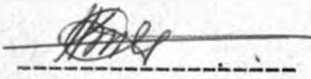A STUDY OF ACUTE DIARRHOEAL DISEASE IN CHILDREN UNDER FIVE, TO
DETERMINE THE FEASIBILITY OF DISTRIBUTING ORAL REHYDRATION
SALTS (UNICEF PACKETS) AND HEALTH EDUCATION THROUGH ORGANIZED
WOMEN'S GROUPS IN URBAN KISUMU, IN WESTERN KENYA.

By

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(M.B.Ch.B NAIROBI UNIVERSITY)

A DISSERTATION   PRESENTED IN PART FULFILMENT FOR

THE MASTERS DEGREE OF PUBLIC HEALTH
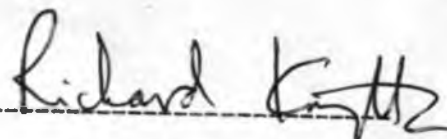
TABLE OF CONTENTS:

DECLARATION:

THIS DISSERTATION IS MY ORIGINAL WORK AND HAS NOT BEEN
PRESENTED FOR A DEGREE IN ANY OTHER UNIVERSITY:

DR. YERI KOMBE

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OF NAIROBI)

THIS DISSERTATION HAS BEEN SUBMITTED FOR EXAMINATION BY MY
APPROVAL.

DR. RICHARD KNIGHT

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my
supervisor, Dr. R. Knight of the Department of Community Health,
University of Nairobi for guiding me very patiently throughout
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I would also like to express my gratitude to Mr. P. Chaka,
Mr. R. Konde and Mr. Nathan, for their kind assistance during
my stay both in Kisumu and Nairobi.

My heartfelt thanks go to my beloved Nzembi, her friend
Jane Mwangi and Alice Waweru who helped me write and type the
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Kombe, Mr. Parmenas Kombe and once again Nzembi, I am truly
thankful.

ABBREVIATIONS USED IN THE TEXT

P.I.   ------------- Principal Investigator.

O.R.T. ------------ Oral Rehydration Therapy.

H.E.--------------- Health Education.

C.D.A.------------- Community Development Assistant.

I.G.A.O.----------- Income Generating activity Officer.

GLOSSARY

UJI --------------- Swahili word for porridge.

SUMMARY:

199 women belonging to 9 women's groups and 194 control women
were studied in Urban Kisumu between April and September 1985.
The history, structure and social functioning of the womens'
groups is fully described.

Their socio-economic status and knowledge, attitudes and
practices (K.A.P.) concerning acute diarrhoeal diseases in
children under 5 years were determined by questionnaire. The
results showed that on average, both the economic status and
educational status were higher among the controls than among
the study group. Morbidity, prior to the study, due to acute
diarrhoea was however higher in the control than the study group.
Apart from these variables, the study and control groups were
markedly similar.

In the K.A.P. study, the responses were generally more favourable
in the control than in the study group, though both groups
showed acceptable responses as regards acute diarrhoeal diseases
in children.

The K.A.P. in the study group improved markedly two months after
the study women were given detailed sessions of Health Education
by the Principal Investigator.

Following the health education, oral rehydration therapy (O.R.T.)
was provided through the women group leaders, to those study

group women who needed it for their children.

Although a significantly higher rate of morbidity due to
dehydration from acute diarrhoea in children under 5 years
was recorded in the study compared with the control group,
this was probably attributable to a difference in surveillance
methods.

The rate of seeking medical help from hospital was higher in
the control than the study group. In addition, the average
duration of acute diarrhoea was longer in the control group.

The organization and infrastructure of established women's
groups make them ideal vehicles for O.R.T. popularization
among women not only in Kisumu, but in Kenya as a whole.

INTRODUCTION:

Acute diarrhoeal diseases are a common cause of death in children under 5 years, next to measles and respiratory tract infection, in the third world countries.[1] It is estimated that 5,000,000 children under 5 years over the world, die every year from diarrhoea and 60-70% of these deaths are due to severe dehydration. These children may suffer 2 to 3 diarrhoea episodes per year, contributing to between 20 to 30 days of illness per year from diarrhoea alone. This is associated with malnutrition especially in borderline cases.

Though it has been agreed at recent International Conference on Oral Rehydration Therapy (I.C.O.R.T.)[2] that Oral Rehydration is a cheap, effective and acceptable way to prevent millions of children dying from dehydration, it seems not yet popular among the Kenya women population.

This study conducted in Kisumu urban area, tries to establish the feasibility of one of the ways by which O.R.T. may be popularised, namely by using organized women's groups.

Kisumu Urban area is located in Kisumu District in Western part of Kenya along the North-Eastern shores of Lake Victoria. It is the third largest town in Kenya and administratively run by the Municipal Council of Kisumu which falls under the Ministry of Local Governments.

The town covers a total of 417 square kilometers^3 of which 157 square kilometers is water. It is bordered by such districts as Kakamega and Nandi on the North, Kericho in the East, Kisii on the South East, South Nyanza to its South and Siaya on its West.

The population is 149,482 (estimated to rise to 214,647 by 1990) consisting of 77,384 males and 72,802 females. While about 65% of the population in Kisumu live in the Urban and peri-urban areas, the average income per capita is low, at KShs. 1200. These populations earn their living through among others, employment in Agro-industries like KICOMI and The Kenya Breweries.

Kisumu has a high population growth rate, 7%, which is allegedly due to a high immigration rate of people from surrounding rural areas.

Assuming the town shares the same Childhood Mortality as the Kisumu district, it ranks fourth in Kenya among the districts with highest Childhood mortality of 199 children per every 1000 dying before age two.

The projected child population (0-2 years) by 1990 is about 10 732. Assuming the childhood mortality of 199 per thousand it will mean that 2,135 children 0-2 years die every year. Because of this UNICEF has been collaborating with Kisumu Municipality over the last three years, as part of its Urban basic services, to improve the quality of life of mothers and their children through advocating the importance of community participation.

MAP SHOWING PART OF KISUMU DISTRICT AND AREAS WHERE STUDY WAS CONDUCTED.
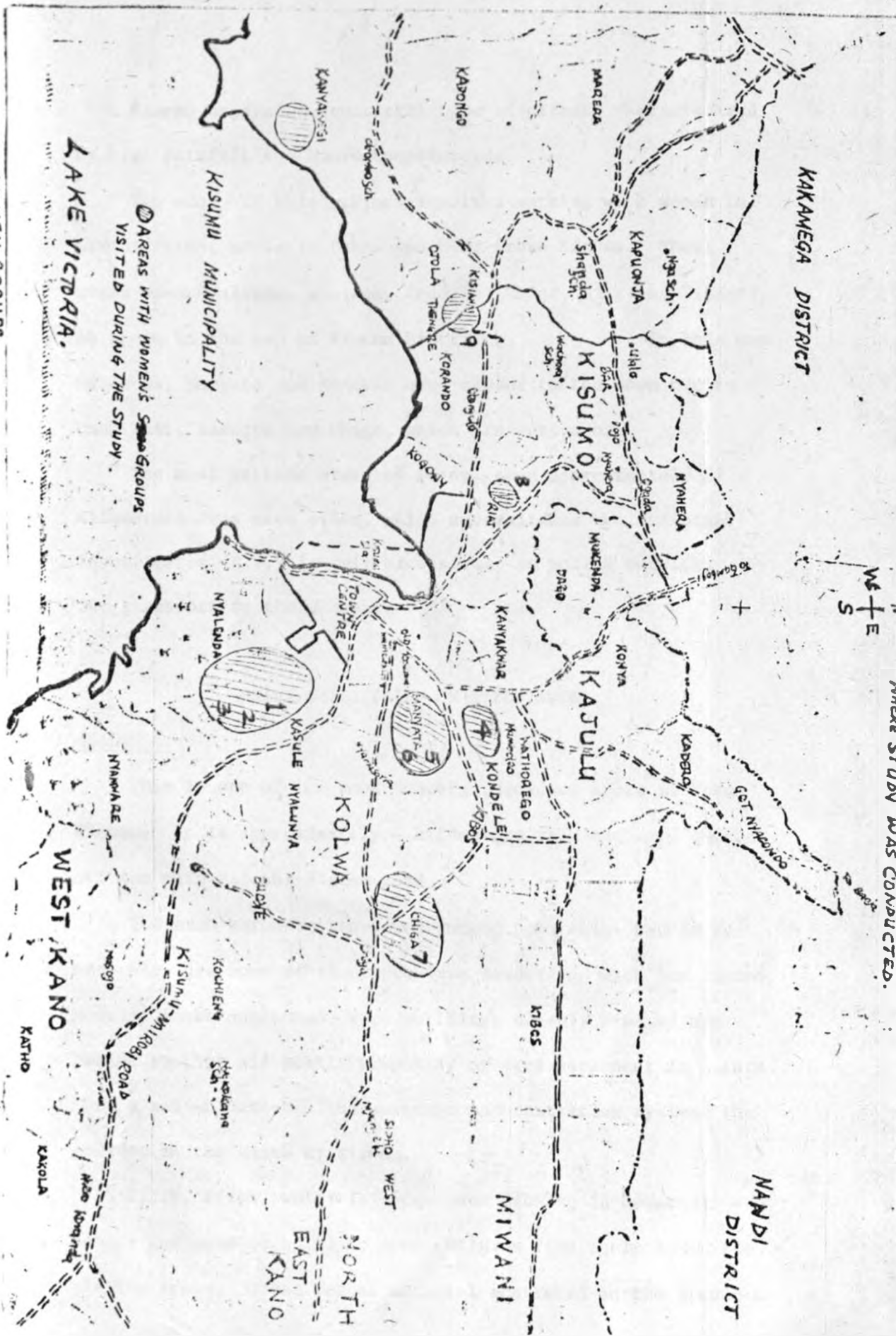
Kisumu enjoys an equatorial type of climate characterized by high rainfall and humid temperatures.

The study in this project involved working with women in six different areas in Urban and Peri-Urban Kisumu. These areas were Nyalenda, Manyata, Kondele, Chiga, Riat and Tiengre, as shown in the map of Kisumu District. In this map Nyalenda, Manyata and Kondele are closer to the town centre than Riat, Tiengre and Chiga, which are Peri-urban.

The most extreme areas of study, span approximately 27 kilometers from each other, which necessitated the Principal Investigator (P.I.) to rely excessively on public services for transport to these areas.

BRIEF DESCRIPTION OF STUDY AREAS

NYALENDA:

This is one of the most densely populated areas in Urban Kisumu. It is approximately 4 kilometers from the town centre off the main Nairobi-Kisumu road.

The area harbours the lower income population and to be seen here are most of those problems associated with low income. Housing looks unplanned, with buildings closely erected one beside another and mostly temporary or semi-permanent in nature. Such a set up has made the sewerage and sanitation systems the poorest in the whole of Kisumu.

Dirty, filthy water is often seen flowing in between houses and upon such filth; most children find their favourite playing areas. Human faecal material scattered on the ground is

a common sight and imagination will be left to the reader as
to the nature of the scene in this area, when rain water mixes
up with the ground filth. All this is despite the presence of
scattered latrines in the community.

Water is available from water points served with taps,
often belong-/ to individuals who sell water at a profit.   /ing
Occasionally the water is sold expensively especially when there
is some shortage, at times of crises.

During the rainy season, apart from the filth, the wet
ground becomes so soft that houses with poor foundations slowly
sink into the ground. A number of families have been rendered
homeless due to this.

The community in this area is quite hard working. The men
and women provide skilled and unskilled labour to most of the
labour requirements in the town. Self employment in carpentry
and petty business is quite a common feature not only in
Nyalenda but Kisumu as a whole, and many women and children can
be seen in kiosks or at the road-sides selling food, vegetables
or fish. Prostitution and other forms of promiscuity is
practiced as expected of such communities.

A description of Nyalenda would be incomplete without
mentioning the company of domestic animals the community enjoys.
These animals include pigs, which scavange for food in the filth,
ducks, cattle, goats and chicken whose care adds onto the
poor sanitation of this area.

The majority of inhabitants of this area are the Luo. Other
tribes include the Luhya, Kisii, Kikuyu and Swahili.

Here, three women's groups were studied, namely:
Akonya, Joot and Onyalobiro, all from Nyalenda.

MANYATA:

This is another densely populated area, but less so than
Nyalenda. Housing seems to have been like that in Nyalenda, but
a project currently in progress (The World Bank Shelter Project)
has changed the outlook. Houses look more planned, and more are
of permanent nature.

Sewerage, provision of clean water and provision of latrines
is greatly improved here, though a few sites bear marked
resemblances to Nyalenda.

Though the average income in the community might not be very
different from that of Nyalenda, prospects of better living
seem brighter.

The Luo again make up the majority of people who inhabit
this place. Two women groups, Dongri Kendi and Flamingo were
studied from Manyatta area.

KONDELE:

This place is about 4 kilometers from the town centre along
Kisumu-Kakamega road.

Housing, sewage and provision of clean tap water is more
improved in this set up. The houses are more spacious with some
of them fenced. Among these is the home of the Mayor of Kisumu
Municipality.

The average income per capita in this area appears to be higher than any of the other places of the study.

Most of the people inhabiting this are are retired men who have taken to business for their sources of income, business women, Senior civil servants and others. The Luo people form the majority in this place too. One women's group, Nyathimatin was studied here.

CHIGA:

This area is peri-urban. It is on the Kano plains, at a distance of approximately 15 kilometers from the urban centre, with poor transport system between it and the town. Far as it is from town, public service vehicles stop 5 kilomaters away, with the rest of the distance to be covered on foot.

Like most rural areas, houses are more scattered and of temporary and semi-permanent structure, though, occasionally, beautiful permanent houses are seen.

Cattle and goats are commonly kept for their milk, and for their meat, which is sold to slaughter houses, for money. The livelihood of the community is based on cultivation of crops for food and cash. This is mostly done by the women who still rely on traditional subsistence technology.

There is, occasionally, marked flooding of this area by rains which, apart from destroying crops, make roads almost impassable either by foot or vehicles. The situation is worse where paths rather than roads, connect important points like schools, market places and the like.

The community obtains its water from taps at various points which are often far from homes. For this reason (and also the

need to purchase water where a family has no tap of its own),
tap water is reserved for cooking with and drinking, while that
for bathing and cleaning clothes is fetched from streams.
This water though clear is definitely contaminated.

Being rural or peri-urban, sewage does not pose a major
problem. The Women's Group studied here was the Chiga.

RIAT AND TIENGRE:

These two places bear marked similarities to the situation
in Chiga, apart from transport which is much eased by the
availability of many regular and reliable public service
vehicles.

Tiengre is farthest from town, at a distance of about
8 kilomaters off the Kisumu-Busia road. Riat lies, roughly,
mid-way between Kisumu and Tiengre.
One women's group from each of these areas was studied namely,
the Riat and Tiengre Women's groups.

RATIONALE OF THE STUDY

A. During a Child-survival and Development-Programme planning
    workshop held for Kisumu Municipality in 1984, the partici-
    pants (who were mostly from the local Communities) agreed
    that acute diarrhoeal diseases ranked seventh highest
    among all the Community problems in Kisumu.[3]
    In as far as Medical problems were concerned, acute
    diarrhoeal diseases were ranked the third commonest after

malnutrition and the group of six diseases currently included
in the KEPI Programme. This indicates the Community's
awareness of the prevalence and seriousness of diarrhoeal
diseases.

B.   The study is designed to establish the feasibility of one
     way by which the community may help themselves out of
     this problem. This involves the use of established women's
     groups.

C.   Kisumu District ranks fourth highest with respect to I.M.R.[4]
     among the districts of Kenya. Among the major causes of
     death in children under 5 years, recognized in the third
     world,is dehydration due to acute diarrhoea. Thus a control
     programme to reduce mortality from acute diarrhoeal disease
     would go a long way in substantially reducing the overall
     mortality rate.

D.   An Integrated Child Survival and Development Programme
     is currently being carried out jointly by UNICEF and Kisumu
     Municipality. Among the objectives of this programme is
     the proposal to impliment a Diarrhoeal Disease Control
     Component.. This study is therefore seen as a
     preliminary step towards a major Diarrhoeal Control Programme.

E.   A strategy, the O.R.T, exists which if correctly and
     adequately popularized is very effective in reducing mortality,

and to a limited extent morbidity, due to acute
diarrhoeal diseases.[5] O.R.T. is cheap, easily prepared
and can be easily administered by any responsible household
member with no major complications known to date, if correctly
applied.

The use of the women's groups for its popularization was
seen to be worth studying.

F.   Kisumu District has in existence, organized womens groups,
     whose original objectives, though not directly related to
     health have formed a nucleus upon which to base community
     directed health care, including the use of O.R.T.

OBJECTIVES:

(i)   To study the organization, demographic and Socio-economic
      characteristics of women's groups in Kisumu Urban area.

(ii) To provide, and assess the feasibility, of health education
      to mothers in the study group.

(iii) To determine the knowledge, attitudes and practices
      (K.A.P.) of study group women and a control group of women,
      about acute diarrhoea. In the study group, K.A.P. was
      repeated after the health education programme and the two
      K.A.P.s compared.

(iv) To distribute, through the leaders of women's groups, O.R.T.
      satchets to women in the study group for use in children
      under 5 years with acute diarrhoea and to measure and compare

the morbidity and mortality rates of those in the study group
to whom O.R.T. had been distributed and those in a randomly
selected sample to whom neither O.R.T. nor H.E. had been given.
This part of the study was limited to 6 weeks because of time
constraints.

METHODS AND MATERIALS:

SELECTION OF STUDY AND CONTROL GROUPS:

Kisumu District has currently 60 women's groups
previously formed for purposes other than those related directly
to health.

The groups have an average of 30 members each. In
their on-going joint programme, the UNICEF/Kisumu Municipality
are using these womens groups.

However, due to the great amount of work involved were
all the 60 groups to be covered at one time, it was decided
that it would be appropriate to start with 12 women's groups and
slowly recruit more every year.

This is to continue so that by 1990 all the 60 groups
will have been covered. The P.I. proposed to work with the
12 women groups that had been chosen initially by the joint
programme. (Note that it was a requirement by the Community
Health Department, University of Nairobi, that this project
study should be conducted alongside a major on-going, UNICEF
Project).

However, due to unanticipated difficulties in
covering all the 12 women groups, the P.I. decided, after a
familiarization tour of the 12 groups, to choose 9 out of them,
that could be covered within the six months study period.

The nine study groups were selected in the following
manner:

The twelve women groups were listed on a plain piece
of paper and each given a number from 1 to 12 inclusive. Twelve
small pieces of paper were likewise numbered 1 to 12, folded

and mixed up together in a tin. Then from the tin, a blind-folded colleague picked out nine pieces of paper each of which was opened out and the number it bore matched with the number against a group on the list of women groups.

In this way, nine study women groups were randomly selected by ballotting.

For each of the nine study groups, a complete list of names was obtained from the group Chairman and each member's household was identified with the help of a responsible member of the group.

After the study groups were identified, control groups were selected as follows:-

For every household belonging to a study group member, one control household was chosen.

The four compass directions, North (N), South (S), East (E), and West (W), were numbered as shown below:

N=1; S=2; E=3; W=4

After visiting a study household, the interviewer determined its control household by randomly selecting one of the four compass directions above, and the number of the household as he walked in the specified direction.

For example, if a random number, preselected from a random number table, was 04932, then the last two digits under-lined were used to determine the direction (with last digit which in this case is 2) and the number of control household away from the study household along the chosen direction by the second last digit, 3.

Since from the numbered compass directions, above S=2, then the interviewer after visiting the study household, would face South and move along this direction to the third household, which would be the control.

All random numbers were preselected from a table of random numbers the night prior to the actual visits.

Where the last digit in a random number was greater than 4 (since only four compass directions were used), the number 4 would be subtracted from the last digit repeatedly until a number equal to or less than 4 was obtained. For example if the random number was 32439, the last digit for determining the direction is 9 which is greater than 4. Therefore, $9 - 4 = 5 - 4 = 1$. The direction to be taken by the interviewer is going to be represented by 1, which is North.

When zero was the last digit in the random number chosen, e.g. 32430, then the zero would be taken as 10, and the same procedure of subtraction followed until a number small enough was obtained.

This exercise was considered complete when each study household had a randomly selected control household.

However, after the study was completed, it was realized that this method of selecting compass bearing was not without bias since, of the 10 possible terminal digits, 3 would indicate North, 3 South, 2 East and 2 West.

The study households were all visited in order of the list of members in each women group as provided by the Chairman of the group.

Another random selection done was to choose 50 households, from among the controls, on which follow up surveillance for cases of acute diarrhoea was to be conducted.

Since each study group had a name, namely Akonya, Dongrikendi, Riat, Tiengre, Flamingo, Chiga, Nyathimatin, Joot and Onyalo Biro, each group was represented by the first letter of its name i.e. A,D,R,T,F,C,N,J, and O respectively.

Each study groups' control was represented by the same letter as the study. Every control group member was then given a number from 1 to n, where n was the last member in the sequence on the list, as in the study group. Each control group member ended up represented by a specific number and letter as shown below,

$$A_1, A_2, A_3, \text{------------------} A_{13}$$

$$A_{14}, D_1, D_2 \text{----------------} D_{10}$$

$$D_{11}, D_{12}, D_{13} \text{------------------} R_2 \text{ etc}$$

By this arrangement, each fell on a given row and column,(in each row there were 13 elements).

The numbered letters were then, each, numbered from 1 to 199 inclusive as shown below.

$$A_1, A_2, A_3 \text{--------------------} A_{13}$$
(1) (21) (31)

$$A_{14}, D_1, D_2 \text{------------------} D_{10}$$
(2) (22) (32)

$$D_{11} \quad D_{12} \quad D_{13} \text{------------------} R_2$$
(3) (23) (33)
etc

Having done this, 50 random numbers, from the random number table, were selected and these matched against the numbered letters above. For example, if the random number was 032, then from the arranged letters above, the selected control would be D_2,, and so on.

The control group was selected in such a way that its' members would be as similar as possible to the members of the study group in all respects apart from membership of a women's group.

(1) TO STUDY THE ORGANIZATION DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTIC OF THE VARIOUS WOMEN'S GROUPS IN KISUMU URBAN AREA

In the study of the organization and composition of the women's groups in Kisumu Urban, participant observations were made and interviews conducted without pre-set questionnaires.

This involved visiting the various study groups, at their meeting places, once every week.

Prior arrangement was made with the Community Development Assistant (C.D.A.) attached to a particular study group, to notify the group to be visited, through their Chairman. The importance of all members attending the meeting was stressed so that as many as all members attended the meeting.

The meetings were organized in such a way that they corresponded to visits by the Income Generating Activity Coordinating Official from UNICEF. This was necessary due to the fact that an official introduction of the P.I. was needed prior to the study among the women.

The Income Generating Activity Coordinating Officer (I.G.A.O.) particularly, enjoyed marked credibility among the women and therefore was most suitable for introducing the P.I. This, however, necessitated adjusting the projects' schedule to suit the I.G.A.O. which imposed certain constraints on the speed of the implimentation of the project due, for example, to postponement of some meetings where the I.G.A.O. was committed elsewhere.

During meetings with the women, the I.G.A.O., after introducing the P.I., continued with his official programme with them while the P.I., within the group, observed their activities throughout the session.

At the end of every session, interviews were held by the P.I. on a few women of the group who included the Chairman, the Treasurer, the Secretary and any three other members without official posts.

The information sought during such interviews included:

(1)   History of formation of the group.

(2)   Why it was formed.

(3)   How many members form the group.

(4)   The group's day to day activities.

(5)   Age distribution of the members in the group.

(6)   Blood relationships of the members.

(7)   Organization of the group in terms of offices.

(8)   Political involvements of the group.

(9)   Opinions of the members about achievements as members of the group.

The demographic and socio-economic characteristics were
obtained by use of a pretested questionnaire as given in
Appendix A at the end of the book. Also included in this
questionnaire was the baseline information sought on morbidity
and mortality.

The questions "b" to "f" in appendix A were initially asked.
Question "g" was asked much later as it involved weighing
children which couldn't be done then, due to lack of a weighing
scale.

This exercise was conducted on all study groups which
lasted one and a half months between mid-April and May.

(II)   TO PROVIDE AND ASSESS THE FEASIBILITY OF HEALTH EDUCATION
TO MOTHERS IN THE STUDY GROUP

Though it had been anticipated during the study proposal,
that the UNICEF staff would assist in the provision of health
education (H.E.), it became necessary that the P.I. himself
provide the H.E. single-handedly due to pre-scheduled
commitments of the UNICEF staff.

The C.D.A's were again called in to assist in summoning
the study group members for the H.E. meetings.

The H.E. was provided in the form of a discussion with the
mothers in each group, at their usual meeting places. The
discussions were all held in Kiswahili. However, an interpreter
was used in all cases especially for the few that did not
understand Swahili well.

During the teaching sessions, aids such as demonstrations
and posters kindly contributed by UNICEF staff, were used.

The following was discussed at H.E. sessions,

(a) A talk on diarrhoea emphasizing the common factors that
contribute to acute diarrhoea:-

- poor hygiene in the preparation, handling, storing
and serving of feeds to children.

- complete exclusion of breast milk in children under
2 years.[7]

(b) Methods of preventing diarrhoea by adopting favourable
hygienic practices, such as using boiled water to give
to children and preparing food for them, washing hands
and breast nipples before feeding a child.

At the end of each health education session, the O.R.T.
was introduced. This was done after explaining and demonstrating
its use, preparation and administration. Advice to mothers, on
when to seek medical assistance for a child with acute
diarrhoea, was given at the end of every H.E. session.

In all the H.E. sessions, the P.I. stood infront of the
women and explained the purpose of the meeting before discussions
started.

Each teaching session lasted an average of 40 minutes, with
as much livelihood as the P.I. could employ. Thereafter, the
women were allowed to ask as many questions as they wished. The
overall time for each sitting, therefore, depended on the
number of questions asked.

DETAILS OF DISCUSSION DURING H.E.

Discussions were carried out under the following sub-topics:

(i)   What is diarrhoea?

   This was taken as more than 3 watery stools per
day. It may be with or without blood.[6]

(ii) Common conditions that lead a Child into getting diarrhoea

  (a) Germs - From uncleaned hands and food containers
      used to feed child with.

    -Food stored (after preparation) without covering to
    prevent contamination by flies or dust and giving
    child such food without adequate heating.

    -use of unclean unboiled water.[7]

  (b) Breast feeding - Complete exclusion of breast
      feeding in babies or inappropriate early weaning.

The germs get into the child through the mouth during feeding.
To avoid getting such germs, before feeding a child;

  - clean hands with clean water and soap.

  - use boiled water to feed child with.

  - wash breast and nipple before breast feeding.

  - store prepared food covered well to keep off flies
    and dust. Preferably, feed baby with enough
    freshly prepared food so that little or none remains
    for storage.

  - use clean water (boiled if necessary) to clean the
    utensils to be used in feeding child.

  - use latrines to dispose of all human faecal matter.

  - keep all immediate house surroundings clean of any
    garbage.

(iii)Seriousness of diarrhoea in Children:

Children lose a lot of body water in stools and this make them "dried" up. If no water is replenished and the diarrhoea continues this will kill the child.

(iv)   How to help a child with acute diarrhoea at home;

Because of the loss of fluids you must give the child some extra fluids. This can be in form of packed O.R.T. (as that by UNICEF); or water to which measured salt and sugar has been added at home; fruit juices; very dilute "UJT"; breast milk especially for those under 2 years.

In the preparation of O.R.T. by using O.R.T. packets by UNICEF, mothers were taught to use the following method and items:

(A)   A 500 mg empty KIMBO tin (that earlier contained fat), trimmed on its opened edges, cleaned and boiled in water.

(B)   A clean saucepan borrowed from one of the members and cleaned again in their presence.

(C)   The oral rehydration therapy (UNICEF) satchets.

(D)   Clean boiled water.

(E)   Posters.

All the above items were displayed before the mothers. The P.I. proceeded to clean his hands with clean water, assisted by one of the mothers. Water (which the mothers were always advised to boil and cool first) was measured into the Kimbo tin twice full, both of which were emptied into the clean saucepan. These made approximately 1 litre of clean water.

A whole O.R.T. satchet was emptied into the water in the saucepan and stirred with a clean spoon. No boiling was done after the solution was stirred. In this form, the solution was ready for administration in the following way:

(i)   For children 7 months or less, the mean weight estimated at 5kg, would be given a volume of between 250 and 300 mls which is roughly $^1/2$ the kimbo tin and an equivalent of 50ml/kg body weight.

(ii) For children 7 months to 1 year at an estimated weight of 8kg, a volume of one Kimbo tinfull which is approximately 500mls is equivalent to 62.5mls/kg.

(iii) For children 1 to 2 years, the weight estimated at an average of 12kg, the estimated volume to be given was $1^1/2$ tins full of solution which was approximately 750mls and an equivalent of 62.5mls/kg.

(iv) Children 2 years and above at an estimated average weight of 16kg, two tins full, approximately 1 litre, of .. solution, equivalent to 62.5mls/kg was given.

These volumes were estimations which may seem slightly lower than those sometimes recommended. These were estimated thus; to avoid anticipated difficulties by mothers in measuring volumes with technical accuracy which was made easier for them by using units of half or one tinful. Advice was also given that the O.R.T. solution measured be given over 6 hours concurrently with liberal amounts of other fluids as described below.

These measurements were approximations and were demonstrated to the mothers using the tin and posters available. Older children were given the O.R.T. solution by sipping directly

from a clean cup while smaller ones by cup and spoon.

After six hours of administration, if diarrhoea still continued, more of the solution of a similar quantity was to be measured and given slowly over the same time period.

This was to be continued until the diarrhoea stopped. If it didn't stop after two days the child would be considered for other Medical attention.

The prepared O.R.T. was discarded, if it remained unused 24 hours after preparation, and a fresh sample prepared if administration was to continue.

Vomiting was considered not a contraindication to O.R.T. administration. If a child vomited, the mother was advised to wait 5 to 10 minutes, then start administering the O.R.T. again, waiting a little longer in between sips, until the child vomited no more.

The mothers were advised to take the child to hospital, if any one of the following conditions were observed:

(a) If diarrhoea continued and child looked weak despite administration of O.R.T. A few features to be looked for on the child included:

- The mouth and tongue looking markedly dry.

- Eyes looking sunken and more shiny than normal.

- skin looking more wrinkled and less retractable than normal.

- child looking irritable.

(b) If child's body felt abnormally hot, because this could be due to other diseases like malaria,

pneumonia etc.

It was stressed that administration of O.R.T. should start immediately acute diarrhoea was noticed in a child. O.R.T. was to be given concurrently with breast milk[8], for children who still breast fed, or fruit juices, dilute "UJI", soup of meats and etc.

Bloody diarrhoea and abdominal distension should perhaps have been included in the observations that necessitate taking a child to hospital. However, due to their rare occurence (as shown by the absence of even a single case with bloody diarrhoea in the course of this study) and the need to limit the total amount of information given, they were not included.

High roughage foods, such as green vegetables, were to be avoided during the acute stage.

The H.E. was given during the months of July and August.

(iii) TO DETERMINE THE KNOWLEDGE, ATTITUDES AND PRACTICES
      (K.A.P.) OF STUDY GROUP WOMEN AND A CONTROL GROUP OF
      WOMEN ABOUT ACUTE DIARRHOEA

The information for this part of the study was obtained by the use of pretested questionnaires. The questionnaires were applied to every member of a study group and the head woman in every control household selected.

The questionnaire used is given in appendix B. It was applied by visiting all the households. The questionnaire was pretested on other women who neither belonged to the study nor the control groups:

Responses to the questionnaire from a total of 9 women, from three separate communities in which a study group was found, were collected. Three of the questionnaires were applied by the P.I. and three each by a project assistant.

The responses were then studied and where changes on the questionnaires were necessary, appropriate alterations made. A second pretest was made on 9 other women, in the same way as the first. The P.I., having been satisfied, started applying the questionnaire on the groups selected for the study.

The P.I. (with a translator and a pretranslated questionnaire from English to Luo) and his two assistants visited the home of each study group member and the homes of each matched control selected as described earlier. Both questionnaires in appendix A and B were applied at the same time. For each question asked, the respondent was given as much time as possible to give as many responses as she could. When she felt she had exhausted her answers the next question was asked.

The questionnaires were completed, per respondent, during an average period of 15 minutes for the study group and 25 minutes for the controls. It took longer in the control, due to the fact that there had been prior introduction, of the P.I. and his assistants to the study group and not to the control.

Walking in the community for such an exercise was not only difficult but worse when some of the members visited were not at home. It was particularly frustrating where households were
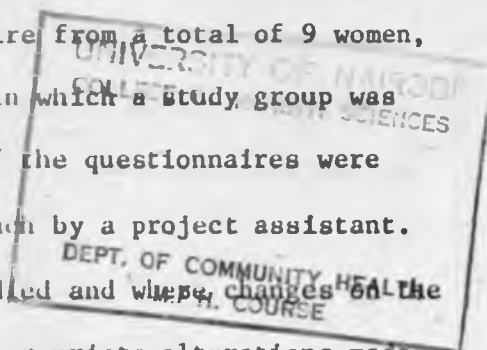
far apart and the interviewers had to come back (sometimes
more than twice) to check on the mother to be interviewed.

The whole exercise lasted five weeks from the end of
May to early July.

(iv) TO DISTRIBUTE; THROUGH WOMEN'S GROUP LEADERS, O.R.T.
SATCHETS, TO WOMEN IN THE STUDY GROUP FOR USE IN CHILDREN
UNDER 5 YEARS WITH ACUTE DIARRHOEA AND TO MEASURE AND
COMPARE MORBIDITY AND MORTALITY AMONG SUCH CHILDREN BETWEEN
THOSE IN THE STUDY GROUP TO WHOM O.R.T. HAD BEEN
DISTRIBUTED AND THOSE IN A RANDOMLY SELECTED CONTROL
SAMPLE TO WHOM NEITHER O.R.T. NOR H.E. WAS GIVEN.

The O.R.T. satchets were kindly donated by the Ministry
of Health, in collaboration with UNICEF officials. A total of
1000 satchets were available and from each, 1 litre of O.R.T.
solution could be prepared.

The satchets were packed in fifties in small boxes,
which were in turn stacked together in a big carton. Each
study group was provided with two boxes (apart from two
study groups that were large, which received three boxes
each).

The boxes were handed to the Chairman of every group,
and she was reminded of the important steps in the
preparation and administration of the formulation.

The Chairman was supposed to remind the recepient these
steps every time a woman   came to collect satchets.

Every member was given two satchets for every reported
case of diarrhoea, under 5 years, in her household. The
Chairman kept a note of every member who came for O.R.T. and
this listing was presented to the P.I. (or his assistants)
every third day, when he visited the Chairman.

For the prupose of this research investigation,
distribution of O.R.T. to non-members, by a Chairman,
was discouraged both verbally and by the system of O.R.T.
distribution. Every case of diarrhoea reported, was followed
up and it was therefore not very easy for a neighbour to
borrow O.R.T. if she didn't belong to the study group.

Any satchets remaining after a child was successfully
treated, were to be returned to the Chairman. The ?.I.
actually enquired about this, every time he visited cases
of diarrhoea. This minimized further the spill over of
O.R.T. into the control group.

Despite this, 5 members in the control acquired some O.R.T.
Satchets. This forced the P.I. to drop them completely out
of the study; these "drop outs" were not replaced.
The adopted system of distributing O.R.T. made it possible
for the P.I. to follow up cases of acute diarrhoea in the
study group.

The possibility of cases of diarrhoea not reported to the
Chairman was considered. For this reason, an independent
study was also conducted on a randomly selected non-reporting
member in the study group, for every member that reported to
the chairman.

The random selecting was made among all those members who at the time of visiting the group had not reported diarrhoea. Selection was by the balloting method. The results would give an indication of how effective the method of distributing O.R.T. was. This part of the study exposed only two women who failed to report diarrhoea for reasons explained later in the text.

The objectives in morbidity data collection were:

1. To determine the incidence of acute diarrhoeal diseases among the study and control groups.

2. To determine the severity of acute diarrhoeal diseases for every case in the study and control groups in terms of degree of dehydration, the rate of seeking medical help from hospital and the rate of hospital admissions.

Morbidity was assessed on house visits to the selected 50 members of the control group and those study group members who had reported diarrhoea. The organization of the study groups made their follow-up easier.

During each visit, the following data was recorded:

- Duration of diarrhoea.

- Type of diarrhoea.

    (a) Watery

    (b) Dysentery

- Degree of dehydration

    (a) mild

    (b) moderate

    (c) severe

For the control group, 50 women were studied. It was necessary to study, only 50 of the women in the control group because it was difficult to cover all the 194 members in the control group in the time available. Every study group and control was visited every three days over a period of 6 weeks. For every visit, every member with a child or children with diarrhoea, was noted and the morbidity questionnaire completed - see Appendix C.

Follow up for every case was for a maximum of three days. The first day of the visit was taken as the first time the visitor saw the case of diarrhoea. The visitor would then check on the same case the next day, and fill in the questionnaire in appendix C. The third day would be skipped, and the visitor came to see the same case on the fourth day which was also the last day.

On every visit, the same kind of information was sought from the case, apart from the last day when additional information was filled in Row 5 of the table in Appendix C. This information was on the fate of the child, whether taken to hospital or not and whether alive or dead.

The information on whether child died or not, was obtained from the Chairman of the study group in cases where the child was taken away and died in hospital or outside the household.

During every visit to a study household, the mother was reminded on the steps of preparing and administering the O.R.T. And where the mother was found to have erred grossly, the prepared O.R.T. solution would be discarded and a fresh one prepared.

The exercise of collecting morbidity data and the
K.A.P. after H.E., was conducted in the last 7 weeks of the
study between end of August and October.

The degrees of dehydration in the children seen with
acute diarrhoea were assessed, by examination, using the
criteria shown in Table i below:

TABLE 1

A TABLE FOR ASSESSING DEHYDRATION IN A CHILD [1]

SIGNS AND SYMPTOMS	MILD DEHYDRATION	MODERATE DEHYDRATION	SEVERE DEHYDRATION
General Condition	Thirsty, Restless	Thirsty, irritable	Drowsy, cold, coma
Respiration	Normal	Deep and Rapid	Deep and Rapid
Anterior fontanelle	Normal	Sunken	Very sunken
Skin elasticity	Normal	Slow retraction after pinching	Very slow Retraction
Eyes	Normal	Sunken	Deeply sunken
Tears	Present	Absent	Absent
Mouth(inside) and the tongue	Moist	Dry	Very dry

The assistants wrote on a separate piece of paper, the
signs and symptoms they could best elicit from a sick child
and the degree of dehydration determined later by the P.I.

-Mild dehydration was taken to be present when a child [1]
was observed to be thirsty.

-Moderate dehydration was when two or more of the signs
of moderate dehydration (above) were observed.

-Severe dehydration, when two or more of the signs of
severe dehydration (above) were observed.

Selection and Training of Research Assistants:

Throughout the study, two assistants selected from
among 4 who wished to work in the project were employed.
The 4 had attained either O or A level certificates but were
unemployed. They were given a short session of instruction
on how to fill the questionnaires, then each given two
questionnaires to fill by interviewing any adult women of his
choice. Those that filled the questionnaires best were
selected as assistants and more training provided to them.

For the assessment of dehydration in children with
acute diarrhoea, the assistants were exposed to demonstrations
on normal children and dehydrated children from the
Community and nearby health centre.

In addition, from each women's study group, a woman was
employed to direct the P.I. to the households of every member.

RESULTS OF THE STUDY:

1. <u>TO STUDY THE ORGANIZATION, DEMOGRAPHIC AND SOCIO-ECONOMIC</u>
   <u>CHARACTERISTICS OF WOMENS GROUPS IN KISUMU URBAN AREA</u>:

9 women's groups were studied over the study period. The 9
women's groups selected for the study included:

(A) Onyalo Biro in which a total of 25 members were seen.

(B) Joot with a total of 50 members seen.

(C) Nyathimatin, with a total of 10 members seen.

(D) Dongrikendi, with a total of 21 members seen.

(E) Flamingo, with a total of 13 members seen.

(F) Tiengre in which a total of 14 members were seen.

(G) Akonya with a total of 14 members seen.

(H) Chiga with 28 members seen.

(I) Riat with 16 members seen.

The distribution of these groups is indicated in the map
of Kisumu District.

The groups were formed at various times between 1972
(the oldest) and 1983 (the most recent). The majority of them
were formed between 1979 and 1983, apart from JOOT which was
formed in 1972.

These groups were formed initially for various reasons
which, generally, were for purposes of improving the income
of the members and directly or indirectly /help needy neighbours. /to

For example, JOOT women Group was formed by women who
belonged to one religious denomination. They felt if they
did so, they would find ways of helping themselves and their
less fortunate neighbours (irrespective of their denomination)
through raising funds by various means.

Most of the other women'sgroups were formed for business

partnership. This facilitated their ability to acquire permits

for the purchase of commodities for sale that were rare and

restricted by the government authorities.   Such commodities

like maize, during the period of marked drought in Kenya, were

quite marketable and therefore profitable.

Other reasons for formation of groups included;

a)   Organizing women into groups, especially those who did

      not have any source of income due to widowhood or other

      unfortunate circumstances (some of whom indulged in

      begging in the streets), so that as a group, donations

      from sympathizers e.g. the Kisumu Municipality, could be

      provided to them together.

b)   Organizing women into groups, for example those whose

      children had chronic medical illnesses like polio-

      myelitis or mental subnormalities, so that health

      workers would visit them together, and advise them on

      how best to take care of those children.

All these reasons given above, were later on modified and the

operational reason currently keeping groups together is now

principally to improve the member's income and their family

welfare.

      Except for one group, AKonya, whose reason for   formation

was "a", all other groups were formed for the other reasons given .

      None of the groups was formed for political purposes.

From the time the groups were formed to shortly before the study

was started, the women's groups had lost most of their members

for reasons which included; financial mismanagement by office

bearers; failure of the groups to achieve objectives for
which they were formed,and dissatisfaction among members on
the selection of office bearers.

Some members felt strongly that, their office bearers
were too closely related by blood or came from the same tribal
clan. They thought this led to unfair domination of offices
rather than a democratic running of the groups. These and
other petty personal reasons made many members exit from
their groups.

However, when UNICEF proposed to work with these
women'sgroups, among other facilities to be made available
to the groups were loans for developing better methods for
income.

Those who had dropped out from the groups, on hearing
of this new development, re-enrolled as members, and new
members enrolled. Enrolment however was restricted so that the
sizes of groups didn't go beyond what the office bearers felt
they could run without many problems. Recruitment was on
first come, first served basis.

ORGANIZATION OF THE GROUPS

Each group has a Chairman, a treasurer and a secretary.
In larger groups, assistants to each of these posts were
elected.

Selection of office bearers is reported to have been
by consensus, (though not all interviewed quite agreed to this)
where the most able member, for each post, was elected by
a majority of members in the group.

For most of the groups, however, office bearers have
remained the same over a long time.

In others, men have been included as advisers in
matters that pertain to the groups activities, but none
of them holds an office.

Some groups, such as Joot, have a written constitution.
The members of these groups vary in their ages between
25 years and 60 years. Most of them, however, are between
30 and 50 years old.

All the Chairpersons are above 40 years of age. These,
particularly, command marked respect in the communities.

The Secretaries are mainly younger ladies, with a better
educational status, who can read and write one or more
languages including English. A few of these are actually
teachers.

DAY TO DAY ACTIVITIES OF WOMEN'S GROUPS

Apart from attending to their own household duties the
group members attend group activities such as

- Pottery (where they make earth pots for sale in
  places as far away as Mombasa).
- Buying and selling at a profit commodities such
  as maize, charcoal, clothing and tap water, to
  others within the communities.

A day is allocated for each member to work for the
group. Not in all groups, however, has the same degree of
cooperation among members, leadership,and therefore benefits,
been achieved.

The better organized and apparently more committed groups like Joot and Tiengre have achieved more.

The UNICEF/Kisumu Municipality Child Survival and Development Programme is encouraging feasible income generating activities for the groups, through their officials; they give out loans for such activities to be accomplished.

Each of the groups has opened a Savings Bank Account and money raised from profits etc. banked. This has been necessary to avoid previous experiences of financial mismanagement.

The I.C.A.O. has been particularly concerned about this, that he has organized sessions with women to teach them a few important aspects of financial managerial skills. Profits obtained by the groups are shared equally after repaying a monthly sum for the loan , while some is banked, for other group activities to be proposed later.

Occasionally, UNICEF/Kisumu Municipality have invited the groups to participate in concerts, staged often in Kisumu Social Hall, in an effort towards advertising ways of attaining better child health and development. Such occasions have attracted large crowds indicating the extent of its popularity.

The groups don't participate in political activities though politicians have been known to aid some groups financially.

There is a lot of optimism among group members,
especially after UNICEF's adventism. Members feel that the
provision of loans is timely and given a chance, they
promise to work hard to better their income. Some have
expressed their wish to work longer than their allocated
times. This is true particularly with a group like Dongri
Kendi, who recently acquired a maize milling machine.

It has been a source of great pride for the members
and envy from the community as a whole. Because of this,
Chair-persons have complained of repeated pestering by other
women to enrol as members of the groups. On this, the
Chair-persons have encouraged them to form their own groups.

It should therefore not come as a surprise to anyone
if,in a few years time from now, every woman in Kisumu
district belonged to a certain prosperous group, a state
of affairs the P.I. expects in shorter than two years time.

Demographic and Socio-economic characteristics including
baseline morbidity and mortality data:
The survey population were 199 study women belonging to
women's groups and 194 control women. Their enumerated
children, under 5 years, totalled 266 in the study group and
317 in the control group. Out of the 266 children belonging
to the study group, 90 were less than 2 years old, while 123
out of the 317 children belonging to the control were less
than 2 years. The study and control groups had similar mean
numbers of occupants per household: Mean=5.8 in the study
group, mean = 5.5 in control group.

The number of members in households which was most frequent
(the MODE) was 7 in the study group and 5 in the control;
see table 1.

Figure 1, is a composite bar chart to show how the number
of members in each household were distributed. There seems

to be marked differences in the frequency distribution
of the number of members in each household. An application
of the X^2 test, to the observations in Table 1 given,
X^2 = 26.56, the null hypothesis was rejected (P = 0.05).
There were thus, more members per household in the study
group than the control group. This could have been due to
the fact that, on average, the study group were older and
more responsible women who took care of, apart from their
own children, their grand children.

The sizes of the houses was not taken into account and the
number of members per household is therefore not an indication
of over-crowding or otherwise.

TABLE I

THE DISTRIBUTION OF THE TOTAL MEMBERS IN EACH HOUSE HOLD

Number of Members	Number of Households Study	Control	Total
1	9	2	11
2	7	5	12
3	10	22	32
4	13	28	41
5	20	39	59
6	26	21	47
7	38	22	60
8	24	22	46
9	17	11	28
10	12	8	20
11	8	5	13
12	9	2	11
13	6	7	13
	199	194	393

$P = 0.05$; d.f. $= 12$; $X^2 = 21.026$.

Computed $X^2 = 26.56$.

$\bar{X}$ (Control group) $= 5.5$

$\bar{X}$ (Study group) $= 5.8$

FIGURE 1.

A COMPOSITE BAR CHART TO SHOW THE DISTRIBUTION OF THE TOTAL
MEMBERS IN EACH HOUSEHOLD IN THE STUDY AND CONTROL GROUPS:
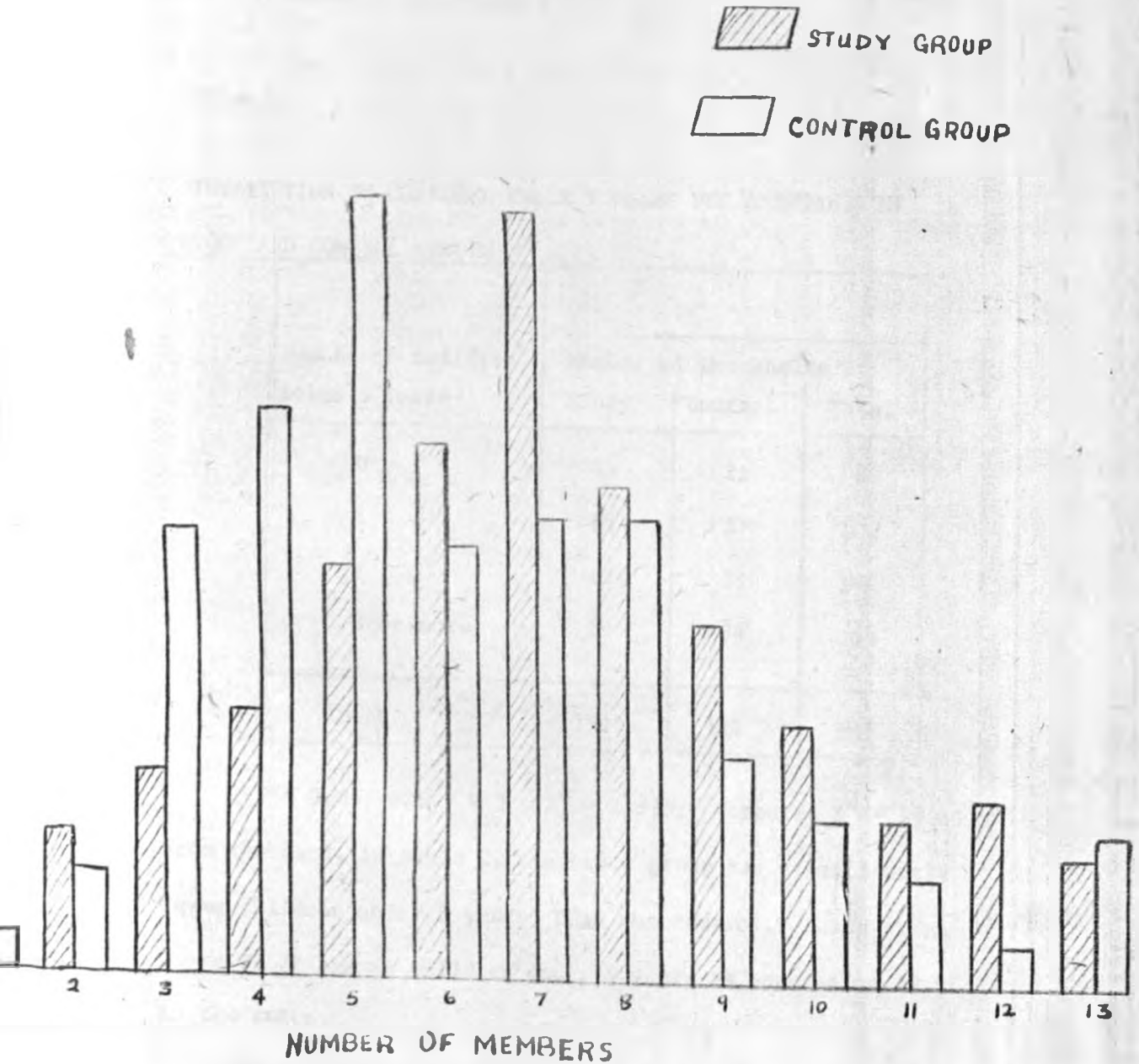
NUMBER OF MEMBERS

If anything, the study women had more spacious houses than
the controls, many of whom rented a room or two, in town, to
be shared by the household members.

ɔ   The distribution of the total number of children less
than 5 years, per household in the study and control groups
is shown in the table 2.

TABLE 2:

DISTRIBUTION OF CHILDREN UNDER 5 YEARS PER HOUSEHOLD IN
STUDY AND CONTROL GROUPS.

| Number of children | Number of Households | | |
Below 5 Years	Study	Control	Total
0	63	25	88
1	45	57	102
2	62	78	140
3 or more	29	34	63
TOTAL	199	194	393

$P = 0.05$; d.f. $= 3$; $x^2 = 7.815$; Computed $x^2 = 19.80$.
From the data, in table 2, the study group had significantly
fewer children under 5 years, than the control. Among these
women 31.7% had no children under 5 years as opposed to 12.9%
in the control.

Of those that had children less than 5 years, most had a total
of 2 children in the household in both study and control
groups.

Smaller percentages of women (14.6% in the study and 17.5% in the control) had more than 2 children under 5 years, per household. Out of these, 2 study households, and 1 control household each had 4 children under 5 years.

Overall however, the control group had more children under 5 years, than the study. This was due to the fact that the control group had a higher percentage of younger and thus more reproductive women than the study group.

Note that the households with more than 3 children under 5 years have not been included separately in table 2, because the figures are too small to apply the X^2 test to them.

EDUCATIONAL STATUS OF MOTHERS:

It has been shown that maternal literacy is one factor that markedly determines a child's welfare.[9] For this reason, measures are being undertaken to improve women's literacy, because the higher the educational status, the higher and better the child's welfare and the less the morbidity.

In the groups studied, the control group had generally a higher and better educational status than the study group; see table 3.

As many as 59.8% of women in the study group had 4 years or less of formal primary school education compared with 41.2% of the controls. These percentages fall in the study group as the educational status rises, such that 31.7% have had more than 4 years of formal' primary school education, with or without 1 year of formal secondary school education. Only 8.5% of the study group had between 1 and 4 years of formal

secondary school education.

In comparison among the controls, 46.4% of women had more than 4 years of primary school up to 1 year of formal secondary school education, while 12.4% had more than 1 year but 4 years or less of formal secondary school education.

TABLE 3

THE MEMBERS IN CONTROL AND STUDY GROUPS AND THEIR EDUCATIONAL STATUS

Educational Status Attained	Number of Women		
	Study	Control	TOTAL
4 years or less of formal education	119(59.8%)	80(41.2)	199
Above 4 years but less than 9 years of education	63(31.7%)	90(46.4%)	153
9 years and above formal education	17(8.5%)	24(12.4%)	41
TOTAL	199	194	393

$P = 0.05$; d.f. $= 2$; $x^2 = 5.99$; Computed $x^2 = 13.57$

The x^2 test applied to the frequencies in the table above shows significant difference ($P = 0.05$) in the educational status between the study and control groups, with a higher average, of educational status in the control than the study.

The reason for this could be due again to the average age in the control groups which was lower than the study, with younger generations generally having spent longer time at school than the older.

ECONOMIC STATUS:

The economic status of a given household was determined by enquiring from the respondent what type of job she and/or her husband did.

It was difficult to elicit reliable responses directly from the respondent on how much she or her husband earned per month, since this is rarely disclosed by the husband to the wife, let alone to strangers. With the information collected from respondents, an estimate was made, from the expected earnings of a given job, of how much the household earned per month.

For those involved in petty business, estimates were made by enquiring from 6 reliable study group members on roughly, how much profit they made per day. The average per month was generalized as earnings for those involved in petty business.

The occupations were grouped into 4 categories according to the estimated earnings per month. The grouping is as shown below:

(1) Business and others - This included those who owned shops, maize mills, carpentry shops, those employed as senior civil servants and the like.

(2) School teachers and clerks - These included secondary
and primary school teachers and clerks.

(3) Retired on pension etc. - These include those retired
and were receiving some monthly amount of payment
from the N.S.S.F., mechanics, employed carpenters,
police (constables) etc.

(4) Petty business and others - This included those who
sell green vegetables, fish, water from taps, baskets,
etc., those involved in peasant farming, watchmen and
office messengers.

The table 4 below shows the distribution of members in the
study and control groups on the type of occupation (income).
For ("1") above, the income was estimated at above Shs. 3,000/=
per month.

For ("2") above, estimated at Shs. 2,000/= to Shs.2,999/= per month.

For ("3"), it was estimated at Shs.1,000/= to 1,999/= per month. and

For ("4"), it was estimated at below Shs.1,000/= per month.

TABLE 4

THE DISTRIBUTION OF CONTROL AND STUDY HOUSEHOLDS ON ESTIMATED
INCOME PER MONTH.

Type of Employment (Income)	Number of Households		TOTAL
	Study	Control	
1	15	13	28
2	27	45	72
3	50	60	110
4	107	76	183
TOTAL	199	194	393

$P = 0.05$; d.f. = 3; X^2 =7.815 Computed X^2 = 10.76.

The chi square test applied to the table contents above shows a significant difference between the study and control groups. The control group showed a slightly higher average income per month than the study.

This observation agrees with the information given earlier on the reasons for which the groups were formed. Especially if groups like Akonya, whose members are mostly of the lowest income brackets, are considered.

In this study, it will be noted that, no consideration was made of any external financial aid, as from older working children etc. It was thought that this would complicate further the method of estimating the monthly income especially when such money was received by the husband who was not included as a respondent in the questionnaire.

Past morbidity and mortality in under 5 years in the last 12 months (see table 5)

This showed marked similarity between the study and control groups. Out of the children under 5 years who suffered an illness, 35.8% in the study group had suffered from diarrhoea and 35.4% did so in the control. These give annual diarrhoea incidences 0.36 and 0.35 respectively which are much lower than the expected values as is discussed later on page 53.

The tables 5 and 6 shows the number of children who had suffered an illness in each group and those with which diarrhoea was associated.

TABLE 5 AND 6

THE NUMBERS OF CHILDREN WHO FELL ILL IN THE PAST 12 MONTHS AND

THOSE ILLNESSES DUE TO DIARRHOEA

	Study	Control	Total		Study	Control	Total
Number in which an illness was reported in the last 12 months	218	260	478	Number with diarrhoea reported in the last 12 months	78	92	170
Number in which no illness was reported in last 12 months	48	57	105	Number without diarrhoea reported in the last 12 months.	140	168	308
TOTAL	266	317	583		218	260	478

P = 0.05; d.f. = 1; x^2 = 3.84   P = 0.05; d.f. = 1; x^2 = 3.84
Computed x^2 = 0.0004.   Computed x^2 = 0.009.

Statistical x^2 tests applied to the table above showed no significant

difference in morbidity between the study and control groups.

Mortality in under 5 years in the last 12 months.(see table 7)

The study group reported 13 deaths in under 5 years in 12 months prior

to the interviews. Out of these, 4 were diarrhoea associated deaths,

this represented 30.8% of the total. The control group had 22 deaths

out of which 7 were diarrhoea associated representing 31.8% of the

total.

Table 7 and 8 below show the numbers dead and those alive in each group; and those children whose deaths were diarrhoea associated.

TABLE 7

NUMBER OF DEATHS, IN THE CONTROL AND STUDY GROUPS, IN CHILDREN UNDER 5 YEARS IN THE LAST 12 MONTHS

	Study	Control	Total
Number of Children below 5 years dead in the last 12 months.	13	22	35
Number of children who survived the last 12 months.	266	317	583
TOTAL	279	339	618

$P = 0.05$; d.f. = 1; $x^2 = 3.84$ Computed $x^2 = 0.96$

The chi square test applied to the data in table 7 above shows/significant difference between the study group and / no control group..

The chi square test applied to the data in table 8 shows no significant difference between the diarrhoea associated deaths in the study and control groups; the two were similar.

TABLE 8:

DIARRHOEA-ASSOCIATED DEATHS IN UNDER 5 YEARS AMONG STUDY
AND CONTROL GROUPS, IN THE LAST 12 MONTHS.

	Study	Control	Total
Number of diarrhoea associated deaths in the last 12 months	4	7	11
Number alive in the last 12 months.	266	317	583
	270	324	594

$P = 0.05$; d.f. = 1, $X^2 = 3.84$ Computed $X^2 = 0.37$.

Number of Cases with diarrhoea in the previous 2 weeks:
Refer Table 9.

The table 9 below shows among the study, 76 cases of diarrhoea
reported and 149 cases among the control. This gave annual
incidences of diarrhoea of 7.4 and 12.2 in the study and
control groups respectively (see calculation method on page 87).
These give incidences far above the expected of 2-5 episodes
per year. Though accurate reporting within the past 2 weeks
is expected as compared to the past 12 months, it is highly
probable that there was over-reporting and under-reporting in
the 2 weeks and 12 months recall respectively.

The high reported incidences of diarrhoea for 2 weeks
recall are likely to be due/the impression that free medical / to
treatment would be provided.

As for the incidences given on page 50, they show poor ability of the mothers to recall diarrhoea in their children over the 12 months period prior to the study. These small incidences could also be due to the attitude of many mothers to whom diarrhoea seemed unimportant due to their mildness or spontaneity in recovery.

There is a statistically significant difference between the two groups, the incidence being higher in the control than the study group.

TABLE 9:

THE NUMBER OF DIARRHOEA CASES IN CHILDREN UNDER 5 YEARS IN THE PREVIOUS 2 WEEKS

	Study	Control	Total
Number of cases of diarrhoea in the last 2 weeks	76	149	225
Number with no diarrhoea reported in the last 2 weeks.	190	168	358
	266	317	583

$P = 0.05$; d.f. = 1; $x^2 = 3.84$ Computed $x^2 = 20.79$.

Nutritional Status. (see table 10)

The weight for age index was used in this study, though this
does not indicate any distinction between acute and chronic
under nutrition.

The children weighed were all those in the study and control
groups, who were less than 2 years old. A few of these
children were not at home on several visits. The total
weighed in the study group therefore, was 87 and in the control
group, 119.

Of the 87 children weighed in the study group, only one was
far below 60% of the expected normal weight for age. This
particular child died later in hospital due to severe anaemia
complicated by diarrhoea and fever. Most children (64.4%)
were in the normal expected weight for age i.e. greater than
80%. The remaining 31% are between 60% and 80% of the
expected normal weight for age.

The picture was not very different in the control group in which
3 children are below 60% of the expected weight for age, 66.4%
above 80%, and 31.1% between 60% and 80% of the expected weight
for age.

In both groups, most of the children below 80% of the expected
weight for age were 10 months to 2 years old. This conformed
to the expected among such children, in whom if inadequate
appropriate supplimentary weaning foods are given, breast
milk alone will not sustain the child in good nutritional status.

Table 10 shows the nutritional status between the two groups;

TABLE 10:

THE NUTRITIONAL STATUS OF CHILDREN UNDER 2 YEARS IN THE STUDY
AND CONTROL GROUPS

% of Expected weight for age	Study	Control	Total
60 - 80%	27	40	67
Above 80%	60	79	139
TOTAL	87	119	206

$P = 0.05$; d.f. = 1; $x^2 = 3.84$; Computed $x^2 = 0.15$.

The difference in nutritional status between the study and
control groups is statistically tested in table 10. The x^2
test shows no significant difference in the nutritional
status between the two groups.

Note that, those less than 60% of expected normal weight
for age were not included due to their small number on which
the x^2 test would not be applicable. The Harvard standard
of normal weight to age is used above.

TO DETERMINE THE KNOWLEDGE, ATTITUDES AND PRACTICES (K.A.P.)
OF STUDY GROUP WOMEN AND A CONTROL GROUP OF WOMEN, ABOUT ACUTE
DIARRHOEA AND ASSESS THE FEASIBILITY OF HEALTH EDUCATION TO
MOTHERS.

For this study, a total of 199 study and 194 control women
were interviewed. Every member in these groups was required to

answer questionnaires 1 and 11 in appendix A and B.

Responses were as summarized below:

A. WHAT CAUSES DIARRHOEA?

This was an open ended question. Each respondent gave

several various responses. These responses were easily

grouped into the following.

The following table II shows the frequency of each

response in both groups.

TABLE II:

THE FREQUENCY OF EACH RESPONSE IN BOTH STUDY AND CONTROL GROUPS:

	RESPONSES:	NUMBER OF RESPONDENTS		
		STUDY	CONTROL	TOTAL
(a)	FEEDING CHILD WITH HALF COOKED DIRTY FOOD	63	74	137
(b)	EATING SOIL	62	59	121
(c)	DRINKING DIRTY UNBOILED WATER	41	63	104
(d)	I DONT KNOW	38	40	78
(e)	EATING WITHOUT WASHING HANDS	29	41	70
(f)	FLIES LEFT TO LAND ON UNCOVERED FOOD	28	34	62
(g)	FILTHY HOUSE SURROUNDINGS	23	29	52
(h)	MEASLES	19	14	33
(i)	SCATTERING HUMAN FAECES AROUND HOUSE	12	18	30
(j)	EATING NEW FOOD ONE HASNT EATEN BEFORE	13	10	23
(k)	BOTTLE FEEDING	7	12	19
(L)	MALARIA	13	4	17
(m)	TEETHING IN CHILDREN	8	5	13
(n)	WORMS	6	6	12
(o)	GERMS	4	8	12
(p)	AMOEBA	2	1	3*
(Q)	KWASHIORKOR	1	1	2*
(R)	GREETING A MOTHER WITH A DEAD CHILD	1	0	1*
	TOTAL	370	419	789

$P = 0.05$; d.f. = 14; $X^2 = 23.685$; Computed $X^2 = 16.223$

*Responses P, Q, R, were excluded in the test of
significance using the x^2 due to their low frequency for
which the x^2 test is inapplicable.

From the pattern of responses, there seemed to be
marked awareness in the possible causes of diarrhoea. This
awareness does not differ much between the study and control
groups. Apart from those who did not seem to have any
knowledge of possible causes, most answers agreed with the
generally known determinants of diarrhoea.

To be noted are such responses as P, Q, R and M which
had rare responses. These responses, apart from R, emanated from
respondents who desired to be impressive to the interviewer.
However, it is generally known that such diseases or conditions
may be associated with diarrhoea.

Response R seemed to be a peculiar belief which all other
women did not share. As for response M, it is agreed among
many high parity women (through experience) that teething in
children is commonly associated with diarrhoea though not much
shared by medical personnel.

Bottle feeding (K) seemingly had a relatively small frequency
of responses. One thing noticed during the study though not
included in the protocol was that there was almost no bottle
feeding among the mothers. It was either breast feeding or cup
and spoon feeding of babies with weaning foods.

This could have been due to earlier deliberate campaigns
against bottle feeding or just adoption of practices from
earlier generations among the community.

The x^2 test applied to the frequencies in table II, shows
no significant difference between the control and study and
control groups.

B. DIARRHOEA IS A SERIOUS DISEASE: (Refer table 12)

This particular question was close ended. Responses were either YES; NO or OTHER. None, however, gave a response other than YES or NO. Only 3 out of the 199 study women have the response, NO. The three felt that diarrhoea helped to flush out impurities from the gut which otherwise harm the child. This belief is not a very strange one however since in another study project conducted by Shahid,[11] mothers interviewed on beliefs and practices on measles related diarrhoea, felt that diarrhoea was good because it helped to flush out impurities from the body. The same view was however, shared by only one member from the control group. However, there did not seem to be any difference between the study and control groups in their overal responses. All seemed to accept that diarrhoea should be taken seriously in children, a view held as strongly by the P.I. himself.

The table 12 below shows the frequencies of each response in the two groups.

TABLE 12:

THE FREQUENCY OF EACH RESPONSE IN THE STUDY AND CONTROL GROUPS

Response	Number of Respondents		Total
	Study	Control	
Yes	196	193	389
No	3	1	4
TOTAL	199	194	393

c. DIARRHOEA AFFECTS ALL CHILDREN AT ONE STAGE IN LIFE:

This question is, likewise, close-ended. Responses were
recorded as YES, NO, or OTHER. None gave a response
as OTHER. The results are shown in the Table 13, below.

TABLE 13:

THE FREQUENCY OF RESPONSES TO QUESTION C ABOVE, IN BOTH
STUDY AND CONTROL GROUPS

Response	Number of Respondents		Total
	Study	Control	
Yes	106	87	194
No	93	107	200
TOTAL	199	194	393

$P = 0.05$; d.f. $= 1$; $X^2 = 3.84$ Computed $X^2 = 2.81$.

The responses did not show any significant difference
between the two groups. However, 53.3% of the study women
interviewed and 44.8% of the control felt that diarrhoea
was inescapable in children, no matter what one did. This
is because, they felt, the conditions that predispose
one to diarrhoea are constantly prevalent in the community.
To them therefore, diarrhoea is there to stay.

D. WHAT WOULD YOU DO WITH YOUR CHILD AT HOME IF HE HAD

DIARRHOEA

This was an open-ended question and as with question A,

above, responses fell under the following; table 14.

TABLE 14:

FREQUENCY OF RESPONSES TO QUESTION D (ABOVE) FROM BOTH

STUDY AND CONTROL GROUPS

RESPONSES		STUDY	CONTROL	TOTAL
		NUMBER OF RESPONDENTS		
(i)	BOIL WATER, ADD SUGAR AND SALT AND GIVE CHILD	63	61	124
(ii)	BOIL WATER, MIX WITH SALT AND GIVE CHILD	38	51	89
(iii)	RUSH CHILD TO HOSPITAL	21	26	47
(iv)	BUY SHOP MEDICINE (CAPSULES E.T.C OR FROM DRUG PEDDLERS	23	19	42
(v)	GIVE WATER TO CHILD	18	24	42
(vi)	GIVE CHILD, TRADITIONAL HERBS	25	12	37
(vii)	GIVE CHILD DILUTE "UJI"	24	7	31
(viii)	I DONT KNOW	6	6	12
(ix)	BOIL WATER, ADD SUGAR AND GIVE CHILD	2	3	5*
(x)	GIVE CHILD, COCONUT WATER	3	1	4*
(xi)	PRAY FOR CHILD	1	1	2*
(xii)	WOULD NOT TAKE CHILD TO HOSPITAL, BECAUSE HOSPITAL STAFF ARE RUDE	1	0	1*
	TOTAL	225	211	436

$P = 0.05$; d.f. $= 7$; $x^2 = 14.067$; Computed $x^2 = 17.445$

* These responses were exempted from the x^2 test because of
their small frequencies. Of the responses for this question,
D, responses IV, VI, VIII, to XII, will be commented on. The
rest of the responses is what was expected by the P.I. as near
or correct. Responses IV, VI, XI and XII are particularly
interesting. For IV, some respondents had no idea of what

medicine they would ask for, from the shop keeper or drug-
peddlers. They relied on the shopkeepers or drug-peddlers
to give them the right medicine for diarrhoea. Some
respondents felt they would simply ask for capsules.

Response VI, had examples of traditional herbs for
treating diarrhoea given as "Rague Pien", "Ober", "Ochol",
among others. These would be boiled and either given orally
alone or some of the water, used to boil the herbs with,
poured over the childs body.

Response XII, simply shows a bad experience the mother had
with hospital staff which left her with the impression that
hospitals are places for embarrassment. Response Xi came from
two members who belonged to a religious denomination that looked
strange to the P.I. Among other things, the members of this
denomination do not shake hands with strangers or non-believers.
More could have been observed on this community by the P.1. but
for lack of time.

A reponse like X sounded a little strange. However, it was learnt
that, the respondent got this from health education sessions given
to them by health workers. Otherwise it is well known that
coconuts are a rare thing in Nyanza Province, let alone Kisumu
district. From the table, 14, the trend of responses in the study
and control groups shows marked differences. The statistical
test, X^2, was applied to the data in the table to test for any
significant difference between the study and control responses.
There is a significant difference (P = 0.05) between the study
and control groups. Better reponses were generally given by the
control group. This could have been contributed to, by the better

average educational status in the control than the study
group.

E. HOW LONG WOULD YOU STAY AT HOME WITH A CHILD WITH DIARRHOEA
BEFORE TAKING HIM TO HOSPITAL.   (Refer table 15)

This question once again was open ended.   The answers were
all given in hours (where the response was given in days
it was converted into hours. (Refer table 15).
The hours the respondents felt they would allow to elapse,
before taking a child to hospital, varied between half an
hour to about 30 hours. It was however, generally, felt
by the P.I. that all those who felt they would rush the
child to hospital in less than 5 hours from the time the
diarrhoea started, exaggerated their expected reaction to
the situation in an effort to impress the interviewer to
avoid ridicule. It is known, from experience that most
women especially of the type seen in this study, could stay
even for several days before seeking medical help. This
is even commoner among those whose homes are long distances
from health units.

For those who gave responses of 6 hours and above, of the time
they would wait before taking a child to hospital, seemed
convincing. Such mothers explained they would wait so long
while attempting other forms of help to the sick child at home.
The following Table 15, shows the frequency of responses for
the length of time mothers would stay with their children at home
before taking them to hospital.

TABLE 15

THE REQUENCIES OF RESPONCE AMONG MOTHERS IN STUDY AND CONTROL
GROUPS ON THE LENGTH OF TIME THEY WOULD TAKE BEFORE TAKING
CHILDREN WITH ACUTE DIARRHOEA TO HOSPITAL.

		NUMBER OF RESPONDENTS		
NUMBER OF HOURS TAKEN BEFORE TAKING CHILD WITH DIARRHOEA TO HOSPITAL		STUDY	CONTROL	TOTAL
(a)	LESS THAN 6 HOURS	90	105	195
(b)	6 TO LESS THAN 12 HOURS	35	45	80
(c)	12 TO LESS THAN 18 HOURS	24	30	54
(d)	18 TO 30 HOURS	50	14	64
	TOTAL	199	194	393

$P = 0.05$; d.f. = 3; $x^2 = 7.815$; Computed $x^2 = 23.235$.

The mean $(\bar{X})$ time in hours, for responses given by the study
was 11.47 hours while $\bar{X}$ for the control was 7.93. The statistical
test x^2 applied to the data in table 15, showed a significant
difference between the study and control groups. Generally, the
control seemed they would take a shorter time with a child with
diarrhoea before taking him to hospital.

F. WHAT IN THE CHILD WOULD MAKE YOU TAKE HIM TO HOSPITAL?

This question was like others above, open-ended. The various
responses and their frequencies are shown in table 16. (see next page)

TABLE 16:

THE FREQUENCY OF THE VARIOUS RESPONSES FOR QUESTION·F (ABOVE)

IN THE STUDY AND CONTROL GROUPS

		NUMBER OF RESPONDENTS		
RESPONSE		STUDY	CONTROL	TOTAL
(i)	IF CHILD LOOKS WEAK	143	140	283
(ii)	IF DIARRHOEA WORSENS DESPITE TREATMENT	83	88	171
(iii)	IF CHILD'S EYES LOOK SUNKEN	34	31	65
(iv)	IF CHILD REFUSES TO FEED	30	35	65
(v)	IF CHILD HAS HIGH FEVER	25	12	37
(vi)	IF CHILD'S SKIN LOOKS WRINKLED	15	15	30
(vii)	IF CHILD'S EYES LOOK SHINY AND WHITER THAN NORMAL	14	12	26
(viii)	IF CHILD WAS SWEATING EXCESSIVELY	1	12	13
(ix)	IF CHILD HAD A DEPRESSED ANTERIOR FONTANELLE	5	2	7 *
(x)	IF CHILD'S BREATHING SEEMED FASTER THAN NORMAL	4	3	7 *
(xi)	IF CHILD'S TONGUE LOOKED DRY	2	5	7 *
	TOTAL	356	355	711

$P = 0.05$; d.f. = 7; x^2 =14.067; Computed x^2 = 14.730.

* Responses IX, X, XI, were excluded in the x^2 test because of
their small frequencies to which the Chi square test is not
applicable.

The Chi Square test applied to the data in table 16, showed
a statistically significant difference between study and
control groups. Responses as expected, are slightly better

in the control than in the study group.

In both groups however, none of the responses deviated
grossly, from the expected correct answers. The
awareness of features of dehy-dration in both groups
was reasonably good.

G. HAVE YOU HEARD OF, SEEN OR USED O.R.T.?

The three questions are close-ended. Responses were
either YES OR NO. The frequency of the responses is
as tabulated in table 17 below.

TABLE 17:

THE FREQUENCY OF RESPONSES TO EACH OF THE QUESTIONS IN G,

IN THE STUDY AND CONTROL GROUPS

| | HEARD OF O.R.T. | | | SEEN O.R.T. | | | USED O.R.T. | | |
| | Number of Respondents | | | Number of Respondents | | | Number of Respondents | | |
Response	Study	Control	Total	Study	Control	Total	Study	Control	Total
YES	157	150	307	140	142	282	115	92	207
NO	42	44	86	59	52	111	84	102	186
TOTAL	199	194	393	199	194	393	199	194	393

$P = 0.05$; d.f. $= 1$; $X^2 = 3.84$ $P = 0.05$; d.f. 1; $X^2 =$ $P = 0.05$; d.f. $= 1$; $X^2 =$
Computed $X^2 = 0.13$.   3.84 Computed $X^2 = 0.39$ 3.84; Computed $X^2 = 4.25$

No significant differences was seen between the study and control
groups over those who had heard of or seen O.R.T. This is shown
statistically by applying X^2 test to the data in table 17.
However, among those who had used O.R.T. more in the study group
had done so, than in the control group. This is shown statistically
by the X^2 test ($P - 0.05$) which shows the existence of some

significant difference between the two groups' responses.

H. WHAT IS O.R.T. USED FOR?

This was an open-ended question. Reponses given, fell into the
following categories, in table 18 below.

TABLE 18:

THE FREQUENCY OF EACH RESPONSE TO QUESTION H, IN THE STUDY

AND CONTROL GROUPS.

RESPONSES		NUMBER OF RESPONDENTS		
		STUDY	CONTROL	TOTAL
(i)	For treating diarrhoea	109	129	238
(ii)	Dont know	42	39	81
(iii)	for treating diarrhoea and vomiting	29	17	46
(iv)	Treating measles	14	6	20
(v)	Treating bloody diarrhoea	5	3	8*
		199	194	393

$P = 0.05$; d.f. = 3; $x^2 = 7.815$ Computed x^2 8.036

* Response V has been excluded from the table above on x^2 test
application because of the small frequencies to which x^2 is
not applicable.

The only seemingly odd answers to the question above are
responses IV and V. However, look/at the responses still, /ing
measles is commonly associated with diarrhoea, while bloody
diarrhoea is considered an even worse type of diarrhoea than
watery diarrhoea. In both cases, O.R.T. might have been

offered in hospital, etc. In each of the responses
therefore, diarrhoea may have been indicated indirectly.
The statistical X^2 test applied to the data in table 18
above showed a significant difference between the control and
study groups. The control group seemed more aware of the
use of O.R.T. than the study, especially if responses like
"dont know" and "treating bloody diarrhoea" are excluded
from total respondents in each group.

I. WHAT DO YOU THINK ABOUT IT (O.R.T.)? (see table 19).
    Again this was a close ended question. The responses were
    either GOOD, USELESS, OR NOT ALWAYS GOOD. 74.9% of the
    study women felt that it was useful while one of those
    in the study group felt it was useless after once having
    used it on her child who later died.
    The frequency of responses is as show in table 19 below.
    TABLE 19:
    FREQUENCIES OF RESPONSES TO QUESTION 1, IN STUDY AND
    CONTROL GROUPS

Responses	Number of Responses		Total
	Study	Control	
GOOD	149	150	299
NOT ALWAYS GOOD	49	44	93
Useless	1	0	1*
TOTAL	199	194	393

P = 0.05; d.f. = 1; X^2 = 3.84   Computed X^2 = 0.225

The two groups equally felt that the O.R.T. was good. X^2 test applied to the data in the table 19 showed no significant difference between the responses by the study and control groups.

* This response was excluded in the X^2 test because of its small frequency, to which the X^2 test was not applicable.

J. Is there any food you would/would not give your child with acute diarrhoea?

This question is open-ended. Responses were grouped as shown in Table 20.

TABLE 20:

THE FREQUENCY OF EACH TYPE OF FOOD MOTHERS FELT THEY WOULD GIVE THEIR CHILDREN WITH DIARRHOEA IN STUDY AND CONTROL GROUPS:

RESPONSES	NUMBER OF RESPONDENTS		
TYPE OF FOOD	STUDY	CONTROL	TOTAL
(i) "UJI" made from millets, maize or Cassava flour	122	135	257
(ii) Cow or breast milk	59	72	131
(iii) Fresh cooked fish	58	49	109
(iv) Eggs (cooked)	45	36	81
(v) Cooked and mashed Irish potatoes	35	51	86
(vi) Cooked beans	29	31	60
(vii) Mashed cooked bananas	27	40	67
(viii) Rice	27	17	44
(ix) Any food that child would like to eat	25	31	56
(x) Vegetables	26	23	49
(xi) Soup of cooked meat or peas	19	17	36
(xii) Oranges and other fruits	17	32	49
(xiii) Bread made from wheat flour	11	13	24
(xiv) Cooked and mashed sweet potatoes	9	13	22
(xv) Tea	4	8	12
(xvi) Mashed groundnuts	2	1	3*
TOTAL	515	569	1084

$P = 0.05$; d.f. $= 14$; $X^2 = 23.685$; Computed $X^2 = 16.566$.

* Response XVi was excluded from application of X^2 test due to

its low frequency. X^2 test wouldn't be applicable to this.

The X^2 test applied to the data in table 20, shows no significant

difference between the responses by the control and those by the

study groups.

From the variety of foods mentioned above, there seemed to have

been some confusion on the mothers as to the type of foods

ideal for children with acute diarrhoea, and the type of foods

ideal in children with chronic protein-calorie malnutrition;

they may have been advised on the later at health units.

However, in most of the responses apart from x and xvi the

foods made dilute enough could be given concurrently with

O.R.T. or other fluids.

The responses on those foods mothers felt they would not

give to their children who had acute diarrhoea are summarized

in Table 21 below.

TABLE 21:

THE FREQUENCY OF THE VARIOUS TYPES OF FOODS MOTHERS IN STUDY
AND CONTROL GROUPS FELT THEY WOULDN'T GIVE TO THEIR CHILDREN
WITH ACUTE DIARRHOEA.

RESPONSE TYPE OF FOOD	NUMBER OF RESPONDENTS		
	STUDY	CONTROL	TOTAL
(i) "UJI" Made from maize flour	61	58	119
(ii) Vegetables	48	60	108
(iii) Cows Milk	43	47	90
(iv) Sweet Potatoes	30	53	83
(v) Beans	38	31	69
(vi) Meat	35	23	58
(vii) Dry fish	14	24	38
(viii) Tea	15	20	35
(ix) Irish Potatoes	13	10	23
(x) Peas	9	12	21
(xi) Oranges and Sodas	9	8	17
(xii) Fatty Foods	3	10	13
(xiii) Bananas (Sweet)	2	7	9 *
(xiv) Food stayed overnight	1	6	7 *
(xv) Any solid food	1	6	7 *
(xvi) Any food child refuses to eat	3	0	3 *
TOTAL	325	375	700

p=0.05; d.f. = 1; X^2 = 19.675; Computed X^2 =19.751.

Responses in the Table 21 above, shows some definite

pattern. Most mothers seemed to be unwilling to give their

children relatively solid foods during acute diarrhoea

attacks. They preferred to give more fluids foods, apart

from cow's milk which is discouraged so as to encourage

the use of breast milk, in infants.

Fewer women felt they would exclude such foods like

oranges, bananas, peas, fish, and Irish potatoes as compared

to those who would include them.

The X^2 test applied to the data in Table 21 showed

statistically significant difference between the study and

control groups, though both groups erred grossly.

* Responses Xiii, Xiv, Xv, and Xvi were not included

in the application of the X^2 because of their relatively low

frequencies to which X^2 is not applicable.

The question "J" was actually verbally phrased as follows:

Is there any food which you feel if you gave your child with

diarrhoea would either;

a) Be helpful or

b) Worsen the diarrhoea.

This was to make it understandable the way the P.I.

desired it to be.

K.A.P. BEFORE AND AFTER PROVISION OF HEALTH EDUCATION COMPARED:

This part of study was designed to determine changes in

K.A.P. in the study group after Health Education was given

to them (study group only). The change was determined by

asking the same K.A.P. questionnaire, as during the K.A.P.

assessment before he health education, then comparing the responses to

questions in the questionnaire before H.E. (K.A.P.I) and
after H.E. (K.A.P. II).

The change is analysed under individual questions in
the questionnaire. The responses under this study (K.A.P.II)
were collected 6 weeks after Health Education was provided.

A. What causes diarrhoea?

The following table 22, summarizes the responses and
frequency of each response to question A above.

TABLE 22:

THE FREQUENCY OF EACH RESPONSE OF K.A.P. I. AND K.A.P. II
RESPONSE

	RESPONSE	NUMBER OF RESPONDENTS		
		K.A.P.I.	K.A.P. II	TOTAL
(i)	Giving child cold, half cooked dirty food.	63	68	131
(ii)	Eating Soil	62	107	169
(iii)	Drinking dirty unboiled Water	41	70	111
(iv)	I dont know	38	1	39
(v)	Eating without washing hands	29	64	93
(vi)	Flies landing on food not covered.	28	24	52
(vii	Filth around house premises	23	11	34
(viii)	Measles	19	22	41
(ix)	Malaria	13	13	26
(x)	Scattering human faeces around house	12	32	44
(xi)	Teething	8	5	13
(xii)	Bottle feeding	7	19	26
(xiii)	Worms	6	6*	12
(xiv)	Germs	4	1	5
	TOTAL	353	443	796

$P = 0.05$; d.f. $= 12$; $x^2 = 21.026$; Computed $x^2 = 76.929$.

After the H.E., responses that appeared to have been frequent in K.A.P.I. became less so in K.A.P.II. Some of the responses in K.A.P.I. were never again in K.A.P.II especially those that appeared incorrect.

The X^2 test was applied to the data in the Table 22 above which showed marked significant difference between K.A.P.I. and K.A.P.II. The respondents definately acquired through the H.E. some better impression in as far as predisposing factors to acute diarrhoea is concerned, hence the exclusion of some of the responses given in K.A.P.I. from K.A.P.II.

There was however, one respondent who couldn't still remember any single possible cause of diarrhoea. She particularly was a shy mother who preferred to answer her questions in monosyllables.

* Response xiv in table 22 has been combined with i, with which it looks similar. This is because of the low frequency of the respondents to which the X^2 test would not be applicable separately.

B. Diarrhoea is a serious disease

Responses to this question are as shown summarized in

Table 23 below:

TABLE 23:

THE FREQUENCY OF EACH RESPONSE ON K.A.P.I. AND II

RESPONSE	NUMBER OF RESPONDENTS		
	K.A.P.I.	K.A.P.II	TOTAL
YES	196	199	395
NO	3	0	3
TOTAL	199	199	398

Responses as in K.A.P.I. were either YES or NO.

Women in K.A.P.I. who had felt that diarrhoea is not a
bad disease since it cleaned the gut of any harmful substances[10]
changed their opinions in K.A.P.II. All members of the study
group during K.A.P.II therefore felt diarrhoea is a dangerous
disease.

C. Diarrhoea affects all children at one stage in life

The differences between K.A.P.I. and K.A.P.II is summarized in

Table 24 below:

TABLE 24:

RESPONSE	NUMBER OF RESPONDENTS		
	K.A.P.I.	K.A.P.II	TOTAL
YES	106	41	147
NO	93	158	251
TOTAL	199	199	398

$P = 0.05$; d.f. $= 1$; $X^2 = 3.84$

Computed $X^2 = 45.57$.

Again for this question, responses were either YES or NO. Most mothers after the health education felt diarrhoea could be prevented and did not necessarily affect every child at one stage in life. For those that were affected, it could be due to failure to employ some of the preventive measures mentioned during health education.

The X^2 test was applied to test the significance of the differences between responses in K.A.P.I and K.A.P.II. The difference is shown to be markedly significant. The responses in K.A.P.II had greatly improved.

D. What would you do to your child with diarrhoea at home?

Responses to this question are again summarized, with frequencies to each question, in the table 25 below:

TABLE 25:

THE FREQUENCY FOR EACH RESPONSE IN K.A.P.I. AND K.A.P.II

	RESPONSES	NUMBER OF RESPONDENTS		
		K.A.P.I.	K.A.P.II	TOTAL
(i)	Boil water add sugar and salt and give child	63	164	227
(ii)	Boil Water, mix with salt and give child	38	13	51
(iii)	Give child traditional herbs	25	24	49
(iv)	Buy shop medicine or from drug peddlers who sell capsules	23	5	28
(v)	Give child, water to drink	18	1	19
(vi)	Boil water, mix with sugar and give child	2	1	3
	TOTAL	169	208	377

$p = 0.05$; d.f. $= 4$; $X^2 = 9.488$; Computed $X^2 = 80.480$.

The difference between K.A.P.I. and K.A.P.II. is marked as shown in the Table 25 above.

Again some responses in K.A.P.I. have been dropped by the respondents in K.A.P.II.

The responses dropped include:

- Would rush child to hospital

- I don't know

To be noted is the fact that there was no change of opinion in those women who felt traditional herbs had a significant part to play in the treatment of diarrhoea in children, though they stated they would give the traditional medicine alongside O.R.T. solution.

The difference between K.A.P.I. and K.A.P.II is shown to be statistically significant by applying the X^2 test to the data in Table 25.

Most women who felt they would give plain water to a child with diarrhoea, and those who felt they would mix the water with sugar only, before giving the child with diarrhoea, showed marked changes in such opinions as shown in K.A.P.II.

E. How long would you stay at home with a child
    with diarrhoea before taking him to hospital

Responses are as shown in Table 26 (see next page).

TABLE 26:

THE FREQUENCES OF RESPONSES IN K.A.P.I. AND K.A.P. II

NUMBER OF HOURS TAKEN BEFORE TAKING CHILD TO HOSPITAL	NUMBER OF RESPONDENTS		
	K.A.P.I.	K.A.P.II	TOTAL
(a) Less than 6 hours	90	15	105
(b) 6 to less than 12 hours	35	81	116
(c) 12 to less than 18 hours	24	76	100
(d) 18 to 30 hours	50	27	77
TOTAL	199	199	398

$P = 0.05$; d.f. = 4; x^2 = 9.488 Computed x^2 = 105.723.

Women showed a dramatic change in K.A.P.II in the length of time they would prefer to stay with their children with diarrhoea before taking them to hospital.

This is mainly due to health education and the O.R.T. satchets given. There seemed, among them, no hurry in rushing a child to hospital as had been   the case in the responses in K.A.P.1.

The average length of time in K.A.P.II was 12.9 hours. The women felt with the form of treatment available that could be administered at home, the child would be observed for a longer time.

The statistical x^2 test applied to the data in Table 26 above shows a   marked significant difference between K.A.P.I. and K.A.P.II.

F.   What in the child would make you take him to hospital?

Responses to this question are shown in the Table 27
below:

TABLE 27:

THE FREQUENCY OF EACH RESPONSE IN K.A.P.I. AND K.A.P.II

	RESPONSE	NUMBER OF RESPONSE		
		K.A.P.I	K.A.P.II	TOTAL
(i)	If childs body becomes weak	143	159	302
(ii)	If diarrhoea worsens despite treatment	83	24	107
(iii)	If child has sunken eyes	34	85	119
(iv)	If child refuses to feed	30	32	62
(v)	If child has high fever	25	26	51
(vi)	If child's skin is wrinkled	15	49	64
(vii)	If child's eyes become whiter than normal	14	14	28
(viii)	If child has a sunken anterior fontanelle	5	1	6*
(ix)	If child breathes faster than normal	4	1	5*
(x)	If child's tongue looks dry	2	30	32
(xi)	If child looks thirsty	0	3	3*
(xii)	If child passes little urine	0	3	3*
	TOTAL	355	427	782

$P = 0.05$; d.f.$=7$; $x^2 = 14.067$.

Computed $x^2 = 86.852$.

Like in other questions above, some responses given in K.A.P.I.
seem to have been dropped in K.A.P.II while new ones adopted.

Examples of responses dropped in K.A.P.II include
"If child starts sweating", and "If child's body becomes
yellow".

New responses adopted in K.A.P.II which weren't given
in K.A.P.I. include responses xi and xii in Table 27.

The frequencies of certain responses also dropped
markedly in K.A.P.II. Such include response iii in Table 27.
Though depression of the anterior fontanelle is an important
feature in moderate or severe dehydration, the P.I. did
not stress it during the H.E., because it would be a difficult
sign for the mothers to elicit or remember to look for as it is
not obvious.

Response vii showed a drop in frequency also. Mothers
could have felt that in as far as some O.R.T. was given to
the child with acute diarrhoea, the chances of the diarrhoea
worsening were slim.

Response ii unexpectedly showed a drop from 84 in K.A.P.I.
to 24 in K.A.P.II; this is unlike what might have been expected.
However, this is thought to be due to the fact that the mothers
developed a sense of security with O.R.T. where they felt the
diarrhoea was unlikely to continue or worsen as O.R.T. was being
administered. Hence the drop in responses. Nevertheless,
this goes to show that in future H.E. sessions with these
or other women should emphasize on the possibility of the
diarrhoea worsening despite treatment hence this being an
important criterion for taking a child with diarrhoea on treat-
ment with O.R.T.,to hospital.

Generally, responses in K.A.P.II were more correct than
K.A.P.I.

X^2 test applied to the data in table 27 shows a marked significant difference between K.A.P.I. and K.A.P.II.

* Responses viii, ix, xi, xii, in Table 27 were excluded from the X^2 test for significance, again due to their small frequencies.

G.   Have you heard of, seen or used O.R.T.?

Responses to this question were YES or NO. Table 28 is a summary of the frequencies to each response.

All the responses compared between K.A.P.I. and K.A.P.II showed a marked significant difference. All the women in the study group, at the end of the study had at least heard of and seen the O.R.T. satchets.

The number of women who had at least used O.R.T. rose from 115 to 138, a difference of 11.5%. This is partly because not all children had diarrhoea during the study period and even if they did, not all hoseholds would have used O.R.T; Since some households had no child less than 5 years.

TABLE 28:

NUMBER OF RESPONDENTS TO EACH RESPONSE TO QUESTION G, IN K.A.P.I. AND K.A.P.II.

	HEARD OF			SEEN			USED		
	RESPONDENTS			RESPONDENTS		:	RESPONDENTS		
RESPONSES	KAP I	KAP II	TOTAL	KAP I	KAP II	TOTAL	KAP I	KAP II	TOTAL
YES	157	199	356	140	199	339	115	138	253
NO	42	0	42	59	0	59	84	61	145
TOTAL	199	199	398	199	199	398	199	199	398

$P = 0.05$; d.f. $= 1$; $x^2 = 3.84$ $P = 0.05$; d.f. $= 1$ $P=0.05$; d.f. 1;

Computed $x^2 = 47.0$ $x^2 = 3.84$ $x^2 = 3.84$

Computed $x^2 =$ Computed $x^2 = 5.74$

69.27

J.   Is there any food you would/could not give your child

with diarrhoea at home?

The responses to this question are shown in Table 29. As

with most other responses in earlier questions, the respondents

dropped out some foods in K.A.P.II which they felt they would

have given in K.A.P.I. The foods included vegetables, which never

appeared in K.A.P.II as shown in the table below.

Some foods which should have had higher frequencies of

response had the converse. This mainly due to the fact that, although

all foods may have been mentioned during the H.E., emphasis was

given to those foods that are cheap and easily available but still

ideal. For example, cow's milk and breast milk would be cheaper

and easier to get than an egg which sells at Shs. 1.50 each, in

most shops in Kisumu town.

TABLE 29:

THE FREQUENCY OF THE RESPONSES TO QUESTION H IN K.A.P.I

AND K.A.P.II.

	RESPONSES	NUMBER OF RESPONDENTS		
		K.A.P.I	K.A.P.II	TOTAL
(i)	"UJI" made from millet or maize Flour	106	126	235
(ii)	Fish (fresh or dry)	58	44	102
(iii)	Cow's milk	50	72	122
(iv)	Tea	45	18	63
(v)	Mashed cooked Irish potatoes	35	37	72
(vi)	Any food child would like to ea	29	24	53
(vii)	Mashed cooked bananas	27	14	41
(viii)	Eggs	25	19	44
(ix)	Soup of meat or peas	19	29	48
(x)	Oranges or other fruits	17	39	56
(xi)	Breast milk	9	29	38
(xii)	Sweet potatoes	9	7	16
(xiii)	Beans	4	17	21
	TOTAL	433	475	908

$P = 0.05$; d.f. = 12; $x^2 = 21.026$; Computed $x^2 = 46.083$.

The x^2 test applied to the data in the Table 29 above shows statistically significant difference between K.A.P.I. and K.A.P.II; generally the changes are an improvement.

Table 30 below shows the frequencies of the responses as foods mothers would not give to their children with acute diarrhoea.

As with responses in the Table above, women changed their opinions over foods they earlier (K.A.P.I.) thought were not good for their children with diarrhoea. Again some responses in K.A.P.I. never featured in K.A.P.II.

Foods like vegetables and beans have been insisted on as not ideal for children with acute diarrhoea.

TABLE 30:

THE FREQUENCY OF RESPONSES ON FOODS THAT MOTHERS WOULD NOT GIVE THEIR CHILDREN WITH DIARRHOEA IN K.A.P.I. AND K.A.P.II

		NUMBER OF RESPONDENTS		
RESPONSES		K.A.P.I.	K.A.P.II	TOTAL
(i)	Maize	61	38	99
(ii)	Vegetables	48	54	102
(iii)	Cow's Milk	43	26	69
(iv)	Beans	38	23	61
(v)	Meat	35	15	50
(vi)	Sweet Potatoes	30	10	40
(vii)	Dry fish	14	7	21
	TOTAL	269	173	442

$P = 0.05$; d.f. $= 6$; $x^2 = 12.592$; Computed $x^2 = 12.100$

The statistical x^2 test applied to the data in Table 30, shows that there was no significant difference between K.A.P.I. and K.A.P.II.

H.   What is O.R.T. used for?

Two types of responses were given in K.A.P.II for

this question as compared to K.A.P.I. in which 5

responses were given.

The responses are shown in Table 31 below. In K.A.P.II,

responses like "Don't know, bloody diarrhoea, measles"

did not feature. The mothers completely excluded them.

Statistically tested with the X^2 test, the difference between the

frequencies inK.A.P.I. and K.A.P.II for responses in this

question, showed a marked difference.

TABLE 31:

THE FREQUENCY OF RESPONSES TO QUESTION I, IN K.A.P.I. AND K.A.P.II

		NUMBER OF RESPONDENTS		
	RESPONSES	K.A.P.I.	K.A.P.II	TOTAL
(i)	Treating diarrhoea	109	154	263
(ii)	I don't know	42	0	42
(iii)	Treating diarrhoea and Vomiting	29	45	74
(iv)	Treating Measles	14	0	14
(v)	Treating bloody diarrhoea	5	0	5
	TOTAL	199	199	398

P = 0.05; d.f. = 3; X^2 = 7.815

Computed X^2 = 60.159.

There is a significant difference between K.A.P.I. and

K.A.P.II. The mothers' knowledge improved in the second K.A.P.

I.   <u>Do you think that O.R.T. is helpful in children with</u>

<u>Diarrhoea or it doesn't help at all?</u>

<u>What do you think about it?</u>

The attitude of all members in K.A.P.II about O.R.T.

seemed completely changed. Those who felt that O.R.T. is

useful were all those on whom K.A.P.II was conducted which

is 100%.

In K.A.P.I, 74.9% of the study women had thought that

O.R.T. was useful while less than 1% felt it was not helpful

at all. The rest thought, like/any other medicines,it has its / with

success and failures. Therefore sometimes it was helpful and

sometimes not/all. However, the women changed their opinion /at

to that of "helpful" or rather "Good" in the second K.A.P. assessment.

During the health education sessions, it had been explained

that any drug taken according to instructions may be quite

useful and if not, the same drug which may have been useful may

even be fatal.

K.   How would you try to prevent death from diarrhoea in a

child at home?

The responses to this question are given in Table 32.

(see next page)

TABLE 32:

FREQUENCIES OF RESPONSES TO QUESTION K (ABOVE) ON K.A.P.II

RESPONSES	NUMBER OF RESPONDENTS	PERCENTAGE
i) Boil water add measured salt and sugar and give child	142	71.4%
ii) Ask for O.R.T. if available and give child	6	3.0%
iii) Give alot of fluids and continue to feed child	2	1.0%

Results of responses to the question K were either accepted as correct and included in the table above, or wrong and excluded in the table above. For this reason, 24.6% of the women in the study group gave wrong answers and were excluded from the table. Examples of excluded responses are "I would mix capsules, like traditional herbs and O.R.T".

The women giving correct responses were 75.4%, the frequencies of the various responses are shown on table 32.

Each respondent was allowed to give only one response.

(iv) TO DISTRIBUTE, THROUGH WOMEN'S GROUP LEADERS, O.R.T. SATCHETS TO WOMEN IN THE STUDY GROUP FOR USE IN CHILDREN UNDER 5 YEARS WITH ACUTE DIARRHOEA AND TO MEASURE AND COMPARE MORBIDITY AND MORTALITY AMONG SUCH CHILDREN BETWEEN, THOSE IN THE STUDY GROUP TO WHOM O.R.T. HAD BEEN DISTRIBUTED AND THOSE IN A RANDOMLY SELECTED CONTROL SAMPLE TO WHOM NEITHER O.R.T. NOR H.E. WAS GIVEN.

The distribution of O.R.T. as explained earlier was done through the Chairman of every group to the respective members. This proved a reliable system for distribution as shown by the

extent to which mothers made use of this facility. Thus a
survey conducted to establish the rate of non-reporting of
diarrhoea by mothers, identified two cases only. In both,
the mothers gave the same reason of not reporting, namely,
the long distance of their homes from the Chairman's home.
However, in both cases, the degree of dehydration was mild
and the diarrhoea stopped spontaneously after 2 and 3 days
respectively. Mothers therefore usually reported diarrhoea
and were issued with O.R.T. mostly on the first day the diarrhoea
started.

Incidence of Diarrhoea:

During the study period of 6 weeks, a total of 50 children
under 5 years in the study group and 21 in the control group
were identified as cases of acute diarrhoea.

The incidence of diarrhoeal episodes per child per
year in the two groups were calculated as follows:

*I = Number of children less than 5 years at the time[9]
of study who had or have diarrhoea which started
in the last six weeks
_____
Number of children less than 5 years at the time
of Survey.

$$\frac{50}{266} \div \frac{6}{52} = 1.6 \text{ episodes per year in study group}$$

$$\frac{21}{50} \div \frac{6}{52} = 3.6 \text{ .episodes per year in the control group.}$$

The X^2 test for significance was applied to the frequencies
of diarrhoea to test for differences between the study and control
groups as shown in Table 33 below:

*I = Incidence

TABLE 33:

THE FREQUENCIES OF ACUTE DIARRHOEA BETWEEN STUDY AND CONTROL
GROUPS

Children 5 years	Study	Control	
With diarrhoea	50	21	71
Without diarrhoea	216	29	345
	266	50	316

$$P = 0.05; \text{d.f.} = 1; \quad X^2 = 3.84$$
$$\text{Computed } X^2 = 36.4$$

The X^2 test shows a significant difference of diarrhoea
cases between the study and control group ie. more in the control
than the study groups.

It should be noted that, the two groups had different
methods of surveillance. For the study groups, surveillance
was passive involving asking the Chairman of the group to
identify every 3 days the members who had reported diarrhoea,
and then following these up.

In the control group, it involved visiting all 50 of the
selected households of the group every 3 days.

The difference in the diarrhoea incidences therefore
could have arisen due to the difference in methods of
surveillance between the two groups or the control group may
really be a high risk group.

The incidence of diarrhoea during the study period would

be expected to be high since the rainy season was just
coming to an end.

Deaths:

During the study period, a total of 3 children under
5 years died in the study group.

(a)   The first child had been a known case of anaemia who
        had been admitted several times in hospital for treatment.
        The child was still under treatment at home when he
        developed diarrhoea and fever during the time of
        study and was admitted to hospital two days after he
        was seen by the P.I.   The condition worsened and the child
        died on the night of admission.

        The hospital cards with the parents did not show the
        cause of anaemia, but the P.I. strongly suspected the
        child was a case of Sickle Cell disease at $3^{1}/2$ years of
        age, or else severe anaemia due to repeated malarial
        attacks.

(b)   The second child who died was 1 year old.   This child
        was fairly normal apart from being underweight (he
        weighed 7.3 kg).   He had developed fever, cough and
        marked diarrhoea when first seen by the P.I. and was
        admitted in hospital the same day he was seen by the
        P.I.

        It was learnt later that while in hospital, the child
        developed measles and acute pneumonia.   He died four
        days later while still on treatment.

(c)   The third child who died was 9 months old. In this
      child, apart from acute diarrhoea and vomiting that
      was seen, no other problem was diagnosed. This child was
      seen the second day after diarrhoea started. O.R.T. had
      apparently been started by the mother. At the time of
      visit the child looked fairly dehydrated and drowsy.
      Rather than continue with the O.R.T., the P.I. doubted
      the precision with which the mother was administering
      the O.R.T. and advised the child be taken to hospital.
      The child died the second day after admission.

      In the control group, during the study, only one child under 5
years died. This child was also seen one day after he had started
passing diarrhoea.

      The child had been passing copious and frequent diarrhoeal
stools and looked quite dehydrated. The P.I. advised the mother
to take the child to hospital which she did, and the child was admitted.

      The father however, who was not present when the diarrhoea
started, went to the hospital and smuggled the child out to a
traditional healer alleging that the condition of the child wasn't
getting any better in the hospital.

      The child died the same night of being taken to the
traditional healer.

C. Hospital Attendance and Hospital Admissions

During the study, a total of 10 children in the study group
and 10 in the control group were taken to hospital because of
diarrhoea. Of those taken to hospital, 5 in the study group and

6 in the control group were admitted. The rest of those taken to hospital in both groups were given out patient treatment. The percentage of study cases attending hospital was 20% as compared with 48% in the controls with diarrhoea (X^2 =5.62,P<0.05). Table 34 below shows the frequencies of hospital admissions in the study and control groups.

TABLE 34:

THE FREQUENCY OF HOSPITAL ADMISSIONS OF CASES OF DIARRHOEA IN STUDY AND CONTROL

	Number of Cases		
	Study	Control	Total
Children admitted to hospital	5(10%)	6(28.6%)	11
Children not admitted to hospital	45(90%)	15(71.4%)	60
TOTAL	50	21	71

P = 0.05; d.f. = 1; X^2 = 3.84 Computed X^2 = 3.74.

The frequencies of hospital admissions between the study and control group did show a nearly statistically significant difference. There being a higher percentage of admissions in the control than the study group.

Duration of diarrhoea:

The table 35 below shows the frequencies of the duration of diarrhoea, in days, in each of the groups i.e. control and study.

TABLE 35:

THE FREQUENCY OF DURATION OF DIARRHOEA IN CHILDREN BETWEEN THE
STUDY AND CONTROL GROUP:

Duration in days	Number of Cases		
	Study	Control	Total
(i) 1 - 1.9	8	3	11
(ii) 2 - 2.9	9	3	12
(iii) 3 - 3.9	13	5	18
(iv) 4 - 4.9	9	6	15
(v) 5 - 5.9	5	1	6
(vi) 6 - 6.9	5	3	8
TOTAL	49	21	70

$P = 0.05$; d.f. $= 5$; $x^2 = 11.07$ Computed $x^2 = 0.9$.

The mean duration of diarrhoea in the control group was 3.83 with
a standard deviation of ±1.6. The mean for the study group was
3.56 with a standard deviation of ±1.5. The x^2 test applied to
the data in table 35 above, showed no significant difference in the
duration of diarrhoea between the study and control groups.

Type of Diarrhoea

All the children seen in both groups had watery diarrhoea, none
of them had dysentery.

Degree of Dehydration

As mentioned earlier, for every case of diarrhoea, there were
three visits, each on separate days, to collect the morbidity
data mentioned earlier. The data on degree of dehydration per day

is summarized in tables 36, 37 and 38 below:

1st Day: (Visit)

TABLE 36:

THE FREQUENCIES OF THE VARIOUS DECREES OF DEHYDRATION, ON THE
FIRST DAY, IN THE STUDY AND CONTROL GROUPS

	Number of Cases		
Degree of Dehydration	Study	Control	Total
Mild	18(36%)	13(61.9%)	31
Moderate	29(58%)	8(38.9%)	37
Severe	3(6%)	0	3
	50	21	71

$P = 0.05$; d.f. $= 1$; $x^2 = 3.84$ Computed $x^2 = 3.97$.

Table 36 shows the frequency of the degree of dehydration,
in all those cases on the first day they were visited. The x^2
test was applied to the data in the table above, and showed a
significant difference between the study and control groups.
The study group has a higher incidence of moderately or
severely dehydrated children than the control group on the first
day of the visit. Perhaps this is due to the difference in
surveillance method used for the two groups.
Note that cases with severe dehydration which were very few, were
combined with those with moderate dehydration (in the table 36
above) for application of x^2 test.

2nd Day (visit)

TABLE 37:

THE FREQUENCY OF THE VARIOUS DEGREES OF DEHYDRATION IN THE
STUDY AND CONTROL GROUPS ON THE SECOND DAY

|	Number of Cases		
Degree of Dehydration	Study	Control	Total
Mild	32(84.5%)	11(64.7%)	43
Moderate	5(13.5%)	5(29.4%)	10
Severe	0	1(5.9%)	1
	37	17	54

$P = 0.05$; d.f. $= 1$; $x^2 = 3.84$ Computed $x^2 = 3.29$.

Figure 2 also shows a frequency distribution of the number of
satchets prepared each day for use in the study group children
with diarrhoea during the three days of visit to acute diarrhoea
cases.
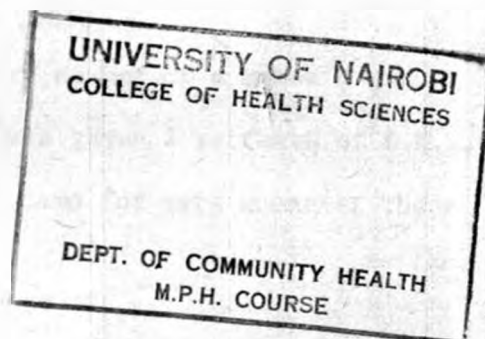
FIG. 2:

Frequency distribution of number of satchets prepared each

day for use in study group children with diarrhoea;

DAY OF VISIT
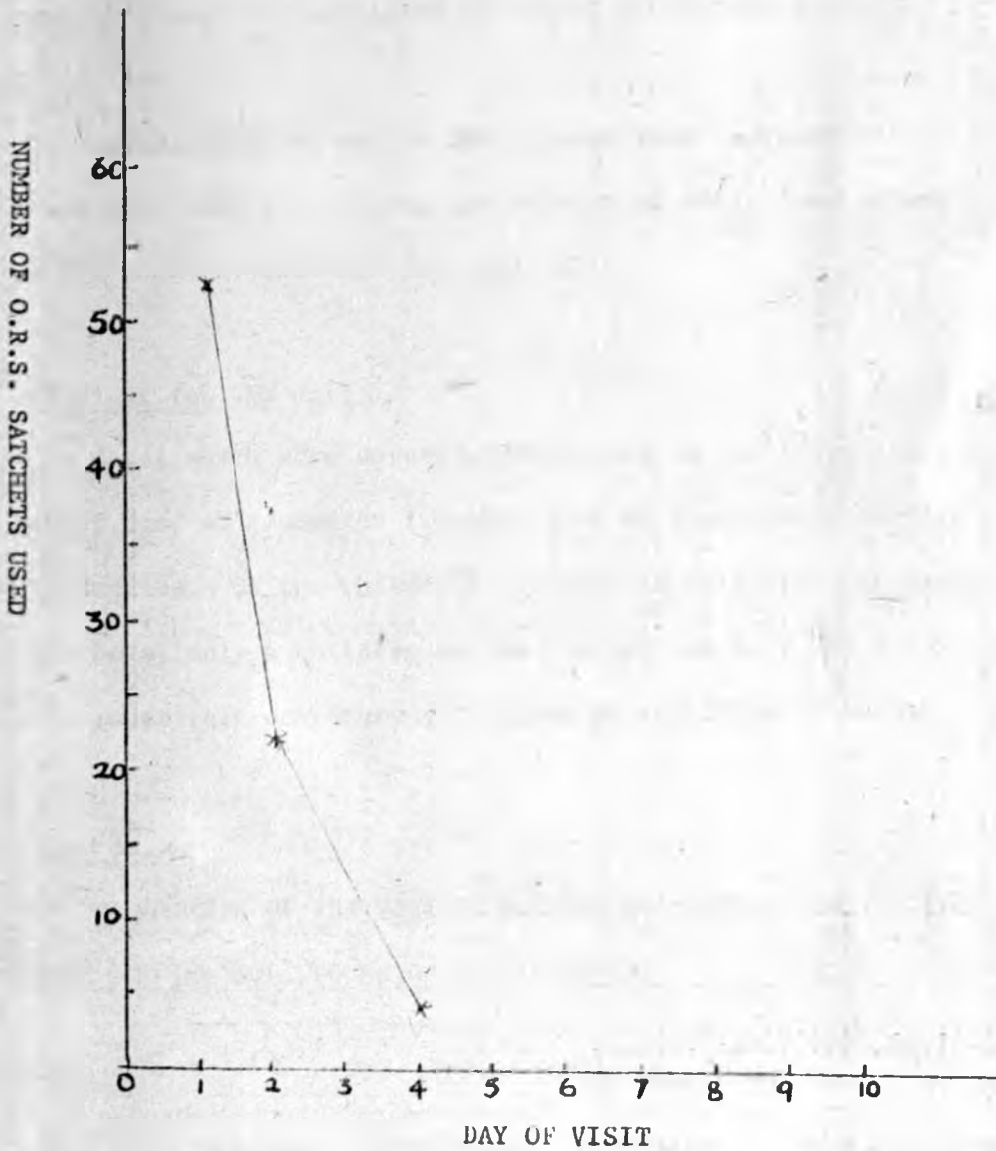
Note that, as mentioned earlier, every member of a Women's group

who visited the Chairman for O.R.S. was given 2 satchets of O.R.S.

which she administered liberally and came for more whenever these

were exhausted.

On the second day of the visit, the frequencies in each group, of the various degrees of dehydration were as tabulated in table 37 above. The statistical $\bar{X}^2$ test on the difference in degrees of dehydration between the study and control groups on the second day shows no significant difference.

Again, cases of severe dehydration were combined with those with moderate dehydration because of their low frequency to which the X^2 test was not applicable.

3rd Visit (on 4th day)

Cases which were severely dehydrated on the first and second visits, either died or recovered from the more to less severe degrees of dehydration. On the third day of visit to children with acute diarrhoea, only 4 children in the control and 2 in the study groups were moderately dehydrated, as shown in the table 38 below.

TABLE 38:

THE FREQUENCIES OF THE VARIOUS DEGREES OF DEHYDRATION IN THE STUDY AND CONTROL GROUPS ON THE THIRD DAY

	Number of Cases		
Degree of Dehydration	Study	Control	Total
Mild	5(71.4%)	5(55.65)	10
Moderate	2(28.6)	4(44.4%)	6
Total	7	9	16

Number of O.R.T. Satchets prepared for use (Refer fig. 2)

On the first day of diarrhoea (the first day the interviewer

saw the cases of diarrhoea), 52 satchets of O.R.T. were
prepared for use by the study group members to rehydrate
their children. This fell to 22 satchets on the second day
and only 4 on the 3rd visit. Most of the mothers had either
given up or had taken the child to hospital, or the child had
improved, between the 2nd and third visits. Hence the fall in
the number of satchets used.

DISCUSSION:

What might have been anticipated prior to the study, is
that the study group excelled above the control group in most
aspects including the socio-economic status and K.A.P. with
respect to health. However, the converse turned out to be
true, to /̲ extent. The control group had a higher educational /̲ some
status, on average, than the study group for reasons given
earlier. This difference in educational status however, did
not seem to have any impact on morbidity, especially acute
diarrhoea. This is contrary to what is generally believed,
namely, that the higher the mothers educational status the
better the health of the child.

Thus Bertrand W.E. et al[12], found that among a study group
of mothers, the general knowledge of diarrhoea was the best
predictive variable for diarrhoea morbidity in children. Other
factors would include overcrowding, maternal ages, etc, which
were not included in the present study. Any one or more of
these factors could have contributed to the similarity in
morbidity between the study and control groups, despite the

difference in educational status.

The morbidity due to acute diarrhoea, two weeks before the first K.A.P. questionnaire was applied, showed surprisingly high incidences of 7.4 and 12.2 episodes per child per year in the study and control groups respectively. This applied to both groups, though much more to the control than the study group. The reasons for this were given earlier in the test. These incidences did greatly exceed the expected incidences of 2 to 5 episodes[1] per child per year.[3] The degrees of dehydration in the control and study groups generally didn't differ much apart from the first day of visit on which the difference in severity of dehydration between the two groups was significant with a higher incidence in the study than the control group. This difference in severity quickly fell in the second and third days of visits such that no significant difference was noted.

In the K.A.P. assessment of both groups, there also were marked similarities. More women, however, had used O.R.T. before the study in the study group, than in the control group. This is due to previous health activities that may have been conducted by health officials in the groups.

However, no distribution of O.R.T. satchets by UNICEF to the women groups had ever been conducted before this present study.

Generally, both groups had reasonably acceptable K.A.P. standards as far as acute diarrhoea was concerned. After the health education, there were marked and obvious changes on the

K.A.P. in the study group. The change was, evident two months after the H.E. was given, when the second K.A.P. was done.

It is to be expected, however, that the ability to retain the acquired K.A.P. may fall so that, another K.A.P. assessment conducted several months later might show a lesser degree of change. It might, therefore, be important that H.E. should be offered regularly to these women.

In the follow-up of cases with acute diarrhoea in the control and study groups, over-reporting cannot be completely excluded. This could have been the case particularly with mild dehydration where the P.I. relied on less obvious signs of dehydration like thirst and number of stools per day.

Regarding the percentage of children taken to hospital, this was significantly higher in the control than the study group. (48% for the control and 20% for the study group). This in no way means that mothers, during the H.E., were advised not to take their children to hospital. It is probable that having nothing they could rely on to give their children with diarrhoea, mothers in the control group became more apprehensive, and hence, more quickly sought medical assistance from hospitals than the study group.

There was a difference (not quite significant at the P = 0.05 level) however, in the rates of admission, between the study and control groups the rate being higher in the later. Other studies report on this difference in the hospitalization rate between groups of children receiving O.R.T. and those not receiving any.

In one report of a field trial by an international study group,[13] there was no significantly reduced rate of hospitalization between a group receving O.R.T. and one receiving receiving none. In yet another study conducted by Rahman MM etal,[14] there was significant reduction in rates of hospitalization and mortality due to dehydration between a group receiving O.R.T. and another that did not. If the study in Kisumu had been conducted over a longer period, the results might have agreed with those of the later study.

CONSTRAINTS DURING THE STUDY:

Among the problems faced during the study were the following:

(i)   Discussed earlier is the spill over of O.R.T. into the control from the study group which is quite likely, because of the nature of study design and the community structure. This is a handicap which the P.I. felt could possibly have influenced the results; this effect could not be fully controlled without a radical change in the study design. Time and resources could not permit such an alternative study design.

(ii)   Financial constraints: It became financially difficult to employ more than 2 assistants for the study. Houses were therefore covered only with a great deal of physical effort by the P.I.

(iii) Transport is more expensive in Kisumu than in Nairobi and Mombasa. Many of the areas studied in Kisumu were too far to be reached by foot, yet public service vehicles stopped as far as 5 kilometres away, necessitating the rest of the

distance to be covered on foot, especially, Chiga.

(iv) Rescheduling of meetings with women groups became a
fairly frustrating experience. Many women only seemed
to be able to turn up for meetings after being constantly
reminded. The C.D.A.S. and chairmen helped a lot in getting
all women in a group to attend meetings.

(v) At the time of visiting homes, mothers often were not
at home. Interviewers sometimes, waited for a long time
before mothers were summoned, (if nearby), or they had to revisit
the homes. This required a lot of patience, especially where
distances were long.

(vi) Members of the control group were often suspicious of the
credentials and purpose of the project workers. This sometimes
needed lengthy introduction and explanations before winning
their confidence. The situation seemed to be particularly
bad when the husband was present during the interview.

CONCLUSION:

Though the socio-economic status and K.A.P. between the study and
control groups, to some extent, bore marked similarities, the
organization of the study groups is admirable, a situation which,
until recently, has been rare among Kenyan women's groups.
The Organizations are respected by other women in the communities
especially due to their recent progress in development. It is
evident that the community is keen in following what is going
on in the groups. The women's groups could therefore be an open
way of channelling health activities to non-members in the community.
Were more similar groups formed, it would definitely enhance the
accessibility of women for all purposes, including health.

The K.A.P. generally improved after health education and distribution of O.R.T. was carried out. These mothers would benefit a lot from repeated health education activities. Lack of money is the general complaint by the mothers. They feel that, availability of money would help them achieve some of the recommended opinions during the H.E. sessions. The UNICEF/Kisumu Municipality project on child survival and development will go a long way to alleviate their poor economic status.

The basic aim of this study was to determine whether it was possible to popularise and effectively distribute O.R.T. among organized women groups in Kisumu.
The findings reported here show that O.R.T. distribution can indeed be achieved in this way. It is to be hoped that women's groups can be encouraged to pursue this throughout Kenya.

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APPENDIX A

QUESTIONNAIRES I.

DATE _____

QUESTIONNARE FOR ASSESSING SOCIOECONOMIC STATUS BETWEEN

STUDY AND CONTROL GROUPS AMONG WOMEN IN KISUMU URBAN AREA

(a)   CONTROL /___/   STUDY GROUP /___/

(b)   Total members in household /___/

(c)   Total number of children less than 5 years in household

Ages (i) /___/   (ii)/___/ (iii) /___/ (iv)/___/ (v) /___/

(d)   Educational status of mothers. (If more than one mother
in household, state number _____).

. i)   4 years or less of formal education /___/ Number _____

ii)   > 4 years but < 9 years of formal education /___/

Number _____

iii)   > 9 years of formal Education /___/

(e)   Husbands Occupation _____

Woman's Occupation _____

(f) i)   Past morbidity and mortality in the last 12 months in
under 5 years.

Number sick /___/   Cause _____

Number dead /___/   Cause _____

ii)   Number of diarrhoea cases in last 2 weeks.

(i) /___/   (ii) /___/ (iii) /___/ (iv) /___/

(v) /___/

(g)   Nutritional Status

Age /___/

Weight /___/

APPENDIX B.

QUESTIONNAIRE II

QUESTIONNAIRE FOR ASSESSING K.A.P. ON ACUTE GASTROENTERITIS
AMONG WOMEN STUDY AND CONTROL GROUPS IN KISUMU URBAN AREA.

Text Code (i)   Study group. /____/ Control group. /____/

A   (ii)   What causes diarrhoea _____

B   (iii) Diarrhoea is a serious disease.

                        YES /____/   NO. /____/

C   (iv)   Diarrhoea affects all children at one stage in life

                  YES/____/   NO   /____/   OTHER /____/

D   (v)   What would you do at home, if your child had
                  diarrhoea, before taking him to hospital _____

                  _____

E   (vi)   How long would you stay at home with a child with
                  diarrhoea before taking him to hospital _____

                  _____

F   (vii) What would you wait to see in this child with diarrhoea
                  before taking him to hospital _____

G   (viii) Have you heard of O.R.T.   /____/

                  Have you used O.R.T.   /____/

                  Have you seen O.R.T.   /____/

J   (ix)   Is there any food you would/would not give your child
                  with diarrhoea at home.
                  Would _____
                  Would not _____

H   (x)   If you have heard, seen or used O.R.T., What is it
                  used for?

                  _____.

I   (xi)   What do you think about it?

                  GOOD   /____/   USELESS /____/ OTHER /____/

K   (xii) How would you try to prevent death from diarrhoea in
                  a child at home _____

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*   Note that the numbering of the questions in questionnaire II above
    was represented by letters in the text, as shown on the left hand
    margin on this page.

DATE _____

TABLE FOR FOLLOW UP OF CASES WITH GASTROENTERITIS

Name ...._____   Control /__ /

Age ...._____   Study   /__ /

DAY OF VISIT

		1st	2nd	3rd	4th	5th
1.	DURATION OF DIARRHOEA HOURS(No)					
	DAYS (No)					
2.	TYPE OF DIARRHOEA WATERY					
	DYSENTERY					
3.	DEGREE OF DEHYDRATION MILD					
	MODERATE					
	SEVERE					
4.	NUMBER OF O.R.T. PACKS USED					