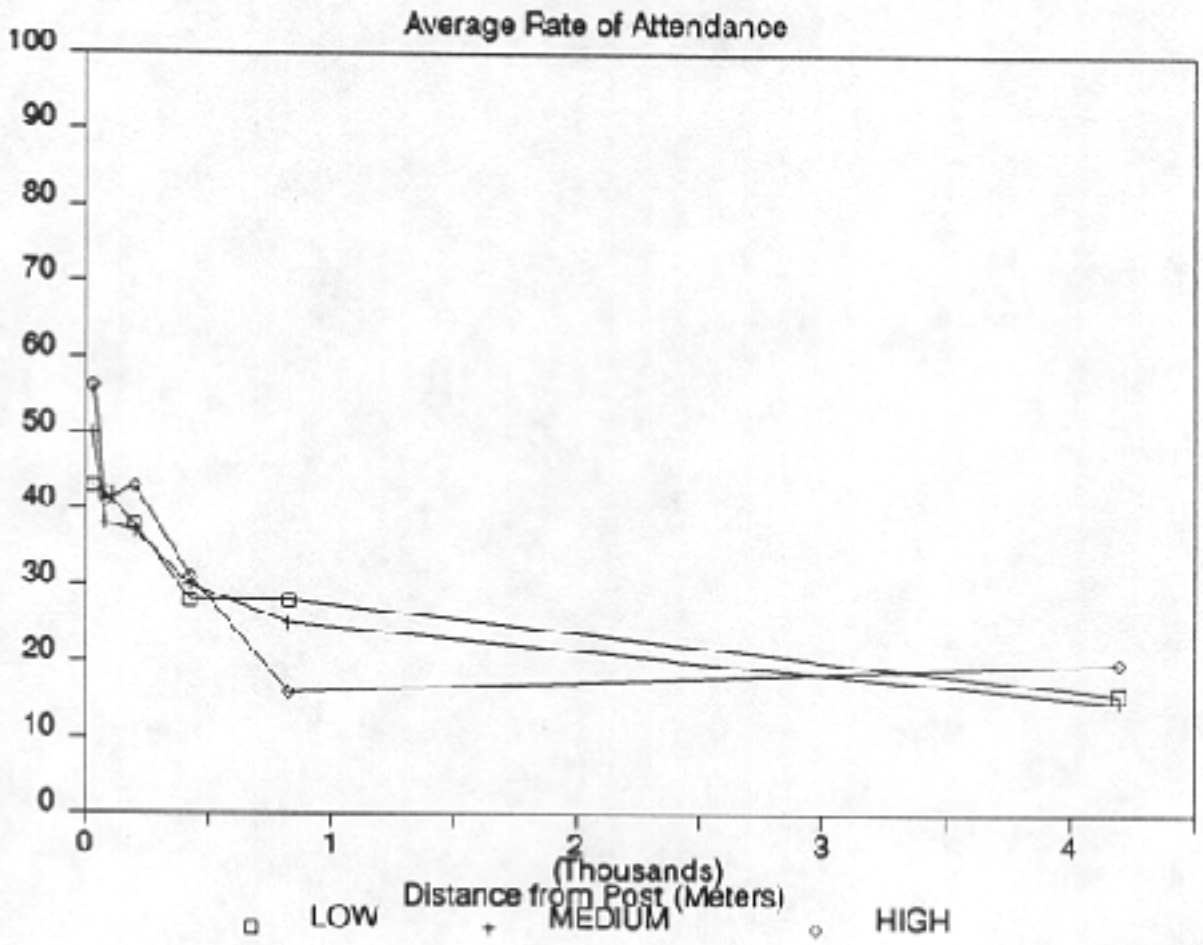


FIGURE 7-2



Figures 7-1 and 7-2 show that modernization does not appear to influence this relationship much, except that it may be that in more modern communities, people that live approximately one kilometer from the weighing post are less likely to attend than the corresponding group in less modern communities. This is surprising since high quality roads are inherent in the modernization process (in fact are an element in the index), and make for easier travel. It may be that people living outside the center of a modern community in Indonesia are less likely to attend for other reasons.

The next step of the analysis is to estimate the entire household model using path analysis under high and low levels of modernization. Figures 7-3 and 7-4 show the results of this analysis.

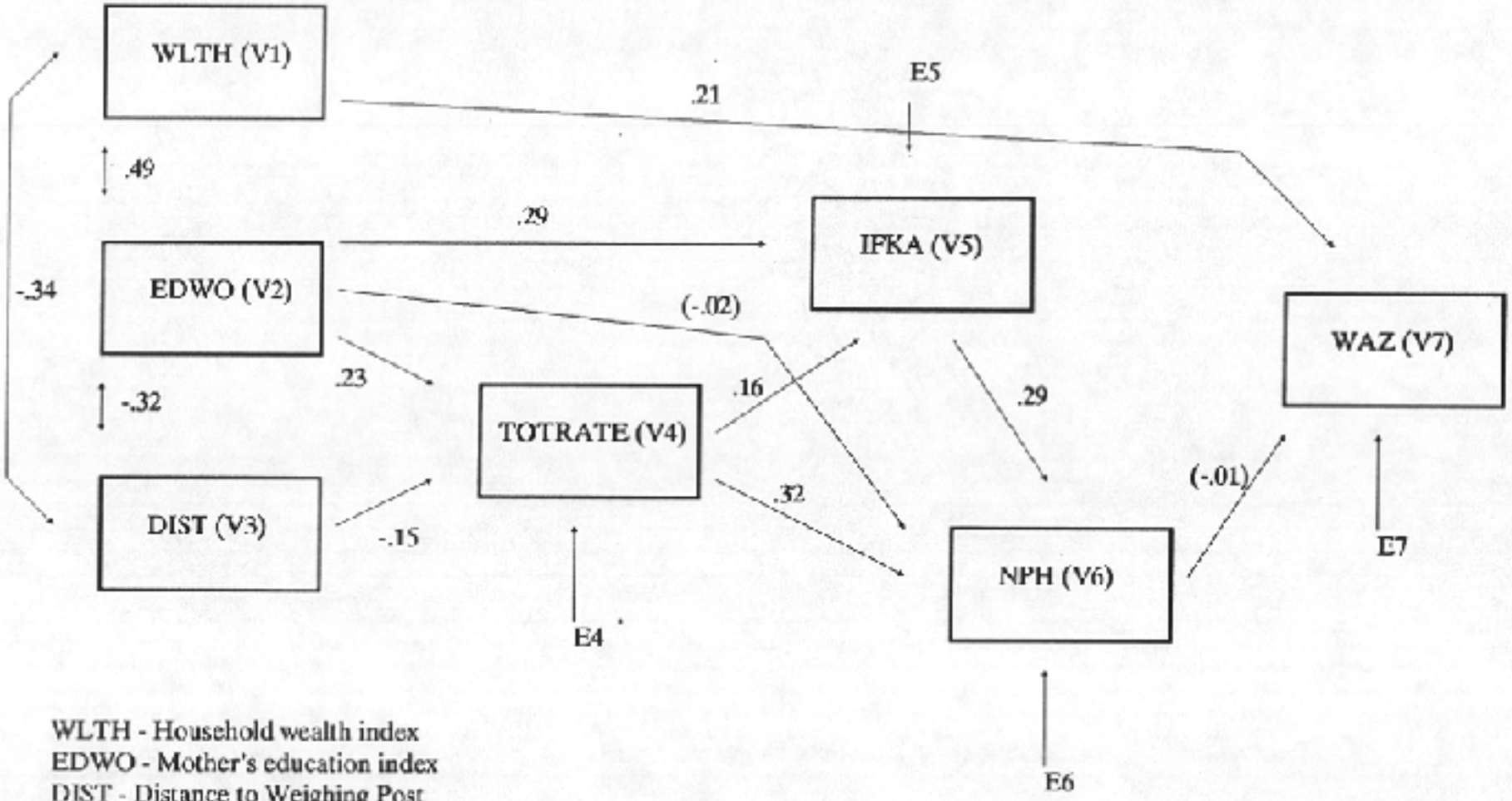
Again, we examine the part of the model that is most directly related to growth monitoring and related programs.

TABLE 7-8
The Influence of Modernization on the Household's Participation in Growth Monitoring and Related Activities

	p_{54}	p_{65}	p_{64}	$p_{65}p_{54}+p_{64}$
All Communities (n=803)	.12	.27	.26	.29
Level of Modernization				
low (n=283)	.16	.29	.32	.37
high (n=177)	.14	.15	.32	.34

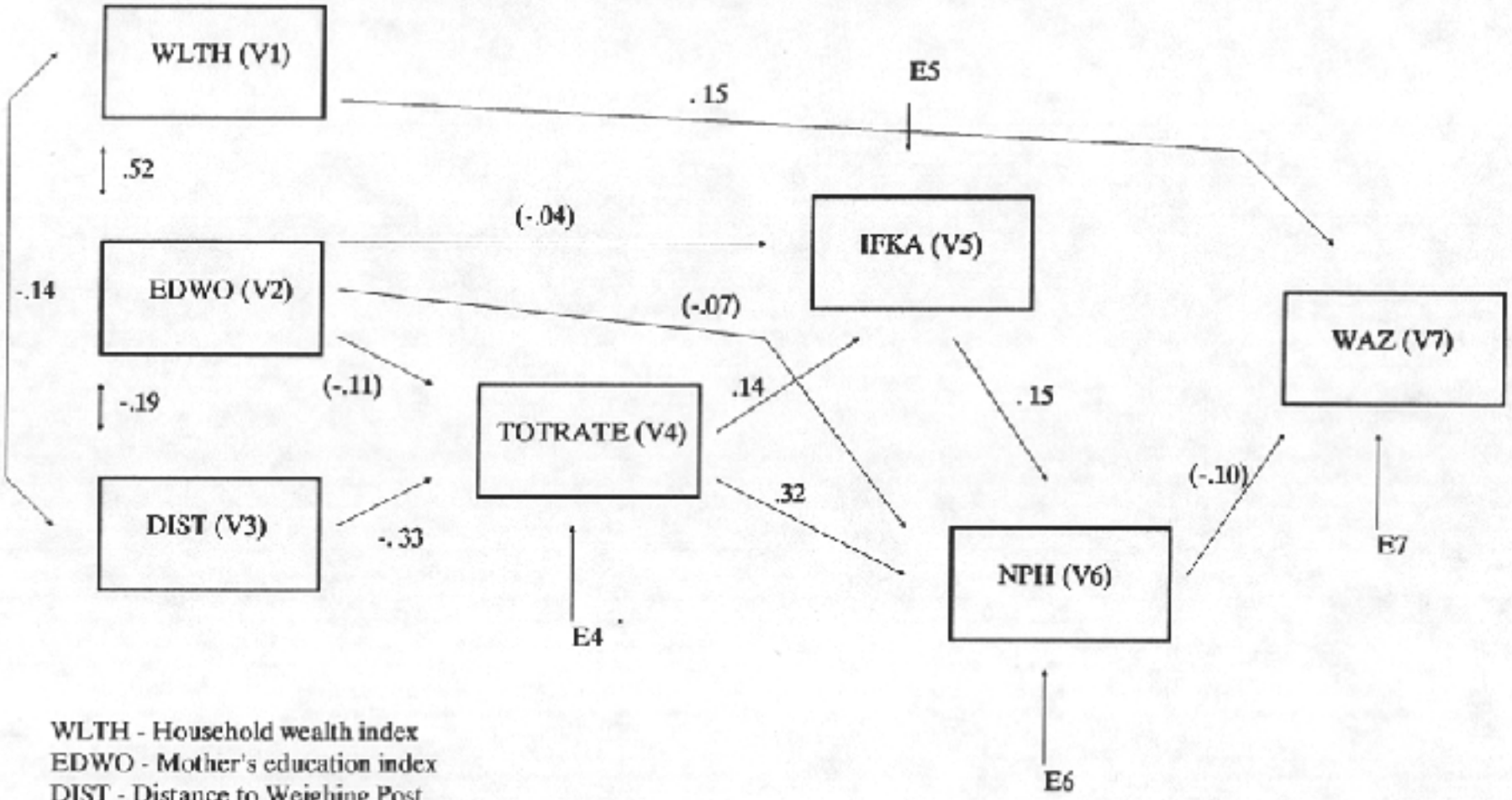
The only element in this part of the model that differs significantly is the relationship between infant nutrition knowledge (IFKA) and and nutrition practice history (NPH). As discussed in Chapter VI, this path relates to the variance in practice that is explained by knowledge. It appears that the relationship between knowledge and practice is less strong in more modern communities. This may be due to the tendency to breast feed in more modern areas.

FIGURE 7-3 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF LOW MODERNIZATION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

FIGURE 7-4 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF HIGH MODERNIZATION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

7.4 The Interaction Between Modernization and Growth Monitoring Design Factors

The next step of analysis is to examine differences in the relationship between elements in the model between various levels of community modernization. Because program design factors and contextual factors are both measured at the community level, the tests of significance are constrained because of the small number of observations within each group. Tables 7-9 and 7-10 show the effect of modernization on the relationship between quality of execution and growth monitoring attendance.

TABLE 7-9
The Effect of Modernization on the Relationship Between Quality of Execution as Measured by Accuracy of SKDN Statistics and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Modernization	78	46	**
Medium Modernization	77	51	**
High Modernization	86	50	**
Average Rate of Attendance			
Low Modernization	46	24	**
Medium Modernization	52	23	**
High Modernization	55	24	**

ANOVA controlled for woman's education and household wealth.

TABLE 7-10
The Effect of Modernization on the Relationship Between Quality of Execution as Measured by Immunization Coverage of Ever Attenders and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Modernization	76	41	**
Medium Modernization	65	58	NS
High Modernization	71	37	**
Average Rate of Attendance			
Low Modernization	45	21	**
Medium Modernization	38	30	NS
High Modernization	43	14	**

ANOVA controlled for woman's education and household wealth.

As discussed in Chapter VI, there is strong support for the hypothesis that a well executed program is a well attended program. In all cases, well executed programs are better attended. Comparing these findings to Table 7-2 which illustrates that the rate of attendance of growth monitoring activities is not influenced by modernization, is valuable. Well executed programs in communities where modernization is low are the best attended of all the programs when quality of execution is measured by immunization coverage of ever attenders. This underlines the importance of related activities, as well as the general quality of execution, especially in communities where modernization is low.

Tables 7-11 and 7-12 show the effect of modernization on the relationship between attendance and knowledge.

TABLE 7-11
The Effect of Modernization on the Relationship Between Program Attendance and Knowledge

	AVERAGE RATE OF ATTENDANCE			SIG
	NEVER	LOW	HIGH	
Nutrition Knowledge Index				
Low Modern.	9.7	11.0	11.2	*
Medium Modern.	10.3	10.2	10.9	*
High Modern.	10.8	10.7	11.5	*
Health Knowledge Index				
Low Modern.	18.6	22.7	24.7	**
Medium Modern.	20.2	24.9	28.2	**
High Modern.	25.3	25.8	30.7	**
Infant Nutrition Knowledge Index				
Low Modern.	6.8	7.6	7.8	*
Medium Modern.	7.1	7.0	7.6	*
High Modern.	7.2	7.1	7.7	*

ANOVA controlled for woman's education and household wealth.

Participation has a consistent and significant positive effect on knowledge indices under all levels of modernization. As expected, there are higher average levels of knowledge in communities where the level of modernization is high, than where it is low.

The difference between the average knowledge of those who have never attended, and those whose attendance is high is also revealing. The difference in the average of the nutrition knowledge index of those who have never attended and those who attend frequently in communities where modernization is low is 1.5 (11.2 - 9.7). The same difference in communities where modernization is high is .7. This pattern holds true for all the knowledge indices. This can be interpreted to mean that though average knowledge is higher in more modern communities, growth monitoring and related activities have more relative impact in communities where modernization is low.

TABLE 7-12
The Effect of Modernization on the Relationship Between Program Attendance and Practice

	AVERAGE RATE OF ATTENDANCE			SIG
	NEVER	LOW	HIGH	
Nutrition Practice Index				
Low Modern.	6.6	7.5	7.6	**
Medium Modern.	7.1	7.3	7.5	*
High Modern.	7.3	7.4	7.4	NS
Nutrition Practice History Index				
Low Modern.	4.2	5.8	6.0	**
Medium Modern.	4.3	5.7	5.8	**
High Modern.	3.4	5.7	5.3	**
Family Planning Practice Index				
Low Modern.	3.3	5.5	4.9	**
Medium Modern.	3.2	4.8	5.5	**
High Modern.	5.4	5.1	5.2	NS

ANOVA controlled for woman's education and household wealth.

Similar results appear in the case of nutrition practice are shown in Table 7-12. Nutrition practice is, in general, higher in more modern communities, and for the most part, significantly related to attendance. In addition, the increase in practice due to participation in the program is greater in communities where modernization is low than those where it is high except in the case of nutrition practice history. Furthermore, there is no significant difference in level of practice between attenders across levels of modernization.

Tables 7-13 shows the effect of modernization on the relationship between the design factors and the rate of attendance.

TABLE 7-13
The Effect of Modernization on the Relationship Between Support and Attendance

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Modernization	36	28	29	**
(communities)	(8)	(13)	(18)	
Medium Modernization	31	46	29	**
(communities)	(11)	(13)	(13)	
High Modernization	21	44	64	**
(communities)	(10)	(5)	(2)	

ANOVA controlled for woman's education and household wealth.

It appears that support influences attendance in different ways depending on level of modernization. Among communities where modernization is low, communities where support is low are the best attended. In moderately modern communities, moderately supported programs fare best in terms of attendance. In communities where modernization is high, highly supported programs are the best attended.

TABLE 7-14
The Effect of Modernization on the Relationship Between Staffing and Attendance

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Modernization	15	42	28	**
(communities)	(9)	(13)	(17)	
Medium Modernization	27	36	47	**
(communities)	(15)	(12)	(10)	
High Modernization	24	41	33	**
(communities)	(7)	(7)	(3)	

ANOVA controlled for woman's education and household wealth.

In the case of staffing, there appears to be a consistent pattern--communities where the level of staffing is moderate to high maintain higher rates of attendance than in those communities where staffing is low.

TABLE 7-15
The Effect of Modernization on the Relationship Between Intensity and Attendance

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Modernization	25	31	32	*
(communities)	(8)	(17)	(14)	
Medium Modernization	29	40	33	*
(communities)	(10)	(17)	(10)	
High Modernization	17	45	18	**
(communities)	(6)	(10)	(1)	

ANOVA controlled for woman's education and household wealth.

Table 7-15 shows that low intensity programs are less well attended than medium or highly intense programs, regardless of level of modernization. In addition, high intensity programs are the best attended where modernization is low. Medium intensity programs are the best attended where modernization is medium to high. This suggests that high levels of intensity are more important to attendance in communities where modernization is low.

TABLE 7-16
The Effect of Modernization on the Relationship Between Crowding and Attendance

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Modernization	42	20	28	**
(communities)	(15)	(12)	(12)	
Medium Modernization	35	41	32	*
(communities)	(12)	(13)	(12)	
High Modernization	56	61	25	**
(communities)	(6)	(3)	(8)	

ANOVA controlled for woman's education and household wealth.

Finally, in Table 7-16 it appears that growth monitoring is better attended in communities where crowding is medium to low. Note also, that the difference between attendance in medium to high modernization communities is not a significant one, where in low modernization communities the difference is significant. This suggests that the threshold of crowding is lower in low modernization communities.

The next stage of analysis is to examine the interaction between program design factors and modernization in terms of their relationship with knowledge and practice indicators. This relationship is tested only for those *balita* which had attended the weighing post in the last twelve months. Tables 7-17 through 7-24 present these findings.

TABLE 7-17
The Effect of Modernization on the Relationship Between Program Support and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Modernization	10.8	11.1	11.4	*
Medium Modernization	10.6	10.3	10.3	*
High Modernization	---	---	---	NS
Health Knowledge Index				
Low Modernization	21.5	24.2	25.0	*
Medium Modernization	25.7	27.9	26.0	*
High Modernization	---	---	---	NS
Infant Nutrition Knowledge Index				
Low Modernization	---	---	---	NS
Medium Modernization	7.2	7.6	7.0	**
High Modernization	---	---	---	NS

ANOVA controlled for woman's education and household wealth.

In two of the three indices, support appears to have a strong positive effect on the acquisition of related knowledge in communities where modernization is low or medium. Support has no influence in communities where modernization is high. This finding is interesting when considered in conjunction with earlier findings--that well supported programs are better attended in highly modern communities, and are less well attended in communities where modernization is low. In the case of low modernization, this may be a natural selection process--namely, that attenders are influenced by community leaders. Those that are not so influenced, do not attend as frequently. In addition, crowding has also been shown to be an important design factor, and it may affect the transferal of knowledge in high modernization communities. Finally, previous analysis has shown that related knowledge is generally higher in high modernization communities, suggesting the possibility that people in these communities learn the information outside of growth monitoring.

TABLE 7-18
The Effect of Modernization on the Relationship Between Program Support and Practice
(Calculated only for those balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	7.3	7.7	7.2	*
High Modernization	----	----	----	NS
Nutrition Practice History Index				
Low Modernization	5.6	6.2	5.9	*
Medium Modernization	6.0	6.0	5.5	*
High Modernization	----	----	----	NS
Family Planning Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

Support also appears to have some influence on practice, as shown in Table 7-18. However, it is likely that these significant relationships are random due to the low number of observations -- and, as will be seen with regard to other program design factors, do not

significantly influence the average level of practice. As mentioned in Chapter V, the general lack of significant findings with respect to design factors is probably due to the limited variance within the Indonesian program. It appears, in fact, that all Indonesian programs have adequate levels of critical design factors.

The remaining tables are presented here, but merit only general comments. First, the relationships between program design factors and knowledge are sporadically significant. This result can be explained by two facts. First, the number of observations within each cell is quite low, and significant differences may be more or less random. Second, there is a significant difference between attenders and non attenders with respect to this knowledge. These messages are simple enough that they can be learned after one or two sessions, meaning that improved design makes little significant difference with respect to the acquisition of these messages.

Second, the relationship between program design factors and practice is not significant in almost every case. The reasons stated above with respect to nutrition knowledge can be applied here. In addition, there are a large number of competing explanations for this behavior (we have already seen that nutrition practice is much higher in communities where modernization is high).

TABLE 7-19
The Effect of Modernization on the Relationship Between Program Staffing and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	11.0	10.4	13.1	**
Health Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	24.2	26.5	29.4	**
High Modernization	----	----	----	NS
Infant Nutrition Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	7.4	6.8	8.8	**

ANOVA controlled for woman's education and household wealth.

TABLE 7-20
The Effect of Modernization on the Relationship Between Program Staffing and Practice (Calculated only for those balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS
Nutrition Practice History Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS
Family Planning Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 7-21
The Effect of Modernization on the Relationship Between Program Intensity and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Modernization	11.8	11.1	11.0	*
Medium Modernization	----	----	----	NS
High Modernization	9.0	11.4	12.6	**
Health Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	25.2	28.6	24.4	**
High Modernization	----	----	----	NS
Infant Nutrition Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	6.2	7.7	7.9	**

ANOVA controlled for woman's education and household wealth.

TABLE 7-22
The Effect of Modernization on the Relationship Between Program Intensity and Practice (Calculated only for those balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS
Nutrition Practice History Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS
Family Planning Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 7-23
The Effect of Modernization on the Relationship Between Crowding and Knowledge
(Calculated only for those balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	11.7	10.2	11.2	*
Health Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	24.1	29.8	25.5	**
High Modernization	30.5	28.1	27.9	**
Infant Nutrition Knowledge Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	7.9	6.6	7.5	*

ANOVA controlled for woman's education and household wealth.

TABLE 7-24
The Effect of Modernization on the Relationship Between Crowding and Practice
(Calculated only for those balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS
Nutrition Practice History Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS
Family Planning Practice Index				
Low Modernization	----	----	----	NS
Medium Modernization	----	----	----	NS
High Modernization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

7.5 Findings

(1) As modernization increases, so does household wealth, woman's education, knowledge, practice and nutritional status. Distance to weighing post is also related to level of modernization. The more modern the community, the less the average distance.

(2) There is no significant difference between the average rate of attendance according to modernization.

(3) There is no significant relationship between level of modernization and growth monitoring design components except support. Low modernization communities have high levels of support, and high modernization communities have low levels of support.

(4) Level of modernization has little effect on the relationship between distance to weighing post and rate of attendance.

(5) The relationship between knowledge and practice is less strong in highly modern communities than it is in communities where modernization is low. The overall effect of growth monitoring attendance on practice is approximately the same in each, however.

(6) Well executed programs are better attended across levels of modernization. In addition, well executed programs in low modernization communities, have as high a rate of attendance as communities where modernization is medium or high.

(7) Growth monitoring and related activities have a positive effect with respect to both knowledge and practice indicators across levels of modernization, though attenders is less modern communities have lower average knowledge and practice than attenders in modern communities. (The same is true for non-attenders.) However, the average increase in knowledge and practice is greater in less modern communities, and there is no significant difference in level of practice between attenders across levels of modernization.

(8) Support has a positive effect on attendance in communities where modernization is high, and a negative effect on attendance when modernization is low. Other design factors appear to have a generally positive influence.

(9) There is some interaction between design factors and modernization with respect to attendance. First, in communities where modernization is low, low support programs are the best attended. In high modernization communities, high support programs are the best attended. Second, in low modernization communities, high intensity programs are the best

attended, while in high modernization communities, low intensity programs are the best attended. Third, it appears that highly modernized communities are able to maintain high rates of attendance under conditions of crowding better than low modernization communities.

(10) Modernization appears to have little influence on the relationship between design factors and the knowledge and practice of attenders. This is probably due to the generally adequate levels of these design factors in Indonesia.

VIII. THE EFFECT OF OTHER GOVERNMENT INTERVENTION

8.1 The Effect of Government Intervention on Household-Level Factors

Differences in household conditions according to the level of government intervention are first described.

TABLE 8-1
The Effect of Level of Government Intervention on Household Factors

	MEAN	SIG
Household Wealth Index		**
Low Intervention	16.5	
Medium Intervention	16.9	
High Intervention	12.3	
Woman's Education Index		**
Low Intervention	2.0	
Medium Intervention	2.1	
High Intervention	1.7	
Distance to Weighing Post (Meters)		NS
Low Intervention	737	
Medium Intervention	674	
High Intervention	652	

ANOVA significant at .05 (*), .001 (**).

There are significant differences in education and wealth according to the level of government intervention, but no significant difference in average distance to weighing post. The average household wealth and level of woman's education is significantly lower in communities where the number of government intervention is high. This may be due to the fact that poorer communities are targeted to receive government programs. Consequently, in analyzing the effect of the level of government intervention, the fact that the communities where where wealth and education are lowest have the highest level of intervention must be considered.

Table 8-2 presents differences in program factors.

TABLE 8-2
The Effect of Level of Government Intervention on Growth Monitoring Attendance

PROGRAM ATTENDANCE	MEAN	SIG
Percent Ever Attend		NS
Low Intervention	57	
Medium Intervention	56	
High Intervention	61	
Average Rate of Attendance		NS
Low Intervention	32	
Medium Intervention	30	
High Intervention	36	

ANOVA significant at .05 (*), .001 (**).

Table 8-2 shows that there is no significant difference in the percentage of *balita* that have ever attended between levels of government intervention. This is an important finding, primarily because we would expect attendance to be influenced by the level of intervention in the community. The question of interest in this chapter is whether there is a competitive or synergistic relationship between the programs.

Table 8-3 shows the effect of intervention of knowledge indicators.

TABLE 8-3
The Effect of Level of Government Intervention on Nutrition-Related Knowledge

KNOWLEDGE	MEAN	SIG
Nutrition Knowledge Index		*
Low Intervention	10.6	
Medium Intervention	10.8	
High Intervention	10.3	
Health Knowledge Index		**
Low Intervention	22.0	
Medium Intervention	23.7	
High Intervention	24.4	
Infant Nutrition Knowledge Index		NS
Low Intervention	7.2	
Medium Interventio	7.3	
High Intervention	7.1	

ANOVA significant at .05 (*), .001 (**).

Nutrition knowledge is lowest in communities where the level of intervention is high. There are also appears to be a positive relationship between the level of intervention and health knowledge. The lack of consistency here suggests that intervention has little effect on knowledge in general, though there may be some reinforcement of health messages in other programs. In general, we wouldn't expect that the level of intervention would have much impact on knowledge, practice or nutritional status indicators.

TABLE 8-4
The Effect of Level of Government Intervention on Nutrition Practice

PRACTICE	MEAN	SIG
Nutrition Practice Index		*
Low Intervention	7.3	
Medium Intervention	7.3	
High Intervention	7.2	
Nutrition Practice History Index		*
Low Intervention	5.3	
Medium Intervention	5.4	
High Intervention	5.1	
Family Planning Practice Index		NS
Low Intervention	4.7	
Medium Intervention	4.7	
High Intervention	4.5	

ANOVA significant at .05 (*), .001 (**).

Table 8-4 illustrates the effect of government intervention on related practices. As in the case of knowledge, it appears that other intervention has little impact on practice, though it is worth noting that in the cases of the nutrition practice and nutrition practice history indices, that communities where intervention is high score lowest. This is probably due to lower average levels of wealth and education in these communities.

TABLE 8-5
The Effect of Level of Government Intervention on Nutritional Status

NUTRITIONAL STATUS	MEAN	SIG
Height for Age		**
Low Intervention	-1.9	
Medium Intervention	-1.5	
High Intervention	-1.7	
Weight for Height		NS
Low Intervention	-.3	
Medium Intervention	-.4	
High Intervention	-.3	
Weight for Age		*
Low Intervention	-1.4	
Medium Intervention	-1.3	
High Intervention	-1.3	

ANOVA significant at .05 (*), .001 (**).

Finally, the effect of government intervention on nutritional status is determined. Table 8-5 shows no consistent pattern except that in the cases of weight for age and height for age, the communities where intervention is low have the lowest average nutritional status. This is surprising in that previous analysis has shown that communities where intervention is high have the lowest average wealth and education. This suggests the possibility that government interventions directly or indirectly improve nutritional status of children. However, the previous finding that high intervention communities have the lowest nutritional practice confuses this finding.

8.2 The Relationship Between Government Intervention and Program Factors

The relationships between the contextual factor and program design factors are again explored.

TABLE 8-6
Crosstabulation Between Level of Government Intervention and Program Design Factors (expressed as percentages)

	LEVEL OF SUPPORT			SIG
	Low	Medium	High	
Level of Intervention				NS
Low	20.7	27.6	51.7	
	(6)	(8)	(15)	
Medium	31.3	34.4	34.4	
	(10)	(11)	(11)	
High	40.6	37.5	21.9	
	(13)	(12)	(7)	
	LEVEL OF STAFFING			
	Low	Medium	High	
Level of Intervention				*
Low	13.8	41.4	44.8	
	(4)	(12)	(13)	
Medium	32.3	25.8	41.9	
	(10)	(8)	(13)	
High	50.0	37.5	12.5	
	(16)	(12)	(4)	
	LEVEL OF INTENSITY			
	Low	Medium	High	
Level of Intervention				NS
Low	24.1	37.9	37.9	
	(7)	(11)	(11)	
Medium	31.3	40.6	28.1	
	(10)	(13)	(9)	
High	21.9	62.5	15.6	
	(7)	(20)	(5)	
	LEVEL OF CROWDING			
	Low	Medium	High	
Level of Intervention				NS
Low	28.0	24.0	48.0	
	(7)	(6)	(12)	
Medium	46.2	34.6	19.2	
	(12)	(9)	(5)	
High	29.6	33.3	37.0	
	(8)	(9)	(10)	

Chi-square significant at .05 (*), .005 (**).

Table 8-6 shows that, as usual, the contextual factor appears to have little effect on the program design factors. The only significant relationship is between the level of intervention and staffing. When the level of intervention is low, the level of staffing tends to be high and

visa versa. This may be due to competition for volunteers among programs. This same type of relationship may also be the case with respect to support, though the relationship is not a statistically significant one.

Table 8-7 shows the relationship between the level of intervention and quality of execution.

TABLE 8-7
Crosstabulation Between Level of Government Intervention and Quality of Execution (expressed as percentages)

	QUALITY OF EXECUTION	
	Upper 50% -- Accuracy of SKDN Statistics	Upper 50% -- Immunization Coverage
Level of Intervention		
Low (N=39)	55	38
Medium (N=37)	39	50
High (N=17)	57	59
SIGNIFICANCE	NS	NS

Chi-square significant at .05 (*), .005 (**).

There is no statistically significant relationship between intervention and quality of execution. However, a consistent pattern emerges when quality of execution is measured by immunization coverage of attenders. A relatively higher percentage of well executed programs are located in communities where the level of government intervention is high. We speculate that other government programs in the community have a positive influence on the execution of growth monitoring (though again, the relationship is not a significant one). This would lend support to the hypothesis of synergism between government programs.

8.3 The Effect of Government Intervention on the Household

The third part of the analysis is to examine the effect of government intervention on the household's participation in growth monitoring and related activities. An analysis of the relationship between distance to weighing post and attendance under the various levels of government intervention is conducted.

Figures 8-1 and 8-2 show this relationship. The average rate of attendance appears to be influenced by the level of government intervention. Figure 8-2 shows that distance has a stronger negative influence on attendance for people who live .25 to .5 kilometer from the weighing post in communities where the level of intervention is low, than where it is medium or high. There appears to be no difference in the effect of distance on ever attendance across levels of intervention.

Next, the entire household model is estimated using path analysis under high and low levels of government intervention. Figures 8-3 and 8-4 show the results of this analysis.

Again, we examine the part of the model that is most directly related to growth monitoring and related programs.

TABLE 8-8
The Influence of Government Intervention on the Household's Participation in Growth Monitoring and Related Activities

	p_{54}	p_{65}	p_{64}	$p_{65}p_{54} + p_{64}$
All Communities (n=803)	.12	.27	.26	.29
Level of Government Intervention				
low (n=249)	.14	.27	.35	.39
high (n=295)	(.02)	.26	.18	.19

Surprisingly, Table 8-8 shows that total program impact is higher in communities where the level of intervention is low. First, the relationship between attendance and knowledge is much higher in communities where the level of intervention is low. Given that the levels of attendance and knowledge are not different according to level of intervention, this suggests that people that live in communities where the level of intervention is high are learning program messages outside the program. It may be that messages are diffused through interaction in other programs.

Next, Table 8-8 shows that the relationship between knowledge and practice is consistent across levels of intervention. Additionally, the effect of knowledge on practice is relatively strong in both cases.

THE EFFECT OF INTERVENTION ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 8-1

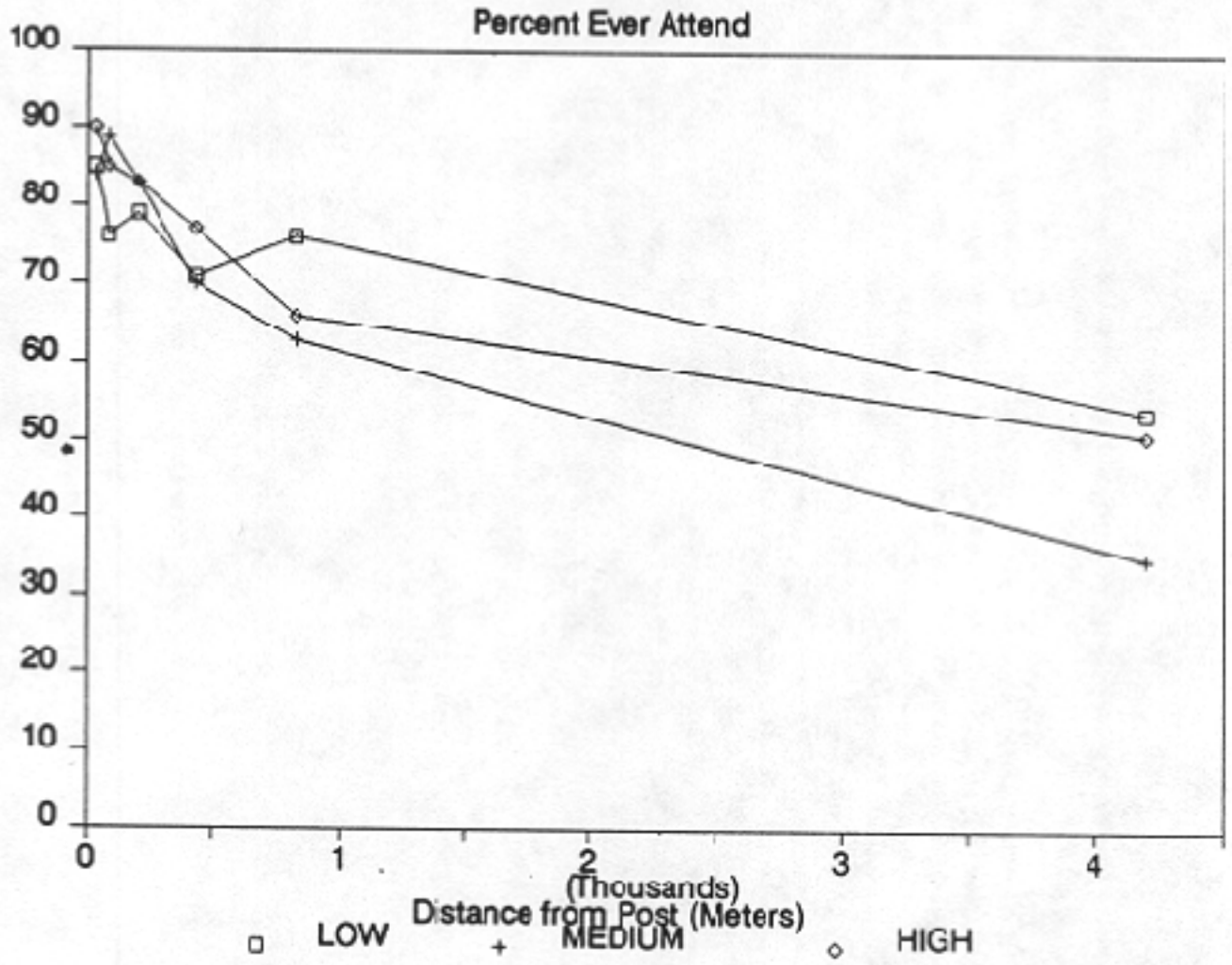


FIGURE 8-2

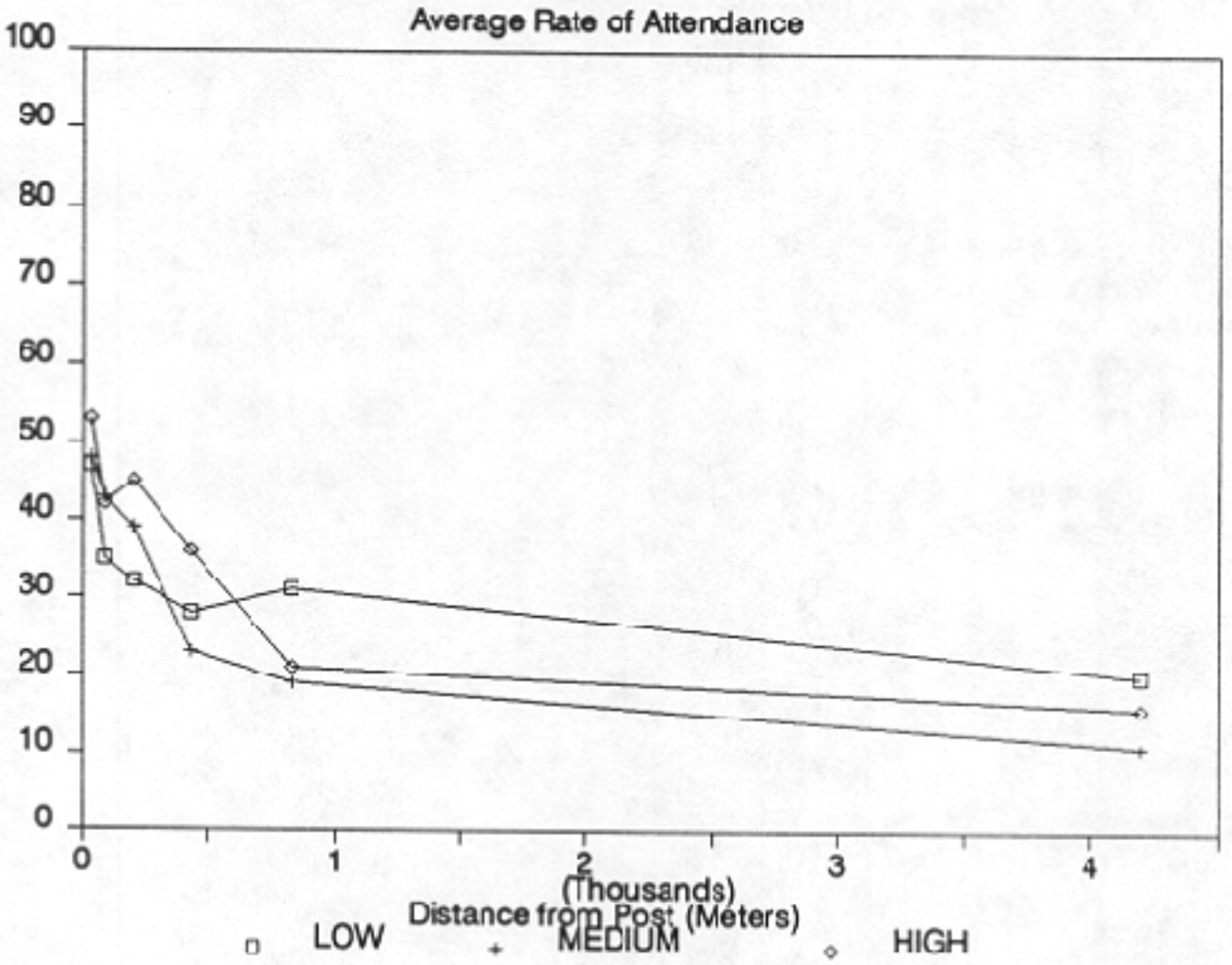
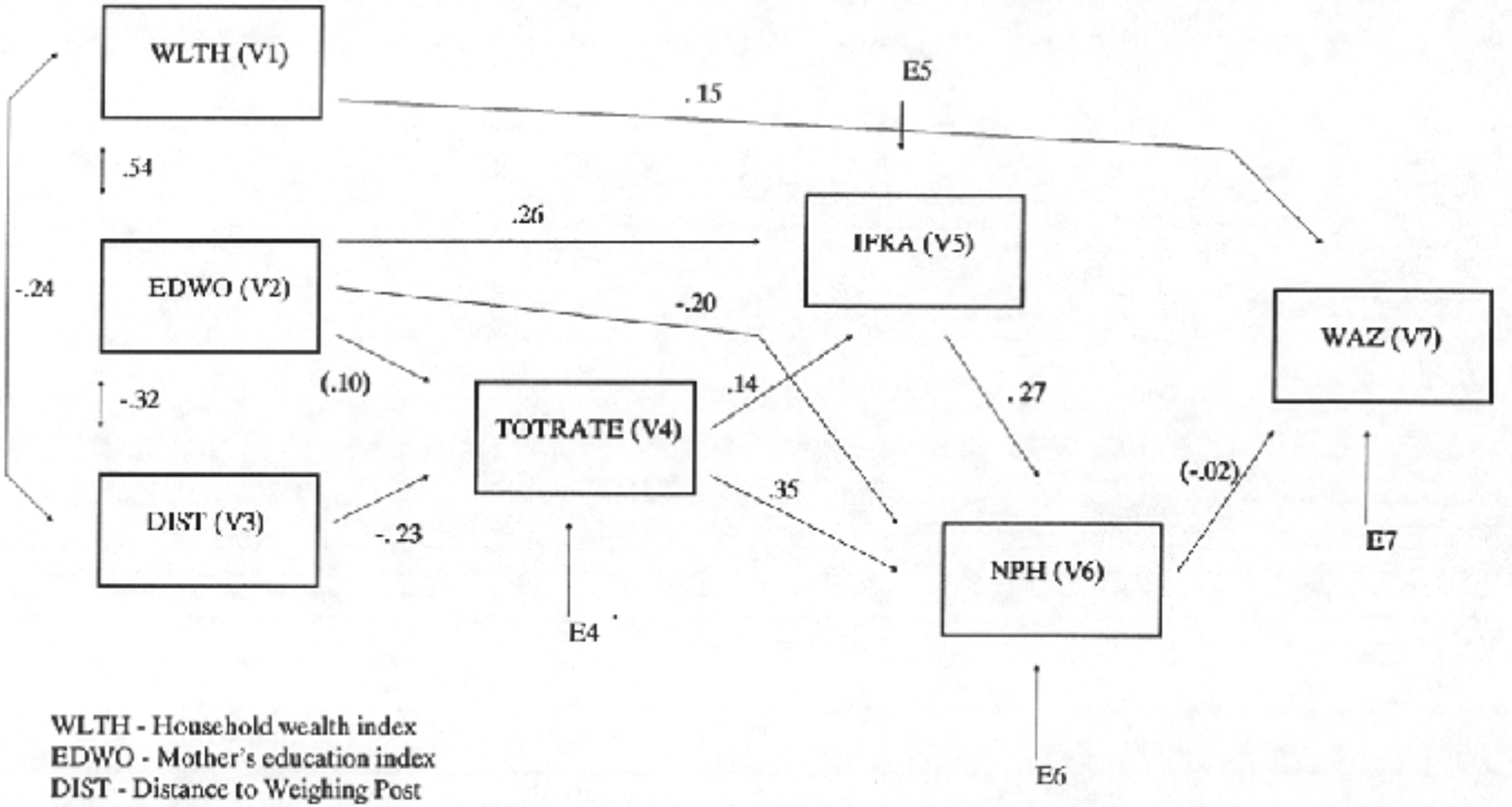
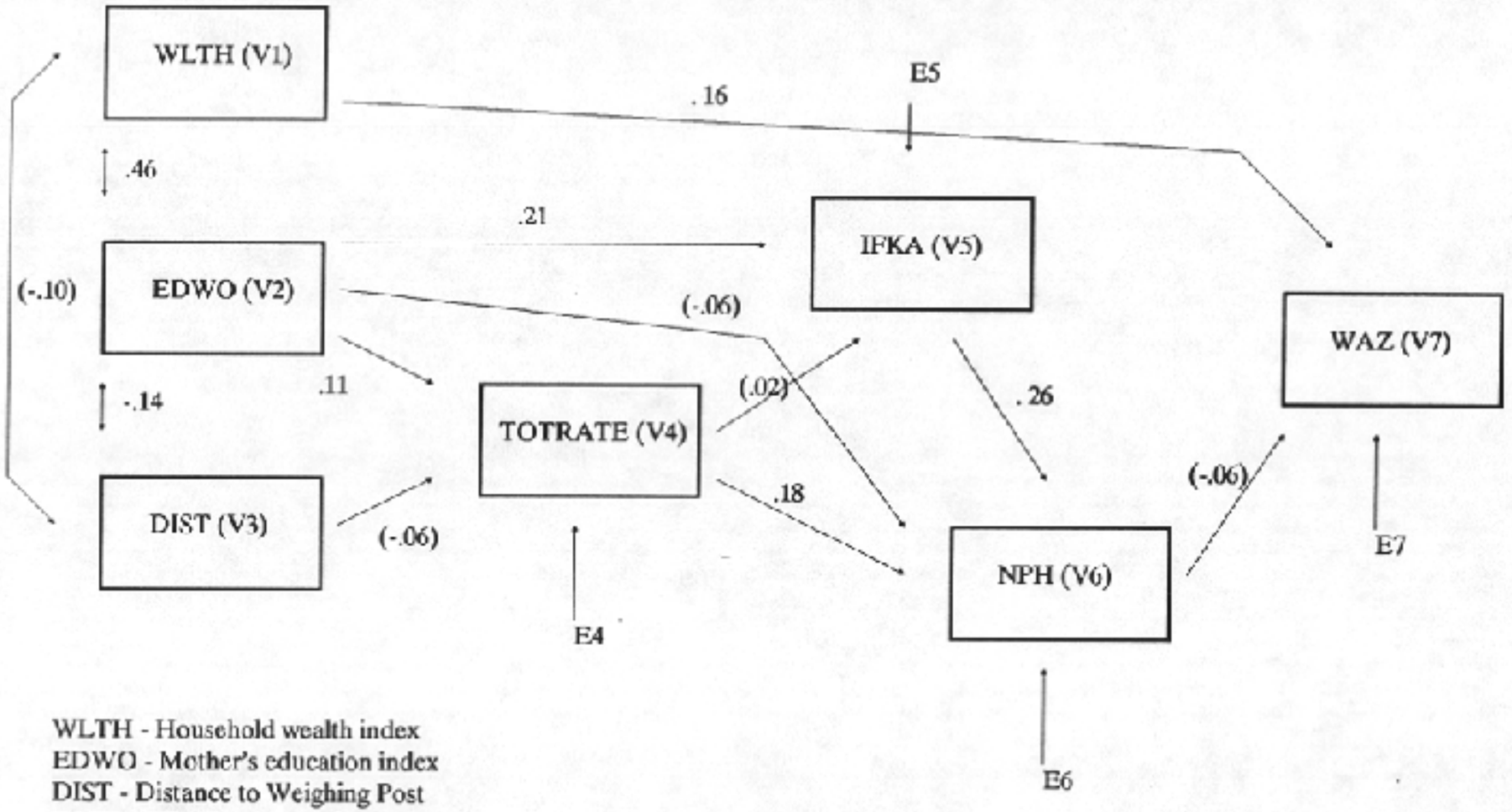


FIGURE 8-3 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF LOW INTERVENTION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

FIGURE 8-4 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF HIGH INTERVENTION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

Third, the relationship between attendance and practice (controlled for knowledge) is much higher in communities where the level of intervention is low. Apparently, people are more willing to practice program messages without knowing why in communities where the level of intervention is low.

Finally, Figures 8-3 and 8-4 show that the negative effect of distance on attendance is greater in communities where the level of intervention is low.

One way in which all of this might be interpreted is that the level of intervention has an impact on growth monitoring attendance. It appears that people are willing to make a greater effort to attend in communities where the level of intervention is high. At the same time, attenders of programs where intervention is high do not increase knowledge as a result of attendance, though some small gain in practice is made directly through attendance (controlled for knowledge).

On the other hand, people who live in communities where the level of intervention is low are less willing to make an effort to attend growth monitoring and related activities. But, attenders make significantly higher gains in knowledge and practice as a result of attendance. This may be due to a process of natural selection--those people willing to make the effort to attend in these communities are more willing to learn and change practices.

8.4 The Interaction Between Government Intervention and Growth Monitoring Design Factors

The next step of analysis is to examine differences in the relationship between elements in the model between various levels of government intervention. Because program design factors and contextual factors are both measured at the community level, the tests of significance are constrained because of the small number of observations within each group. Tables 8-9 and 8-10 show the effect of government intervention on the relationship between quality of execution and growth monitoring attendance.

TABLE 8-9
The Effect of Government Intervention on the Relationship Between Quality of Execution as Measured by Accuracy of SKDN Statistics and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Intervention	72	52	**
Medium Intervention	84	51	**
High Intervention	83	45	**
Average Rate of Attendance			
Low Intervention	43	25	**
Medium Intervention	50	25	**
High Intervention	57	21	**

ANOVA controlled for woman's education and household wealth.

TABLE 8-10
The Effect of Government Intervention on the Relationship Between Quality of Execution as Measured by Immunization Coverage of Ever Attenders and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Intervention	67	51	*
Medium Intervention	73	33	**
High Intervention	68	50	**
Average Rate of Attendance			
Low Intervention	41	26	**
Medium Intervention	42	13	**
High Intervention	42	28	*

ANOVA controlled for woman's education and household wealth.

Again, in all cases, well executed programs are better attended. Well executed programs in communities where government intervention is high are the best attended of all the programs. This table also shows that the difference between attendance rates in programs where SKDN statistics are measured accurately and those where they are not is greater in communities where the level of intervention is high. Immunization coverage of ever attenders

does not appear to affect attendance as consistently, though the effect is always a positive one.

Tables 8-11 and 8-12 show the effect of government intervention on the relationship between attendance and knowledge.

TABLE 8-11
The Effect of Government Intervention on the Relationship Between Program Attendance and Knowledge

	AVERAGE RATE OF ATTENDANCE			SIG
	NEVER	LOW	HIGH	
Nutrition Knowledge Index				
Low Intervention	10.2	11.0	11.0	NS
Medium Intervention	10.3	10.5	11.9	**
High Intervention	10.1	10.3	10.8	NS
Health Knowledge Index				
Low Intervention	19.5	22.4	25.7	**
Medium Intervention	21.5	25.2	26.2	**
High Intervention	21.8	25.2	30.4	**
Infant Nutrition Knowledge Index				
Low Intervention	6.9	7.5	7.6	*
Medium Intervention	7.1	7.2	8.1	**
High Intervention	7.0	7.1	7.4	NS

ANOVA controlled for woman's education and household wealth.

Though the differences are not always significant in Table 8-11, frequent attenders always have a higher average knowledge score than non-attenders. The magnitude of the difference between attenders and non attenders does not appear to deviate across levels of intervention. Previous analysis found that attendance has a greater magnitude of effect on the nutrition knowledge indicator in communities where the level of intervention is low. This specific finding is confirmed here, though does not hold true across the other knowledge indicators.

TABLE 8-12
The Effect of Government Intervention on the Relationship Between Program Attendance and Practice

	AVERAGE RATE OF ATTENDANCE			SIG
	NEVER	LOW	HIGH	
Nutrition Practice Index				
Low Intervention	6.7	7.5	7.5	**
Medium Intervention	6.9	7.4	7.4	NS
High Intervention	7.0	7.2	7.6	*
Nutrition Practice History Index				
Low Intervention	3.9	5.8	5.7	**
Medium Intervention	4.2	5.7	6.1	**
High Intervention	4.1	5.7	5.5	**
Family Planning Practice Index				
Low Intervention	3.6	5.3	5.1	**
Medium Intervention	3.8	5.5	5.3	**
High Intervention	3.6	4.7	5.3	**

ANOVA controlled for woman's education and household wealth.

The relationship between attendance and practice indicators under levels of intervention is shown in Table 8-12. Here again, previous findings are reinforced. First, attendance has a strong positive effect on practice, and the magnitude of that effect is approximately the same across levels of intervention, though there is variance between indicators.

Tables 8-13 shows the effect of government intervention on the relationship between the design factors and the rate of attendance.

TABLE 8-13
The Effect of Government Intervention on the Relationship Between Support and Attendance

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Intervention	33	25	34	**
(communities)	(6)	(8)	(15)	
Medium Intervention	26	41	25	**
(communities)	(10)	(11)	(11)	
High Intervention	30	45	31	**
(communities)	(13)	(12)	(7)	

ANOVA controlled for woman's education and household wealth.

First, Table 8-13 shows a significant relationship between support and attendance across levels of intervention, though it is difficult to interpret the results. It appears that in communities where intervention is medium to high that a medium level of support is most effective in relation to attendance. The reverse appears to be true in communities where the level of intervention is low.

TABLE 8-14
The Effect of Government Intervention on the Relationship Between Staffing and Attendance

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Intervention	10	40	27	**
(communities)	(4)	(12)	(13)	
Medium Intervention	22	37	35	**
(communities)	(10)	(8)	(13)	
High Intervention	28	40	59	**
(communities)	(16)	(12)	(4)	

ANOVA controlled for woman's education and household wealth.

In the case of staffing, there appears to be a consistent pattern -- that is that communities where the level of staffing is moderate to high, maintain higher rates of attendance than in those communities where staffing is low. This relationship is strongest in communities where the level of intervention is high.

TABLE 8-15
The Effect of Government Intervention on the Relationship Between Intensity and Attendance

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Intervention	27	30	37	**
(communities)	(7)	(11)	(11)	
Medium Intervention	25	39	28	**
(communities)	(10)	(13)	(9)	
High Intervention	23	42	25	**
(communities)	(7)	(20)	(5)	

ANOVA controlled for woman's education and household wealth.

Table 8-15 shows that medium to high intensity programs fare best in terms of attendance in communities where the level of intervention is medium to high. High intensity programs draw highest attendance in communities where the level of intervention is low.

TABLE 8-16
The Effect of Government Intervention on the Relationship Between Crowding and Attendance

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Intervention	43	14	34	**
(communities)	(7)	(6)	(12)	
Medium Intervention	47	27	16	**
(communities)	(12)	(9)	(5)	
High Intervention	34	55	30	**
(communities)	(8)	(9)	(10)	

ANOVA controlled for woman's education and household wealth.

Finally, Table 8-16 shows that growth monitoring is better attended in communities where crowding is medium to low. Further note that high intervention communities display high rates of attendance in medium crowding. This suggests that high intervention communities are better able to maintain attendance under conditions of moderate crowding better than medium or low intervention communities.

Overall, there appears to be little interaction between design factors and level of intervention in terms of their effect on attendance. Given the fact that level of intervention has no effect on attendance in general, this finding is not unexpected.

The next stage of analysis is to examine the interaction between program design factors and government intervention in terms of their relationship with knowledge and practice indicators. This relationship is tested only for those *balita* that had attended the weighing post in the last twelve months. Tables 8-17 through 8-24 present these findings.

TABLE 8-17
The Effect of Government Intervention on the Relationship Between Program Support and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Intervention	10.1	11.1	11.4	*
Medium Intervention	----	----	----	NS
High Intervention	11.1	10.6	10.0	*
Health Knowledge Index				
Low Intervention	20.8	24.6	25.4	*
Medium Intervention	----	----	----	NS
High Intervention	----	----	----	NS
Infant Nutrition Knowledge Index				
Low Intervention	7.0	7.7	7.8	*
Medium Intervention	----	----	----	NS
High Intervention	7.4	7.5	6.6	**

ANOVA controlled for woman's education and wealth.

With respect to the three knowledge indices, support appears to have a mixed effect on the acquisition of knowledge. It is of interest that support has a positive relationship with all three knowledge indicators where the level of intervention is low, and a negative influence on the two nutrition knowledge indices when the level of intervention is high.

Also, there appears to be no significant relationship between design factors and practice indicators when controlled for level of intervention. This is again probably the result of a number of factors including the large number of intervening variables, and the adequate design levels displayed throughout the Indonesian case.

TABLE 8-18
The Effect of Government Intervention on the Relationship Between Program Support and Practice (Calculated only for those balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	7.4	7.7	7.2	*
Nutrition Practice History Index				
Low Intervention	5.4	6.3	5.8	*
Medium Intervention	----	----	----	NS
High Intervention	----	----	----	NS
Family Planning Practice Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	----	----	----	NS

ANOVA controlled for woman's education and wealth.

TABLE 8-19

The Effect of Government Intervention on the Relationship Between Program Staffing and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Intervention	8.5	10.9	11.8	**
Medium Intervention	11.4	10.4	12.0	**
High Intervention	----	----	----	NS
Health Knowledge Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	24.8	29.5	31.5	**
Infant Nutrition Knowledge Index				
Low Intervention	5.8	7.6	7.9	**
Medium Intervention	7.8	7.1	8.1	*
High Intervention	7.7	6.9	7.4	*

ANOVA controlled for woman's education and wealth.

The level of staffing is positively related to nutrition knowledge in communities where the level of intervention is medium or low. Health knowledge, on the other hand, is significantly related to staffing only when the level of intervention is high. In the case of infant nutrition knowledge, a positive relationship appears in communities where the level of intervention is medium to low, and a negative relationship appears when intervention is high.

The following tables show the interaction between design factors and intervention with respect to knowledge and practice outcomes. To summarize, staffing appears to have a generally positive relationship on nutrition practice history, but only in communities where the level of intervention is high. Intensity appears to have no consistent effect on knowledge or practice across levels of government intervention. Crowding has a negative effect on knowledge when the level of intervention is high. It has no influence under other levels of intervention. Crowding has no effect on practice.

TABLE 8-20

The Effect of Government Intervention on the Relationship Between Program Staffing and Practice (Calculated only for balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	7.2	7.6	7.7	*
Nutrition Practice History Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	5.9	5.4	5.6	*
Family Planning Practice Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	4.8	4.9	5.9	*

ANOVA controlled for woman's education and wealth.

TABLE 8-21

The Effect of Government Intervention on the Relationship Between Program Intensity and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Intervention	----	----	----	NS
Medium Intervention	10.7	11.9	10.9	*
High Intervention	11.0	10.4	11.3	*
Health Knowledge Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	30.0	29.2	19.9	**
Infant Nutrition Knowledge Index				
Low Intervention	----	----	----	NS
Medium Intervention	7.4	8.2	7.3	*
High Intervention	7.5	7.1	7.9	*

ANOVA controlled for woman's education and wealth.

TABLE 8-22

The Effect of Government Intervention on the Relationship Between Program Intensity and Practice (Calculated only for balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Intervention	---	---	---	NS
Medium Intervention	---	---	---	NS
High Intervention	---	---	---	NS
Nutrition Practice History Index				
Low Intervention	---	---	---	NS
Medium Intervention	5.7	6.3	5.6	*
High Intervention	---	---	---	NS
Family Planning Practice Index				
Low Intervention	---	---	---	NS
Medium Intervention	---	---	---	NS
High Intervention	---	---	---	NS

ANOVA controlled for woman's education and wealth.

TABLE 8-23

The Effect of Government Intervention on the Relationship Between Crowding and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Intervention	10.9	10.7	11.5	*
Medium Intervention	11.6	10.6	11.7	*
High Intervention	10.8	10.9	10.1	*
Health Knowledge Index				
Low Intervention	---	---	---	NS
Medium Intervention	---	---	---	NS
High Intervention	27.8	31.0	26.2	**
Infant Nutrition Knowledge Index				
Low Intervention	---	---	---	NS
Medium Intervention	---	---	---	NS
High Intervention	7.2	7.5	7.0	*

ANOVA controlled for woman's education and wealth.

TABLE 8-24
The Effect of Government Intervention on the Relationship Between Crowding and Practice (Calculated only for those balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	----	----	----	NS
Nutrition Practice History Index				
Low Intervention	----	----	----	NS
Medium Intervention	6.2	5.6	5.6	*
High Intervention	4.9	5.2	4.9	*
Family Planning Practice Index				
Low Intervention	----	----	----	NS
Medium Intervention	----	----	----	NS
High Intervention	----	----	----	NS

ANOVA controlled for woman's education and wealth.

8.5 Findings

(1) The average levels of household wealth and woman's education are significantly lower in communities where the level of intervention is high.

(2) The level of intervention has no influence on the average rate of growth monitoring attendance.

(3) Government intervention has a positive effect on health knowledge, no effect on nutrition knowledge.

(4) Communities where the level of intervention is high have the lowest levels of practice.

(5) Communities where the level of intervention is low have lowest average nutritional status as measured by height for age and weight for age.

(6) There is a significant relationship between government intervention and level of staffing. In communities where the level of intervention is low have high levels of staffing, and communities where the level of intervention is high have low levels of staffing. This may be due to competition for volunteers. No other design factors are significantly related to level of intervention, though support appears to display a pattern similar to that of staffing.

(7) Level of intervention does not significantly affect the quality of growth monitoring execution as measured by accuracy of SKDN statistics and immunization coverage of attenders.

(8) The effect of distance to weighing post on attendance is negative across levels of government intervention. The analysis suggests that people that live in the 250 - 500 meter range are less likely to attend in communities where the level of government intervention is low. This suggests a synergistic relationship between government programs with respect to attendance.

(9) The total effect of attendance on practice is higher in communities where the level of government intervention is low.

(10) Well executed programs, where execution is measured by the accuracy of SKDN statistics, are better attended across levels of intervention.

(11) Attendance is higher in programs where the immunization coverage of ever attenders is high than where it is low across levels of intervention.

(12) Knowledge is higher for attenders across levels of intervention, though the difference is not always significant. The relationship between attendance and knowledge is highest in communities where the level of intervention is medium.

(13) Attenders have higher levels of practice across levels of intervention.

(14) There is some interaction between program design factors and level of intervention with respect to attendance. First, high levels of staffing are more important to attendance where intervention is high. Second, it appears likely that communities where intervention is high are better able to maintain attendance where crowding is medium than communities where intervention is medium or low. Though support and intensity influence attendance, they affect attendance similarly across levels of intervention.

(15) There is little interaction between program design factors and level of intervention with respect to knowledge. Support has a positive effect on knowledge when the level of intervention is low, and a negative effect when the level of intervention is high.

(16) There is no discernible interaction between design factors and intervention with respect to practice indicators.

IX. THE EFFECT OF COMMUNITY ORGANIZATION

9.1 The Effect of Community Organization on Household-Level Factors

Differences in household conditions according to the level of community organization are described.

TABLE 9-1
The Effect of Level of Community Organization on Household Factors

	MEAN	SIG
Household Wealth Index		**
Low Organization	13.5	
Medium Organization	14.1	
High Organization	19.0	
Woman's Education Index		**
Low Organization	1.7	
Medium Organization	1.8	
High Organization	2.4	
Distance to Weighing Post (Meters)		**
Low Organization	684	
Medium Organization	825	
High Organization	514	

ANOVA significant at .05 (*), .001 (**).

It is not surprising that there are significant differences in these three household background factors. The average household wealth and average level of woman's education is significantly lower in communities where the number of community organizations is low. In addition, though the average distance to the weighing post is significantly different according to level of organization, the inconsistent pattern suggests that there is no real relationship between the geographical size of the community and level of organization. Note however, that in communities where the level of organization is high have the lowest average distance to weighing post. This may be due to the fact that smaller communities are closer knit, and that smaller communities are more modern communities, as discussed in chapter 7.

Next, differences in program factors are presented.

TABLE 9-2
The Effect of Level of Community Organization on Growth Monitoring Attendance

PROGRAM ATTENDANCE	MEAN	SIG
Percent Ever Attend		**
Low organization	40	
Medium organization	64	
High organization	72	
Average Rate of Attendance		**
Low Organization	21	
Medium Organization	37	
High Organization	42	

ANOVA significant at .05 (*), .001 (**).

Table 9-2 shows an important finding--attendance is significantly higher where the number of other community organizations is high. This may in part be due to the higher average level of education and wealth in these communities, but also may indicate a synergistic relationship between participatory activities with respect to attendance.

TABLE 9-3
The Effect of Level of Community Organization on Growth Nutrition-Related Knowledge

KNOWLEDGE	MEAN	SIG
Nutrition KnowledgeIndex		**
Low Organization	10.2	
Medium Organization	10.5	
High Organization	10.9	
Health Knowledge Index		**
Low Organization	22.4	
Medium Organization	23.7	
High Organization	24.1	
Infant Nutrition Knowledge Index		**
Low Organization	7.0	
Medium Organization	7.3	
High Organization	7.5	

ANOVA significant at .05 (*), .001 (**).

When the influence of community organization on knowledge indices is described (Table 9-3), a clear and significant pattern emerges--knowledge is greater in the communities where a high number of community organizations exist. This finding might be attributed to higher attendance in these communities, as well as the higher levels of wealth and education.

TABLE 9-4
The Effect of Level of Community Organization on Nutrition Practice

PRACTICE	MEAN	SIG
Nutrition Practice Index		**
Low Organization	7.1	
Medium Organization	7.2	
High Organization	7.5	
Nutrition Practice History Index		**
Low Organization	4.8	
Medium Organization	5.6	
High Organization	5.6	
Family Planning Practice Index		*
Low Organization	4.4	
Medium Organization	4.5	
High Organization	4.9	

ANOVA significant at .05 (*), .001 (**).

Table 9-4 illustrates the effect of community organization on related practices. As in the case of knowledge, it appears that people in highly organized communities have better nutrition and family planning practices than people in less organized communities. Once again, it is likely that this difference is due to higher attendance, as well as higher levels of wealth and education.

TABLE 9-5
The Effect of Level of Community Organization on Nutritional Status

NUTRITIONAL STATUS	MEAN	SIG
Height for Age		**
Low Organization	-1.6	
Medium Organization	-1.9	
High Organization	-1.5	
Weight for Height		*
Low Organization	-.4	
Medium Organization	-.3	
High Organization	-.2	
Weight for Age		**
Low Organization	-1.4	
Medium Organization	-1.4	
High Organization	-1.1	

ANOVA significant at .05 (*), .001 (**).

Finally, the effect of community organization on nutritional status is determined. Table 9-5 shows that the average nutritional status is the best in communities where the level of organization is high.

9.2 The Relationship Between Community Organization and Program Factors

The relationships between the contextual factor and program design factors are again explored.

TABLE 9-6
Crosstabulation Between Level of Community Organization and Program Design Factors (expressed as percentages)

	LEVEL OF SUPPORT			SIG
	Low	Medium	High	
Level of Organization				NS
Low	41.9	25.8	32.3	
	(13)	(8)	(10)	
Medium	21.2	36.4	42.4	
	(7)	(12)	(14)	
High	31.0	37.9	31.0	
	(9)	(11)	(9)	
	LEVEL OF STAFFING			
	Low	Medium	High	
Level of Organization				NS
Low	33.3	33.3	33.3	
	(10)	(10)	(10)	
Medium	21.2	30.3	48.5	
	(7)	(10)	(16)	
High	44.8	41.4	13.8	
	(13)	(12)	(4)	
	LEVEL OF INTENSITY			
	Low	Medium	High	
Level of Organization				NS
Low	32.3	45.2	22.6	
	(10)	(14)	(7)	
Medium	27.3	42.4	30.3	
	(9)	(14)	(10)	
High	17.2	55.2	27.6	
	(5)	(6)	(8)	
	LEVEL OF CROWDING			
	Low	Medium	High	
Level of Organization				NS
Low	29.2	37.5	33.3	
	(7)	(9)	(8)	
Medium	42.9	21.4	35.7	
	(12)	(6)	(10)	
High	30.8	34.6	34.6	
	(8)	(9)	(9)	

Chi-square significant at .05 (*), .005 (**).

No significant relationship is found in Table 9-6 suggesting, surprisingly, that the level of community organization has little influence on program design factors.

Table 9-7 shows growth monitoring execution in relation to level of organization.

TABLE 9-7
Crosstabulation Between Level of Community Organization and Quality of Execution (expressed as percentages)

	QUALITY OF EXECUTION	
	Upper 50% -- Accuracy of SKDN Statistics	Upper 50% -- Immunization Coverage
Level of Community Organization		
Low (N=39)	38	29
Medium (N=37)	48	42
High (N=17)	62	79
SIGNIFICANCE	NS	**

Chi-square significant at .05 (*), .005 (**).

A relatively higher percentage of programs where immunization coverage of attenders is high are located in communities where the level of community organization is high. This suggests that growth monitoring is better executed with respect to immunization in communities where the level of organization is high, despite the fact that these programs are, one average, no better designed. Though the relationship is not a significant one with respect to accuracy of SKDN statistics, the same pattern holds.

9.3 The Effect of Community Organization on the Household

The third part of the analysis is to examine the effect of community organization on the household's participation in growth monitoring and related activities. An analysis of the relationship between distance to weighing post and attendance under the various levels of community organization is conducted.

Figures 9-1 and 9-2 show this relationship. Both the percentage of ever attenders and the average rate of attendance are strongly influenced by the level of community organization.

THE EFFECT OF ORGANIZATION ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 9-1

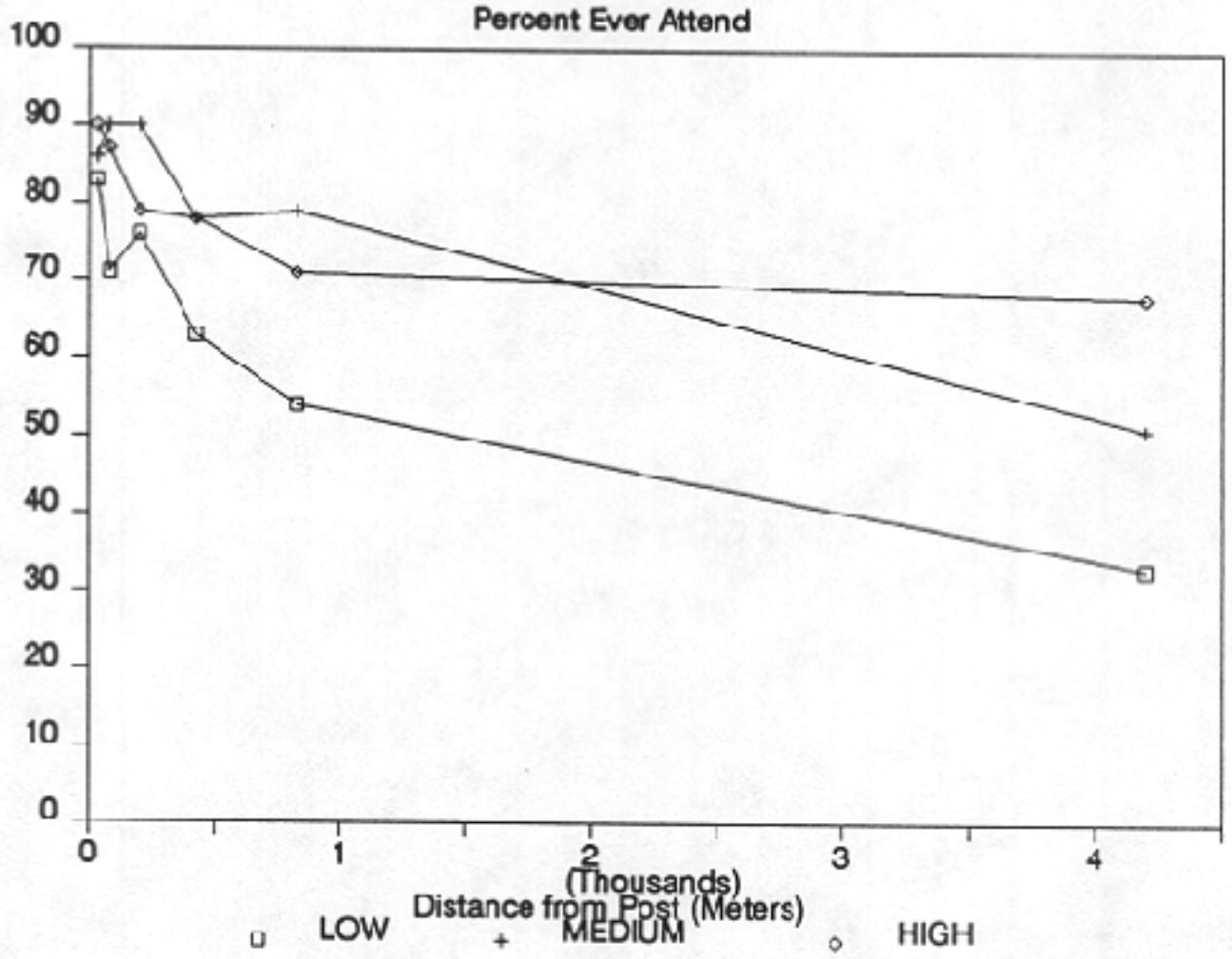
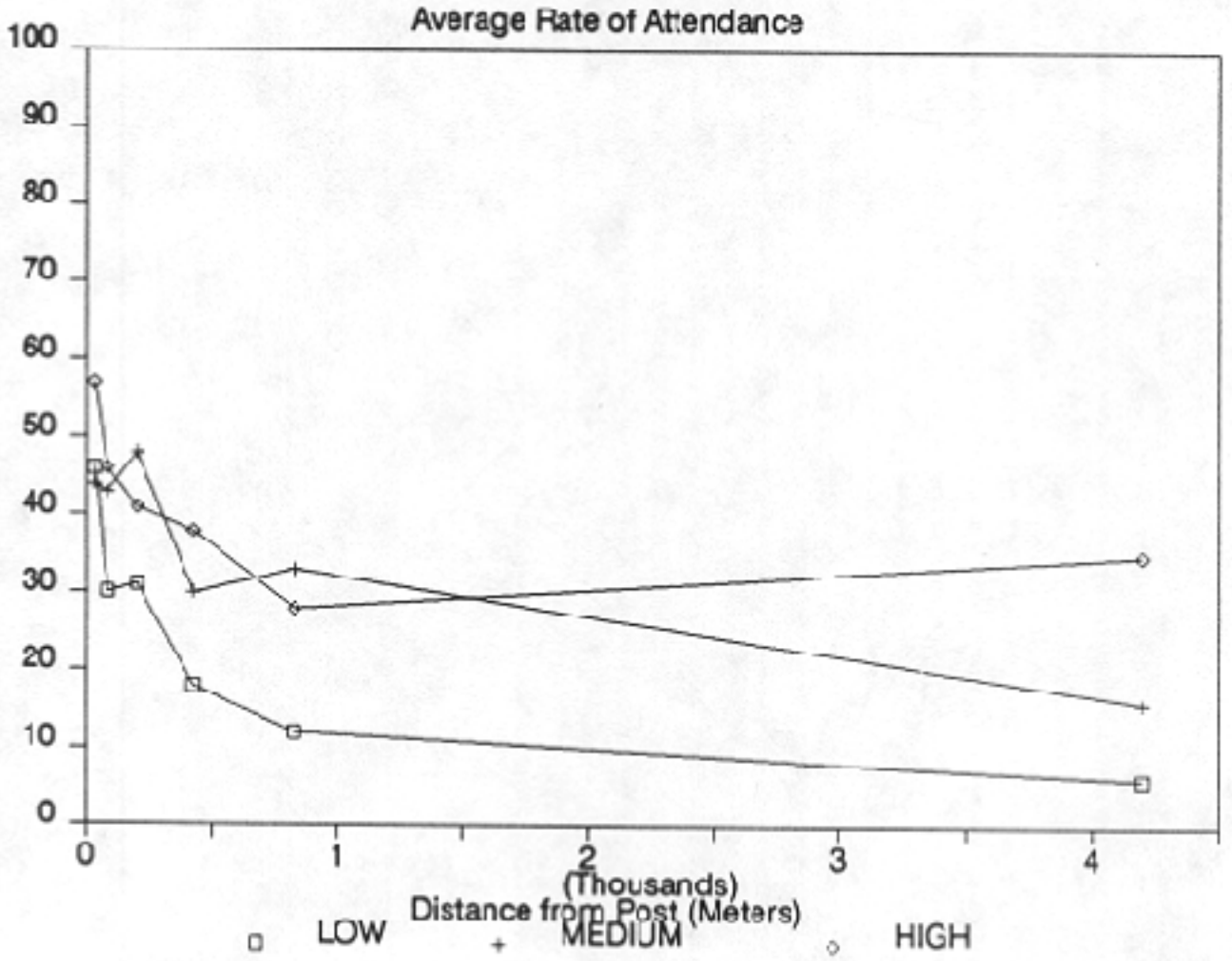


FIGURE 9-2



People are much less likely to attend in communities where the level of organization is low. This is consistent with previous findings findings regarding the influence of community organization.

Next, the entire household model is estimated using path analysis under high and low levels of community organization. Figures 9-3 and 9-4 show the results of this analysis.

Again, we examine the part of the model that is most directly related to growth monitoring and related programs.

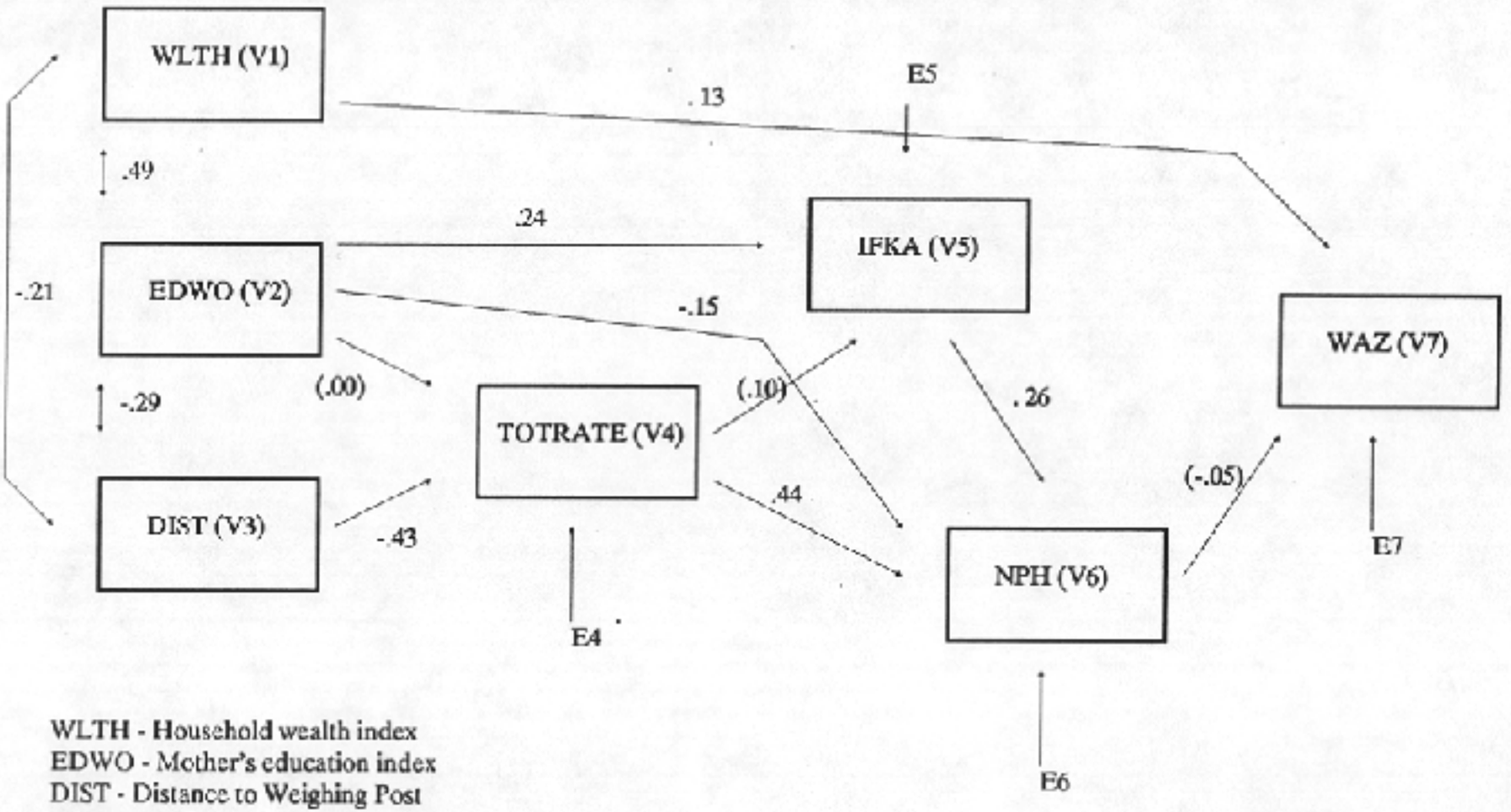
TABLE 9-8
The Influence of Community Organization on the Household's Participation in Growth Monitoring and Related Activities

	p_{54}	p_{65}	p_{64}	$p_{65}p_{54}+p_{64}$
All Communities (n=803)	.12	.27	.20	.29
Level of Community Organization				
low (n=230)	(.10)	.26	.44	.47
high (n=269)	.11	.12	.21	.22

Surprisingly, Table 9-8 shows that total program impact is actually much lower in communities where the level of organization is high. Though the effect of program participation on knowledge is approximately the same in both cases, the links between knowledge and practice, and program attendance and practice are both considerably lower in the case of high organization. At the same time, in comparing Figures 9-3 and 9-4, the relationship between distance to weighing post and attendance is confirmed, people are less likely to attend in communities where the level of organization is low.

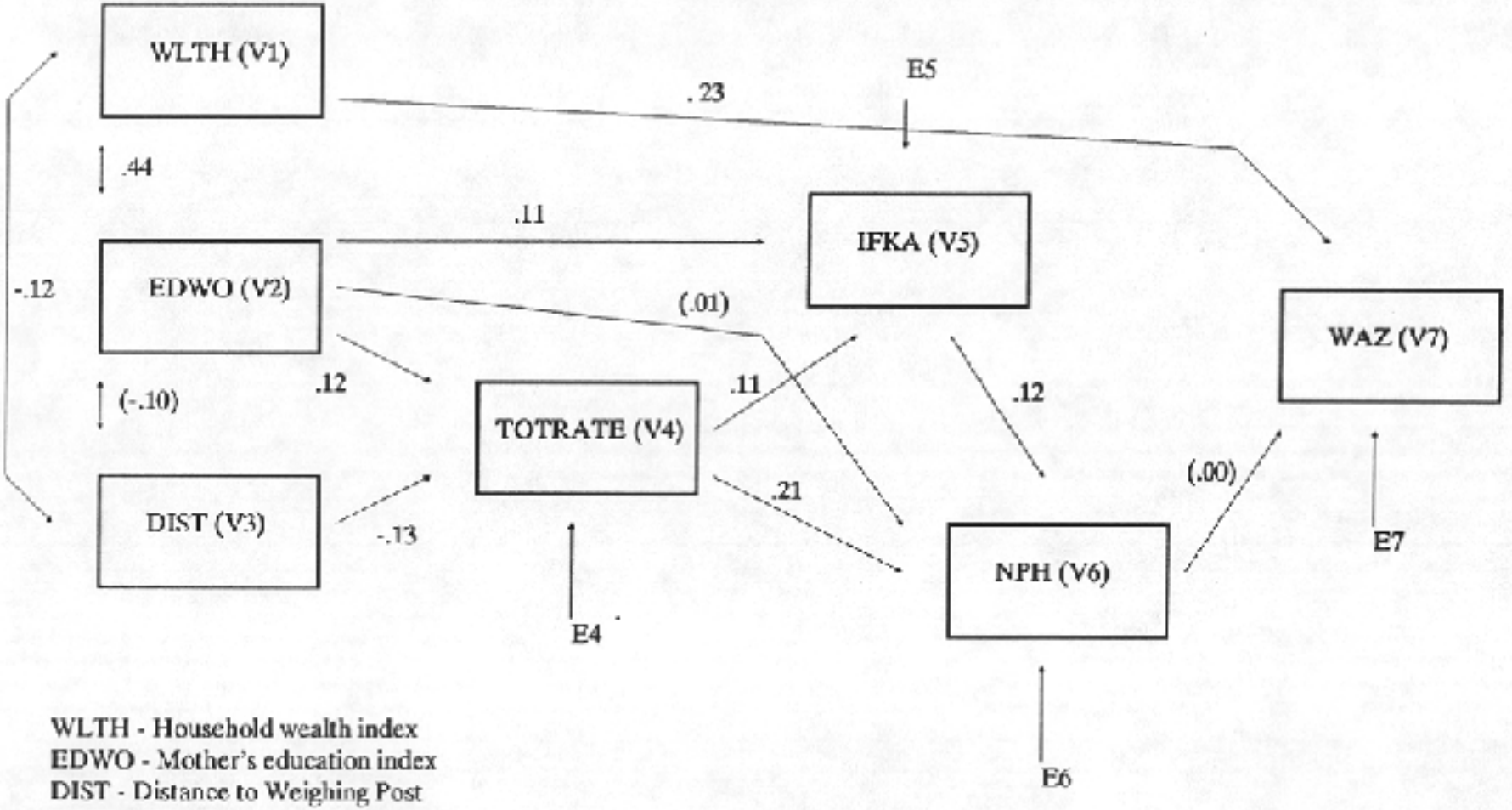
One way in which this might be interpreted is that the level of organization has a strong positive impact on growth monitoring attendance. In addition, previous analysis has shown that level of organization also has a strong positive impact of quality of execution. However, it appears that the third link in the model is not as strong -- in communities where the level of organization is high, attenders appear to be less willing to change practices. This may

FIGURE 9-3 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF LOW COMMUNITY ORGANIZATION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

FIGURE 9-4 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF HIGH COMMUNITY ORGANIZATION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

be due to increased attendance and crowding in these communities, or that more people less receptive to program messages attend in these communities. Furthermore, knowledge and practice levels are significantly higher in high modernization communities, it may also be the case that people in these communities learn program messages outside of growth monitoring. Consequently, the effect of the program on attenders is not as great.

9.4 The Interaction Between Community Organization and Growth Monitoring Design Factors

The next step of analysis is to examine differences in the relationship between elements in the model between various levels of community organization. Because program design factors and contextual factors are both measured at the community level, the tests of significance are constrained because of the small number of observations within each group. Tables 9-9 and 9-10 show the effect of community organization on the relationship between quality of execution and growth monitoring attendance.

TABLE 9-9
The Effect of Community Organization on the Relationship Between Quality of Execution as Measured by Accuracy of SKDN Statistics and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Organization	80	34	**
Medium Organization	68	61	NS
High Organization	83	63	**
Average Rate of Attendance			
Low Organization	54	16	**
Medium Organization	43	31	*
High Organization	51	34	**

ANOVA controlled for woman's education and household wealth.

TABLE 9-10
The Effect of Community Organization on the Relationship Between Quality of Execution as Measured by Immunization Coverage of Ever Attenders and Program Attendance

	QUALITY		
	HIGH	LOW	SIG
Percent Ever Attend			
Low Organization	56	36	**
Medium Organization	65	58	NS
High Organization	71	37	**
Average Rate of Attendance			
Low Organization	28	18	*
Medium Organization	38	30	NS
High Organization	43	14	**

ANOVA controlled for woman's education and household wealth.

In communities where the level of organization is low or high well executed programs are better attended. Well executed programs in communities where community organization is high are the best attended of all the programs. This table also shows that the difference between attendance rates in programs that are well executed and those that are not is greater in communities where the level of organization is high. Why the difference in attendance is not significant in medium organization communities is not clear.

Tables 9-11 and 9-12 show the effect of community organization on the relationship between attendance and knowledge.

TABLE 9-11
The Effect of Community Organization on the Relationship Between Program Attendance and Knowledge

	AVERAGE RATE OF ATTENDANCE NEVER	LOW	HIGH	SIG
Nutrition Knowledge Index				
Low Organization	10.2	10.0	10.8	NS
Medium Organization	9.7	10.7	11.2	**
High Organization	10.7	10.8	11.3	NS
Health Knowledge Index				
Low Organization	22.1	23.7	24.7	NS
Medium Organization	19.4	24.9	28.0	**
High Organization	20.5	23.8	28.7	**
Infant Nutrition Knowledge Index				
Low Organization	7.0	6.8	7.4	NS
Medium Organization	6.7	7.4	7.8	**
High Organization	7.4	7.4	7.7	NS

ANOVA controlled for woman's education and household wealth.

Though the differences are not always significant in Table 9-11, frequent attenders always have a higher average knowledge score than non-attenders. The fact that this difference is only significant half of the time relates to previous findings--that though programs are well executed, the relationship between attendance and knowledge is not a strong one in any case. In addition, there is no significant difference in the practice of attenders across levels of organization.

TABLE 9-12
The Effect of Community Organization on the Relationship Between Program Attendance and Practice

	AVERAGE RATE OF ATTENDANCE			SIG
	NEVER	LOW	HIGH	
Nutrition Practice Index				
Low Organization	6.9	7.2	7.3	NS
Medium Organization	6.6	7.4	7.5	**
High Organization	7.2	7.5	7.6	NS
Nutrition Practice History Index				
Low Organization	3.7	5.6	5.6	**
Medium Organization	4.3	5.7	5.9	**
High Organization	4.6	5.9	5.7	**
Family Planning Practice Index				
Low Organization	3.9	5.2	5.2	**
Medium Organization	3.1	5.1	5.4	**
High Organization	4.0	5.1	5.1	*

ANOVA controlled for woman's education and household wealth.

The relationship between attendance and practice indicators under levels of organization is shown in Table 9-12. Here again, previous findings are reinforced. Attendance has a strong positive effect on practice and the magnitude of that effect is slightly greater in communities where the level of organization is low.

Tables 9-13 shows the effect of community organization on the relationship between the design factors and the rate of attendance.

TABLE 9-13
The Effect of Community Organization on the Relationship Between Support and Attendance

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Organization	18	22	25	*
(communities)	(13)	(8)	(10)	
Medium Organization	41	56	24	**
(communities)	(7)	(12)	(14)	
High Organization	39	39	49	*
(communities)	(9)	(11)	(9)	

ANOVA controlled for woman's education and household wealth.

First, Table 9-13 again shows the positive relationship between level of organization and attendance. This table also suggests that support has a moderately positive effect. This effect shows up across levels of community organization, with the exception of the case of medium organization.

TABLE 9-14
The Effect of Community Organization on the Relationship Between Staffing and Attendance

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Organization	12	29	25	**
(communities)	(10)	(10)	(10)	
Medium Organization	31	38	39	NS
(communities)	(7)	(10)	(16)	
High Organization	31	48	64	**
(communities)	(13)	(12)	(4)	

ANOVA controlled for woman's education and household wealth.

In the case of staffing, there appears to be a consistent pattern--communities where the level of staffing is moderate to high, maintain higher rates of attendance than in those communities where staffing is low. This relationship is strongest in communities where the

level of organization is high. The relationship is not significant where the level of organization is medium.

TABLE 9-15
The Effect of Community Organization on the Relationship Between Intensity and Attendance

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Organization	23	20	20	NS
(communities)	(10)	(14)	(7)	
Medium Organization	28	43	32	**
(communities)	(9)	(14)	(10)	
High Organization	25	47	41	**
(communities)	(5)	(16)	(8)	

ANOVA controlled for woman's education and household wealth.

Table 9-15 shows that medium to high intensity programs fare best in terms of attendance in communities where the level of organization is medium to high. The fact that there is no significant difference between the attendance rates in communities where the level of organization is low suggests that level of intensity has little impact on attendance in these programs.

TABLE 9-16
The Effect of Community Organization on the Relationship Between Crowding and Attendance

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Organization	36	17	23	*
(communities)	(7)	(9)	(8)	
Medium Organization	42	45	28	*
(communities)	(12)	(6)	(10)	
High Organization	46	49	36	**
(communities)	(8)	(9)	(9)	

ANOVA controlled for woman's education and household wealth.

Finally, Table 9-16 shows that growth monitoring is better attended in communities where crowding is medium to low. Further, crowding appears to make more relative difference in communities where organization is low, and communities where organization is high are better able to maintain attendance under conditions of moderate crowding.

The next stage of analysis is to examine the interaction between program design factors and community organization in terms of their relationship with knowledge and practice indicators. This relationship is tested only for those *balita* which had attended the weighing post in the last twelve months. Tables 9-17 through 9-24 present these findings.

TABLE 9-17
The Effect of Community Organization on the Relationship Between Program Support and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Organization	10.8	9.4	11.3	*
Medium Organization	11.0	11.4	10.6	*
High Organization	----	----	----	NS
Health Knowledge Index				
Low Organization	26.6	22.4	22.9	*
Medium Organization	21.4	29.6	27.8	**
High Organization	28.7	25.7	25.7	*
Infant Nutrition Knowledge Index				
Low Organization	7.2	6.5	7.8	*
Medium Organization	7.6	8.0	7.2	**
High Organization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

With respect to the three knowledge indices, support appears to have a mixed effect on the acquisition of knowledge. The fact that the following tables show very little in terms of consistent effect, especially in the case of practice indicators, is not surprising since it has already been shown that the relationship between attendance and knowledge is low regardless of level of organization.

Also, no significant relationship appears between design factors and practice indicators when controlled for level of organization. This is again probably the result of a number of factors including the large number of intervening variables, and the adequate design levels displayed throughout the Indonesian case.

TABLE 9-18

The Effect of Community Organization on the Relationship Between Program Support and Practice (Calculated only for balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Organization	----	----	----	NS
Medium Organization	7.6	7.6	7.2	*
High Organization	----	----	----	NS
Nutrition Practice History Index				
Low Organization	----	----	----	NS
Medium Organization	5.7	6.1	5.5	*
High Organization	----	----	----	NS
Family Planning Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 9-19

The Effect of Community Organization on the Relationship Between Program Staffing and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Organization	----	----	----	NS
Medium Organization	11.4	10.4	11.6	*
High Organization	----	----	----	NS
Health Knowledge Index				
Low Organization	----	----	----	NS
Medium Organization	29.5	24.9	27.7	**
High Organization	24.6	27.2	28.7	*
Infant Nutrition Knowledge Index				
Low Organization	----	----	----	NS
Medium Organization	7.8	7.2	8.0	*
High Organization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 9-20
The Effect of Community Organization on the Relationship Between Program Staffing and Practice (Calculated only for balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS
Nutrition Practice History Index				
Low Organization	----	----	----	NS
Medium Organization	6.0	5.5	6.1	NS
High Organization	----	----	----	NS
Family Planning Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	4.7	5.2	6.2	*

ANOVA controlled for woman's education and household wealth.

TABLE 9-21
The Effect of Community Organization on the Relationship Between Program Intensity and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Organization	9.5	10.7	11.1	**
Medium Organization	----	----	----	NS
High Organization	12.2	11.0	10.9	*
Health Knowledge Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	25.8	28.2	23.7	**
Infant Nutrition Knowledge Index				
Low Organization	6.6	7.5	7.2	*
Medium Organization	----	----	----	NS
High Organization	8.4	7.4	7.6	**

ANOVA controlled for woman's education and household wealth.

TABLE 9-22
The Effect of Community Organization on the Relationship Between Program Intensity and Practice (Calculated only for balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS
Nutrition Practice History Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS
Family Planning Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 9-23
The Effect of Community Organization on the Relationship Between Crowding and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Organization	10.6	9.5	11.4	*
Medium Organization	12.0	10.8	10.7	**
High Organization	----	----	----	NS
Health Knowledge Index				
Low Organization	----	----	----	NS
Medium Organization	26.0	32.2	28.2	**
High Organization	27.6	27.7	24.9	*
Infant Nutrition Knowledge Index				
Low Organization	----	----	----	NS
Medium Organization	8.4	7.6	7.2	**
High Organization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 9-24
The Effect of Community Organization on the Relationship Between Crowding and Practice (Calculated only for balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS
Nutrition Practice History Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS
Family Planning Practice Index				
Low Organization	----	----	----	NS
Medium Organization	----	----	----	NS
High Organization	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

9.5 Findings

(1) The average levels of household wealth, woman's education, attendance, knowledge and practice increase as the level of community organization increases. Average distance to weighing post is lowest in communities where the level of organization is high. Nutritional status is highest where the level of organization is high.

(2) There is no significant relationship between level of organization and program design factors.

(3) There is a significant relationship between level of organization and quality of growth monitoring execution as measured by immunization coverage of attenders. This is true in spite of the fact that they are no better designed. There is no significant relationship between level of organization and accuracy of SKDN statistics.

(4) Distance has a similar magnitude of negative effect on attendance across levels of organization. At the same time, level of attendance is lower in less organized communities across levels of organization.

(5) The relationship between attendance and practice is lower in communities where level of organization is high. May be due higher levels of attendance, attenders being less likely to adhere to program messages, and higher knowledge in practice in highly organized communities outside of growth monitoring.

(6) Quality of execution as measured by accuracy of SKDN statistics has a positive effect on program attendance across levels of organization. Yet difference in attendance rates between low and high quality programs is greater in communities where the level of organization is low.

(7) Quality of execution as measured by immunization coverage also has a positive effect on attendance across levels of organization, though in this case the difference in attendance rates between low and high quality programs is greater in communities where the level of organization is high.

(8) The effect of attendance on knowledge and practice is positive, but not always significantly so.

(9) The effect of attendance on practice is positive, and attenders have the same level of knowledge and practice across levels of organization.

(10) There is some interaction between organization and design factors with respect to attendance. First, staffing positively influences attendance, and this influence is strongest in communities where the level of organization is high. Second, intensity has a positive effect on attendance in medium and high organized communities and no effect where the level of organization is low. Third, crowding has a generally negative influence on attendance across levels of organization. Highly organized communities appear to be able to draw high attendance to moderately crowded programs better than communities where organization is low.

(11) There is no evidence of interaction between organization and program design factors with respect to knowledge or practice indicators.

X. THE EFFECT OF AVERAGE HOUSEHOLD EDUCATION

10.1 The Effect of Average Household Education on Household-Level Factors

As before, differences in household conditions according to the level of average education are described.

TABLE 10-1
The Effect of Level of Average Household Education on Household Factors

	MEAN	SIG
Household Wealth Index		**
Low Average Education	8.7	
Medium Average Education	15.6	
High Average Education	22.8	
Woman's Education Index		**
Low Average Education	1.1	
Medium Average Education	2.1	
High Average Education	2.8	
Distance to Weighing Post (Meters)		**
Low Average Education	823	
Medium Average Education	811	
High Average Education	406	

ANOVA significant at .05 (*), .001 (**).

There are significant differences between the average household wealth and woman's education according to levels of average education. More interesting is the fact that there is a significant difference between the average distance to weighing post. People who reside in communities where the level of average education is high have, on average, half the distance to travel to the nearest weighing post.

Next, Table 10-2 presents differences in program factors.

TABLE 10-2
The Effect of Level of Average Household Education on Growth Monitoring Attendance

PROGRAM ATTENDANCE	MEAN	SIG
Percent Ever Attend		**
Low Average Education	45	
Medium Average Education	66	
High Average Education	64	
Average Rate of Attendance		**
Low Average Education	23	
Medium Average Education	35	
High Average Education	37	

ANOVA significant at .05 (*), .001 (**).

Attendance is significantly lower in communities where the average level of education is low.

Table 10-3 shows the effect of average education on knowledge indicators.

TABLE 10-3
The Effect of Level of Average Household Education on Nutrition-Related Knowledge

KNOWLEDGE	MEAN	SIG
Nutrition Knowledge Index		**
Low Average Education	9.7	
Medium Average Education	10.8	
High Average Education	10.9	
Health Knowledge Index		**
Low Average Education	21.7	
Medium Average Education	22.8	
High Average Education	25.4	
Infant Nutrition Knowledge Index		**
Low Average Education	6.8	
Medium Average Education	7.5	
High Average Education	7.3	

ANOVA significant at .05 (*), .001 (**).

Not surprisingly, those that live in communities where the average level of education is low have the lowest average nutrition knowledge. At the same time, there is no significant

difference between knowledge indicators between medium and high levels of average education.

TABLE 10-4
The Effect of Level of Average Household Education on Nutrition Practice

PRACTICE	MEAN	SIG
Nutrition Practice Index		**
Low Average Education	6.9	
Medium Average Education	7.4	
High Average Education	7.6	
Nutrition Practice History Index		**
Low Average Education	5.1	
Medium Average Education	5.7	
High Average Education	5.1	
Family Planning Practice Index		**
Low Average Education	4.1	
Medium Average Education	4.8	
High Average Education	5.0	

ANOVA significant at .05 (*), .001 (**).

Table 10-4 illustrates the effect of average education of modern medicine on practice. A positive relationship between average education and practice emerges, except in the case of nutrition practice history. This may be due to a tendency for more educated people to bottle feed their children.

TABLE 10-5
The Effect of Level of Average Household Education on Nutritional Status

NUTRITIONAL STATUS	MEAN	SIG
Height for Age		**
Low Average Education	-1.9	
Medium Average Education	-1.8	
High Average Education	-1.4	
Weight for Height		*
Low Average Education	-.4	
Medium Average Education	-.2	
High Average Education	-.3	
Weight for Age		**
Low Average Education	-1.5	
Medium Average Education	-1.3	
High Average Education	-1.2	

ANOVA significant at .05 (*), .001 (**).

Finally, the effect of average education on nutritional status is determined. Table 10-5 shows that as average education increases, so do average weight for age and height for age.

10.2 The Relationship Between Average Household Education and Program Factors

The relationships between the contextual factor and program design factors are explored.

TABLE 10-6
Crosstabulation Between Level of Average Household Education and Program Design Factors (expressed as percentages)

	LEVEL OF SUPPORT			SIG
	Low	Medium	High	
Level of Average Education				NS
Low	28.1	37.5	34.4	
	(9)	(12)	(11)	
Medium	22.6	35.5	41.9	
	(7)	(11)	(13)	
High	43.3	26.7	30.0	
	(13)	(8)	(9)	
	LEVEL OF STAFFING			
	Low	Medium	High	
Level of Average Education				NS
Low	31.3	37.5	31.3	
	(10)	(12)	(10)	
Medium	35.5	32.3	32.3	
	(11)	(10)	(10)	
High	31.0	34.5	34.5	
	(9)	(10)	(10)	
	LEVEL OF INTENSITY			
	Low	Medium	High	
Level of Average Education				NS
Low	37.5	53.1	9.4	
	(12)	(17)	(3)	
Medium	19.4	41.9	38.7	
	(6)	(13)	(12)	
High	20.0	46.7	33.3	
	(6)	(14)	(10)	
	LEVEL OF CROWDING			
	Low	Medium	High	
Level of Average Education				NS
Low	21.4	39.3	39.3	
	(6)	(11)	(11)	
Medium	44.0	28.0	28.0	
	(11)	(7)	(7)	
High	40.0	24.0	26.0	
	(10)	(6)	(9)	

Chi-square significant at .05 (*), .001 (**).

Table 10-6 shows that level of average education has no significant effect on levels of program design factors.

Table 10-7 shows the relationship between the level of average education and quality of execution.

TABLE 10-7
Crosstabulation Between Level of Average education of Modern Medicine and Quality of Execution (expressed as percentages)

	QUALITY OF EXECUTION	
	Upper 50% -- Accuracy of SKDN Statistics	Upper 50% -- Immunization Coverage
Level of Average education		
Low (N=25)	44	22
Medium (N=26)	46	61
High (N=25)	60	67
SIGNIFICANCE	NS	**

Chi-square significant at .05 (*), .001 (**).

First, as average education increases, so does the percentage of communities where immunization coverage of attenders is high. However, no significant relationship exists between average education and accuracy of SKDN statistics though the pattern is the same.

10.3 The Effect of Average Household Education on the Household

The third part of the analysis is to examine the effect of average education on the household's participation in growth monitoring and related activities. An analysis of the relationship between distance to weighing post and attendance under the various levels of average education is conducted.

Figures 10-1 and 10-2 show this relationship. Distance appears to have approximately the same magnitude of effect on attendance in both groups of communities. At any one distance however, the average rate is the lowest in communities where the level of average education is low, and highest where average education is high.

Next, the entire household model is estimated using path analysis under high and low levels of average education . Figures 10-3 and 10-4 show the results of this analysis.

THE EFFECT OF AVERAGE EDUCATION ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 10-1

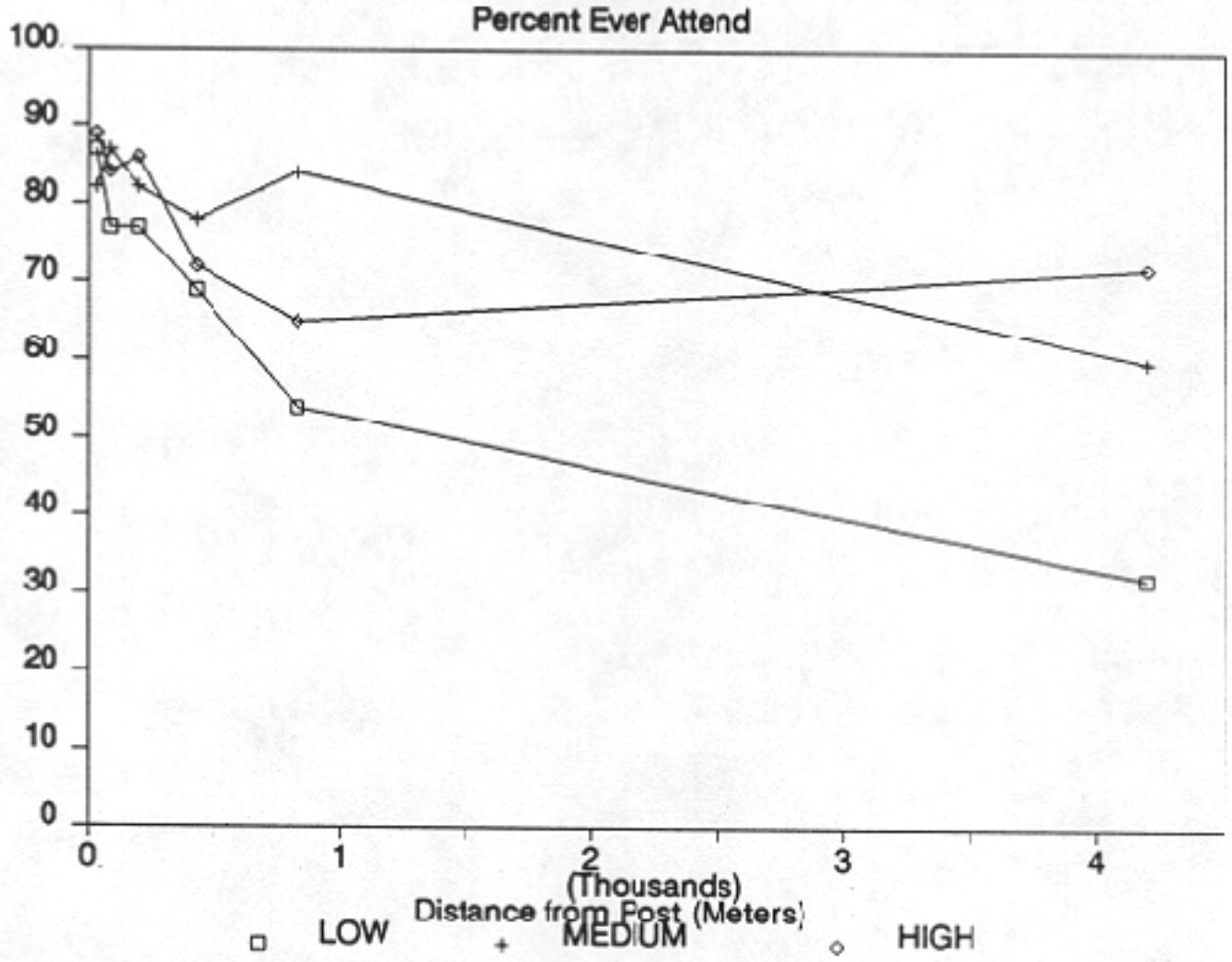


FIGURE 10-2

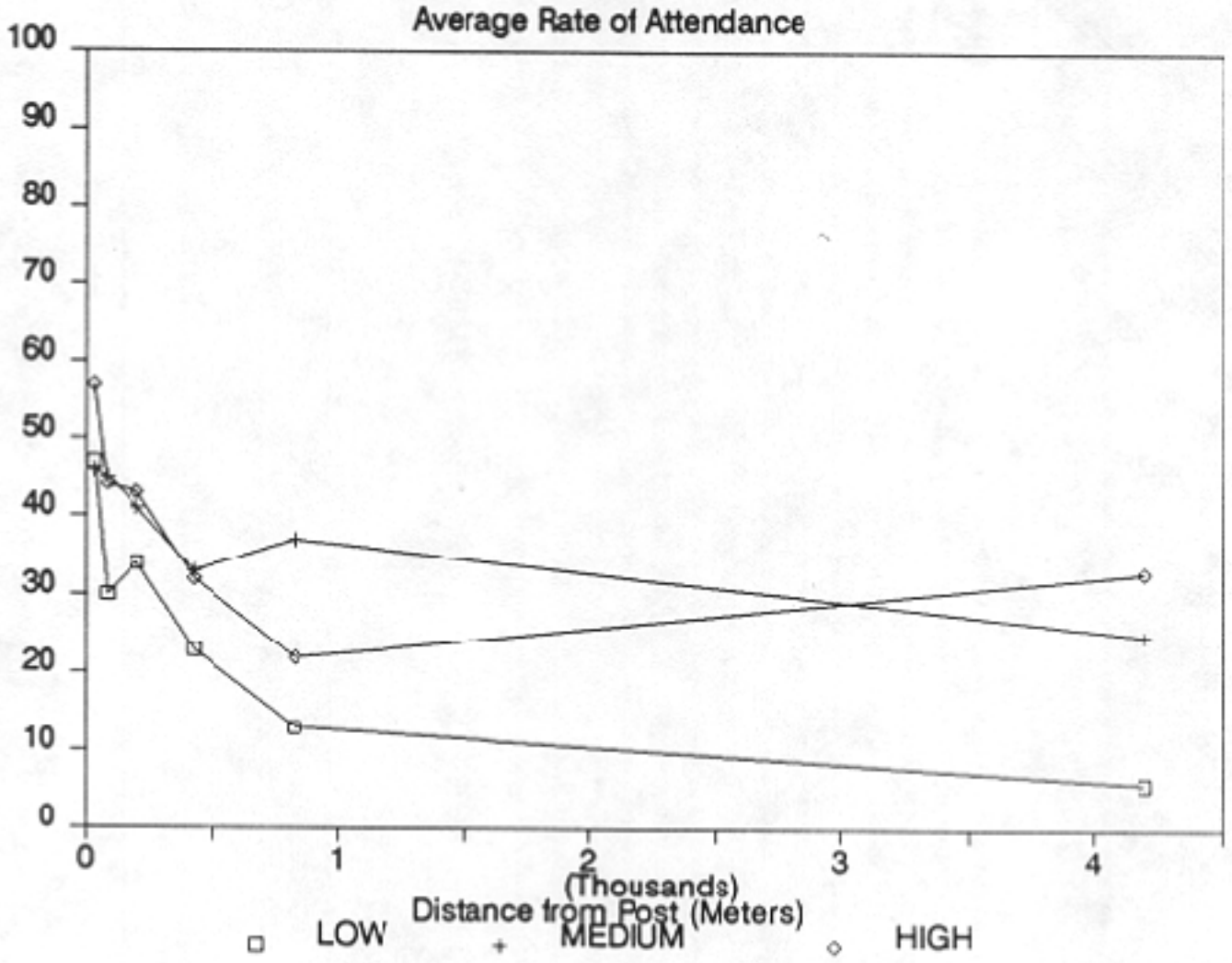
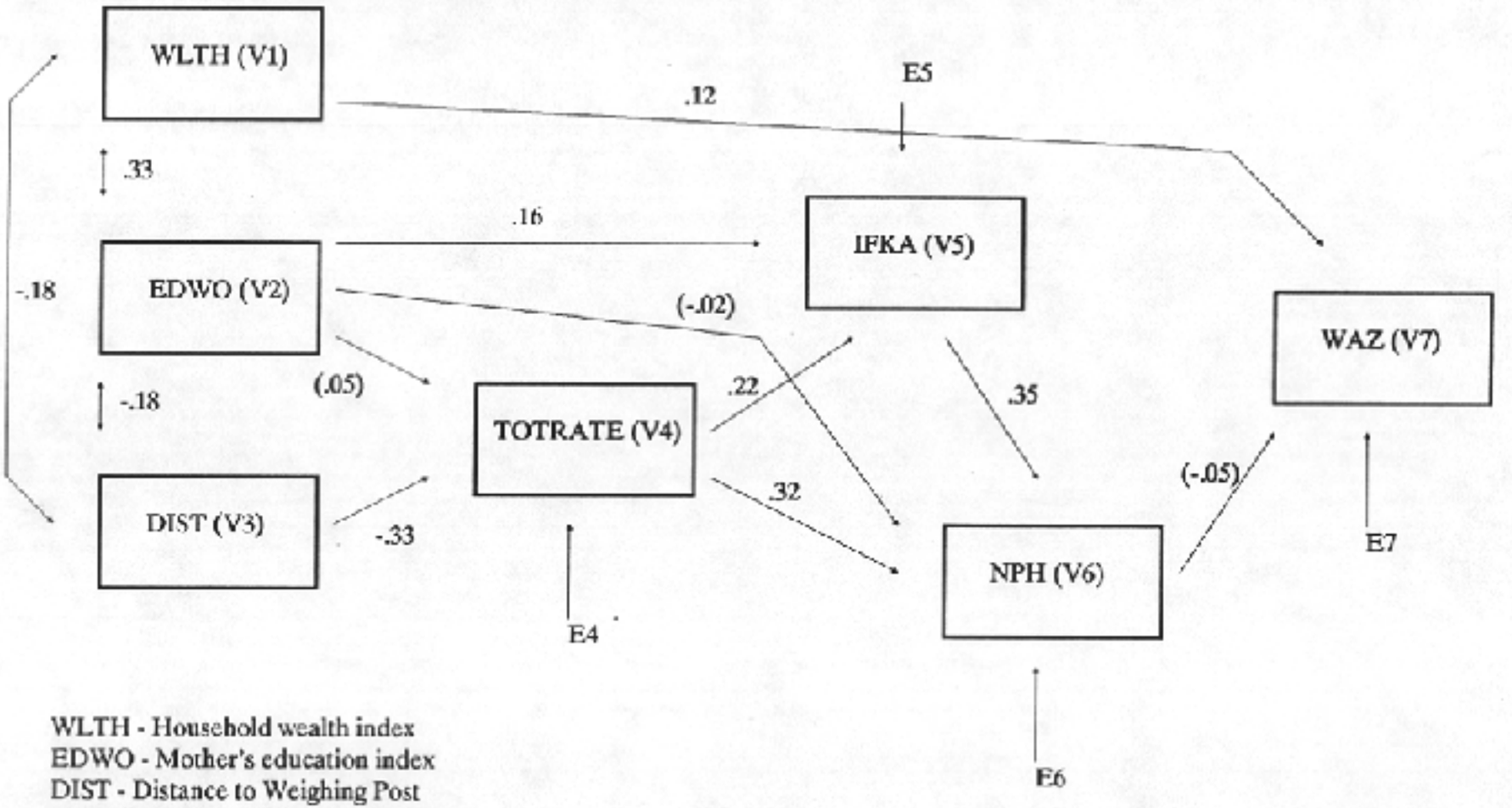
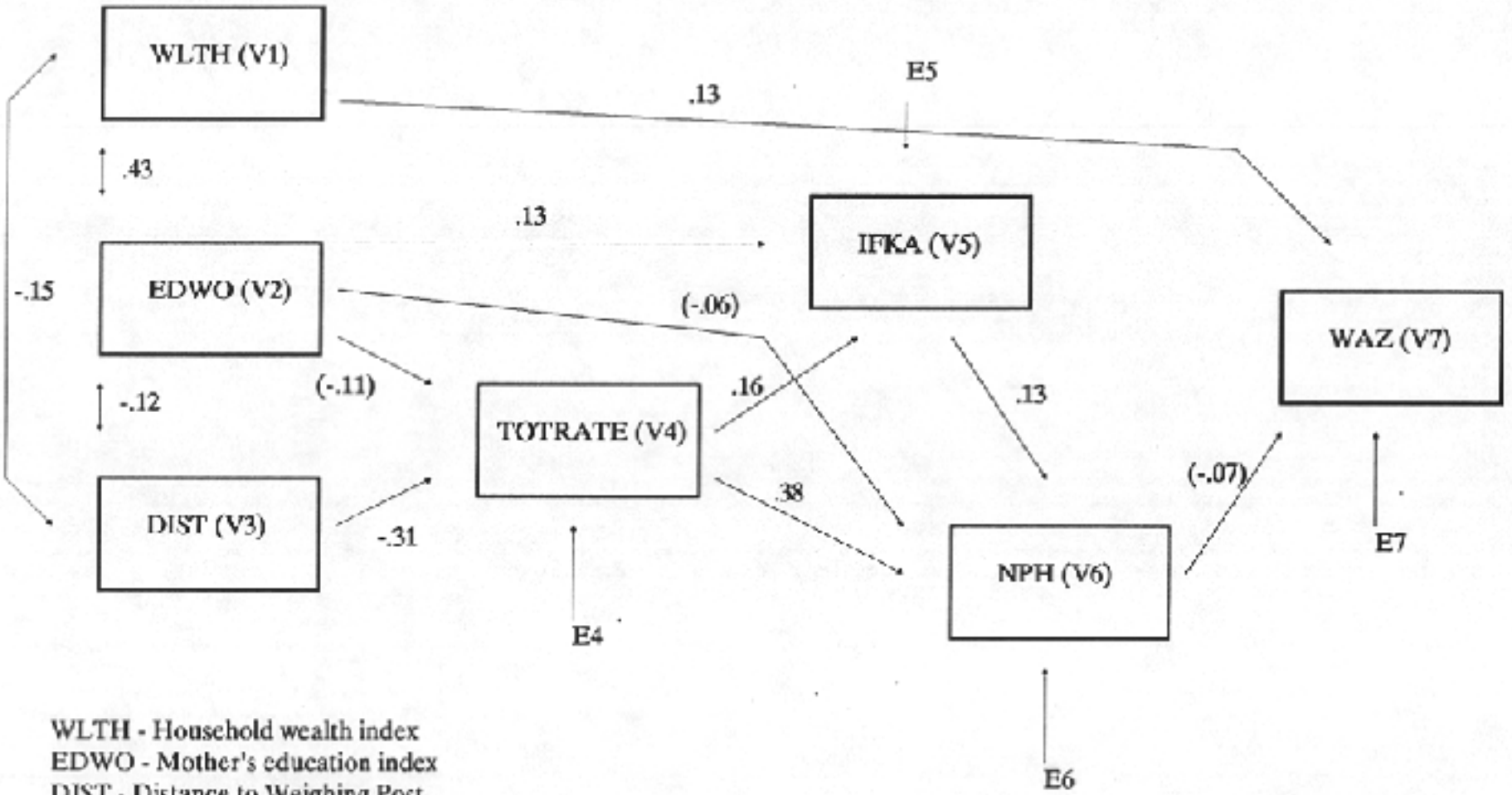


FIGURE 10-3 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF LOW AVERAGE EDUCATION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

FIGURE 10-4 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF HIGH AVERAGE EDUCATION



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

Again, we examine the part of the model that is most directly related to growth monitoring and related programs.

TABLE 10-8
The Influence of Average Household Education on the Household's Participation in Growth Monitoring and Related Activities

	P_{54}	P_{65}	P_{64}	$P_{65}P_{54}+P_{64}$
All Communities (n=803)	.12	.27	.26	.29
Level of Average education				
low (n=248)	.22	.35	.32	.40
high (n=275)	.16	.13	.38	.40

Table 10-8 first shows that the overall impact of growth monitoring and related activities on practice is precisely the same in both groups. The difference lies in the way in which attendance motivates practice. In communities where the average education level is low, there is a slightly stronger relationship between attendance and knowledge. At the same time, there is a stronger relationship between attendance and practice (controlled for knowledge) where the average level of education is high.

This finding may have to do with variance in the indicators. Previous analysis has shown that knowledge and practice indicators are significantly higher in those communities where the level of average education is high.

10.4 The Interaction Between Average education of Modern Medicine and Growth Monitoring Design Factors

The next step of analysis is to examine differences in the relationship between elements in the model between various levels of average education. Because program design factors and contextual factors are both measured at the community level, the tests of significance are constrained because of the small number of observations within each group. Tables 10-9 and 10-10 show the effect of average education on the relationship between quality of execution and growth monitoring attendance.

TABLE 10-9
The Effect of Average Household Education on the Relationship Between Quality of Execution as Measured by Accuracy of SKDN Statistics and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Average Ed.	83	32	**
Medium Average Ed.	73	67	NS
High Average Ed.	84	55	**
Average Rate of Attendance			
Low Average Ed.	54	10	**
Medium Average Ed.	38	36	NS
High Average Ed.	55	26	**

ANOVA controlled for woman's education and household wealth.

TABLE 10-10
The Effect of Average education of Modern Medicine on the Relationship Between Quality of Execution as Measured by Immunization Coverage of Ever Attenders and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Average Ed.	67	39	**
Medium Average Ed.	68	63	NS
High Average Ed.	71	43	**
Average Rate of Attendance			
Low Average Ed.	35	19	**
Medium Average Ed.	37	31	NS
High Average Ed.	42	21	**

ANOVA controlled for woman's education and household wealth.

Quality of execution has a positive influence attendance in communities where average education is high and low. It makes no significant difference in those communities where the level of average education is medium.

Tables 10-11 and 10-12 show the effect of level of average education on the relationship between attendance and knowledge.

TABLE 10-11
The Effect of Average Household Education on the Relationship Between Program Attendance and Knowledge

	AVERAGE RATE OF ATTENDANCE			SIG
	NEVER	LOW	HIGH	
Nutrition Knowledge Index				
Low Avg. Ed.	9.4	9.7	9.8	**
Medium Avg. Ed.	10.5	10.9	11.1	NS
High Avg. Ed.	11.0	10.8	11.4	NS
Health Knowledge Index				
Low Avg. Ed.	18.9	25.3	28.4	**
Medium Avg. Ed.	20.1	22.9	25.7	**
High Avg. Ed.	24.3	25.0	29.0	**
Infant Nutrition Knowledge Index				
Low Avg. Ed.	6.6	6.6	7.7	**
Medium Avg. Ed.	7.3	7.5	7.7	NS
High Avg. Ed.	7.3	7.3	7.7	*

ANOVA controlled for woman's education and household wealth.

Though the differences are not always significant in Table 10-11, frequent attenders tend to have higher average knowledge scores than non-attenders across levels of average education. It appears, however, that the difference is consistently a stronger one in communities where the level of average education is low.

The relationship between attendance and practice indicators under levels of average education is shown in Table 10-12. Attendance has a positive relationship with practice, except in the case of communities where the level of average education is high. There is no significant difference in practice between attenders across levels of average education.

TABLE 10-12
The Effect of Average Household Education on the Relationship Between Program Attendance and Practice

	AVERAGE RATE OF ATTENDANCE NEVER	LOW	HIGH	SIG
Nutrition Practice Index				
Low Avg. Ed.	6.4	7.2	7.5	**
Medium Avg. Ed.	7.0	7.4	7.4	*
High Avg. Ed.	7.6	7.5	7.6	NS
Nutrition Practice History Index				
Low Avg. Ed.	4.1	5.6	5.8	**
Medium Avg. Ed.	4.6	5.8	6.0	**
High Avg. Ed.	3.3	5.8	5.5	**
Family Planning Practice Index				
Low Avg. Ed.	2.9	5.2	5.3	**
Medium Avg. Ed.	4.0	5.0	5.4	**
High Avg. Ed.	4.9	5.3	5.1	NS

ANOVA controlled for woman's education and household wealth.

Tables 10-13 shows the effect of average education on the relationship between the design factors and the rate of attendance.

TABLE 10-13
The Effect of Average Household Education on the Relationship Between Support and Attendance

	SUPPORT LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Avg. Ed.	19	34	15	**
(communities)	(9)	(12)	(11)	
Medium Avg. Ed.	42	34	31	*
(communities)	(7)	(11)	(13)	
High Avg. Ed.	27	40	55	**
(communities)	(13)	(8)	(7)	

ANOVA controlled for woman's education and household wealth.

Support appears to have a mixed influence on attendance, depending on the level of average education. Support has a positive relationship with attendance in communities where

the level of average education is high. The opposite is true in communities where the level of average education is medium or low.

TABLE 10-14
The Effect of Average Household Education on the Relationship Between Staffing and Attendance

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Avg. Ed.	9	31	30	**
(communities)	(10)	(12)	(10)	
Medium Avg. Ed.	30	36	41	*
(communities)	(11)	(10)	(10)	
High Avg. Ed.	26	51	35	**
(communities)	(9)	(10)	(10)	

ANOVA controlled for woman's education and household wealth.

Staffing has a positive effect on attendance in communities where average education is low to medium. Where average education is high, the highest rate of attendance occurs in those communities where the level of staffing is medium to high.

TABLE 10-15
The Effect of Average Household Education on the Relationship Between Intensity and Attendance

		INTENSITY			
		LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance					
Low Avg. Ed.		20	27	8	**
(communities)		(12)	(17)	(3)	
Medium Avg. Ed.		28	43	29	**
(communities)	(6)	(13)	(12)		
High Avg. Ed.		18	46	38	**
(communities)		(6)	(14)	(10)	

ANOVA controlled for woman's education and household wealth.

Communities where the level of program intensity is medium have the highest rates of attendance across levels of average education.

TABLE 10-16
The Effect of Average Household Education on the Relationship Between Crowding and Attendance

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Avg. Ed. (communities)	30 (6)	24 (11)	19 (11)	*
Medium Avg. Ed. (communities)	40 (11)	38 (7)	26 (7)	**
High Avg. Ed. (communities)	47 (10)	47 (6)	35 (9)	**

ANOVA controlled for woman's education and household wealth.

Crowding has a negative effect on attendance across levels of average education. The drop in attendance between communities where crowding is low and medium is least in communities where the level of average education is high. This suggests that high education communities are better able to maintain attendance under conditions of moderate crowding.

The next stage of analysis is to examine the interaction between program design factors and average education in terms of their relationship with knowledge and practice indicators. This relationship is tested only for those *balita* that had attended the weighing post in the last twelve months. Tables 10-17 through 10-24 present these findings.

In summary, there is no interaction between any of the design factors and practice indicators. Staffing has a mixed effect on knowledge indicators across levels of average education such that interpretation is impossible. crowding appears to have a negative effect on knowledge across levels of average education.

TABLE 10-17
The Effect of Average Household Education on the Relationship Between Program Support and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS
Health Knowledge Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	22.2	24.9	25.5	*
High Avg. Ed.	---	---	---	NS
Infant Nutrition Knowledge Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS

ANOVA controlled for woman's education and household wealth.

TABLE 10-18
The Effect of Average Household Education on the Relationship Between Program Support and Practice (Calculated only for balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS
Nutrition Practice History Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS
Family Planning Practice Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS

ANOVA controlled for woman's education and household wealth.

TABLE 10-19
The Effect of Average Household Education on the Relationship Between Program Staffing and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Avg. Ed.	10.4	9.7	11.2	**
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	10.6	11.0	12.2	*
Health Knowledge Index				
Low Avg. Ed.	24.0	26.2	29.5	**
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS
Infant Nutrition Knowledge Index				
Low Avg. Ed.	7.0	6.7	8.0	*
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS

ANOVA controlled for woman's education and household wealth.

TABLE 10-20
The Effect of Average Household Education on the Relationship Between Program Staffing and Practice (Calculated only for balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS
Nutrition Practice History Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS
Family Planning Practice Index				
Low Avg. Ed.	---	---	---	NS
Medium Avg. Ed.	---	---	---	NS
High Avg. Ed.	---	---	---	NS

ANOVA controlled for woman's education and household wealth.

TABLE 10-21
The Effect of Average Household Education on the Relationship Between Program Intensity and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	9.9	11.2	11.6	*
Health Knowledge Index				
Low Avg. Ed.	23.8	28.4	24.8	**
Medium Avg. Ed.	26.2	23.8	23.6	*
High Avg. Ed.	25.1	29.3	25.8	**
Infant Nutrition Knowledge Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	6.8	7.5	7.8	*

ANOVA controlled for woman's education and household wealth.

TABLE 10-22
The Effect of Average Household Education on the Relationship Between Program Intensity and Practice (Calculated only for balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS
Nutrition Practice History Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS
Family Planning Practice Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 10-23
The Effect of Average Household Education on the Relationship Between Crowding and Knowledge (Calculated only for balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Avg. Ed.	12.9	10.0	9.7	**
Medium Avg. Ed.	10.7	11.7	11.0	*
High Avg. Ed.	----	----	----	NS
Health Knowledge Index				
Low Avg. Ed.	22.0	29.4	26.6	**
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	29.0	27.9	26.7 *	
Infant Nutrition Knowledge Index				
Low Avg. Ed.	9.0	7.0	6.7	**
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 10-24
The Effect of Average Household Education on the Relationship Between Crowding and Practice (Calculated only for balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS
Nutrition Practice History Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS
Family Planning Practice Index				
Low Avg. Ed.	----	----	----	NS
Medium Avg. Ed.	----	----	----	NS
High Avg. Ed.	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

10.5 Findings

(1) As the level of average education increases, so do average levels of household wealth, woman's education, attendance, knowledge, practice and nutritional status. The average distance to weighing post is significantly less in communities where the level of average education is high.

(2) There is no relationship between average education and any of the design factors.

(3) There is a positive relationship between average education and quality of execution as measured by immunization coverage of ever attenders. There is no relationship between average education and quality of execution as measured by accuracy of SKDN statistics.

(4) Distance has same magnitude of effect on attendance across levels of average education. At the same time, there is a correspondence between average education and rate of attendance across distance from weighing post.

(5) Well executed programs are significantly better attended in low and high average education communities. There is no difference in medium average education communities.

(6) Attendance is positively related to knowledge across levels of average education. This relationship is strongest in communities where the average level of education is low.

(7) There is a positive relationship between attendance and practice in communities where the level of average education is low to medium. This relationship is is less clear-cut where the level of average education is high.

(8) There is evidence of some interaction between level of average education and program design factors in relation to attendance. First, support has a positive relationship with attendance where average education is high. This is not true when average education is medium to low. Second, staffing has a positive effect on attendance in communities where average education is low to medium. Where average education is high, the highest rate of attendance occurs in those communities where the level of staffing is medium. Third, crowding has a negative effect on attendance across levels of average education. The drop in attendance between communities where crowding is low and medium is least in communities where the level of average education is high.

(9) There is no interaction between levels of average education and design factors in relation to knowledge.

(10) There is no interaction between levels of average education and design factors in relation to practice.

XI. THE EFFECT OF ACCEPTANCE OF MODERN MEDICINE

11.1 The Effect of Acceptance of Modern Medicine on Household-Level Factors

Differences in household conditions according to the level of acceptance of modern medicine are described. Because the measure of acceptance is not based on a composite score, but rather a direct question in the survey, the number of communities in each group is not approximately equal as was the case with other contextual factors.

Level of Acceptance of modern medicine:

LEVEL	COMMUNITIES
Low	10
Medium	59
High	23

TABLE 11-1
The Effect of Level of Acceptance of Modern Medicine on Household Factors

	MEAN	SIG
Household Wealth Index		**
Low Acceptance	13.8	
Medium Acceptance	14.9	
High Acceptance	16.5	
Woman's Education Index		**
Low Acceptance	1.5	
Medium Acceptance	2.0	
High Acceptance	2.2	
Distance to Weighing Post (Meters)		**
Low Acceptance	629	
Medium Acceptance	752	
High Acceptance	541	

ANOVA significant at .05 (*), .001 (**).

As the level of acceptance increases, so do average levels of education and wealth. The average household wealth and average level of woman's education is significantly higher in communities where the level of acceptance is high. This is not surprising, as one might expect that wealthier (and more modern) communities are more likely to accept modern medicine.

TABLE 11-2
The Effect of Level of Acceptance of Modern Medicine on Growth Monitoring Attendance

PROGRAM ATTENDANCE	MEAN	SIG
Percent Ever Attend		**
Low Acceptance	37	
Medium Acceptance	55	
High Acceptance	75	
Average Rate of Attendance		**
Low Acceptance	16	
Medium Acceptance	30	
High Acceptance	45	

ANOVA significant at .05 (*), .001 (**).

Table 11-2 shows that there is a significant difference in the percentage of *balita* that have ever attended between levels of acceptance. This finding is not surprising, especially as one probable reason that a high acceptance response was given was that a large number of people attend the program regularly.

Table 11-3 shows the effect of acceptance on knowledge indicators.

TABLE 11-3
The Effect of Level of Acceptance of Modern Medicine on Nutrition-Related Knowledge

KNOWLEDGE	MEAN	SIG
Nutrition Knowledge Index		**
Low Acceptance	9.3	
Medium Acceptance	10.6	
High Acceptance	10.8	
Health Knowledge Index		**
Low Acceptance	20.5	
Medium Acceptance	22.7	
High Acceptance	26.6	
Infant Nutrition Knowledge Index		**
Low Acceptance	6.5	
Medium Acceptance	7.3	
High Acceptance	7.5	

ANOVA significant at .05 (*), .001 (**).

A strong positive relationship exists between acceptance of modern medicine and knowledge indicators.

TABLE 11-4
The Effect of Level of Acceptance of Modern Medicine on Nutrition Practice

PRACTICE	MEAN	SIG
Nutrition Practice Index		*
Low Acceptance	7.2	
Medium Acceptance	7.2	
High Acceptance	7.4	
Nutrition Practice History Index		*
Low Acceptance	5.1	
Medium Acceptance	5.3	
High Acceptance	5.5	
Family Planning Practice Index		**
Low Acceptance	4.0	
Medium Acceptance	4.5	
High Acceptance	5.3	

ANOVA significant at .05 (*), .001 (**).

Table 11-4 illustrates the effect of acceptance of modern medicine on practice. As in the case of knowledge, a positive relationship appears.

TABLE 11-5
The Effect of Level of Acceptance of Modern Medicine on Nutritional Status

NUTRITIONAL STATUS	MEAN	SIG
Height for Age		*
Low Acceptance	-1.9	
Medium Acceptance	-1.7	
High Acceptance	-1.6	
Weight for Height		**
Low Acceptance	-.3	
Medium Acceptance	-.4	
High Acceptance	-.2	
Weight for Age		*
Low Acceptance	-1.4	
Medium Acceptance	-1.4	
High Acceptance	-1.1	

ANOVA significant at .05 (*), .001 (**).

Finally, the effect of acceptance of modern medicine on nutritional status is determined. Table 11-5 shows that in all cases the average nutritional status indicator is highest in communities where acceptance is high.

11.2 The Relationship Between Acceptance of Modern Medicine and Program Factors

The relationships between the contextual factor and program design factors are explored.

TABLE 11-6
Crosstabulation Between Level of Acceptance of Modern Medicine and Program Design Factors (expressed as percentages)

	LEVEL OF SUPPORT			SIG
	Low	Medium	High	
Level of Acceptance				NS
Low	60.0 (6)	20.0 (2)	20.0 (2)	
Medium	23.7 (14)	35.6 (21)	40.7 (24)	
High	39.1 (9)	34.8 (8)	26.1 (6)	
	LEVEL OF STAFFING			
	Low	Medium	High	
Level of Acceptance				NS
Low	30.0 (3)	50.0 (5)	20.0 (2)	
Medium	36.2 (21)	29.3 (17)	34.5 (20)	
High	26.1 (6)	43.5 (10)	30.4 (7)	
	LEVEL OF INTENSITY			
	Low	Medium	High	
Level of Acceptance				NS
Low	50.0 (5)	20.0 (2)	30.0 (3)	
Medium	23.7 (14)	49.2 (29)	27.1 (16)	
High	21.7 (5)	56.5 (13)	21.7 (5)	
	LEVEL OF CROWDING			
	Low	Medium	High	
Level of Acceptance				NS
Low	50.0 (3)	16.7 (1)	33.3 (2)	
Medium	28.8 (15)	32.7 (17)	38.5 (20)	
High	47.4 (9)	31.6 (6)	21.1 (4)	

Chi-square significant at .05 (8), .001 (**).

The contextual factor appears to have little effect on the program design factors.

Table 11-7 shows the relationship between the level of acceptance and quality of execution.

TABLE 11-7
Crosstabulation Between Level of Acceptance of Modern Medicine and Quality of Execution (expressed as percentages)

	QUALITY OF EXECUTION	
	Upper 50% -- Accuracy of SKDN Statistics	Upper 50% -- Immunization Coverage
Level of Acceptance		
Low (N=10)	50	20
Medium (N=59)	46	48
High (N=23)	61	70
SIGNIFICANCE	NS	*

Chi-square significant at .05 (*), .001 (**).

First, a significant positive relationship exists between acceptance and quality of execution as measured by immunization coverage of ever attenders. However, no significant relationship exists between acceptance and accuracy of SKDN statistics. It may be that people in communities where acceptance is high, being more frequent attenders, are more likely to be immunized.

11.3 The Effect of Acceptance of Modern Medicine on the Household

The third part of the analysis is to examine the effect of acceptance of modern medicine on the household's participation in growth monitoring and related activities. An analysis of the relationship between distance to weighing post and attendance under the various levels of acceptance is conducted.

Figures 11-1 and 11-2 show this relationship. The percent ever attend does not appear to be influenced by the level of acceptance. The finding of interest is the average rate of attendance. Figure 11-2 shows that people distance has the same effect on attendance across levels of acceptance, though at any one distance, the average rate is the lowest in communities where the level of acceptance is low, and highest where acceptance is high.

THE EFFECT OF ACCEPTANCE OF MODERN MEDICINE ON THE RELATIONSHIP BETWEEN DISTANCE TO WEIGHING POST AND ATTENDANCE

FIGURE 11-1

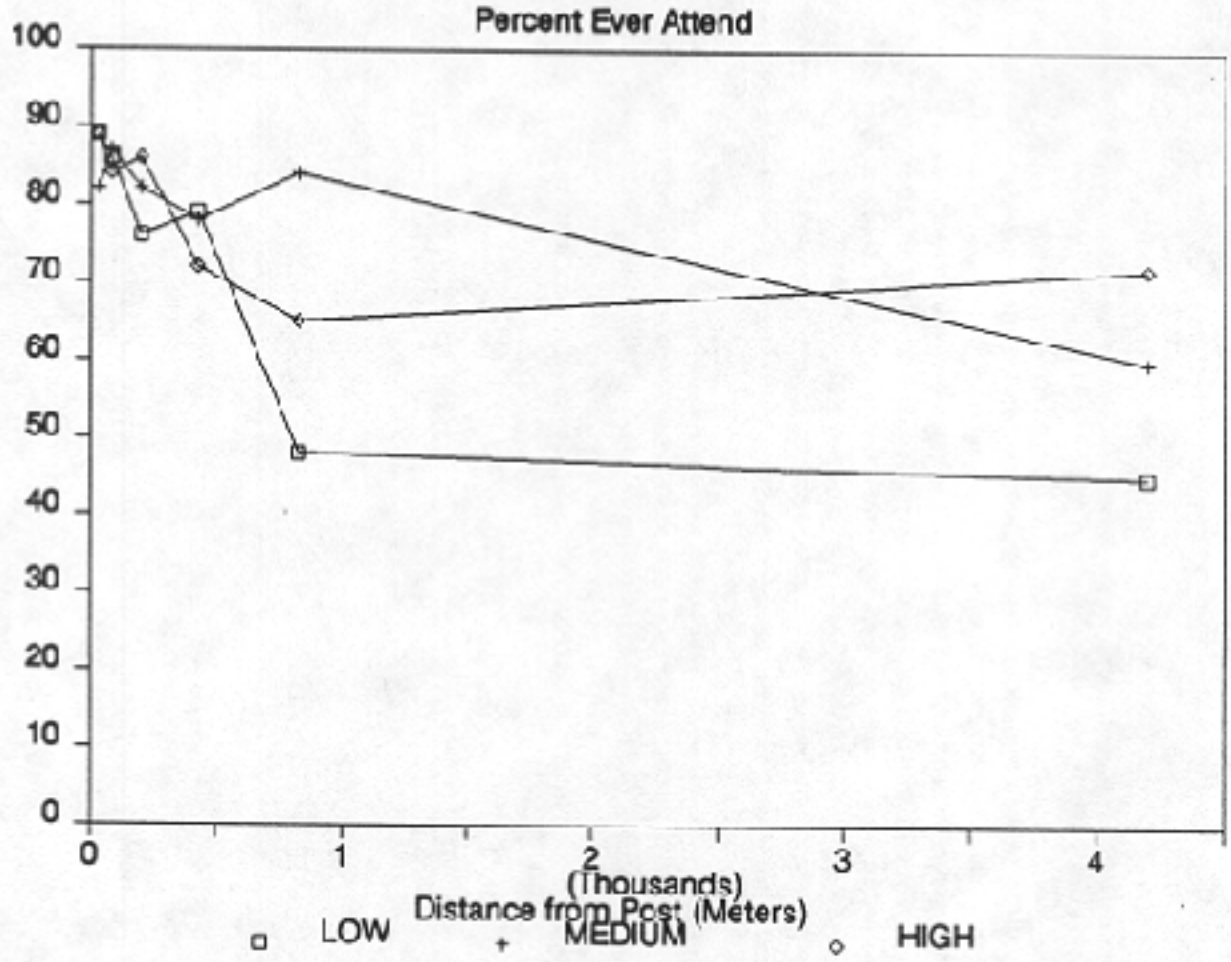
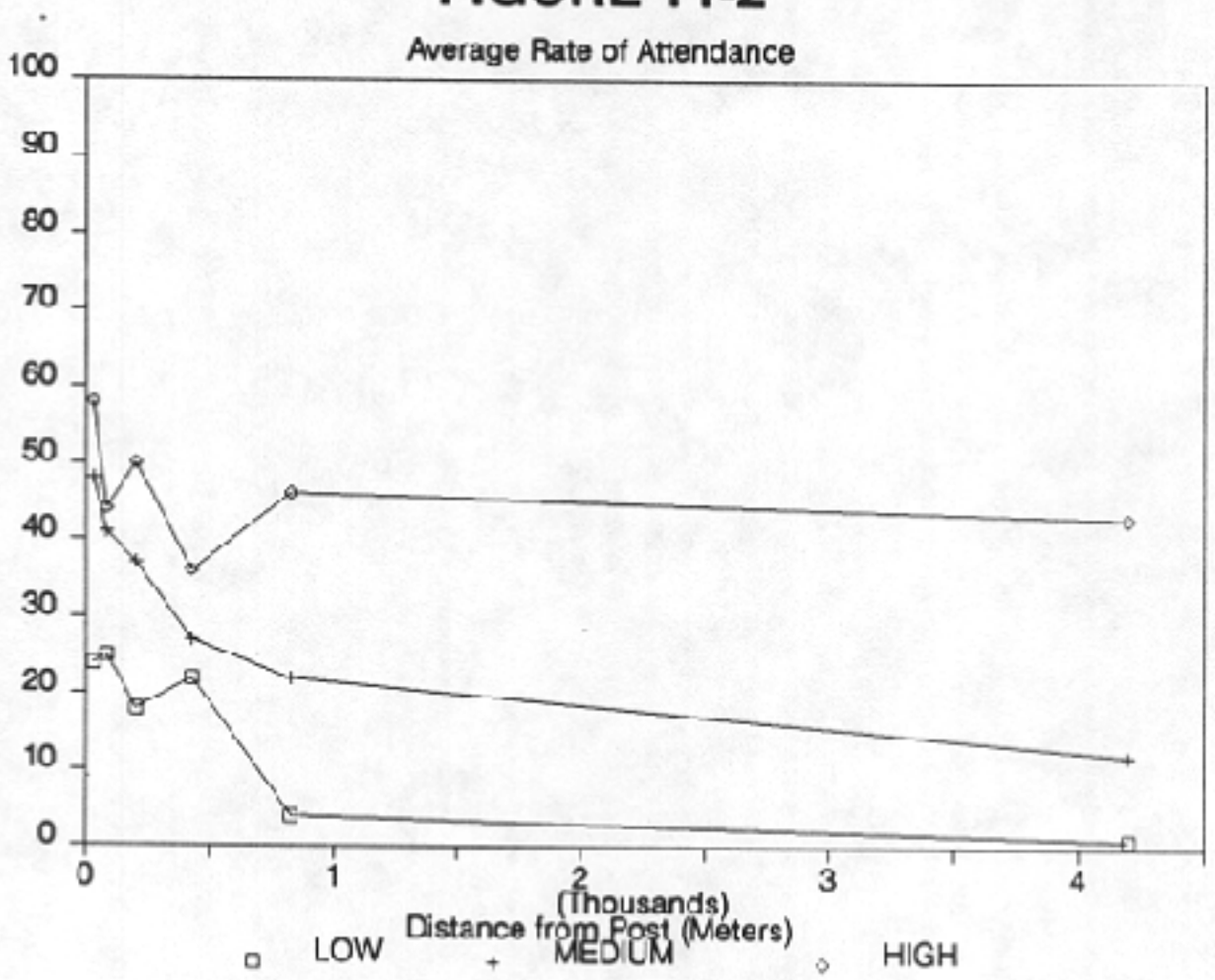


FIGURE 11-2



Next, the entire household model is estimated using path analysis under high and low levels of acceptance. Figures 8-3 through 11-5 show the results of this analysis. All three levels of acceptance have been included in this analysis so as to allow examination of communities where acceptance is medium. Analysis has shown that, in fact, these may be the communities where growth monitoring can be most effective.

Again, we examine the part of the model that is most directly related to growth monitoring and related programs.

TABLE 11-8
The Influence of Acceptance of Modern Medicine on the Household's Participation in Growth Monitoring and Related Activities

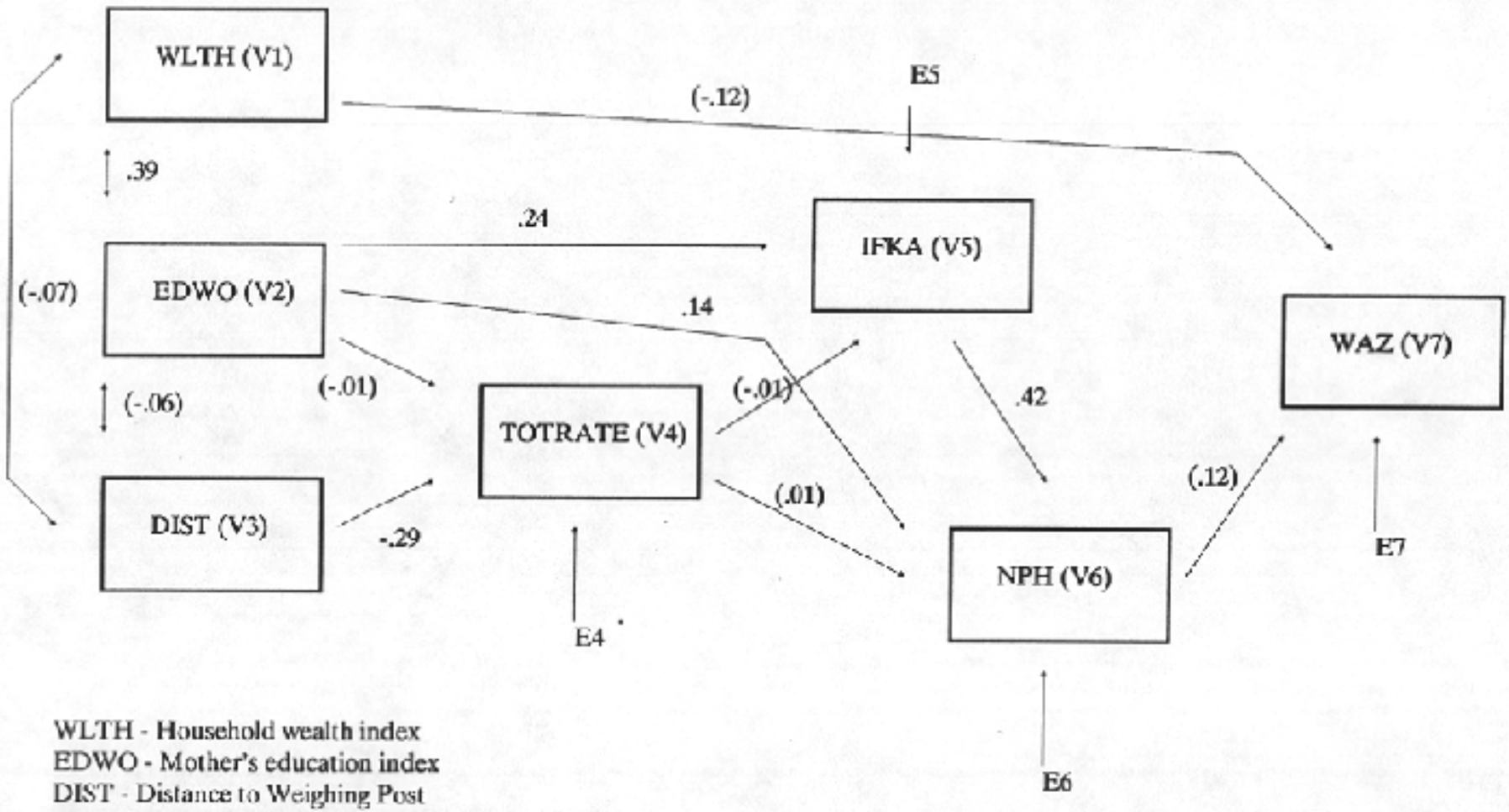
	P_{54}	P_{65}	P_{64}	$P_{65}P_{54}+P_{64}$
All Communities (n=803)	.12	.27	.26	.29
Level of Acceptance				
low (n=60)	(.01)	.42	(.01)	.01
medium (n=551)	.21	.27	.32	.38
high (n=220)	(.04)	.14	.17	.18

The first issue that this table raises is that the number of observations in the group of communities where the level of acceptance is low is very low (n=60). Two reasons might account for this fact. First, the number of communities which were considered to have low acceptance of modern medicine totaled only ten. Second, there are a large number of missing data points in these communities which reduces the number of observations on which the analysis can be based. Consequently, though a solution is generated, the path coefficients are not as reliable as those based on a larger number of observations.

Table 11-8 first shows that the overall impact of growth monitoring and related activities is highest by far in communities where the level of acceptance is medium. In fact, rate of attendance has no effect on knowledge or practice in communities where the level of acceptance is low, and no influence on knowledge where acceptance is low or high.

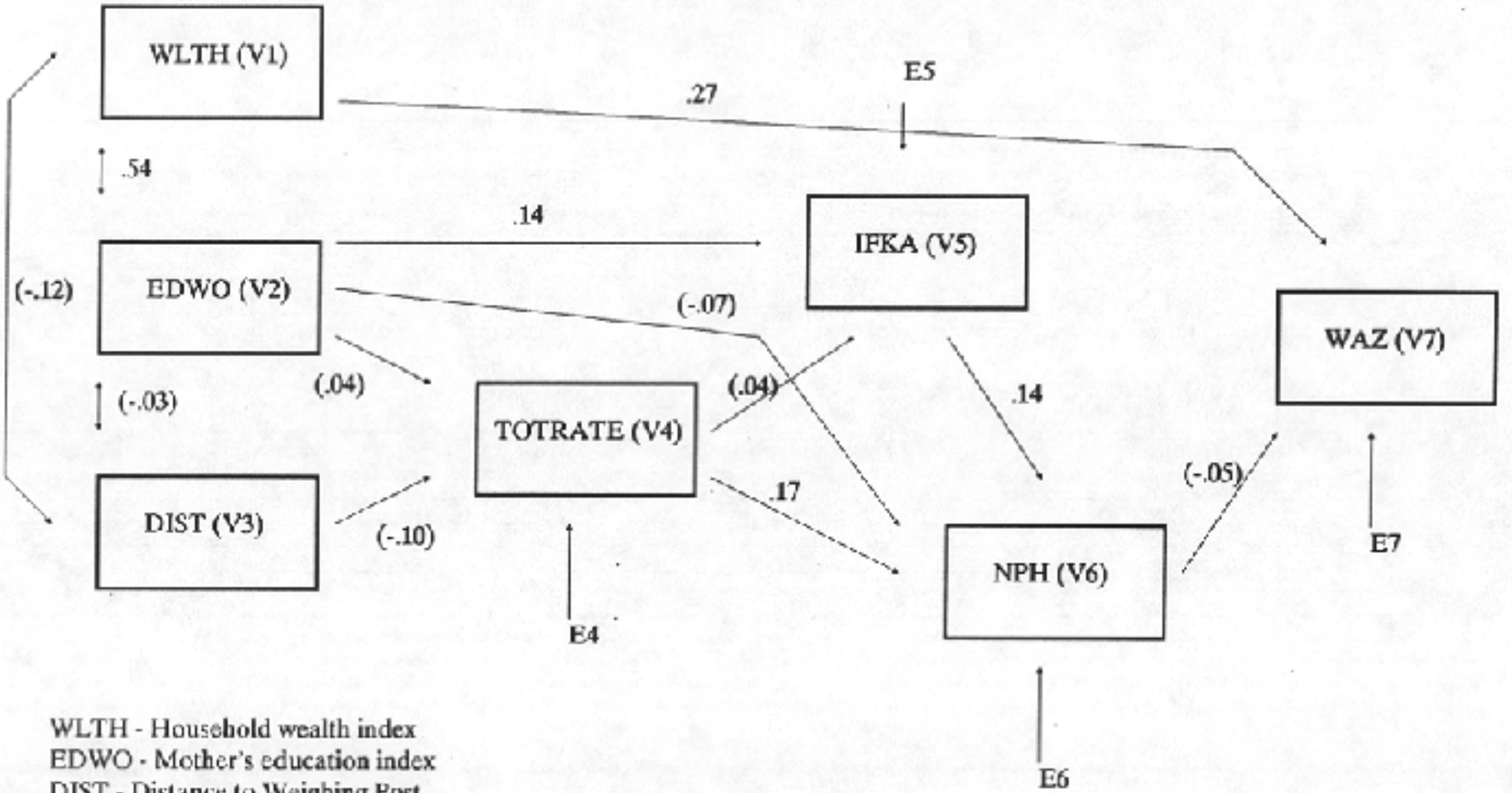
Next, Table 11-8 shows that the relationship between knowledge and practice is stronger in communities where the level of acceptance is low. Since previous analysis has shown that levels of knowledge and practice are lower where acceptance is low, this suggests

FIGURE 11-3 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF LOW ACCEPTANCE OF MODERN MEDICINE



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

FIGURE 11-4 PATH DIAGRAM OF HOUSEHOLD PARTICIPATION IN GROWTH MONITORING IN INDONESIA UNDER CONDITIONS OF HIGH ACCEPTANCE OF MODERN MEDICINE



WLTH - Household wealth index
EDWO - Mother's education index
DIST - Distance to Weighing Post
TOTRATE - Total rate of attendance
IFKA - Infant nutrition knowledge index
NPH - Nutrition practice history index
WAZ - Weight for age expressed as Z- Score

there is less variance in these communities. At any rate, this relationship is essentially independent of growth monitoring effect.

Third, the relationship between attendance and knowledge is not statistically significant in either of the groups. This may be due to low variance in both of the groups. In other words, growth monitoring attendance makes little impact on knowledge in low acceptance communities because everyone believes otherwise. It also makes little impact in high acceptance communities because everyone already accepts the messages, regardless of the program.

Finally, Figures 11-3 to 11-5 show that the negative effect of distance on attendance is greater in communities where the level of acceptance is medium to low.

11.4 The Interaction Between Acceptance of Modern Medicine and Growth Monitoring Design Factors

The next step of analysis is to examine differences in the relationship between elements in the model between various levels of acceptance. Because program design factors and contextual factors are both measured at the community level, the tests of significance are constrained because of the small number of observations within each group. Tables 11-9 and 11-10 show the effect of acceptance of modern medicine on the relationship between quality of execution and growth monitoring attendance.

TABLE 11-9
The Effect of Acceptance of Modern Medicine on the Relationship Between Quality of Execution as Measured by Accuracy of SKDN Statistics and Program Attendance

	QUALITY		
	HIGH	LOW	SIG
Percent Ever Attend			
Low Acceptance	46	49	NS
Medium Acceptance	77	39	**
High Acceptance	84	80	NS
Average Rate of Attendance			
Low Acceptance	16	20	NS
Medium Acceptance	49	17	**
High Acceptance	55	41	**

ANOVA controlled for woman's education and household wealth.

TABLE 11-10
The Effect of Acceptance of Modern Medicine on the Relationship Between Quality of Execution as Measured by Immunization Coverage of Ever Attenders and Program Attendance

	QUALITY HIGH	LOW	SIG
Percent Ever Attend			
Low Acceptance	66	10	**
Medium Acceptance	62	48	*
High Acceptance	83	57	**
Average Rate of Attendance			
Low Acceptance	30	3	**
Medium Acceptance	39	23	**
High Acceptance	49	34	*

ANOVA controlled for woman's education and household wealth.

It is noteworthy that accuracy of SKDN statistics as a measure of quality of execution makes less difference in communities where acceptance os high or low than when it is medium. This offers support for the hypothesis that in high acceptance communities, people are more likely to attend, no matter the quality of the program, and in low acceptance communities, people attend at low rates no matter the quality of the program. It is in the medium acceptance communities where execution is important to attendance. On the other hand, immunization coverage of attenders is related to attendance across levels of acceptance.

Tables 11-11 and 11-12 show the effect of acceptance of modern medicine on the relationship between attendance and knowledge.

TABLE 11-11
The Effect of Acceptance of Modern Medicine on the Relationship Between Program Attendance and Knowledge

	AVERAGE RATE OF ATTENDANCE NEVER	LOW	HIGH	SIG
Nutrition Knowledge Index				
Low Acceptance	8.6	8.8	10.4	NS
Medium Acceptance	10.2	10.7	11.4	**
High Acceptance	11.0	10.8	10.8	NS
Health Knowledge Index				
Low Acceptance	17.7	25.8	26.2	**
Medium Acceptance	20.1	23.2	26.2	**
High Acceptance	23.1	26.0	30.3	**
Infant Nutrition Knowledge Index				
Low Acceptance	6.3	5.8	7.0	NS
Medium Acceptance	6.9	7.4	7.8	**
High Acceptance	7.6	7.3	7.6	NS

ANOVA controlled for woman's education and household wealth.

Though the differences are not always significant in Table 11-11, frequent attenders tend to have higher average knowledge scores than non-attenders across levels of acceptance. The finding of interest with relation to Table 11-11 is that the magnitude of effect is low in low acceptance communities, medium in high acceptance communities and highest in medium acceptance communities. It appears that growth monitoring is having a higher impact in communities where the level of acceptance is medium.

TABLE 11-12
The Effect of Acceptance of Modern Medicine on the Relationship Between Program Attendance and Practice

	AVERAGE RATE OF ATTENDANCE NEVER	LOW	HIGH	SIG
Nutrition Practice Index				
Low Acceptance	7.0	7.3	7.7	NS
Medium Acceptance	6.7	7.4	7.5	**
High Acceptance	7.4	7.4	7.6	NS
Nutrition Practice History Index				
Low Acceptance	3.9	5.0	5.4	*
Medium Acceptance	4.0	5.8	5.7	**
High Acceptance	4.4	5.9	5.9	**
Family Planning Practice Index				
Low Acceptance	3.1	4.2	5.1	NS
Medium Acceptance	3.5	5.1	5.1	**
High Acceptance	5.0	5.6	5.6	NS

ANOVA controlled for woman's education and household wealth.

The relationship between attendance and practice indicators under levels of acceptance is shown in Table 11-12. Results here are similar to those found with respect to knowledge. First, attendance has a generally positive effect on practice, though it is consistently significant only in the medium acceptance communities.

Tables 11-13 shows the effect of acceptance on the relationship between the design factors and the rate of attendance.

TABLE 11-13
The Effect of Acceptance of Modern Medicine on the Relationship Between Support and Attendance

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Acceptance	11	13	22	NS
(communities)	(6)	(2)	(2)	
Medium Acceptance	32	32	27	NS
(communities)	(14)	(21)	(24)	
High Acceptance	31	57	47	**
(communities)	(9)	(8)	(6)	

ANOVA controlled for woman's education and household wealth.

Table 11-13 shows that support has a significant positive effect only when level of acceptance is high. The pattern is the same where acceptance is medium and low, but the differences are not significant.

TABLE 11-14
The Effect of Acceptance of Modern Medicine on the Relationship Between Staffing and Attendance

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance				
Low Acceptance	4	17	21	NS
(communities)	(3)	(5)	(2)	
Medium Acceptance	22	42	28	**
(communities)	(21)	(17)	(20)	
High Acceptance	31	44	62	**
(communities)	(6)	(10)	(7)	

ANOVA controlled for woman's education and household wealth.

Staffing has a positive effect on attendance in communities where acceptance is medium to high. The pattern is the same in the case of communities where acceptance is low though the difference is not statistically significant.

TABLE 11-15
The Effect of Acceptance of Modern Medicine on the Relationship Between Intensity and Attendance

		INTENSITY			
		LOW	MEDIUM	HIGH	SIG
Average Rate of Attendance					
Low Acceptance		2	30	6	**
(communities)		(5)	(2)	(3)	
Medium Acceptance		33	31	27	**
(communities)	(14)	(29)	(16)		
High Acceptance		18	53	48	**
(communities)		(5)	(13)	(5)	

ANOVA controlled for woman's education and household wealth.

Communities where the level of program intensity is medium have the highest rates of attendance across levels of acceptance.

TABLE 11-16
The Effect of Acceptance of Modern Medicine on the Relationship Between Crowding and Attendance

	CROWDING			
	LOW	MEDIUM	HIGH	
Average Rate of Attendance				
Low Acceptance	4	0	20	*
(communities)	(3)	(1)	(2)	
Medium Acceptance	44	28	25	**
(communities)	(15)	(17)	(20)	
High Acceptance	47	54	50	NS
(communities)	(9)	(6)	(4)	

ANOVA controlled for woman's education and household wealth.

Crowding has a negative effect on attendance in medium acceptance communities, and no effect in high acceptance communities. This suggests that high acceptance communities are better able to maintain attendance rates under conditions of crowding.

The next stage of analysis is to examine the interaction between program design factors and acceptance of modern medicine in terms of their relationship with knowledge and practice indicators. This relationship is tested only for those *balita* that had attended the weighing post in the last twelve months. Tables 11-17 through 11-24 present these findings. Once again, no significant interaction appears with respect to any of the design factors.

TABLE 11-17
The Effect of Acceptance of Modern Medicine on the Relationship Between Program Support and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Health Knowledge Index				
Low Acceptance	18.9	12.0	31.6	**
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Infant Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-18

The Effect of Acceptance of Modern Medicine on the Relationship Between Program Support and Practice (Calculated only for those balita who had attended in the previous 12 months)

	SUPPORT			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Nutrition Practice History Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Family Planning Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-19

The Effect of Acceptance of Modern Medicine on the Relationship Between Program Staffing and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	11.0	10.7	12.2	**
High Acceptance	----	----	----	NS
Health Knowledge Index				
Low Acceptance	12.0	30.4	19.9	**
Medium Acceptance	25.8	23.5	25.8	*
High Acceptance	26.6	28.3	30.3	*
Infant Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	7.6	7.4	8.2	*
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-20
The Effect of Acceptance of Modern Medicine on the Relationship Between Program Staffing and Practice (Calculated only for those balita who had attended in the previous 12 months)

	STAFFING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	7.3	7.6	7.2	*
High Acceptance	----	----	----	NS
Nutrition Practice History Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	5.9	5.5	6.0	*
High Acceptance	----	----	----	NS
Family Planning Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-21
The Effect of Acceptance of Modern Medicine on the Relationship Between Program Intensity and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	10.4	11.1	11.4	*
High Acceptance	----	----	----	NS
Health Knowledge Index				
Low Acceptance	16.3	28.0	12.0	*
Medium Acceptance	----	----	----	NS
High Acceptance	29.0	29.6	24.7	**
Infant Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-22
The Effect of Acceptance of Modern Medicine on the Relationship Between Program Intensity and Practice (Calculated only for those balita who had attended in the previous 12 months)

	INTENSITY			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Nutrition Practice History Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Family Planning Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	5.5	4.8	5.4	*
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-23
The Effect of Acceptance of Modern Medicine on the Relationship Between Crowding and Knowledge (Calculated only for those balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	11.7	10.9	11.3	**
High Acceptance	----	----	----	NS
Health Knowledge Index				
Low Acceptance	12.0	0.0	31.6	**
Medium Acceptance	25.8	26.6	24.4	*
High Acceptance	26.8	30.8	28.6	**
Infant Nutrition Knowledge Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	8.0	7.4	7.7	*
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

TABLE 11-24
The Effect of Acceptance of Modern Medicine on the Relationship Between Crowding and Practice (Calculated only for those balita who had attended in the previous 12 months)

	CROWDING			
	LOW	MEDIUM	HIGH	SIG
Nutrition Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS
Nutrition Practice History Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	5.7	5.7	6.5	*
Family Planning Practice Index				
Low Acceptance	----	----	----	NS
Medium Acceptance	----	----	----	NS
High Acceptance	----	----	----	NS

ANOVA controlled for woman's education and household wealth.

11.5 Findings

(1) As acceptance increases, so do levels of household wealth, woman's education, attendance, knowledge and practice.

(2) Average nutritional status highest in communities where acceptance is high.

(3) No significant relationship exists between acceptance of modern medicine and design factors.

(4) There is a positive relationship between acceptance and quality of execution as measured by immunization coverage of ever attenders. No significant relationship exists between acceptance and quality of execution as measured by accuracy of SKDN statistics though the pattern is the same.

(5) Distance to weighing post has a similar magnitude of effect across levels of acceptance. At the same time, the average rate of attendance is lowest across distance zones in communities where acceptance is low, somewhat higher where acceptance is medium, and highest where acceptance is high.

(6) Attendance has no relative impact on knowledge or practice in communities where acceptance is low, some impact where acceptance is high, and a high level of impact where acceptance is medium.

(7) Quality of execution as measured by accuracy of SKDN statistics affects attendance most in medium acceptance communities, some in high acceptance communities, none in low acceptance communities. When quality of execution is measured by immunization coverage of ever attenders, it affects attendance positively across levels of acceptance.

(8) Nutrition knowledge significantly higher for attenders in communities where acceptance is medium only. Health knowledge is higher for attenders across levels of acceptance.

(9) All practice indicators significantly higher for attenders in communities where the level of acceptance is medium. Nutrition practice history is significantly higher for attenders across levels of acceptance.

(10) There is some interaction between acceptance and support in relation to attendance. First, staffing has a positive effect on attendance in communities where

acceptance is medium to high and none where acceptance is low. Second, crowding has a negative effect on attendance in medium acceptance communities, and no effect in high acceptance communities. This suggests that high acceptance communities are better able to maintain attendance under conditions of crowding.

(11) There is no evidence of interaction between acceptance and program design factors with respect to knowledge or practice indicators.