FINAL REPORT

OF

PAKISTAN COMPONENT OF

"SUSTAINABLE IMPROVEMENTS FOR LOW INCOME COMMUNITIES"

RENNIE M. D'SOUZA

SENIOR INSTRUCTOR

COMMUNITY HEALTH SCIENCES DEPARTMENT
AGA KHAN UNIVERSITY, KARACHI
PAKISTAN

in collaboration with

AGA KHAN UNIT FOR HOUSING AND URBANIZATION
HARVARD UNIVERSITY GRADUATE SCHOOL OF DESIGN
CAMBRIDGE, MASSACHUSETTS, U.S.A.

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CONTENTS

Page No

ACKNOWLEDGEMENTS 4

SECTION I:

INTRODUCTION

- Problem Definition 5

RESEARCH SETTING

- Pakistan 6
- Karachi 6
- Katchi Abadis 8
- Community Health Sciences Department of the Aga Khan University 10
- Essa Nagri 12
- Project goal 12
- Project Objectives

SECTION 2:

METHODOLOGY

- Study Design and Time-Period 13
- Sample Size and Sampling 13
- Development of Instrument. 13
- Data Management 14
- Limitations of the study. 15

SECTION 3:

ANALYSIS 16

BIVARIATE ANALYSIS:

Research Findings:

- Characteristics of children under 5 years and morbidity. 17
- Socio-economic, Demographic and morbidity 24
- Use of Space and morbidity 43
- Observations of Physical characteristics of the Plot, Courtyard, House, and its effect on morbidity. 51
- Size of plot, density, humidity and temperature differences and morbidity. 64

SECTION 4:

PREDICTIVE MODEL: 76

SECTION 5:

INDIVIDUAL DISEASE ANALYSIS 99

SECTION 6:

MULTIVARIATE ANALYSIS: 106

CONCLUSION:

Major findings of the study. 123

APPENDIX

List of tables
Questionnaire

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SECTION I

INTRODUCTION

PROBLEM DEFINITION

The World Health Organization estimates that 5 million deaths and 2 to 3 million cases of permanent disability are caused yearly by contaminated water, poor sanitation, air pollution and over crowding. The cumulative impact of these conditions is the most severe for children in low-income urban neighborhoods. It is estimated that a child born in a squatter settlement is 40-to-50 times more likely to die before the age of five than a child in an industrialized country. According to the UN, efforts to alleviate these conditions through conventional upgrading and sites-and-services projects, have reached only ten percent of the urban poor. This investment has been concentrated in 150 projects which sought to achieve replicability through lower standards and higher levels of cost recovery.

These projects, which necessitate central government subsidies in one form or another, are increasingly becoming unaffordable to nations burdened by heavy foreign debts at a time when decentralization policies are shifting the responsibility of providing services to local governments. Municipalities in developing countries are attempting to cope with their new obligations by redefining their land development strategies, reorganizing their institutional structures and finding new methods of generating the financial resources necessary to provide and maintain urban services.

Sustaining the positive impacts of government expenditures on urban infrastructure is of crucial importance if effectiveness in public investment is to be ensured. For government authorities, this is a demanding task. Intense development pressures in many urban communities, especially in the larger cities, can cause densities to double in less than five years and triple within eight to ten years. Lower development standards and the lack of maintenance combine to erode the effects of service improvements and undermine the livability of project sites. Settlements, which were upgraded less than a decade ago have reverted back to slum conditions. Higher densities, overburdened services, and the general lack of indoor and outdoor space undermine the health and development of young children.

The ability of local government to respond to needs, and the effectiveness of the responses are linked to the capability to formulate and implement affordable improvement strategies which are also sustainable without a continuous infusion of public resources.

The study "Sustainable Improvements for Low Income Communities" is based on data collected from a number of urban centers around the world. Essa Nagri, a squatter settlement in Karachi, Pakistan is one such center selected to form a part of the study. This report focuses on data collected at Essa Nagri, its analysis and interpretation.

RESEARCH SETTING:

PAKISTAN

Pakistan is the tenth most populous country in the world with a growth rate of 3.7% per annum. It's population has tripled in a period of less than four decades and now stands at 118.8 million, (UNICEF 1991). With the current growth rate, the population would again double itself in about 25 years. This in contrast to other South Asian countries which would double in 40 years.

The growth in the population is mainly attributed to the fall in death rates with there being only a modest corresponding decline in birth rates. Although the mortality has declined in the country but it is still high (an Infant Mortality Rate of 106/1000 live births, Maternal Mortality Rate of 500/100,000 live births _ UNICEF 1991.) when compared to some of the other developing countries with the same socio-economic grouping. One of the predominant reasons for high death rates is closely spaced and repeated pregnancies and births which are associated with ill health and mortality of infants, children and mothers.

Two-third's of the total urban population of the country is living in 28 cities with populations of 100 thousand and above, 58% of these are living in 12 cities with population 200 thousand and more. Two-fifth (40%) of the total urban population lives in three major cities Karachi, Lahore and Faisalabad. This rapidly growing population is adversely affecting the urbanization patterns of the country. At present One third of the population lives in urban areas and this number continues to grow at a rate of 5%. (UNICEF's State of the World's children, 1991). The major problems faced by these large urban cities are over-crowding, inadequate housing, shortage of schools, shortage of sanitation services, pollution and deterioration of general quality of life giving rise to the formation of slums and shanty towns, and above all germination of crimes and socio-psychological problems. These problems are further exacerbated due to the acceleration of the urbanization process.

KARACHI: [1]

In 1990, Karachi became the 28th largest city in the world, and by the year 2000, with a population of 11.6 millions, it will be ranked as the fifth biggest city in South Asia, just behind Bombay, Calcutta, Madras and Jakarta.

Karachi has more than 500 squatter settlements and dominates the country's economic, political and cultural life. According to the 1981 Census, Karachi's population (5.2 million) is bigger than the combined population of Lahore, Faisalabad, Rawalpindi and Islamabad (5.1 million) (Table 1). In fact, Karachi is not only Pakistan's most populous city, it is one of the fastest growing metropolises of South Asia (Table 2).

[1] Aslam, Asif and Octavio Gomez, unpublished paper, Department of Community Health Sciences, The Aga Khan University.

Table I
Major cities of Pakistan
1981

City	Population (thousands)
Lahore	2952
Faisalabad	1104
Rawalpindi	794
Islamabad	204
Karachi	5208

Source: 1981 Census Data of Pakistan.

Table II
Urban population growth in South Asia
1950-2000

Population (millions)			
	1950	1980	2000
Dacca (Bangladesh)	0.3	3.0	10.5
Bombay (India)	3.0	8.4	16.8
Calcutta (India)	4.6	8.8	16.4
Dehli (India)	1.4	5.4	11.5
Madras (India)	1.4	5.4	12.7
Jakarta (Indonesia)	1.7	7.2	15.7
Teheran (Iran)	1.1	5.4	11.1
Baghdad (Iraq)	0.6	5.1	11.0
Karachi (Pakistan)	1.1	5.0	11.6
Manila (Philippines)	1.6	5.5	11.4
Bangkok (Thailand)	1.4	4.7	10.6
Istanbul (Turkey)	1.0	5.2	10.8
Danang (Vietnam)	---	1.8	6.6

Source: Harpham T, Lusty T, Vaughan P, ed., In the shadow of the city: Community Health and the Urban Poor. Oxford University Press, 1988.

Moreover, Karachi has been subjected to much more rapid growth than the rest of the country. During 1961-1981, Karachi's population almost quadrupled, while that of Pakistan only doubled. With a birth rate of about 35 (46 UNICEF) per 1000 population, and a death rate of about 10 (12 - UNICEF 1991), the city's population is currently growing at about 2.5% annually by natural increase alone. The remaining is the contribution of immigration. In cities like Karachi growth is taking place at a rate that exceeds the government's ability to meet the demand for basic amenities. That is why most of the new immigrants to Karachi are destined for the "katchi abadis", which have sprung around the city in riverbeds, alongside railway lines and over the barren hillocks, which mark the city's hinterland.

KATCHI-ABADIS (SQUATTER SETTLEMENTS):[1]

The word "katchi abadis" comes from an Urdu language expression meaning squatter settlement. The word "abadi" stands for settlement and the word "katchi" conveys first of all the non-legal nature of the settlement, but it also means unfinished, imperfect, below a fixed standard.
At present close to 40% of Karachi's population is living in over 500 katchi abadis, which are scattered all over the city, covering some 14,000 acres mostly of public land, expanding at an annual rate of 300 acres. In most of these slums housing consists of huts made of reed matting, second hand tin sheets or simple cardboard. Many of them are transient, while others have become firmly entrenched, developing into solid townships.

As the name implies, the katchi abadis are nests of low income, rapid growth, improper sanitation, and consequently a heavier burden of disease. A shortage of potable water, a problem throughout the city, is much more acute here. Access to piped water is limited. People are dependant upon the few community faucets, which function only part time. Like the quantity, the quality of water is also far from desirable. Community taps are sometimes situated so close to leaking sewerage lines that seepage and mixture is a common occurrence. In some areas even these taps may not be available, and water has to be purchased from trucks and vendors, which is much costlier.

Electricity is available only in those settlements which have been regularized. In most cases, however, people make use of illegal connections. Sewerage systems are also conspicuous by their absence. Like improper drainage, the garbage disposal system is also deficient.
Katchi abadis have to pay the cost of living in such an environment by carrying a heavier burden of disease. According to surveys conducted by the Department[2] of Community Health Sciences of The Aga Khan University, health conditions in katchi abadis are much worse than in middle income areas, and are characterized by a high birth rate, in turn stimulated by high perinatal and infant mortality rates (in some cases as high as 208 deaths per 1000 live births); a high prevalence of infectious diseases - mainly respiratory infections and diarrhoea; and poor and inadequate nutrition.

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[1] Aslam Asif and Octavio Gomez, unpublished paper, Department of Community Health Sciences, The Aga Khan University.

2. Department of the Community Health Sciences, The Aga Khan University (Unpublished)

Table III

Intra-urban differentials in socioeconomic indicators
Karachi, Pakistan

	Orangi[1] 1984	Karimabad[2] 1984-85	Essa Nagri 1986-87	Baba Island 1989
Number of residents	3870	3690	8580	5738
Persons/house	7.6	5.1	6.7	7.3
% literate (10+)	73.0	92.6	54.2	19.6
Average income	1490	2400	2310	2309
Income per capita	196	470	217	316
% with private water connection	23.5	100.0	4.6	0.3
% toilet facilities	88.0	100.0	84.2	12.4
Crude birth rate	40.8	16.3	44.4	39.2
Crude death rate	9.6	7.3	18.4	20.0
IMR	110.4	33.3	143.6	208.9
Infant death as % of total deaths	45.2	7.4	44.0	40.9
Major diseases among those reported ill (%):				
Malaria/fever	19.0	3.7	10.4	49.6
Upper Respiratory Infection	24.2	25.3	25.2	22.8
Diarrhoea/ Gastrointestinal Tract	17.6	7.7	41.5	16.4
Health facility utilized by those reported ill (%):				
Government Unit	9.7	7.3	11.2	39.4
Private facility	58.8	63.4	40.4	32.9
None	22.7	17.6	37.0	14.9

1. Katchi Abadi
2. Low middle class area

Source: Department of Community health Sciences Department, The Aga Khan University (Unpublished).

COMMUNITY HEALTH SCIENCES DEPARTMENT:

The Department of Community Health Sciences of the Aga Khan University took the lead in developing primary health care (PHC) centre prototypes in katchi abadis of Karachi, working closely with other Departments of the University, community and the government.
The general objectives for the establishment of these centers are:

To develop urban PHC prototypes which will allow to:

i. Increase the accessibility, acceptability and availability of selective PHC interventions.

ii. Reduce maternal morbidity and mortality.

iii. Reduce morbidity and mortality in children under 5.

iv. Reduce mortality and morbidity in other high risk groups.

v. Promote community participation in disease prevention and health promotion and project management.

vi. Promote and participate in community development through inter-sectoral collaboration.

PROGRAM PERSONNEL

The CHS-AKU Urban PHC programs are operated by a three-tiered system of manpower consisting of Doctors/Nurses, Lady Health Visitors, and Community Health Workers. The work of the three different types of health workers is inter-related and mutually supportive.

The grass root care providers in the system are the Community Health Workers (CHWs). These are women from the katchi abadis, motivated and trained by the PHC team. Most of them are literate, while a few are illiterate.

After a period of basic training, a minimum of 100 households are assigned to each CHW. The health status of women and children of these households is monitored through planned home visits in which the CHWs provide selective interventions which are both preventive and promotive in nature. In addition, they record information in family folders, identify individuals at risk and make referrals to the PHC centres.

The CHWs work under the close supervision of the LHV, CHN and CHD. The traditional birth attendants or "dais" form an effective partner of the PHC team in providing selective PHC services.

The Lady Health Visitors (LHVs) support the CHWs by helping them in facing difficult problems, and periodically summarize data such as prevalence of malnutrition and demographic

changes. They also provide services in the various PHC components.

The Community Health Nurses (CHNs) and Community Health Doctors (CHDs), supervise the CHWs and LHVs, provide clinical and managerial function, analyze data and design appropriate interventions. They are responsible for designing, implementing and monitoring and evaluating the PHC programs.

There are eight focal areas in the PHC program which are being implemented in the various field sites. These are: Immunizations, Growth Monitoring, Antenatal care, Management of diarrhoea, Health education, Family planning, Basic curative care and Traditional Birth Attendant training.

Growth Monitoring:

Home based growth monitoring of children under-5 is done routinely every month by the Community Health Workers (CHWs). Each CHW on the average monitors the growth and morbidity of nearly 150 under-5 children. Children who are moderately (grade II) or severely (grade III) malnourished are visited by CHWs more frequently than children with grade I or normal nutrition status.

Antenatal Care:

Routine ante-natal care is provided to all pregnant mothers in the catchment area of the five field sites. This consists of conducting routine ante-natal clinics at each of the field sites.

Management of Diarrhoea:

During their routine visits the CHWs educate the mothers about the preparation and administration of home-based Sugar and Salt Solution (SSS) and the use of ORS packets. Personal hygiene and improvements in environmental sanitation are also emphasized.

Health Education:

There are various levels at which this is carried out. At the home level the target are the adult females and mothers and the providers are the CHWs. The topic of health education are diarrhoea management, personal hygiene, environmental sanitation, breast feeding, supplementary feeding, growth monitoring, birth spacing, immunization and curative care. Besides one-to-one approach the CHWs organize lane meetings, where they meet about 10-12 mothers from the community on a weekly basis.

Basic Curative Care:

These services are not only rendered to the registered population but are also offered to patients from un-registered areas. However follow-up of patients and clients are only conducted for registered population.

ESSA NAGRI

Essa Nagri is one of the squatter settlements, located 4 kms. north of the Aga Khan University, in the heart of the city. The population is predominantly second generation Christian, who came to Karachi from rural Punjab in search of better employment.

According to a baseline survey conducted in 1987 [1], the crude birth rate was 44 while the crude death rate was 18. The infant mortality was found to be 144. Of the reported illness 41% were cases of diarrhoea. There are various kinds of health facilities available within the community. Of those who reported ill, 37% did not visit a doctor and 40% went to a private hospital/clinic. Only 11.2% visited government hospital/dispensary. The median expenditure incurred on medical treatment per household was Rs. 135/- per month. There are 1714 families registered with the PHC center of the Aga Khan University. The total population is 10,181. Of these the children under 5 are 1996 and the number of women between 15 and 49 years of age are 1846.

Two-thirds of Essa Nagri have water connections in their lanes and these were installed by the community, local councillor and the Aga Khan University PHC Center. Some families also have individual connections in their houses. The houses have an underground sewerage system which connect the drains of the house to the main open sewerage running through Essa Nagri.

RESEARCH PROJECT'S GOAL:

The research project seeks to identify, define and test strategies and methods to enable government authorities with private sector participation, to develop sustainable approaches to upgrading and maintaining urban environments in limited income communities. Special emphasis will be placed on defining strategies which have beneficial impacts on the quality of life for children and youth. The data collected in Essa Nagri will be integrated into the larger study of urban areas around the world.

PROJECT OBJECTIVES:

1. Identify and select pragmatic approaches to sustaining environmental quality in low-income urban neighborhoods with particular emphasis on the needs of children and youth.

2. Identify, select and define appropriate monitoring and evaluation criteria to appraise prevailing levels of urban environmental quality including health and sanitary conditions.

3. Develop guidelines for sustainable improvement programs to be implemented by public authorities and non-government organizations.

4. Train public officials and members of community organizations in assessment techniques and implementation of action programs and maintaining environmental quality.

[1]Ibid.

SECTION II

METHODOLOGY:

STUDY DESIGN:

A cross-sectional study design was selected as the most suitable for this component given the objectives and the circumstances.

TIME PERIOD:

The data was collected during the period October 10, 1990 - November 10, 1990. Data editing, entry and analysis was begun immediately afterwards and completed by September 1991.

SAMPLE SIZE:

A random sample of 350 structures was selected, in which 405 families with children under 5 were interviewed. Of these, questionnaires and measurements were completed for 403 families. These families had 698 children under 5 years of age. (35% of under 5 children in Essa Nagri).

DEVELOPMENT OF INSTRUMENT:

QUESTIONNAIRE:

The questionnaire consisted of structured questions as well as observations. The questionnaire was translated into Urdu (local language), was pretested and changes made in the questionnaire according to local terminology. A research assistant was hired to supervise the field activities. The Community Health Worker's were trained in administering the questionnaires and were supervised by the research assistant. The CHW's administered the questionnaires after working hours (usually after 2 pm).

MEASUREMENTS:

The measurements were done by the Research Assistant to decrease Inter-Observer Bias. After some training a few of the CHW's managed to do the measurements. The measurements were done between 12:00 -3:30 in the afternoon so that there was uniformity in the timings for all households, for when the measurements were done. The weather changed at the end of October and became very dry, therefore, the humidity and temperature decreased quite drastically.

DATA MANAGEMENT:

The questionnaires were edited and a random sample was verified by the research assistant. The data was entered into DBase III plus program and errors checked through consistency checks. The analysis of the data has been done in SPSS/PC and STATA.

DATA:

The information gathered through the survey is grouped into the following categories:

1. Health Status of the children under 5 years of age in the first fortnight and second fortnight.
2. Socio-economic and demographic characteristics of the household.
3. Use of Space.
4. Observations of Physical characteristics of the dwelling and its immediate surroundings.
5. Measurements: Lot size, Humidity and Temperature (External and Internal).

1. Characteristics of Children under 5 years and their effect on morbidity :

- Nutrition, age, sex, immunization and child order.
- History of the following illnesses in the first fortnight and second fortnight.
    - Diarrhoea.
    - Cough > 3 days.
    - Fever > 5 days.
    - Skin problems.
    - Fracture.
    - Burns.
    - Ear infections.
    - Others

2. Socio-economic and Demographic Data :

- Age, education, occupation, employment status and income of the parents.
- Number of children under 5 years, number of children over 5 years.
- Total number of people in the household.
- Ownership of house, tenure and rent paid monthly if applicable.
- Upkeep of house, i.e. painting, and cleaning of sewers.

3. Use of Space:

- Where children under 5 and over 5 years play.
- Where formal and informal social gatherings are held.
- Where grocery shopping is done.
- Presence of a kitchen garden and if present where.
- Any business operating in their plot and what type.
- Disposal of garbage and how far dumped from the dwelling.
- Presence of sewers, human and animal waste in the neighborhood.
- Responsibility to keep a certain area clean.
- Animals in the courtyard, and if so how they were contained.

4. Observations of Physical Characteristics of Plot, Courtyard, House and Environment :

- No. of rooms, lot size
- Common Latrines.
- Presence of kitchens.
- Courtyard floor - material.
- Source and storage of drinking water.
- No. of times cooking is done/day and the no. of hours spent in cooking/day.
- Where the cooking is done.
- Presence of electricity.
- Presence of windows in the rooms.
- Type of flooring, roofing and walls.
- Presence of human and animal waste in and around the dwelling unit.
- Disposal of animal waste and the frequency with which it is done.
- Disposal of household refuse in courtyard and if it is kept away from children.
- Level of tidiness of the courtyard.
- Presence of stagnant, overflowing or flowing sewerage in the neighborhood.
- Condition of the structure.
- Persons sleeping in the room.
- Number of persons per room.

5. Measurements:

- Area of the plot, courtyard.
- Area and volume of the rooms.
- Density. i.e. Plot area/ no. of people in the household.
- External and Internal humidity and temperature.
- Difference between External and Internal Temperature and Humidity.
- Density of the room: Area of the room / Number of people per room.
- Volume of the room / Persons per room.

LIMITATIONS OF THE STUDY:

As this was a cross-sectional study it is difficult to establish a cause-effect relationships.
There is the possibility of **recall bias** on part of the mothers, especially in recalling illness for the second fortnight.

The interviewers had asked for symptoms of the diseases, which does not establish a diagnosis. At the same time the duration of illness was also not asked as this was difficult for mothers to recall.
Even though the interviewers were trained especially for the observations section, there is still some subjectivity because each interviewer has used their own judgement in categorizing different households.

SECTION III

ANALYSIS:

The **unit for analysis is a household** which has at least one child under 5 years old.
This study focuses on children under five. The house and its environment (internal and external) are considered as exposures for a child to become sick.

The crude analysis will first consider a household as either sick or not sick irrespective of the number of children sick within that household.
Illness will be studied within the different time periods as explained below.

a. The **First fortnight** is the two weeks preceding the date of the interview.

b. The **Second fortnight** refers to the two weeks preceding the first fortnight.

Therefore the first fortnight and second fortnight are mutually exclusive.

c. A household that had an illness in **both fortnights** is a household that had an illness in both these time periods or they had an illness that extended over both periods.

d. A household that had an illness in **either fortnight** is a household that had an illness in either of these time periods.

e. A household that had an illness **any time** is a combination of "c" and "d". i.e. the four weeks period is considered as a whole.

e.g. Date of interview	:	11 October, 1991.
a. **First Fortnight**	:	26, Sept. - 10, Oct., 1991
b. **Second Fortnight**	:	12 - 25 Sept. 1991.
c. **Both Fortnights** (First and Second Fortnights)	:	12 - 25 Sept. 1991 and 26 Sept.- 10 Oct., 1991
d. **Either Fortnight** (First or Second Fortnight)	:	12 - 25 Sept. 1991 or 26 Sept.- 10 Oct., 1991
e. **Any Time** (First or/and Second Fortnight)	:	12 Sept. - 10 Oct., 1991.

If a variable is statistically significant when analyzed by time period, i.e. sick in the first fortnight and second fortnight and if they were sick in both fortnights, that variable is considered a very strong factor for a household to have sickness.

The total number of households with children under 5 interviewed was 403.

Of these - 170 households had a single child,
- 171 households had two children,
- 62 households had three children.

The univariate analysis was done first and later the multivariate analysis was done.

RESEARCH FINDINGS:

CHARACTERISTICS OF CHILDREN UNDER 5 YEARS AND MORBIDITY:

NUMBER OF CHILDREN SICK:

The number of children sick in the first fortnight were

SICK:	249 (35.67%)
NOT SICK:	449 (64.32%)

The number of children sick in the second fortnight were

SICK:	198 (28.3%)
NOT SICK:	500 (71.6%)

ILLNESS WITHIN HOUSEHOLDS:

If you stratify the households as sick irrespective of the number of children sick and type of illness, there are 47.1% of the households which had an episode of illness in the First Fortnight and 38.2% in the Second fortnight. **(TABLE I)**

Table I

	HOUSEHOLDS THAT HAD AN ILLNESS	HOUSEHOLDS THAT HAD NO ILLNESS
In first fortnight (a)	190 (47.1%)	213 (52.9%)
in second fortnight (b)	154 (38.2%)	249 (61.8%)

BURDEN OF ILLNESS:

Households that had an illness in the both fortnight was 32.5% and an illness in either fortnight was 20.4%. The former is a much more significant indicator for households who would be considered more at risk of having morbidity.

If you combine these two figures you get the total burden of illness. i.e 213 (52.9%) households were sick in the any time period. **(TABLE II).**

Table II

(c)	(d)	(e)
Households that had an illness in both fortnights	**Households that had an illness either fortnight.**	**Total burden (Illness in Any Time Period)**
131 (32.5%)	82 (20.4%)	213 (52.9%)

If you stratify the households that had an episode of illness by the number of children sick in the household, the breakdown shows: **(TABLE III)**

- 136 Households out of 170 households that had a single child sick.
- 49 households out of 171 households that had two children sick.
- 5 households out of 62 households that had three children sick.

Table III

	Households with one child sick	**Households with two children sick**	**Households with three children sick**	**Total**
In first fortnight (a)	136	49	05	190
In Second Fortnight (b)	116	32	06	154

YOUNGEST CHILD AS PRIME TARGETS:

Now, if you stratify by birth order which child was sick in any time period, it suggests that the youngest child is the most likely to be ill. **(TABLE IV)**

Table IV

SICK IN ANY TIME PERIOD: (e)

	SICK	**NOT SICK**
Youngest child	**163 (40.4%)**	**240 (59.6%)**
Middle child	**75 (32.1%)**	**158 (67.8%)**
Oldest child	**11 (17.7%)**	**51 (82.2%)**
Total	**249 (35.6%)**	**449 (64.3%)**

TABLE V:

These are that ages of the children stratified by child order

	0 - 1 year	> 1 - 3 years	> 3 - 5 years	Total
Youngest child	148	188	67	403
Middle child	5	90	136	231
Eldest child	-	6	55	61
Total	153	284	258	695 *

*** 3 children's ages are missing**

TABLE VI:

This shows the illness stratified by the age. In this the 1-3 year age groups have the greatest risk for being sick and is statistically significant. A possible explanation could be is that this age group are now big enough to go out of the house and explore the lanes and neighborhood.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
YEARS	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
0 - 1	59 (38.6%)	94 (61.4%)	49 (32%)	104 (68%)	67 (43.7%)	86 (56.2%)
> 1 - 3	115 (40.5%)	169 (59.5%)	91 (32%)	193 (68%)	129 (45.4%)	155 (54.6%)
> 3 - 5	75 (30.1%)	183 (70.9%)	58 (22.5%)	200 (77.5%)	91 (35.27%)	167 (64.7%)

* **Significant at .015 level**
@ **Significant at the .02 level**
~ **Significant at the .02 level**

Sex and immunization status had no association with sickness.

The immunization coverage of children in Essa Nagri is quite high and the diseases under consideration for this study were not immunizable diseases but rather the ones that were due to a contaminated environment. Therefore sex and immunization status did not show any association with illness.

TABLE VII

This shows illness stratified by the nutritional status in the first fortnight.
Normal weight children had a smaller proportion sick.

Nutrition *	SICK	NOT SICK
Grade 1	106 (38%)	173 (62%)
Grade 2	30(53.6%)	26 (46.4%)
Grade 3	4 (66.7%)	2 (33.3%)
Normal	109 (30.5%)	248 (69.5%)
Total	249	449

* **Significant association at .001 level.**

TABLE VIII:

This table shows the type of illness in the first fortnight by descending frequency.

Out of 698 children, 249 (35.6%) were sick.
Of these 249 sick children, 57 (22.89%) had more than one illness.

Table VIII

Fever >5 days	**62 (25.3%)**
Cough >3 days	**43 (17.26%)**
Diarrhoea	**38 (15.26%)**
Skin Problem	**29 (11.6%)**
Cough >3 days + Fever >5 days	**24 (9.6%)**
Diarrhoea + Fever	**15 (6%)**
Other	**11 (4.4%)**
Ear Infection	**7 (2.8%)**
Diarrhoea + Cough >3 days	**6 (2.4%)**

TABLE IX:

This table shows illness stratified by age.
The percent of illness is more in the 1-3 age group i.e. 46% as has been seen before.

The following illnesses are over 50% in frequency.

- Cough > 3 days (53.4%)
- Diarrhoea (50%)
- Cough > 3 days with fever > 5 days (50%)
- Diarrhoea with fever > 5 days (60%)

Table IX

ILLNESS	0 - 1 yr	1 - 3 yrs.	3 -5 yrs.	TOTAL
Fever	9 (14.5%)	26 (41.9%)	27 (43.5%)	62
Cough >3 days	7 (16.2%)	23 (53.4%)	13 (30.2%)	43
Diarrhoea	16 (42%)	19 (50%)	3 (7.8%)	38
Skin problem	10 (35.7%)	9 (32%)	9 (32%)	28
Cough >3 days + Fever >5	6 (25%)	12 (50%)	6 (25%)	24
Diarrhoea + Fever	3 (20%)	9 (60%)	3 (20%)	15
Other	1 (.09%)	6 (54.5%)	4 (36.3%)	11
Ear infection	2 (28.5%)	2 (28.5)	3 (42.8%)	7
Diarrhoea + cough >3 days	2 (33.3%)	1 (16.6%)	3 (50%)	6
Total	59 (23.6%)	115 (46%)	75 (30%)	249

TABLE X:

Shows the households that had one, two and three children sick stratified by the type of illness. As the number of children increases, these illnesses increase. i.e. Cough > 3 days, Skin problems, Diarrhoea and fever, Diarrhoea and cough. Diarrhoea is highest in the single child household.

Table X

ILLNESS	Households with 1 child sick	Households with 2 children sick	Households with 3 children sick	Total
Diarrhoea	29 (21.3%)	7 (7%)	2 (13%)	38
Cough >3 days	18 (13.2%)	18 (18.3%)	7 (46.6%)	43
Fever >5 days	36 (26.4%)	24 (24.4%)	2 (13.3%)	62
Skin Problems	15 (11.1%)	11 (11.2%)	3 (20%)	29
Fracture	-	1 (1%)	-	1
Burns	-	1 (1%)	-	1
Ear Problems	6 (44%)	1 (1%)	-	7
Other	8 (5.8%)	3 (3%)	-	11
Diarrhoea + Cough	3 (2.2%)	4 (4%)	-	7
Diarrhoea + Fever	6 (44%)	8 (8.1%)	-	14
Diarrhoea + Skin	1 (.73%)	-	1 (6.6%)	2
Diarrhoea + Ear Infection	-	2.(2%)		2
Diarrhoea + Other		1 (1%)		1
Cough + Fever	7 (5.1%)	5 (5.1%)		12
Cough + Skin	4 (2.9%)	10 (10.2%)		14
Fever + Skin		1 (1%)		1
Cough + Ear infection	1 (.002%)			1
Diarrhoea + Cough + Skin	1 (.002%)			1
Diarrhoea +	1 (.002%)			1
Cough + Fever, Skin		1		1
Total	136 (54.6%)	98 (39.35%)	15 (6%)	249

From this section, onwards the variables have been referenced by the relevant number in the questionnaire.

SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS:

AGE OF PARENTS: (7)

The mean age of the mother was 28.6 $\pm$ 6.5 year with a median of 28 years.
The mean age of the father was 32 $\pm$ 7.5 years with a median of 31 years.
The mothers age did not show any statistical significance for household illness. Similarly the father's age did not show any statistical significance with household illness. Although, there were fewer households sick where there were older mothers and fathers especially for mothers, but this was not statistically significant. A possible explanation could be that older parents have more experience in rearing children and therefore can take better care, or they may be having a higher income than younger parents.

AGE OF MOTHER: (7-W)

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 25	77 (48.7%)	81 (51.3%)	66 (41.8%)	92 (58.2%)	87 (55.1%)	71 (44.9%)
25-34	76 (50.7%)	74 (40.3%)	59 (38.3%)	91 (60.7%)	83 (55.3%)	67 (44.7%)
> 35	37 (38.9%)	58 (61.1%)	29 (30.5%)	66 (69.5%)	43 (45.3%)	52 (54.7%)

AGE OF FATHER: (7-H)

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 30	69 (46.6%)	79 (53.4%)	58 (39.2%)	90 (60.8%)	75 (50.7%)	73 (49.3%)
30-45	117 (49.2%)	121 (50.8%)	90 (37.8%)	148 (62.2%)	131 (55%)	107 (45%)
> 45	4 (23.5%)	13 (76.5%)	6 (35.3%)	11 (64.7%)	7 (41.2%)	10 (58.8%)

EDUCATION OF THE PARENTS (8)

Median years of education for mothers & fathers was 1 year.
The mean years of education for the mothers was 1 ± 1.77 and the fathers was 2 ± 2.7.

Nearly half i.e. (49.4%) of the mothers were illiterate while 3% were educated beyond 5 years of schooling.
36.5% of the fathers were illiterate, 59.2% educated between grades 1-9 and only 3.9% educated above 10 grade.
Surprising the mother's education did not show any association with illness. Our assumption would be that since there was a very small proportion of mothers who were educated to a level that could have an impact on illness of the household. Therefore the statistical significance could not emerge or there were other factors that negated the effect of education.

MOTHER'S EDUCATION: (8-W)

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Illiterate	94 (47.2%)	105 (52.8%)	75 (37.7%)	124 (62.3%)	102 (51.3%)	97 (48.7%)
> Grade 1	96 (47.1%)	108 (52.9%)	79 (38.7%)	125 (61.3%)	111 (54.4%)	93 (45.6%)

The fathers education showed a statistically significant association with illness of the household for the second fortnight. As education increased the number of Households sick increased. The explanation for this could be that there are small numbers in > 8 group which could be distorting the results or there could be other factors interacting that are negating the affect of education.

FATHER'S EDUCATION (8-H)

	FIRST FORTNIGHT		SECOND FORTNIGHT @		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
No Education	66 (44.9%)	81 (55.1%)	47 (32%)	100 (68%)	70 (47.6%)	77 (52.4%)
1 - 8 Years	111 (47.2%)	124 (52.8%)	94 (40%)	141 (60%)	128 (54.5%)	107 (45.5%)
> 8 Years	13 (61.9%)	8 (38.1%)	13 (61.9%)	8 (38.1%)	15 (71.4%)	6 (28.6%)

@ Significant at the .02 level

When the mothers education is stratified by the two income groups, there is no significant difference in the household illness in the two income groups. This is true for all time periods. i.e First Fortnight, Second fortnight, Any Time.

MOTHER'S ECUCATION (8-W) **INCOME ≤ Rs. 1500**

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Illiterate	53 (51.5%)	50 (48.5%)	44 (42.7%)	59 (57.3%)	56 (54.4%)	47 (45.6%)
> Grade 1	51 (51%)	49 (49%)	45 (45%)	55 (55%)	56 (56%)	44 (44%)

MOTHER'S EDUCATION: (8-W) **INCOME > Rs. 1500**

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Illiterate	41 (42.7%)	55 (57.3%)	31 (32.3%)	65 (67.7%)	46 (47.9%)	50 (52.1%)
> Grade 1	45 (43.3%)	59 (56.7%)	34 (32.7%)	70 (67.3%)	55 (52.9%)	49 (47.1%)

When the husband's education is stratified by income, the only significant difference in household illness is in the second fortnight at the .09 level in the higher income group.

There is also a gradient seen, that there are more households sick with increasing education and this is present even when stratified by income in all 3 time periods.

FATHER'S EDUCATION: (8-H) **INCOME ≤ Rs. 1500**

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Illiterate	40 (50.6%)	39 (49.4%)	29 (36.7%)	50 (63.3%)	41 (51.9%)	38 (48.1%)
Grade 1 - 8	56 (49.6%)	57 (50.4%)	53 (46.9%)	60 (53.1%)	63 (55.8%)	50 (44.2%)
> Grade 8	8 (72.7%)	3 (27.3%)	7 (63.6%)	4 (36.4%)	8 (72.7%)	3 (27.3%)

FATHER'S EDUCATION: (8-H) **INCOME > Rs. 1500**

	FIRST FORTNIGHT		@ SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Illiterate	26 (38.2%)	42 (61.8%)	18 (26.5%)	50 (73.5%)	29 (42.6%)	39 (57.4%)
Grade 1 - 8	55 (45.1%)	67 (54.9%)	41 (33.6%)	81 (66.4%)	65 (53.3%)	57 (46.7%)
> Grade 8	5 (50%)	5 (50%)	6 (60%)	4 (40%)	7 (70%)	3 (30%)

@ **Significant at the .09 level.**

OCCUPATION OF THE PARENTS (9)

Majority of the women were housewives and only 21.8% were working mothers. Most of these women worked as cleaners in the Karachi Municipal Corporation and as Household assistants. The children of these women are either looked after by older children or in an extended family.

There was no statistical significance between mothers working and household illness but a larger proportion of households were sick in first fortnight but fewer in the second fortnight and in any fortnight. The assumption would be that the households with working mothers would have more illness.

MOTHER'S OCCUPATION (9-W)

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Housewife	132 (46.3%)	153 (53.7%)	111 (38.9%)	174 (61.1%)	153 (53.7%)	132 (46.3%)
Working Mother	58 (49.2%)	60 (50.8%)	43 (36.4%)	75 (63.6%)	60 (50.8%)	58 (49.2%)

FATHER'S OCCUPATION (9-H)

1: Cleaners
2: Painters, Construction workers, Carpenters, Household assistants, drivers, Chowkidars, and others
3: Religious workers, teachers, clerks and Professionals

The main occupation of the fathers was cleaners in the KMC (Karachi Municipal Corporation) i.e. 43.2%, and these households had the highest proportion sick as compared to the other groups. This is probably a reflection of the socio-economic class of this group and also exposing the kids to infection they brought home.

	* FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	86 (53.8%)	74 (46.8%)	68 (42.5%)	92 (57.5%)	93 (58.1%)	67 (41.9%)
2	84 (41.6%)	118 (58.4%)	70 (34.7%)	132 (65.8%)	97 (48%)	105 (52%)
3	20 (50%)	20 (50%)	16 (40%)	24 (60%)	23 (57.5%)	17 (42.5%)

* **Significant at .06 level**

When the type of occupation is stratified by income, there is no significant difference in the household illness. In the lower income group i.e. below Rs 1500 the category 3 workers have the most illness followed by cleaners and lastly by category 2. In higher income groups i.e more than Rs. 1500, the cleaners have the most illness followed by category 3 and then by category 2 and this is statistically significant in the first fortnight at .02 level and .08 in the any time period.

OCCUPATION OF THE FATHER: (9_H) **INCOME ⩽ Rs. 1500**

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	45 (52.3%)	41 (47.7%)	38 (44.2%)	48 (55.8%)	45 (55.8%)	38 (44.2%)
2	47 (49%)	49 (51%)	40 (41.7%)	56 (58.3%)	50 (52.1%)	46 (47.9%)
3	12 (60%)	8 (40%)	11 (55%)	9 (45%)	14 (70%)	6 (30%)

OCCUPATION OF THE FATHER: (9-H) **INCOME > Rs. 1500**

	* FIRST FORTNIGHT		SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	45 (52.4%)	33 (44.6%)	30 (40.5%)	44 (59.5%)	45 (60.8%)	29 (39.2%)
2	37 (34.9%)	69 (65.1%)	30 (28.3%)	76 (71.7%)	47 (44.3%)	59 (55.7%)
3	8 (40%)	12 (60%)	5 (25%)	15 (75%)	9 (45%)	11 (55%)

* Significant at the .02 level.

~ Significant at the .08 level

EMPLOYMENT STATUS OF PARENTS: (10)

EMPLOYMENT STATUS (MOTHER) (10-W)

There are a lot of working mothers in Essa Nagri i.e. approximately 25%. Households with full-time or part-time employed women had more illness in the first fortnight and less in the second fortnight and in the any time period. This could be due to mothers unable to recall a child's illness in the second fortnight as this period is more subject to errors in recall.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Full Time or Part-Time	56 (48.7%)	59 (51.3%)	41 (35.7%)	74 (64.3%)	58 (50.4%)	57 (49.6%)
Housewife	134 (46.5%)	154 (53.5%)	113 (39.2%)	175 (60.8%)	155 (53.8%)	133 (46.2%)

EMPLOYMENT STATUS (FATHER) (10-H)

Households with unemployed fathers had the most illness, followed by part time and least the full time employed fathers which was statistically significant at .04 level for the second fortnight.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Full time (1)	165 (48%)	179 (52%)	133 (38.7%)	211 (61.3%)	186 (54.1%)	158 (45.9%)
Part time (2)	20 (38.5%)	32 (61.5%)	16 (30.8%)	36 (69.2%)	22 (42.3%)	30 (57.7%)
Un-Employed (3)	5 (83.3%)	1 (16.7%)	5 (83.3%)	1 (16.7%)	5 (83.3%)	1 (16.7%)

* **Significant at the .09 level**
@ **Significant at the .04 level**
~ **Significant at the .09 level**

Employment status of the husband when stratified by income, shows that the unemployed have more illness followed by full time and then part time. This is true when stratified and is significant in the first fortnight at .08 level and .06 level in the second fortnight in the less than Rs. 1500 group

EMPLOYMENT STATUS OF THE FATHER (10-H) **INCOME ≤ Rs. 1500**

	* FIRST FORTNIGHT		@ SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Full Time (1)	87 (52.1%)	80 (47.9%)	73 (43.7%)	94 (56.3%)	93 (55.7%)	74 (44.3%)
Part Time (2)	13 (41.9%)	18 (58.1%)	12 (38.7%)	19 (61.3%)	15 (48.4%)	16 (51.6%)
Un-Employed (3)	4 (100%)	-	4 (100%)	-	4 (100%)	-

* **Significant at the .08 level.**
@ **Significant at the .06 level.**

EMPLOYMENT STATUS OF THE FATHER (10-H) **INCOME > Rs. 1500**

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Full Time (1)	78 (44.1%)	99 (55.9%)	60 (33.9%)	117 (66.1%)	93 (52.5%)	84 (47.5%)
Part Time (2)	7 (33.3%)	14 (66.7%)	4 (19%)	17 (81%)	7 (33.3%)	14 (66.7%)
Un-Employed (3)	1 (50%)	1 (50%)	1 (50%)	1 (50%)	1 (50%)	1 (50%)

INCOME - HEAD OF HOUSEHOLD: (11)

The median income of the head of the household was Rs. 1300.[1]

Households where the head of the household's income was less than Rs. 1300 had more illness and this relationship was statistically significant for the first, second and both fortnight time periods.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
INCOME	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
⩽ Rs 1300	110 (52.9%)	98 (47.1%)	89 (42.8%)	119 (57.2%)	118 (56.7%)	90 (43.3%)
> Rs 1300	78 (40.4%)	115 (59.6%)	63 (32.6%)	130 (67.4%)	93 (48.2%)	100 (51.8%)

* **Significant at .01 level**
@ **Significant at .04 level**
~ **Significant at .05 level**

	BOTH FORTNIGHT *		EITHER FORTNIGHT		ANY TIME ~	
INCOME	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
⩽ Rs. 1300	81 (47.4%)	90 (52.6%	37 (29.1%)	90 (70.9%)	118 (56.7%)	90 (43.3%)
> Rs. 1300	48 (32.4%)	100 (67.6%)	45 (31%)	100 (69%)	93 (48.2%)	100 (51.8%)

* **Significant at .009 level**

~ **Significant at the .05 level.**

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[1] **US $ 1 = Rs. 25**

INCOME FROM OTHER MEMBERS OF THE HOUSEHOLD: (12)

An inverse association was seen with income from other members of the household and illness in that household but no statistical significance except in the second fortnight. This could be due to the head of the household not earning enough and therefore other members of the household had to work. Therefore it is an indirect measure of their socio-economic status.

	FIRST FORTNIGHT		SECOND FORTNIGHT @		ANY TIME	
INCOME	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< Rs. 1200	45 (45.9%)	53 (54.1%)	30 (30.6%)	68 (69.4%)	46 (46.9%)	52 (53.1%)
> Rs. 1200	15 (44.1%)	19 (55.9%)	18 (52.9%)	16 (47.1%)	20 (58.8%)	14 (41.2%)

@ **Significant at the .03 level**

TOTAL FAMILY INCOME: (13)

The median family Income was Rs. 1500.

As income of households increase, illness decreases and this is seen in all the time periods. This was statistically significant for the first, second and both fortnights.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
<Rs 1500	104 (51.2%)	99 (48.8%)	89 (43.8%)	114 (56.2%)	112 (55.2%)	91 (44.8%)
>Rs 1500	86 43%)	114 (57%%)	65 (32.5%)	135 (67.5%)	101 (50.5%)	99 (49.5%)

* **Significant at the .01 level.**

@ **Significant at the .02 level**

	BOTH FORTNIGHT *		EITHER FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< Rs 1500	81 (47.1%)	91 (52.9%)	31 (25.4%)	91 (74.6%)	112 (55.2%)	91 (44.8%)
> Rs.1500	50 (33.6%)	99 (66.4%)	51 (34%)	99 (66%)	101 (50.5%)	99 (49.5%)

* **Significant at .01 level**

NUMBER OF CHILDREN UNDER 5 : (14)

The mean number of children < 5 years per household was 1.73 $\pm$ 0.7.

The no. of children under 5 in a household was highly associated with illness of the household.

As the number of children under 5 increased, the number of households sick increased and was statistically significant in all five time periods. Therefore it is a very significant factor for any household to have illness.

	FIRST FORTNIGHT *		**SECOND FORTNIGHT** @		**ANY TIME** ~	
No. of < 5 children	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	61 (35.9%)	109 (64.1%)	53 (31.2%)	117 (68.8%)	74 (43.5%)	96 (56.5%)
2	94 (55%)	77 (45%)	70 (40.9%)	101 (59.1%)	101 (59.1%)	70 (40.9%)
3	35 (56.5%)	27 (43.5%)	31 (50%)	31 (50%)	38 (61.3%)	24 (38.7%)

* **Significant at the .0005 level**
@ **Significant at the .02 level**
~ **Significant at the .005 level**

	BOTH FORTNIGHTS *		**EITHER FORTNIGHT**		**ANY TIME** ~	
No. of < 5 children	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	40 (29.4%)	96 (70.6%)	34 (26.2%)	96 (73.8%)	74 (43.5%)	96 (56.5%)
2	63 (47.4%)	70 (52.6%)	38 (35.2%)	70 (64.8%)	101 (59.1%)	70 (40.9%)
3	28 (53.8%)	24 (46.2%)	10 (29.4%)	24 (70.6%)	38 (61.3%)	24 (38.7%)

* **Significant at the .003 level**
~ **Significant at the .005 level**

The number of children under 5, when stratified by family income showed a statistical difference in all three time periods for the income group below Rs. 1500 and only in the first fortnight in the income group more than Rs. 1500.
The same association holds as the number of households ill increases as the number of children under 5 years increases.

NUMBER OF CHILDREN UNDER 5 : (14) **INCOME ≤ Rs. 1500**

	* FIRST FORTNIGHT		@ SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	30 (38%)	49 (62%)	26 (32.9%)	53 (67.1%)	34 (43%)	45 (57%)
2	54 (57.7%)	40 (42.6%)	47 (50%)	47 (50%)	57 (60.6%)	37 (39.4%)
3	20 (66.7%)	10 (33.3%)	16 (53.3%)	14 (46.7%)	21 (70%)	9 (30%)

* **Significant at the .007 level.**
@ **Significant at the .04 level.**
~ **Significant at the .0142 level.**

NUMBER OF CHILDREN UNDER 5 : (14) **INCOME > Rs. 1500**

	* FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	31 (34%)	60 (65.9%)	27 (29.7%)	64 (70.3%)	40 (44%)	51 (56%)
2	40 (51.9%)	37 (48.1%)	23 (29.9%)	54 (70.1%)	44 (57.1%)	33 (62.9%)
3	15 (46.9%)	9 (53.1%)	15 (46.9%)	17 (53.1%)	17 (53.1%)	15 (46.9%)

* **Significant at .0586 level.**

The ages and numbers of people within the households had no association with illness within the household.

TOTAL NUMBER OF PEOPLE WITHIN THE HOUSEHOLD. (17)

The mean no. of people in a household was 6.68 $\pm$ 2.278 and the median was 7.

There was an inverse relation between the number of people within a household and sickness. If there were more people in the house, there was less illness, but this was not statistically significant.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
No. of people	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 7	98 (50.3%)	97 (49.7%)	78 (40%)	117 (60%)	108 (55.4%)	87 (44.6%)
> 7	92 (44.2%)	116 (55.8%)	76 (36.5%)	132 (63.5%)	105 (50.5%)	103 (49.5%)

OWNERSHIP OF THE HOUSE (18)

Majority of the people owned their house i.e. 84% and the illness was greater among these households but this was not statistically significant. The assumption would be for households who did not own their house to have more illness but because the number of families that did not own their house was small, this association did not arise.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
Ownership of House	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	161 (47.5%)	178 (52.5%)	133 (39.2%)	206 (60.8%)	183 (54%)	156 (46%)
No	29 (45.3%)	35 (54.7%)	21 (32.8%)	43 (67.2%)	36 (46.9%)	34 (53.1%)

LENGTH OF RESIDENCE: (19)

The mean duration of stay in this settlement was 16.48 ± 9.5 years and the median was 15 years.

The duration of stay in the area did not show any association with illness except that the group in the 5-10 years of stay in that area had less illness than the other two groups. The explanation for this should be looked into as to why the middle category has less households ill.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
Length of Residence	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
(< 5 years)	37 (56.1%)	29 (43.9%)	29 (43.9%)	37 (56.1%)	38 (57.6%)	28 (42.4%)
(5-10 years)	25 (41.7%)	35 (58.3%)	16 (26.7%)	44 (73.3%)	28 (46.7%)	32 (53.3%)
(>10 years)	128 (46.2%)	149 (53.8%)	109 (39.4%)	168 (60.6%)	147 (54.4%)	130 (46.9%)

RENT : (20)

The median rent paid in this area was Rs. 400 but there was no association with illness of the households.

If the rent was less there were more households ill in the second fortnight and any time.

If the rent was more there was increased illness in the first fortnight.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< Rs.400	13 (44.8%)	16 (55.2%)	10 (34.5%)	19 (65.5%)	14 (48.3%) (51.7%)	15
> Rs. 400	16 (45.7%)	19 (54.3%)	11 (31.4%)	24 (68.6%)	16 (45.7%)	19 (54.3%)

GOOD HOUSEKEEPING (21)

Households that paint or don't paint their house didn't have any association with illness of the household.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
PAINTED	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Never	28 (46.7%)	32 (53.3%)	26 (43.3%)	34 (56.7%)	30 (50%)	30 (50%)
When needed	94 (45%)	115 (55%)	79 (37.8%)	130 (62.2%)	107 (51.2%)	102 (48.8%)
Regularly	64 (52.9%)	57 (47.1%)	46 (38%)	75 (62%)	72 (59.5%)	49 (40.5%)

CLEANLINESS - CLEANING OF THE SEWERS (22)

In Essa Nagri, the sewers i.e. the main sewerage drainage in the lanes keeps getting blocked quite frequently and need to be cleaned. The reason for it getting blocked are many e.g. no lid on the man-holes and a lot of solid wastes get thrown in, secondly the width of the drains is not enough to deal with the extra waste generated from the households due to increased densification. Once the sewers are cleaned the waste material is piled outside the sewer in the lanes which may or may not get collected by the sweeper. Therefore this waste material now becomes part of the lanes where the children play and are exposed to it.

Therefore households who clean their sewers regularly had more illness as compared to those who cleaned it when needed or not at all. This was a very significant factor for a household to have illness in all time periods.

	FIRST FORTNIGHT *		**SECOND FORTNIGHT** @		**ANY TIME** ~	
CLEANING SEWERS	SICK	NOT SICK	**SICK**	NOT SICK	SICK	NOT SICK
Never (1)	2	2	2	2	3	1
	(50%)	(50%)	(50%)	(50%)	(75%)	(25%)
When needed (2)	145	187	115	217	162	170
	(43.7%)	(56.3%)	(34.6%)	(65.4%)	(48.8%)	(51.2%)
Regularly (3)	41	23	36	28	46	18
	(64.1%)	(35.9%)	(56.3%)	(43.7%)	(71.9%)	(28.1%)

* **- significant at .011 level**
@ **- significant at .004 level**
~ **- significant at .002 level**

	BOTH FORTNIGHTS *		EITHER FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Never (1)	1	1	2	1	3	1
	(50%)	(50%)	(66.6%)	(33.3%)	(25%)	(75%)
When needed (2)	98	170	64	170	162	170
	(36.6%)	(63.4%)	(27.4%)	(72.6%)	(48.8%)	(51.2%)
Regularly (3)	31	18	15	18	46	18
	(63.3%)	(36.7%)	(45.5%)	(54.5%)	(71.9%)	(28.1%)

* **- significant at .0021 level**
@ **- significant at .039 level**
~ **- significant at .002 level**

Cleaning of the sewers regularly when stratified by income shows a statistical significance in all time periods in both income groups except in the first fortnight in the lower income group. Similarly an association is seen as unstratified i.e. more illness in people who clean their sewers regularly followed by the ones who do it when needed. The numbers in the never category are very small and therefore should be ignored.

CLEANLINESS - CLEANING OF THE SEWERS (22) INCOME < Rs. 1500

	FIRST FORTNIGHT		@ SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Never (1)	1 (100%)	-	1 (100%)	-	1 (100%)	-
When Needed (2)	88 (49.2%)	91 (50.8%)	73 (40.8%)	106 (59.2%)	94 (52.5%)	85 (47.5%)
Regularly (3)	15 (68.2%)	7 (31.8%)	15 (68.2%)	7 (31.8%)	17 (77.3%)	5 (22.7%)

@ **Significant at the .02 level.**
~ **Significant at the .05 level.**

CLEANLINESS - CLEANING OF THE SEWERS (22) INCOME > Rs. 1500

	* FIRST FORTNIGHT		@ SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICk
Never (1)	1 (33.3%)	2 (66.7%)	1 (33.3%)	2 (66.7%)	2 (66.7%)	1 (33.3%)
When Needed (2)	57 (37.3%)	96 (62.7%)	42 (27.5%)	111 (72.5%)	68 (44.4%)	85 (55.6%)
Regularly (3)	26 (61.9%)	16 (38.1%)	21 (50%)	21 (50%)	29 (69%)	13 (31%)

* **Significant at the .015 level.**
@ **Significant at the .02 level.**
~ **Significant at the .0156 level.**

USE OF SPACE:

WHERE DO CHILDREN UNDER 5 PLAY : (31)

About 75% the children under 5 played in the rooms & courtyard and 25% played in the lanes and courtyard. This latter group had more illness and was statistically significant in all five time periods. The explanation is that the lanes and courtyard expose the child to the outside environment which puts the child under 5 at a greater risk of getting disease. Therefore it is a very important risk factor for a household to have an illness.

	FIRST FORTNIGHT *		**SECOND FORTNIGHT** @		**ANY TIME**	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Rooms and Courtyard	134	170	108	196	148	156
	(44.1%)	(55.9%)	(35.5%)	(64.5%)	(48.7%)	(51.3%)
Lanes, Rooms & Lanes, Courtyard and lanes.	55	43	45	53	64	34
	(56.1%)	(43.9%)	(45.9%)	(54.1%)	(65.3%)	(34.7%)

* **- Significant about .04 level**
@ **- Significant about .08 level**
~ **- Significant about .006 level**

	BOTH FORTNIGHTS *		**EITHER FORTNIGHT** @		**ANY TIME** ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Rooms and Courtyard	94 (37.6%)	156 (62.4%)	54 (25.7%)	156 (74.3%)	148 (48.7%)	156 (51.3%)
Lanes, Rooms & Lanes, Courtyard and lanes.	36 (51.4%)	34 (48.6%)	28 (45.2%)	34 (54.8%)	64 (65.3%)	34 (34.7%)

* **Significant at .05 level.**
@ **Significant at the .005 level.**
~ **Significant at the .006 level.**

WHERE DO CHILDREN OVER 5 YEARS PLAY: (32)

Where children older than 5 years played, also had an association with illness of the household i.e illness of the under 5 children.

Households where the children played in the lanes had the least illness , followed by the ones that played in the courtyard and parks and open spaces. The children over 5 year would be the ones transmitting infection to the younger ones. Therefore if they were exposed to the external environment away from the house those households were at a greater risk of getting illness.

	FIRST FORTNIGHT *		**SECOND FORTNIGHT**		**ANY TIME**	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Courtyard	15 (42.9%)	20 (57.1%)	13 (37.1%)	22 (62.9%)	15 (42.9%)	20 (57.1%)
Lanes	64 (38.6%)	102 (61.4%)	59 (35.5%)	107 (64.5%)	72 (43.4%)	94 (56.6%)
Park, Open Spaces, courtyard and Lanes, Lanes and Open space.	111 (55%)	91 (45%)	82 (40.6%)	120 (59.4%)	126 (62.4%)	76 37.6%)

*** Significant at the .0064 level.**

	BOTH FORTNIGHTS		**EITHER FORTNIGHT** @		**ANY TIME**	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Courtyard.	13 (39.4%)	20 (60.6%)	2 (9.1%)	20 (90.9%)	15 (42.9%)	20 (57.1%)
Lanes.	51 (35.2%)	94 (64.8%)	21 (18.3%)	94 (81.7%)	72 (43.4%)	94 (56.6%)
Park, Open Spaces, courtyard and Lanes, Lanes and Open space.	67 (46.9%)	76 (53.1%)	59 (43.7%)	76 (56.3%)	126 (62.4%)	76 (37.6%)

@ **Significant at the .0001 level**

SCHOOL GOING CHILDREN (35)

If the children over 5 years are going to school, this didn't affect the households to have more illness, i.e. there was no increase in the under five children's illness. This is an indirect exposure for children under 5 years if their older brother/sisters were exposed to the other children outside the house.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	92 (44.4%)	115 (55.6%)	79 (38.2%)	128 (61.8%)	107 (51.7%)	100 (48.%)
No.	98 (50%)	98 (50%)	75 (38.3%)	121 (61.7%)	106 (54.1%)	90 (45.9%)

BUSINESS OPERATING IN THE PLOT: (40)

There was no significant association with having a business operating in the plot , with illness of that household, instead there were fewer proportion sick in this group.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	13 (52%)	12 (48%)	11 (44%)	14 (56%)	13 (52%)	12 (48%)
No	89 (56.7%)	68 (43.3%)	72 (45.9%)	85 (54.1%)	99 (63.1%)	58 (36.9%)

TYPE OF BUSINESS: (41)

The type of Business operating in the plot showed an increase illness in households i.e. households that had a sewing center, grocery shop and pan shop had increased illness than the other group but this was not statistically significant. It also needs to be noted that the numbers in these groups are very small.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Sewing Center, Grocery Shop, Pan Shop[1]	6 (60%)	4 (40%)	5 (50%)	5 (50%)	6 (60%)	4 (40%)
Others.	7 (46.7%)	8 (53.3%)	6 (40%)	9 (60%)	7 (46.7%)	8 (53.3%)

[1] Betal leaf confectionery.

DISPOSAL OF GARBAGE : (42)

The manner in which households disposed their garbage didn't show an association with illness within those households.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Dump outside or anywhere	61 (47.7%)	67 (52.3%)	48 (37.5%)	80 (62.5%)	69 (53.9%)	59 (46.1%)
Picked up by garbage disposal and other	128 (47.2%)	143 (52.8%)	105 (38.7%)	166 (61.3%)	143 (52.8%)	128 (47.2%)

HOW FAR THE GARBAGE IS DISPOSED: (43)

The median distance for garbage to be dumped away for the dwelling was 200 meters and the mean distance was 262 ± 220 meters.

There was no association between sickness and how far from the house the garbage was disposed, although there were fewer households sick among those where garbage was disposed < 150 meters from the dwelling unit.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 150 ft	77 (43.3%)	101 (56.7%)	68 (38.2%)	110 (61.81%)	86 (48.3%)	92 (51.7%)
> 150 ft.	113 (50.2%)	112 (49.8%)	86 (38.2%)	139 (61.8%)	127 (56.4%)	98 (43.6%)

HUMAN OR ANIMAL WASTE WITHIN 20 METERS OF THE DWELLING: (44)

42% of households had some presence of human & animal waste within 20 meters of the dwelling, 9.7% had heavy defecation and 48% had none. There was no association of presence of human or animal waste within 20 meters of the dwelling and illness within the household.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Heavy and Some	101 (48.3%)	108 (51.7%)	74 (35.4%)	135 (64.6%)	109 (52.2%)	100 (47.8%)
None	89 (45.9%)	105 (54.1%)	80 (41.2%)	114 (58.8%)	104 (53.6%)	104 (46.4%)

SEWERS IN THE NEIGHBORHOOD: (45)

There is a big open sewer bisecting Essa Nagri and this is fed by underground sewers from the houses through the lanes and which ultimately flow in this open sewer.

The sewers in the neighborhood of the houses were not visible in 78% and the underground sewers which were flowing, stagnant or overflowing was 22%. The latter category had more illness and was statistically significant in three time periods. Therefore it is very important factor for a household to have illness.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Flowing, Stagnant or Overflowing	52 (58.4%)	37 (41.6%)	43 (48.3%)	46 (51.7%)	55 (61.8%)	34 (38.2%)
None visible	138 (43.9%)	176 (56.1%)	111 (35.4%)	203 (64.6%)	158 (50.3%)	156 (49.7%)

* **Significant at the .02 level.**
@ **Significant at the .03 level.**
~ **Significant at the .07 level.**

SEWERS IN THE NEIGHBORHOOD: (45)

	BOTH FORTNIGHTS *		EITHER FORTNIGHT		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Flowing, Stagnant or Overflowing	40 (54.1%)	34 (45.9%)	15 (30.6%)	34 (69.6%)	55 (61.8%)	34 (38.2%)
None	91 (36.8%)	156 (63.2%)	67 (30%)	156 (70%)	158 (50.3%)	156 (49.7%)

* **.01 level of significance.**
~ **.07 level of significance.**

When the presence of sewers in the neighborhood is stratified by income, it is significant in the lower income group in the first fortnight and any time period at the .06 level.

Q 45 SEWERS IN THE NEIGHBORHOOD: INCOME ≤ Rs. 1500

	* FIRST FORTNIGHT		SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	27 (60%)	18 (40%)	9 (33.3%)	18 (66.7%)	36 (66.7%)	18 (33.3%)
2	54 (42.5%)	73 (57.5%)	22 (23.2%)	73 (76.8%)	76 (51%)	73 (49%)

* **Significant at the .06 level.**
~ **Significant at the .068 level.**

Q 45 SEWERS IN THE NEIGHBORHOOD: INCOME > Rs. 1500

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	13 (44.8%)	16 (55.2%)	6 (27.3%)	16 (72.7%)	19 (54.3%)	16 (45.7%)
2	37 (30.8%)	83 (69.2%)	45 (35.2%)	83 (64.8%)	82 (49.7%)	83 (50.3%)

WHICH AREA RESPONSIBLE TO KEEP CLEAN: (46)

72.7% of the women felt that keeping the house and the land around the house clean was their responsibility and to keep the house & their courtyard clean by 23.6% and only the house by 2.7%. Although there was no difference between the illness of the households in the three groups, the first group had fewer households sick in the first fortnight and in any time period.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
House, built area and courtyard	55 (51.9%)	51 (48.1%)	38 (35.8%)	68 (64.2%)	58 (54.7%)	48 (45.3%)
House, built area, courtyard and front of house	135 (45.5%)	162 (54.5%)	116 (39.1%)	181 (60.9%)	155 (52.2%)	142 (47.8%)

OBSERVATIONS OF THE PHYSICAL CHARACTERISTICS OF PLOT, COURTYARD AND HOUSE AND ENVIRONMENT:

COURTYARD FLOOR (47)

The courtyard floor was cemented in about 80% of the houses and 20% had pebble and dirt. This too showed no statistical significance with illness of the household except that households with cemented courtyard floors had more illness..

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Dirt and Pebble	32 (39%)	50 (61%)	25 (30.5%)	57 (69.5%)	41 (50%)	41 (50%)
Cement	158 (49.2%)	163 (50.8%)	129 (40.2%)	192 (59.8%)	172 (53.6%)	149 (46.4%)

POOLS OF STAGNANT WATER IN COURTYARD (50)

Households that had pools of stagnant water in their courtyards were more sick in the first fortnight and in the any time period but was not statistically significant.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	14 (53.8%)	12 (46.2%)	10 (38.5%)	16 (61.5%)	15 (57.7%)	11 (42.5%)
No	176 (46.7%)	201 (53.3%)	144 (38.2%)	233 (61.85)	198 (52.5%)	179 (47.5%)

LEVEL OF TIDINESS: (51)

7.7% of the courtyards were ranked poor, 65.8% ranked fair and 26.6% good.
The level of tidiness of the courtyard showed no statistical significance with illness of the household.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Poor	17 (54.8%)	14 (45.2%)	13 (41.9%)	18 (58.%)	18 (58.%)	13 (41.9%)
Fair	119 (44.9%)	146 (55.1%)	98 (37%)	167 (63%)	130 (49.1%)	135 (50.9%)
Good	54 (50.5%)	53 (49.5%)	43 (40.2%)	64 (59.8%)	65 (60.7%)	42 (39.3%)

NUMBER OF ROOMS (52)

The mean number of rooms was 1.2 and median was 1.
The number of rooms in the household and illness showed no significant association.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
No. of rooms	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1.	153 (46.8%)	173 (53.2%)	125 (38.5%)	200 (61.5%)	171 (52.6%)	154 (47.4%)
2.	32 (46.4%)	37 (53.6%)	26 (37.7%)	43 (62.3%)	36 (52.2%)	33 (47.8%)
3.	6 (66.7%)	3 (33.3%)	3 (33.3%)	6 (66.7%)	6 (66.7%)	3 (33.3%)

CONDITION OF THE STRUCTURE (53)

The structure were well maintained in about 88.6% of the household and badly maintained in 11.4% of the household.

The condition of the structure did show a statistically significant association with illness for the first fortnight and for both fortnights.

Although there was no statistical significance, the percentage of household that had illness were more in the badly maintained category.

	FIRST FORTNIGHT *		**SECOND FORTNIGHT**		**ANY TIME**	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Very well or reasonably maintained	162	195	141	216	184	173
	(45.4%)	(54.6%)	(39.5%)	(60.5%)	(51.5%)	(48.5%)
Somewhat badly or very badly maintained	28	18	13	33	29	17
	(60.9%)	(39.1%)	(28.3%)	(71.7%)	(63%)	(37%)

* **Significant about .04 level**

	BOTH FORTNIGHTS *		**EITHER FORTNIGHT**		**ANY TIME**	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Very well reasonably maintained	65 (27.3%)	173 (72.7%)	119 (40.8%)	173 (59.2%)	184 (51.5%)	173 (48.5%)
Somewhat badly or very badly maintained	17 (50%)	156 (59%)	12 (41.4%)	17 (58.6%)	29 (63%)	17 (37%)

* **Significant at the .01 level**

CONDITION OF THE STRUCTURE (53) INCOME < Rs. 1500

When the condition of the structure is stratified by income, there is a significant association of housing structure with household illness in the lower income group in the second fortnight at .08 level of significance.

	FIRST FORTNIGHT		* SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Very well or reasonably maintained	74 (47.1%)	83 (52.9%)	24 (22.4%)	83 (77.6%)	98 (54.1%)	83 (45.9%)
Somewhat badly or very badly maintained	7 (46.7%)	8 (53.3%)	7 (46.7%)	8 (53.3%)	14 (63.6%)	8 (36.4%)

* **Significant at the .08 level.**

CONDITION OF THE STRUCTURE (53) INCOME > Rs. 1500

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Very well or reasonably maintained	45 (33.3%)	90 (60.7%)	41 (31.3%)	90 (68.7%)	86 (48.9%)	90 (51.1%)
Somewhat badly or very badly maintained	5 (35.7%)	9 (64.3%)	10 (52.6%)	9 (47.4%)	15 (62.5%)	9 (37.5%)

COURTYARD WHEN USED FOR ANIMAL HUSBANDRY (54)

The courtyard was used for animal husbandry by 9.2% of the households and they had more illness in the second fortnight and any time but again this relationship was not statistically significant.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	20	17	17	20	20	17
	(41%)	(45.9%)	(45.9%)	(54.1%)	(54.1%)	(45.9%)
No	170	196	137	229	193	173
	(46.4%)	(53.6%)	(37.4%)	(62.2%)	(52.7%)	(47.3%)

CONTAINMENT OF ANIMALS (55)

If the households did have animals, 40.5% households had them loose in the courtyard and 59.5% had them in an enclosed space.

The household with free wandering animals had more illness and this was statistically significant for the any time period.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Free Wandering	11	4	10	5	11	4
	(73.31%)	(26.7%)	(66.7%)	(33.3%)	(73.3%)	(26.7%)
Closed Space	9	13	7	15	9	13
	(40.9%)	(59.1%)	(31.8%)	(68.2%)	40.9%)	(59.1%)

~ **Significant about .05**

DISPOSAL OF ANIMAL WASTES. (56)

The household that did not dispose animal waste i.e.(56.3%) did have more illness in the first fortnight and in any fortnight but showed no statistical association with illness of the household.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	20	18	17	21	20	18
	(52.6%)	(47.4%)	(44.7%)	(55.3%)	(52.6%)	(47.4%)
No	28	21	21	28	30	19
	(57.1%)	(42.9%)	(42.9%)	(57.1%)	(61.2%)	(38.8%)

FREQUENCY OF DISPOSAL OF ANIMAL WASTE (56-A)

Frequency of disposal of animal waste did show an inverse association with illness but no significant association with illness of the household. Households that did it daily, had more illness versus those who did it every other day.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
Frequency	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Daily	16 (53.3%)	14 (46.7%)	14 (46.7%)	16 (53.3%)	16 (53.3%)	14 (46.7%)
Every other day	3 (42.9%)	4 (57.1%)	3 (42.9%)	4 57.1%)	3 (42.9%)	4 (52%)
Other	1 (100%)		1 (100%)			

DISPOSAL OF HOUSEHOLD REFUSE: (57)

Temporary disposal of household refuse in the courtyard was done by 49.3% (198 households). They had less illness as compared to the other group that did not but this was not statistically significant.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	Sick	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Yes	87	111	65	170	101	97
	(43.9%)	(56.1%)	(34.3%)	(65.7%)	(51%)	(49%)
No	103	101	86	118	112	92
	(50.5%)	(49.5%)	(42.2%)	(57.8%)	(54.9%)	(45.1%)

REFUSE KEPT OUT OF CHILDREN'S REACH (58)

Refuse was kept out of children's reach in 93.9% of the households, the illness was less in the households in the first fortnight and in any time period but was not statistically significant.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
YES	80 (43.2%)	105 (56.8%)	64 (34.6%)	121 (65.5%)	94 (50.8%)	91 (49.2%)
NO	7 (53.8%)	6 (46.2%)	4 (30.8)	9 (69.2%)	7 (53.8%)	6 (46.2%)

COMMON LATRINES ON THE PLOT (shared by more than one family) (59)

98.5% of the households had common latrines on the plot. These households had more illness in the second fortnight and in any time period but not statistically significant.
The number of households with no common latrines was very small, therefore no statistical significance could emerge.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
YES	187 (47.1%)	210 (52.9%)	153 (38.5%)	244 (61.5%)	210 (52.9)	187 (47.1%)
NO	3 (50%)	3 (50%)	1 (16.7%)	5 (83.5%)	3 (50%)	3 (50%)

HOW MANY PEOPLE SHARE THIS COURTYARD. (60)

The mean no. of people sharing a courtyard was 7.1 $\pm$ 2.87 with a median of 7.
The number of people that do share a courtyard did not show any association with illness of the household.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
No. of people	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 8	138 (47.4%)	153 (52.6%)	109 (37.5%)	183 (62.5%)	154 (52.9%)	137 (47.1%)
> 8	52 (46.4%)	60 (53.6%)	45 (40.2%)	67 (59.8%)	59 (52.7%)	53 (47.3%)

SOURCE OF DRINKING WATER (61)

The water in Essa Nagri comes from the Karachi Development Authority. 90% of household had shared water connection i.e. standpipes and 6.7% had individual connections. The source of water did not show an association with illness of the household.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
Water Source	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Individual Connection	13 (48.1%)	14 (51.9%)	6 (22.2%)	21 (77.8%)	14 (51.9%)	13 (48.1%)
Shared connection, Wells, Peddlers	177 (47.1%)	199 (52.9%)	148 (39.4%)	228 (60.6%)	199 (52.9%)	177 (47.1%)

STORAGE OF WATER:

Every household stored their water, therefore no cross tabulation could be done..

UTENSIL FOR STORAGE: (63)

Households that stored their water in large water tanks and earthen vessels had less illness as compared to households who stored in smaller containers in the first fortnight and in any time period but reverses in the second fortnight.

	FIRST FORTNIGHT *		SECOND FORTNIGHT		ANY TIME	
Utensil	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Water tanks, Earthen jars.	146 (44.8%)	180 (55.2%)	126 (38.7%)	200 (61.3%)	167 (51.2%)	159 (48.8%)
Plastic Containers,Tin Cans, Drums,Others	44 (57.1%)	33 (42.9%)	28 (36.4%)	49 (63.6%)	46 (59.7%)	31 (40.3%)

* **Significant at the .06 level**

SUPPLY OF WATER FOR OTHER PURPOSES: (64)

No association with household illness but households illness increased if they had shared water connections.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
Water Source	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Individual Connection	6 (31.6%)	13 (68.4%)	5 (26.3%)	14 (73.7%)	7 (36.8%)	12 (63.2%)
Shared Connection, Wells, Peddlers	184 (47.9%)	200 (52.1%)	149 (38.8%)	235 (61.2%)	206 (53.6%)	178 (46.4%)

WHERE THE COOKING IS DONE: (65)

73.9% of the households cooked their food in the courtyard, 5% in the rooms and 21% cooked in a kitchen.

The households that cooked in the Rooms had the most illness, followed by the ones that cooked in the courtyard and then the kitchen and this was statistically significant in the first and both fortnights. Cooking in the room is probably a reflection of a small house and lower socio-economic status.

	FIRST FORTNIGHT *		SECOND FORTNIGHT		~ANY TIME	
Place	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Room	16 (76.2%)	5 (23.8%)	12 (57.1%)	9 (42.9%)	16 (76.2%)	5 (23.8%)
Courtyard	138 (46.3%)	160 (53.7%)	112 (37.6%)	186 (62.4%)	152 (51%)	146 (49%)
Kitchen	36 (43.4%)	47 (56.6%)	30 (36.1%)	53 (63.9%)	45 (54.2%)	38 (45.8%)

* **Significant at the .02 level**
~ **Significant at the .07 level**

	BOTH FORTNIGHTS *		EITHER FORTNIGHT		ANY TIME	
Place	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Room	12 (70.6%)	5 (29.4%)	4 (44.4%)	5 (55.6%)	16 (76.2%)	5 (23.8%)
Courtyard	98 (40.2%)	146 (59.8%)	54 (27%)	146 (73%)	152 (51%)	146 (49%)
Kitchen	21 (35.6%)	38 (64.4%)	24 (38.7%)	38 (61.3%)	45 (54.2%)	38 (45.5%)

* **Significant at the .03 level**

TYPE OF FUEL: (67)

70% of the households used Kerosene as fuel for cooking, 16.6% used wood and only 6% used gas stoves. There was no statistical association seen between household illness and the different fuels used for cooking.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Kerosene	138 (48.8%	145 (51.2%)	113 (39.9%)	170 (60.1%)	151 (53.4%)	132 (46.6%)
Wood	27 (40.3%)	40 (59.7%)	23 (34.3%)	44 (65.7%)	32 (47.8%)	35 (52.2%)
Gas Stove	9 (37.5%)	15 (62.5%)	8 (33.3%)	16 (66.7%)	13 (54.2%)	11 (45.8%)
Cow Dung	1 (100%)	-	1 (100%)	-	1 (100%)	-
Other & combination	15 (53.6%)	13 (46.4%)	9 (32.1%)	19 (67.9%)	16 (57.1%)	12 (42.9%)

NUMBER OF TIMES COOKED PER DAY (68)

The mean number of times a woman cooked per day was 2.23 $\pm$ .423.
As the frequency of cooking increased, the household illness increased. This was significant for first fortnight, both fortnights and any time period. This could be an indirect measure of a mother who took more trouble while preparing the meals. i.e. Fresh food was cooked for every meal and the afternoons food would not be served for the evening meal.

	FIRST FORTNIGHT *		SECOND FORTNIGHT		ANY TIME ~	
No. of times/day	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
2	135 (43.7%)	174 (56.3%)	112 (36.2%)	197 (63.8%)	155 (50.2%)	154 (49.8%)
3	55 (58.5%)	39 (41.5%)	42 (44.7%)	52 (53.3%)	58 (61.7%)	36 (38.3%)

* **Significant at the .01 level**
~ **Significant at the .06 level**

	BOTH FORTNIGHTS *		EITHER FORTNIGHT		ANY TIME ~	
No. of times/day	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1.	92 (37.4%)	154 (62.6%)	63 (29%)	154 (71%)	155 (50.2%)	154 (49.8%)
2.	39 (52%)	36 (48%)	19 (34.5%)	36 (65.5%)	58 (61.7%)	36 (38.3%)

* **Significant at the .03 level.**

~ **Significant at the .06 level.**

NUMBER OF HOURS PER DAY TAKEN UP IN COOKING (69)

The mean number of hours spent on cooking per day was 2.88 ± 1.172 and median was 3 hours.
Households that spent more time on cooking had less illness and this was statistically significant for the any time period.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME ~	
No. of Hours	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1-3 hours	157 (49.2%)	162 (50.8%)	128 (40.1)	191 (59.9%)	177 (55.5%)	142 (44.5%)
4-9 hours	33 (39.3%)	51 (60.7%)	26 (31%)	58 (69%)	36 (42.9%)	48 (57.1%)

~ **Significant at the .05 level.**

LIGHTING FACILITIES: (70)

97.5% of the households had electricity and the rest used kerosene for lighting the home. The lighting facilities did not show a statistical association with illness of the household.

There was more illness in the households that used kerosene, but these households were very few in number.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
Kerosene	5 (50%)	5 (50%)	5 (50%)	5 (50%)	6 (60%)	4 (40%)
Electric	185 (47.1%)	208 (52.9%)	149 (37.9%)	244 (62.1%)	107 (52.7%)	187 (47.3%)

COOLING : (71)

99.5% of the households used fans for cooling purposes, therefore no analysis could be done.

MEASUREMENTS:

AREA OF THE PLOT (72)

The mean area of a plot was 485 ± 67 sq.ft.

It was seen that households with plot sizes of < 400 sq. feet had more illness as compared to larger plots and was statistically significant for second fortnight, both fortnights and any time.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
Area	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 400 Sq. ft.	125 (50.6%)	122 (49.4%)	105 (57.5%)	142 (42.5%)	140 (56.7%)	107 (43.3%)
> 400 Sq. ft.	65 (41.7%)	91 (58.3%)	49 (31.4%)	107 (68.6%)	73 (46.8%)	83 (53.2%)

* **Significant at on 0.09 level**
@ **Significant at on 0.03 level**
~ **Significant at on 0.05 level**

	BOTH FORTNIGHTS *		EITHER FORTNIGHT		ANY TIME ~	
Area	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 400 Sq. Ft.	90 (45.7%)	107 (54.3%)	50 (31.8%)	107 (68.2%)	140 (56.7%)	107 (43.3%)
> 400 Sq. Ft.	41 (33.1%)	83 (66.9%)	32 (27.8%)	83 (72.2%)	73 (46.8%)	83 (53.2%)

* **Significant at the .04 level.**
~ **Significant at the .05 level**

AREA OF THE COURTYARD: (73)

The mean area of the courtyard was 279.5 ± 241.sq.ft.

It was also seen that households with smaller courtyards had more illness versus those with bigger courtyards. This was statistically significant for first, second, both and any time periods.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
AREA	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 200 Sq.Ft.	115 (53%)	102 (47%)	102 (47%)	117 (53%)	128 (59%)	89 (41%)
> 200 Sq.Ft	75 (40.3%)	111 (59.7%)	52 (28%)	34 (72%)	85 (45.7%)	101 (54.3%)

* **Significant at the .01 level**
@ **Significant at the .0001 level**
~ **Significant at the .01 level**

	BOTH FORTNIGHTS *		EITHER FORTNIGHT		ANY TIME ~	
AREA	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 200 Sq.ft.	89 (50%)	89 (50%)	39 (30.5%)	89 (69.5%)	128 (59%)	89 (41%)
> 200 Sq.Ft.	42 (29.4%)	101 (70.6%)	43 (29.9%)	101 (70.1%)	85 (45.7%)	101 (54.3%)

* **Significant at the .001 level**
~ **Significant at the .01 level.**

TEMPERATURE (81)

The mean External Temperature was 94° ± 3.09° F and the median was 93.9° F.

The mean Internal (Room) temperature was 92.57° ± 3.665° F with a median of 92.7°F.

As the average room temperature increases, the illness of the households also increases.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
⩽ 92.6 F	92 (46.9%)	104 (53.1%)	73 (37.2%)	81 (39.1%)	103 (52.6%)	110 (46.9%)
>92.6 F	98 (47.3%)	109 (52.7%)	123 (62.8%)	126 (60.9%)	93 (47.4%)	97 (46.9%)

HUMIDITY: (82)

The mean Internal (Room) Humidity was 39.823% ± 12.625% and the median was 37%.
The mean External Humidity is 37% ± 14.27% and the median was 34.1%.

	FIRST FORTNIGHT		SECOND FORTNIGHT @		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
⩽ 40	101 (43.5%)	131 (56.5%)	79 (34.1%)	75 (43.9%)	115 (49.6%)	98 (57.3%)
> 40	89 (52%)	82 (48%)	153 (65.9%)	96 (56.1%)	117 (50.4%)	73 (42.7%)

@ **Significant at the .05 level.**

As averate room humidity increases, the household with illness increase and is statistically significant at .05 level for second fortnight.

DIFFERENCE BETWEEN EXTERNAL AND INTERNAL

TEMPERATURE AND HUMIDITY:

The Temperature difference = External temperature - Internal Temperature

The Humidity difference = External humidity - Internal humidity.

If the internal (Room) temperature/humidity is higher than the external temperature/humidity the temperature/humidity difference will be less than 0.

If the internal (Room) temperature/humidity is less than the external temperature/humidity the temperature/humidity difference will be greater than 0.

The temperature difference between External and Internal showed no statistical difference with illness, but as the difference increased i.e External temperature greater than internal temperature, the illness increased.

TEMPERATURE DIFFERENCE BETWEEN INTERNAL AND EXTERNAL.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
$\leqslant 0$	36 (45.%)	44 (55%)	29 (36.3%)	51 (63.8%)	41 (51.2%)	39 (48.8%)
> 0	154 (47.7%)	169 (52.3%)	125 (38.7%)	198 (61.3%)	172 (53.3%)	151 (46.7%)

HUMIDITY DIFFERENCE BETWEEN INTERNAL & EXTERNAL

The humidity difference between External and Internal showed a statistical difference for all time periods. As the diffference between external and internal temperature, increased the number of households sick increased and was statistically significant in all time periods except in the second fortnight.

	FIRST FORTNIGHT *		SECOND FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 0	131 (44%)	167 (56%)	106 (35.6%)	192 (64.4%)	147 (49.3%)	151 (50.7%)
> 0	59 (56.2%)	46 (43.8%)	48 (45.7%)	57 (54.3%)	66 (62.9%)	39 (37.1%)

* **Significant at on 0.04 level**
@ **Significant at on 0.08 level**
~ **Significant at on 0.02 level**

	BOTH FORTNIGHTS *		EITHER FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 0	90 (37.3%)	151 (72.6%)	57 (27.4%)	151 (72.6%)	147 (49.3%)	151 (50.7%)
> 0	41 (51.3%)	39 (66.9%)	25 (39.1%)	39 (66.9%)	66 (62.9%)	39 (37.1%)

* **Significant at the .0019 level.**
@ **Significant at the .03 level.**
~ **Significant at the .02 level.**

HUMIDITY DIFFERENCE

When stratified by External humidity i.e when the external humidity is below 33%, the humidiity difference is not significant but there are more houeholds sick when the difference is greater than 0. Similarly when the external humidity is greater than 34%, there are more households sick if the difference was greater than 0, and was statistically significant at the .03 level for the any time period.

EXTERNAL HUMIDITY < 34%

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 0	73 (42.9%)	97 (57.1%)	57 (33.5%)	113 (66.%)	84 (49.4%)	86 (50.6%)
> 0	14 (56%)	11 (44%)	9 (36%)	16 (64%)	14 (56%)	11 (44%)

EXTERNAL HUMIDITY > 34%

	FIRST FORTNIGHT		SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 0	58 (45.3%)	70 (54.7%)	49 (38.3%)	79 (61.7%)	63 (49.2%)	65 (50.8%)
> 0	45 (56.3%)	35 (43.8%)	39 (48.3%)	41 (51.3%)	52 (65%)	28 (35%)

~ Sigificant at the .03 level.

HUMIDITY DIFFERENCE :

When the humidity difference is stratified by Internal room humidity i.e when the internal humidity is below 40%, the humidiity difference is not significant but there are more houeholds sick when the difference is greater than 0.
Similarly when the internal humidity is greater than 40%, there are more households sick if the difference was greater than 0, and was statistically significant for all time periods.

INTERNAL HUMIDITY ⩽ 40%

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
⩽ 0	73 (41.7%)	102 (58.3%)	57 (32.6%)	118 (67.4%)	84 (48%)	91 (52%)
> 0	28 (49.1%)	29 (50.9%)	22 (38.6%)	35 (61.4%)	31 (54.4%)	26 (45.6%)

INTERNAL HUMIDITY > 40%

	* FIRST FORTNIGHT		@ SECOND FORTNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
⩽ 0	58 (47.2%)	65 (52.8%)	49 (39.3%)	74 (60.2%)	63 (51.2%)	60 (48.8%)
> 0	31 (64.6%)	17 (35.4%)	26 (54.2%)	22 (45.8%)	35 (72.9%)	13 (27.1%)

* Significant at the .06 level.

@ Significant at the .12 level.

~ Significant at the .01 level.

DENSITY: Plot Area / Total people in the household. (Sq. Ft./Person)

The smaller the area/person, i.e. the greater the density, the greater the illness found. As the area/person increased, the households illness decreased .
The density is significant at .01 level for all time periods.
There is also a gradient seen i.e. with increasing density, the households illness increases.

	* FIRST FORTNIGHT		@ SECOND FORTNIGHT		~ ANY FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
<16 Sq Ft./ person	66 (56.4%)	51 (43.6%)	60 (51.3%)	57 (48.7%)	75 (64.1%)	42 (35.9%)
16-25 Sq Ft/ person	69 (46%)	81 (54%)	52 (34.7%)	98 (65.3%)	77 (51.3%)	73 (48.7%)
>25 Sq. Ft/ person	55 (40.4%)	81 (59.6%)	42 (30.9%)	94 (69.1%)	61 (44.9%)	75 (55.1%)

* Significant at the .03 level.
@ Significant at the .002 level.
~ Significant at the .008 level.

	* BOTH FORTNIGHT		EITHER FORNIGHT		~ ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 16 Sq.Ft./ Person	51 (54.8%)	42 (42.2%)	24 (36.4%)	42 (63.6%)	75 (64.1%)	42 (35.9%)
16-25 Sq.Ft./ Person	44 (37.6%)	73 (62.4%)	33 (31.1%)	73 (68.9%)	77 (51.3%)	73 (48.7%)
>25 Sq.Ft./ Person	36 (32.4%)	75 (67.6%)	25 (25%)	75 (75%)	61 (44.9%)	75 (55.1%)

* Significant at the .003 level.
~ Significant at the .008 level.

AREA OF ROOM: (78)

The mean area of a room in the houeholds was 160.8 $\pm$ 77.52 Sq.Ft and mean volume of the room was 1518 $\pm$ I804 cubic ft.

The area and volume of the rooms didn't show any statistical significance with illness of the household.

The number of households sick was more in households that had a smaller room area and volume.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
AREA	**SICK**	**NOT SICK**	**SICK**	**NOT SICK**	**SICK**	**NOT SICK**
$\leq$ 150 Ft.	114 (47.7%)	125 (52.3%)	94 (39.3%)	145 (60.7%)	130 (54.41)	109 (45.6%)
> 150 ft.	76 (46.3%)	88 (53.7%)	60 (36.6%)	104 (63.4%)	83 (50.6%)	81 (49.4%)

VOLUME OF ROOM: (80)

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
$\leq$ 1500 ft^3	124 (48.1)	134 (51.91%)	102 (39.5%)	156 (60.5%)	140 (54.3%)	118 (45.7%)
> 1500 ft^3	66 (45.5%)	79 (54.5%)	52 (35.9%)	93 (64.1%)	73 (50.3%)	72 (49.7%)

PEOPLE SLEEPING IN ROOM (83)

The mean no people sleeping in a room was 5.72 ± 2.27. There is a trend seen that as the no. of people sleeping in a room increased illness of the households increased and was statistically significant for the second fortnight and any time.

	FIRST FORTNIGHT		SECOND FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
1	26 (40%)	39 (60%)	14 (21.5%)	51 (78.5%)	28 (43.1%)	37 (56.9%)
2	87 (47%)	98 (53%)	66 (35.7%)	119 (64.3%)	4 (50.8%)	9 (49.2%)
3	112 (50.9%)	108 (49.1%)	99 (45%)	121 (55%)	129 (58.6%)	91 (41.4%)

@ **Significant at the .002 level**
~ **Significant at the .057 level**

PERSONS PER ROOM:

The mean number of persons/room was 6.148 ± 2.436 and a median of 6.
There was no association between household illness and the number of people per room.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 6	83 (47.2%)	93 (52.8%)	68 (38.6%)	108 (61.4%)	96 (54.5%)	80 (45.5%)
≥ 6	107 (47.1%)	120 (52.9%)	86 (37.9%)	141 (62.1%)	117 (51.5%)	110 (48.5%)

VOLUME OF ROOM / PERSON

The volume of room/person did show an association with household illness in the second fortnight.

	FIRST FORTNIGHT		SECOND FORTNIGHT @		ANY TIME ~	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 212 FT^3	101 (50.5%)	99 (49.5%)	89 (44.5%)	111 (55.5%)	115 (57.5%)	85 (42.5%)
⩾ 212 FT^3	89 (43.8%)	114 (56.2%)	65 (32%)	138 (68%)	98 (48.3%)	105 (51.7%)

@ **Significant at the .01 level**
~ **Significant at the .079 level**

DENSITY OF THE ROOM: AREA OF ROOM / PERSONS PER ROOM

The density of the room did not show any association with household illness but the number of households sick increased as the room density increased.

	FIRST FORTNIGHT		SECOND FORTNIGHT		ANY TIME	
	SICK	NOT SICK	SICK	NOT SICK	SICK	NOT SICK
< 22.50	98 (48%)	106 (52%)	81 (39.7%)	123 (60.3%)	110 (53.9%)	94 (46.1%)
⩾ 22.50	92 (46.2%)	107 (53.8%)	73 (36.7%)	126 (63.3%)	103 (51.8%)	96 (48.2%)

CONSTRUCTION MATERIALS:

99% the Houses had walls made out of concrete blocks.

61% had their roofs made from concrete blocks.

90% had their floor made of concrete blocks 91.5% of households did have windows, which were made of a combination of wood and iron.

SECTION IV

PREDICTIVE MODEL

In the bivariate analysis, single and combination of variables was attempted and a test of significance was applied to determine an association. The Positive Predictive Value (PPV), Negative Predictive Value (NPV), Odds Ratio (OR), Confidence interval (CI), Chi Square and P-value are calculated for each model.

Disease

+	-
a	b
c	d

Odds ratio: $\frac{ad}{bc}$

PPV: $\frac{a}{a+b}$

NPV: $\frac{d}{c+d}$

ODDS RATIO: The likelihod of the cases having been exposed to the risk factor was "x" times greater than the non-exposed and this risk is estimated by the odds ratio.

In the households that have an illness, an odds ratio estimates a ratio of the odds of the household have the risk factor and the odds of the household not having the risk factor.

POSITIVE PREDICTIVE VALUE: on the basis of the figures, which measures whether or not a household actually has the disease, given that the household has the risk factor.

NEGATIVE PREDICTIVE VALUE: is the probability that a household is truly disease free given that they do not have the risk factors.

The single variables are risk factors for an household to have a illness, but when combined, the odds of a household having an illness increases substantially as indicated by the odds ratio. Similarly the positive predictive value when calculated for a single variable is very low. When households with more than one characteristic are combined increases the positive predicative value. This means that given the presence of certain characteristics in the household, we can predict with a certain amount of certainty that this household will develop disease. Therefore we can develop a predictive model by a combination of factors. This type of modelling can enable us to pinpoint households at risk which could be the target of our intervention programs.

The positive predictive value of a single variables did not exceed 66% except for where the cooking was done in a room where it increased the positive predictive value to 76%. In the combination models, the positive predictive values did not exceed 83.3%. The possible reasons are that the combination of variables is only taking into account the household and environmental characteristics and not the child's own individual characteristics, i.e. age and nutritional status. The latter have not been taken into account because the unit of analysis is a household and not a child.

It needs to be noted that the numbers in the cells become very small as the number of variables increases as we are now restricting the households who are included in the model. The models with the highest positive predictive value are number 9, 11 and 16 which have predictive values of 80%, 83% and 83.3% respectively.

In the single variables analysis, the odds ratio range from 1.1. to 2.6, except in cases where the the cooking was done in the room which increased the odds ratio to 4.18. The confidence intervals are narrow and most of them do not include 1 (i.e. the null value). The models where the variables have been combined have odds ratios greater than 7 with wider confidence intervals that do not include 1. The confidence intervals of these models are wide because of the small numbers in the cells.

SINGLE VARIABLES:

AGE OF THE CHILDREN:

		Disease		
		Yes	No	Total
1 - 3 year		115	169	284
3 - 5 year		75	183	258
	Total	190	352	542

PPV	=	40%
NPV	=	70.9%
OR	=	1.66
CI	=	1.16 - 2.376
Chi Sq.	=	7.255
P. Value	=	<.05

AGE OF THE CHILDREN:

		Disease		
		Yes	No	Total
0 - 1 year		59	94	153
3 - 5 year		75	183	258
	Total	190	352	411

PPV	=	38.5%
NPV	=	70.9%
OR	=	1.56
CI	=	1.02 - 2.386
Chi Sq.	=	3.919
P. Value	=	<.05

NUTRITIONAL STATUS

		Disease		
		Yes	No	Total
Grade 2		30	26	56
Normal		109	248	357
	Total	139	274	413

PPV	=	53.5%
NPV	=	69.4%
OR	=	2.63
CI	=	1.438-4.649
Chi Sq.	=	10.499
P. Value	=	<.05

NUTRITIONAL STATUS:

		Disease		
		Yes	No	Total
Grade 3		4	2	6
Normal		109	248	357
	Total	113	250	363

PPV	=	66%
NPV	=	69.4%
OR	=	4.55
CI	=	0.821-25.217
Chi Sq.	=	2.106
P. Value	=	>.05

EDUCATION OF MOTHER:

		Disease		
		Yes	No	Total
Illiterate		94	105	199
Literate		96	108	204
	Total	190	213	403

PPV = 47.2%
NPV = 52.9%
OR = 1.01
CI = 0.681-1.489
Chi Sq. = 0.004
P. Value = >.05

OCCUPATION OF HEAD OF THE HOUSEHOLD:

		Disease		
		Yes	No	Total
Cleaners		86	74	160
Painters, Construction Workers Carpenters, Household Assistants		84	118	202
	Total	170	192	362

PPV = 53.7%
NPV = 60.2%
OR = 1.63
CI = 1.075-2.48
Chi Sq. = 4.82
P. Value = <.05

INCOME OF HEAD OF THE HOUSEHOLD:

		Disease		
		Yes	No	Total
Rs. < 1300		110	98	208
Rs. > 1300		78	115	193
	Total	188	213	401

PPV	=	52.8%
NPV	=	59.5%
OR	=	1.65
CI	=	1.114-2.459
Chi Sq.	=	5.761
P. Value	=	<.05

WHERE DO UNDER 5 CHILDREN PLAY

		Disease		
		Yes	No	Total
Lanes and Courtyard		55	43	98
Rooms and Courtyard		134	170	304
	Total	189	213	402

PPV	=	56.1%
NPV	=	55.9%
OR	=	1.62
CI	=	1.026-2.564
Chi Sq.	=	3.84
P. Value	=	<.05

NUMBER OF CHILDREN <5:

		Disease		
		Yes	No	Total
2		94	77	171
1		61	109	170
	Total	155	186	341

PPV	=	56.7%
NPV	=	64.1%
OR	=	2.32
CI	=	1.28-4.186
Chi Sq.	=	7.099
P. Value	=	<.05

NUMBER OF CHILDREN < 5:

		Disease		
		Yes	No	Total
3		35	27	62
1		61	109	170
	Total	96	136	232

PPV	=	56.4%
NPV	=	64.1%
OR	=	2.18
CI	=	1.412-3.369
Chi Sq.	=	11.770
P. Value	=	<.05

CLEANING OF SEWERS:

		Disease		
		Yes	No	Total
Regularly		41	23	64
When needed		145	187	332
	Total	186	210	396

PPV = 64%
NPV = 56.3%
OR = 2.3
CI = 1.32-4.0
Chi Sq. = 8.154
P. Value = <.05

PRESENCE OF SEWERS IN THE NEIGHBORHOOD:

		Disease		
		Yes	No	Total
Yes		52	37	89
No		138	176	314
	Total	190	213	403

PPV = 58.4%
NPV = 56%
OR = 1.79
CI = 1.113-2.887
Chi Sq. = 5.267
P. Value = <.05

WHERE THE COOKING IS DONE:

		Disease		
		Yes	No	Total
Room		16	5	21
Kitchen		36	47	83
	Total	52	52	104

PPV = 76%
NPV = 56.6%
OR = 4.18
CI = 1.399-12.476
Chi Sq. = 5.967
P. Value = <.05

WHERE THE COOKING IS DONE:

		Disease		
		Yes	No	Total
Room		16	5	21
Courtyard		138	160	298
	Total	154	165	319

PPV = 76%
NPV = 53.6%
OR = 3.71
CI = 1.325-10.389
Chi Sq. = 5.869
P. Value = <.05

HOUSING STRUCTURE:

		Disease		
		Yes	No	Total
Very well maintained		28	18	46
Badly maintained		162	195	357
	Total	190	213	403

PPV = 60.8%
NPV = 54.6%
OR = 1.87
CI = 1-3.5008
Chi Sq. = 3.327
P. Value = <.05

AREA OF VERANDAH

		Disease		
		Yes	No	Total
< 200 sq.ft.		115	102	217
> 200 sq.ft.		75	111	186
	Total	190	213	403

PPV = 52.9%
NPV = 59.6%
OR = 1.67
CI = 1.123-2.48
Chi Sq. = 5.956
P. Value = <.05

DENSITY: (AREA OF PLOT / PERSONS IN THE HOUSEHOLD)

		Disease		
		Yes	No	Total
< 16 sq.ft./person		66	51	117
> 25 sq.ft./person		55	81	136
	Total	121	132	253

PPV = 56.4%
NPV = 59.5%
OR = 1.96
CI = 1.236-3.090
Chi Sq. = 7.638
P. Value = <.05

DENSITY: (AREA OF THE PLOT / PERSONS IN THE HOUSEHOLD)

		Disease		
		Yes	No	Total
16 sq.ft./person		66	51	117
16-25 sq.ft./person		69	81	150
	Total	135	132	267

PPV = 56.4%
NPV = 54%
OR = 1.57
CI = 0.99-2.49
Chi Sq. = 3.28
P. Value = >.05

PERSONS PER ROOM:

		Disease		
		Yes	No	Total
> 6 persons / room		107	120	227
< 6 persons / room		83	93	176
	Total	121	132	403

PPV = 47.1%
NPV = 52.8%
OR = 1.0
CI = .67 - 1.48
Chi Sq. = .009
P. Value = >.05

HUMIDITY DIFFERENCE:

		Disease		
		Yes	No	Total
>0		59	46	105
<0		131	167	298
	Total	190	213	403

PPV = 56.1%
NPV = 56%
OR = 1.64
CI = 1.04-2.56
Chi Sq. = 4.183
P. Value = <.05

TABLE 1: SUMMARY OF THE SINGLE VARIABLE ANALYSIS

Variables	PPV	NPV	OR	CI	Chi Sq.	P.Value
Ages : (1-3) (3-5)	40.4%	70.9%	1.66	(1.160-2.376)	7.255	<.05
Ages : (0-1) (3-5)	38.5	70.9	1.56	(1.02-2.386)	3.919	<.05
Nutrition - Grade (2, 0)	53.5%	69.4%	2.63	(1.438-4.649)	10.499	<.05
Nutrition - Grade (3, 0)	66%	69.4%	4.55	(0.821-25.217)	2.106	>.05
Education of mother (Illiterate, Literate)	47.2%	52.9%	1.01	(0.681-1.489)	.004	>.05
Occupation: Cleaners, Painters	53.7%	60.2%	1.63	(1.075-2.48)	4.82	<.05
Income <1300, >1300	52.8%	59.5%	1.65	(1.114-2.459)	5.761	<.05
Where <5 children play: rooms & courtyard, courtyard & lanes	56.1%	55.9%	1.62	(1.026-2.564)	3.84	<.05
No. of children <5: 2, 1	56.7%	64.1%	2.32	(1.28-4.186)	7.099	<.05
No. of children <5: 3, 1	56.4%	64.1%	2.18	(1.412-3.369)	11.770	<.05
Cleaning Sewers: Regularly, Occasionally	64%	56.3%	2.30	(1.32-4)	8.154	<.05
Presence of sewers in the neighbourhood (Yes, No)	58.4%	56%	1.79	(1.399-12.476)	5.267	<.05
Cooking: Room, Kitchen	76%	56.6%	4.18	(1.113-2.887)	5.967	<.05
Cooking:Room,Courtyard	76%	53.6%	3.71	(1.325-10.389)	5.869	<.05
Housing structure (Poor, Good)	60.8%	54.6%	1.87	(1-3.5)	3.327	>.05
Area Verandah (<200 sq.ft, >200 sq.ft.)	52.9%	59.6%	1.67	(1.123-2.48)	5.956	<.05
Density (<16 sq.ft, >25 sq.ft.)	56.4%	59.5%	1.96	(1.236-3.090)	7.638	<.05
Density (<16 sq.ft.,16-25 sq.ft.)	56.4%	54%	1.57	(0.99-2.49)	3.28	>.05
Persons per room	47.1%	52.8%	1	(.67-1.48)	.009	>.05
Humidity difference	56.1%	56%	1.64	(1.04-2.56)	4.183	<.05

COMBINATION OF VARIABLES:

MODEL 1:

Disease

	Yes	No	Total
Mother illiterate, income < Rs.1300.	58	50	108
Mother literate > 1 grade and income > Rs.1300.	42	60	102
Total	100	110	210

PPV = 53%
NPV = 58%
OR = 1.66
CI = 0.96-2.862
Chi Sq. = 2.817
P. Value = >.05

MODEL 2:

Disease

	Yes	No	Total
Mother illiterate, income < Rs.1300 & children <5 more than 1.	38	25	63
Mother literate > 1 grade, income > Rs.1300 and children <5 = 1	15	32	47
Total	53	57	110

PPV = 60%
NPV = 68%
OR = 3.24
CI = 1.465-7.176
Chi Sq. = 7.59
P. Value = <.05

MODEL 3:

Mother illiterate, income < Rs.1300 & children <5 more than 1 & play in lanes and courtyard.

Income > Rs.1300, children <5 = 1 and play in the rooms & courtyard.

		Disease		
		Yes	No	Total
		4	7	11
		8	24	34
Total		12	94	45

PPV	=	36%
NPV	=	75%
OR	=	1.71
CI	=	0.396-7.4
Chi Sq.	=	0.112
P. Value	=	>.05

MODEL 4:

Income < Rs.1300 & children <5 more than 1 & have a business on the plot.

Income > Rs.1300, children <5 = 1 and do not have a business in the plot.

		Disease		
		Yes	No	Total
		3	1	4
		18	23	41
Total		48	33	81

PPV	=	75%
NPV	=	56%
OR	=	3.83
CI	=	0.367-40
Chi Sq.	=	0.442
P. Value	=	>.05

MODEL 5:

Income < Rs.1300 & children <5 more than 1 & visible/overflowing sewers next to the home.

Income > Rs.1300, children <5 = 1 and not visible/overflowing sewers next to the home.

		Disease		
		Yes	No	Total
		22	9	31
		21	50	71
Total		43	140	101

PPV	=	70.9%
NPV	=	70%
OR	=	5.82
CI	=	2.3-14.72
Chi Sq.	=	13.5
P. Value	=	<.05

MODEL 6:

Income < Rs.1300 & children <5 more than 1 and badly maintained house.

Income > Rs.1300, children <5 = 1 and reasonably maintained house.

		Disease		
		Yes	No	Total
		14	5	19
		24	58	82
Total		38	63	101

PPV	=	73%
NPV	=	70.7%
OR	=	6.77
CI	=	2.296-20.874
Chi Sq.	=	11.44
P. Value	=	<.05

MODEL 7:

Income < Rs.1300, children <5 more than 1, badly maintained house and cooks in the room.

Income > Rs.1300, children <5 =1, a reasonably maintained house and cooks in the courtyard or kitchen.

	Disease		
	Yes	No	Total
	2	1	3
	23	58	81
Total	25	59	84

PPV	=	66%
NPV	=	71.6%
OR	=	5.04
CI	=	0.436-58.36
Chi Sq.	=	0.610
P. Value	=	>.05

MODEL 8:

Children <5 more than 1, badly maintained house and cooks in the room.

Children <5 = 1, reasonably maintained house and cooks in the courtyard or kitchen.

	Disease		
	Yes	No	Total
	3	1	4
	51	100	151
Total	54	101	155

PPV	=	75%
NPV	=	66%
OR	=	5.88
CI	=	0.597-57.88
Chi Sq.	=	1.384
P. Value	=	>.05

MODEL 9:

Children <5 more than 1, badly maintained house, density <16 sq.ft. per person.

Children <5 = 1, reasonably maintained house and density >16 sq.ft. per person.

	Disease		
	Yes	No	Total
	8	2	10
	35	74	109
Total	43	76	119

PPV	=	80%
NPV	=	67%
OR	=	8.46
CI	=	1.7-41.9
Chi Sq.	=	7.146
P. Value	=	<.05

MODEL 10:

Children <5 more than 1, humidity difference >0, density <16 sq.ft. per person.

Children <5 = 1, humidity difference <0, density >16 sq.ft. per person.

	Disease		
	Yes	No	Total
	15	5	20
	27	63	90
Total	42	68	110

PPV	=	75%
NPV	=	70%
OR	=	7
CI	=	2.312-21.198
Chi Sq.	=	12.197
P. Value	=	<.05

MODEL 11:

Children <5 more than 1, humidity difference >0, density <16 sq.ft. per person, persons per room >6

Children >5 = 1, humidity difference <0, density >16 sq.ft. per person and person per room <6.

		Disease		
		Yes	No	Total
		5	1	6
		18	43	61
Total		23	44	67

PPV	=	83%
NPV	=	70.4%
OR	=	11.94
CI	=	1.3-109.587
Chi Sq.	=	4.837
P. Value	=	<.05

MODEL 12:

Children <5 more than 1, density <16 sq.ft. per person and person per room >6.

Children <5 = 1, density >16 sq.ft. per person and person per room <6.

		Disease		
		Yes	No	Total
		15	13	28
		21	52	73
Total		36	65	101

PPV	=	53%
NPV	=	71%
OR	=	2.86
CI	=	1.163-7.021
Chi Sq.	=	4.4
P. Value	=	<.05

MODEL 13:

Clean sewers regularly, density <16 sq.ft. per person and person per room >6.

Clean sewers when needed, density >16 sq.ft. per person and person per room <6.

	Disease		
	Yes	No	Total
	3	2	5
	50	84	134
Total	53	86	139

PPV	=	60%
NPV	=	62%
OR	=	2.52
CI	=	0.407-15.6
Chi Sq.	=	0.310
P. Value	=	>.05

MODEL 14:

Open, flowing, stagnant sewers in neighbourhood, density <16 sq.ft. per person, person per room >6.

No open, flowing, stagnant sewers in the neighbourhood, density >16 sq.ft./person and person/room <6.

	Disease		
	Yes	No	Total
	5	4	9
	44	81	125
Total	49	85	133

PPV	=	55%
NPV	=	66.9%
OR	=	2.309
CI	=	0.588-9.011
Chi Sq.	=	0.751
P. Value	=	>.05

MODEL 15:

Open, flowing, stagnant sewers in neighbourhood, density <16 sq.ft. per person.

No open flowing, stagnant sewers in the neighbourhood, density >16 sq.ft. per person.

		Disease		
		Yes	No	Total
		18	8	26
		90	133	223
Total		108	141	249

PPV	=	69%
NPV	=	59.6%
OR	=	3.33
CI	=	1.36-7.97
Chi Sq.	=	6.77
P. Value	=	<.05

MODEL 16:

Mother illiterate, income <1300, children <5 more than 1 and cleaning of sewers regularly.

Mother illiterate, income >1300, children <5 = 1 and clean as and when needed.

		Disease		
		Yes	No	Total
		10	2	12
		10	15	25
Total		20	17	37

PPV	=	83.3%
NPV	=	42.5%
OR	=	7.5
CI	=	1.348-41.725
Chi Sq.	=	4.510
P. Value	=	<.05

TABLE 2: COMBINATION OF VARIABLES: SUMMARY OF ANALYSIS:

S.#	Variables	PPV	NPV	OR	CI	Chi Sq.	P.Value
1.	Mother illiterate, Income < Rs 1300.	53%	58%	1.66	0.96-2.862	2.817	>.05
2.	Mother illiterate, Income < Rs 1300 and children <5 more than 1.	60%	68%	3.24	1.465-7.176	7.59	<.05 *
3.	Mother illiterate, Income < Rs 1300 children <5 more than 1 and children play in lanes and courtyard.	36%	75%	1.71	0.396-7.4	0.112	>.05
4.	Income < Rs 1300, children <5 more than 1 and have a business on the plot.	75%	56%	3.83	0.367-40	0.442	>.05
5.	Income < Rs 1300, children <5 more than 1 and visible or overflowing sewers next to the home.	70.9%	70%	5.82	2.3-14.72	13.5	<.05 *
6.	Income < Rs 1300, children <5 more than 1 and badly maintained house.	73%	70.7%	6.77	2.196-20.874	11.44	<.05 *
7.	Income < 1300, children <5 more than 1, badly maintained house and cooks in the room.	66%	71.6%	5.04	0.436-58.36	0.610	>.05

* Significant Result.

TABLE 2 CONTINUED

S.#	Variables	PPV	NPV	OR	CI	Chi Sq.	P.Value
8.	Children <5 more than 1, badly maintained house and cooks in the room.	75%	66%	5.88	0.597-57.88	1.384	>.05
9.	Children <5 more than 1, badly maintained house, density <16 sq.ft./person.	80%	67%	8.46	1.7-41.9	7.146	<.05 *
10.	Children <5 more than 1, humidity difference >0, density <16 sq.ft./person.	75%	70%	7	2.312-21.198	12.197	<.05 *
11.	Children <5, more than 1, humidity difference >0, density <16 sq.ft./person & person/room >6.	83%	70.4%	11.94	1.3-109.587	4.837	<.05 *
12.	Children <5 more than 1, density <16 sq.ft./person and person per room >6.	53%	71%	2.86	1.163-7.021	4.4	<.05 *
13.	Clean sewers regularly, density < 16 sq.ft./person and person per room >6.	60%	62%	2.52	0.407-15.6	0.310	>.05
14.	Open, flowing, stagnant sewers in neighbourhood, density <16 sq.ft./person, person per room >6.	55%	66.9%	2.309	0.588-9.011	0.751	>.05
15.	Open, flowing, stagnant sewers in neighbourhood, density <16 sq.ft./person.	69%	59.6%	3.33	1.36-7.97	6.77	<.05 *
16.	Mother illiterate, income < Rs 1300, children <5 more than 1 and cleaning of sewers regularly.	83.3%	42.5%	7.5	1.348-41.725	4.510	<.05 *

* Significant Result.

SECTION V

INDIVIDUAL DISEASE ANALYSIS:

DIARRHOEA:

To see the effect of individual household and environmental characteristics on individual diseases the households with diarrhoea and households with no disease have been cross tabulated with those characteristics.

The significant factors are as follows:

- Number of under 5 children,
- Cleaning of the sewers,
- Where the cooking was done,
- Density of the house.

14: NUMBER OF CHILDREN UNDER 5:

As the number of children under 5 years old increased, the number of households sick with diarrhoea increased and this was significant at the .08 level for the first fortnight.

	* FIRST FORTNIGHT		SECOND FORTNIGHT	
No. of children under 5 years	**SICK**	**NOT SICK**	**SICK**	**NOT SICK**
1	15 (12.1%)	109 (87.9%)	15 (8.8%)	155 (91.2%)
2	17 (18.1%)	77 (81.9%)	11 (6.4%)	160 (93.6%)
3	10 (27%)	27 (73%)	7 (11.3%)	55 (88.7%)

* **Significant at the .08 level.**

22: CLEANING OF THE SEWERS :

There were more households sick with diarrhoea that cleaned their sewers regularly and this was statistically significant at the .02 level for the first fortnight.

	* FIRST FORTNIGHT		SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
Never	0	2 (100%)	4 (100%)	0
When needed	30 (13.8%)	187 (86.2%)	27 (8.1%)	305 (91.9%)
Regularly	12 (34.3%)	23 (65.7%)	6 (9.4%)	58 (90.6%)

* Significant at the .02 level.

DENSITY = AREA OF THE PLOT / NUMBER OF PEOPLE IN THE HOUSEHOLD

As the household density increased the number of households sick with diarrhoea increased and was statistically significant at the .07 level for the second fortnight.

	FIRST FORTNIGHT		* SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
< 16 Sq. Ft/ Person	15 (22.7%)	51 (77.3%)	15 (12.8%)	102 (87.2%)
16-25 Sq. Ft/ Person	16 (16.5%)	81 (83.5%)	11 (7.3%)	139 (92.7%)
> 25 Sq. Ft/ Person	11 (12%)	81 (88%)	7 (5.1%)	129 (94.9%)

* Significant at the .07 level.

65: WHERE THE COOKING IS DONE:

If the cooking was done in the room, the household sick with diarrhoea increased and was statistically significant at the .001 level for the first fortnight.

	* FIRST FORTNIGHT		SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
Room	6 (54.5%)	5 (45.5%)	4 (19%)	17 (81%)
Courtyard	31 (16.2%)	160 (83.8%)	24 (8.1%)	274 (91.9%)
Kitchen	5 (9.6%)	47 (90.4%)	5 (6%)	78 (94%)

* Significant at the .0013 level.

ACUTE RESPIRATORY INFECTION:

Households with acute respiratory infection and households with no disease have been cross tabulated with certain household characteristics.

The significant factors are as follows:

- number of children under 5 years of age,
- humidity difference,
- volume of the room/person,
- area of courtyard,
- structure of the house
- room temperature

Q14: NUMBER OF CHILDREN UNDER 5:

As the number of under 5 children increased, households had more acute respiratory illness which was statistically significant at the .02 level in the second fortnight.

	FIRST FORTNIGHT		@ SECOND FORTNIGHT	
No. of children under 5 years	**SICK**	**NOT SICK**	**SICK**	**NOT SICK**
1	13 (10.7%)	109 (89.3%)	12 (9.3%)	117 (90.7%)
2	24 (23.8%)	77 (76.2%)	13 (11.4%)	101 (88.6%)
3	8 (22.9%)	27 (77.1%)	8 (79.5%)	31 (20.5%)

@ Significant at the .02 level.

HUMIDITY DIFFERENCE BETWEEN EXTERNAL AND INTERNAL:

As the difference between external and internal humidity increased, the number of households with acute respiratory illness increased and was statistically significant at the .006 level for the first fortnight.

	* FIRST FORTNIGHT		SECOND FORTNIGHT	
	1	0	1	0
< 0	26 (13.5%)	167 (86.5%)	22 (10.3%)	192 (89.7%)
> 0	19 (29.2%)	46 (70.8%)	11 (16.2%)	57 (83.8%)

* Significant at the .0068 Level.

VOLUME OF ROOM / PERSON:

If the volume of room per person was < 212 $Ft.^3$, the number of households sick was more and was statistically significant at the .06 level for the second fortnight.

	FIRST FORTNIGHT		* SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
< 212 $FT.^3$	23 (18.9%)	99 (81.8%)	21 (15.9%)	111 (84.1%)
> 212 $FT.^3$	22 (16.2%)	114 (83.8%)	12 (8%)	138 (92%)

* Significant at the .06 Level.

AREA OF THE COURTYARD:

If the area of the courtyard was less than 200 Sq. Ft. there were more households which had acute respiratory illness and was statistically significant at the .08 level for the second fortnight.

	FIRST FORTNIGHT		* SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
< 200 Sq.Ft.	25 (19.7%)	102 (80.3%)	21 (15.4%)	115 (84.6%)
> 200 Sq.Ft.	20 (15.3%)	111 (84.7%)	12 (8.2.%)	134 (91.8%)

* Significant at the .08 Level.

53 STRUCTURE OF THE HOUSE:

If the structure of the house was badly maintained, there were more households which had acute respiratory illness and this was statistically significant at the .04 level for the first fortnight.

	* FIRST FORTNIGHT		SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
Very well or reasonably maintained	36 (15.6%)	195 (84.4%)	28 (11.5%)	216 (88.5%)
Somewhat badly or very badly maintained	9 (33.3%)	18 (66.7%)	5 (13.2%)	33 (86.8%)

* Significant at the .04 Level.

TEMPERATURE:

If the temperature within the house was less the 92° F, there were more households which had acute respiratory illness and this was statistically significant at the .05 for the first fortnight and .007 level for the second fortnight.

	* FIRST FORTNIGHT		@ SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
< 92° F	28 (30.4%)	64 (69.6%)	23 (31.5%)	50 (68.5%)
> 92° F	17 (17.3%)	81 (82.7%)	10 (12.3%)	71 (87.7%)

* Significant at the .05 level.

@ Significant at the .007 level.

HUMIDITY:

When the room humidity is > 40%, there are more households which had acute respiratory illness in the second fortnight but was not statistically significant.

	FIRST FORTNIGHT		SECOND FORTNIGHT	
	SICK	NOT SICK	SICK	NOT SICK
< 40	24 (23.8%)	77 (76.2%)	19 (24.1%)	60 (75.9%)
> 40	21 (23.6%)	68 (76.4%)	14 (18.7%)	61 (81.3%)

SECTION VI

MULTIVARIATE ANALYSIS

Logistic regression has been used to do the multivariate analysis as the outcome is dichotomous i.e. sick or not sick.

The analysis has been done in two ways:

1. The unit of analysis is the household
2. The unit of analysis is the child.

The latter was done because the child's own individual characteristics like age and nutritional status could not be assessed in the household model.

Most of the variables that were significant in the bivariate analysis are also significant in the logistic regression model. Forward selection of the variables was done. The interactions were generated but none were significant and therefore not included in the model.

The final model is a model with ten variables which were all significant. Further adjustment did not change the conclusions. The stepwise models with their coefficients are shown in Table 1 and 3 for the house and child models respectively. The estimated odds ratios of individual coefficients and for the different models is shown in Table 2 and 4 for the house and child models respectively.

Various models have been attempted in the household and child analysis models. The household and environment variables have been looked into separately and their effect has been estimated independently of each other.

1: UNIT OF ANALYSIS: HOUSEHOLD

The logistic regression modelling shows that the estimated odds for a household to have an illness which had three children, density < 16 Sq.Ft / person, and the children > 5 years played in the lanes was 8.8, after adjusting for all other variables in the model. This was the maximum obtained odds ratio for a combination of variables as seen in model No. 11 and it contains 10 variables that were all significant in the model.

The maximum odds ratio obtained if only the house and environment variables were used in the model was 3.6 as seen in model No.17 (OR^{16}). If the number of children in the household is included i.e. three children, and if the cooking was done in the room, and had a household density of < 16 Sq.Ft./person, when all other variables are controlled for in the model, the odds ratio increased to 6 as seen in model No. 20 (OR^{19}) but Model No. 11 (OR^{15}) is the full model where the odds ratio had increased to 8.8.

The codes of the variables used in the models are as follows:

Sick_2w:	Household illness in the last two weeks.
W2_ch:	Child ill in the last two weeks.
q11a:	income of the head of the household.
q14:	Number of children under 5 years in the household.
q22:	Cleaning of the sewers.
q31:	Where the under 5 years old children play.
q32:	Where the over 5 years old children play.
q45:	Presence of sewers in the neighborhood of the house.
q53:	Structure of the house.
q65:	Where the cooking is done.
Humd_dif:	Difference between external and internal humidity.
Dens3:	Density of the household. (Plot Area/number of people in the household.
Agecat:	Age categories to which the children belonged to.
Q27:	Nutritional status of the children under 5 years.

FINAL MODEL:

Logit sick_2w q11a q14 q22 q31 q32 q45 q53 q65 humd_dif dens3

Iteration 0: Log Likelihood =-278.68163
Iteration 1: Log Likelihood =-250.25349
Iteration 2: Log Likelihood =-249.74966
Iteration 3: Log Likelihood =-249.74816
Iteration 4: Log Likelihood =-249.74816

Logit Estimates — Number of obs = 403
chi2(10) = 57.87
Log Likelihood =-249.74816 — Prob > chi2 = 0.0000

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
sick_2w					.471464
q11a	.5158233	.2211779	2.332	0.020	.5210918
q14	.4726175	.1555732	3.038	0.003	1.73201
q22	.7037673	.2824313	2.492	0.013	1.141439
q31	.509969	.2646828	1.927	0.055	1.243176
q32	.3390233	.1778655	1.906	0.057	2.414392
q45	.5571739	.2612355	2.133	0.034	.2208437
q53	.6076034	.3501195	1.735	0.083	.1141439
q65	1.022499	.5604981	1.824	0.069	.0521092
humd_dif	.4476395	.2470994	1.812	0.071	.2605459
dens3	.3427324	.1385712	2.473	0.014	1.952854
_cons	-4.492575	.7605042	-5.907	0.000	1

TABLE: 1 COEFFICIENTS OF VARIABLES IN THE HOUSE MODEL:

	1	2	3	4	5	6
CONSTANT	- .114268	- .3882232	-1.215328	-2.010948	-2.82853	-3.588523
Q11a		.5217548	.4916006	.5412808	.6314119	.6070571
Q14			.4855915	.4723159	.4626972	.4950573
Q22				.694207	.7236057	.7107374
Q31					.605758	.4459811
Q32						.3843985
Q45						
Q53						
Q65						
Humd_dif						
Dens3						
Log Likelihood	-278.6816	- 275.3026	- 269.5910	- 266.5910	- 263. 0451	- 260.4977

	7	8	9	10	11	
CONSTANT	-3.677482	-3.766598	-3.750288	-3.750867	-4.492575	
Q11a	.579088	.5554707	.549956	.558524	.5158233	
Q14	.498468	.4844765	.464528	.4589791	.4726175	
Q22	.685971	.7375886	.7431896	.6804536	.7037673	
Q31	.467072	.4848665	.5238258	.5198494	.509969	
Q32	.376712	.3685995	.3372966	.3219778	.3390233	
Q45	.534386	.5215976	.5125558	.5001515	.5571739	
Q53		.5910145	.5349996	.5799351	.6076034	
Q65			1.117615	1.152726	1.022499	
Humd_dif.				.4352379	.4476395	
Dens3					.3427324	
Log Likelihood	-258.2709	- 256.7158	- 254.4428	- 252.8550	- 249.7481	

TABLE 1: (continued) COEFFICIENTS OF VARIABLES IN THE HOUSE MODEL

VARIABLE	12	13	14	15	16	17
CONSTANT	-1.548552	-2.860007	-2.952444	- .9966771	-1.176322	-1.922881
Q11a						
Q14	.495379	.5254598	.5277602			
Q22	.461426	.623483	.6015755			.649955
Q31						
Q32		.4635842	.459457			
Q45			.5587796		.6114321	.589086
Q53				.7177419	.6969685	.768449
Q65						
Humd_dif				.558045	.542453	.465505
Dens3				.3343491	.3607698	.372261
Log Likelihood	270.59335	-265.37231	-262.87128	-270.55831	-267.52514	-264.5607

VARIABLE	18	19	20			
CONSTANT	-1.809455	-1.991879	-2.698212			
Q11a						
Q14	.467461	.4701685	.4644927			
Q22			.6232399			
Q31						
Q32						
Q45		.6054133	.5901927			
Q53	.584415	.5663328	.6468773			
Q65	.551387	.5356601	.534369			
Humd_dif.	.559001	.5459627	.4734815			
Dens3	.316762	.3434176	.3535813			
Log Likelihood	-262.5740	-259.72416	-257.1073			

TABLE 2: ESTIMATED ODDS RATIO OF THE HOUSE MODELS:

The following are the estimated odds ratio of the individual coefficients in each model.

	1	2	3	4	5	6	7	8	9	10	11
Constant	.89	.678	.29	.13	.05	.02	.02	.02	.02	.0	.01
Q 11		1.68	1.63	1.70	1.88	1.83	1.78	1.74	1.73	1.74	1.67
Q 14			1.62	1.60	1.58	1.64	1.64	1.62	1.59	1.58	1.6
Q 22				2.00	2.06	2.03	1.98	2.09	2.10	1.97	2.02
Q 31					1.83	1.56	1.59	1.62	1.68	1.68	1.66
Q 32						1.46	1.45	1.44	1.40	1.37	1.4
Q 45							1.70	1.68	1.66	1.64	1.74
Q 53								1.80	1.70	1.78	1.83
Q 65									3.05	1.16	2.78
Humd_dif										1.54	1.56
Dens3											1.40
ODDS RATIO											
OR^1		1.1									
OR^2			1.3	1.1	1.0						
OR^3			.78	.73	.66						
OR^4						.38	.58	.97	2.8	1.5	
OR^5						.57	.85	1.4	3.9	2.1	
OR^6						.63	.96	1.6	4.5	2.4	
OR^7						.93	1.4	2.3	6.3	3.3	
OR^8											2.8
OR^9											3.9
OR^{10}											3.9
OR^{11}											4.5
OR^{12}											5.5
OR^{13}											6.3
OR^{14}											6.3
OR^{15}											8.8

TABLE 2: (continued) **ESTIMATED ODDS RATIO OF THE HOUSE MODELS:**

	12	13	14	15	16	17	18	19	20		
Constant	.21	.05	.05	.36	.15	.16	.16	.14	.06		
Q 11											
Q 14	1.6	1.7	1.7				1.6	1.6	1.6		
Q 22	1.6	1.8	1.8			1.9			1.8		
Q 31											
Q 32		1.6	1.6								
Q 45			1.7		1.8	1.8		1.8	1.8		
Q 53				2.0	2.0	2.1	1.8	1.8	1.9		
Q 65							1.7	1.7	1.7		
Humd_dif				1.7	1.7	1.6	1.7	1.7	1.6		
Dens3				1.4	1.4	1.4	1.4	1.4	1.4		
ODDS RATIO											
OR^{2}	.90										
OR^{3}	.55										
OR^{4}		.28	.34								
OR^{5}		.45	.55								
OR^{6}		.48	1.49								
OR^{7}		.77	.93								
OR^{16}				2.6	2.35	3.6					
OR^{17}				1.84	1.64	2.5					
OR^{18}							1.95	2.9	2.68		
$0R^{19}$							4.27	6.7	6.1		
OR^{20}							2.68	4.18	3.82		
OR^{21}							3.21	4.75	4.27		

ESTIMATED ODDS RATIOS OF THE MODELS WITH THE COMBINED EFFECT OF THE VARIABLES

The odds ratios explain the combined effect of the indivdual variables included in each model.
The following are odds ratios for the variables that have three categories included in the model. These models also contain the dummy variables within the model but are not mentioned below.

OR^1: Household where the head of the household earns less than or equal to Rs. 1500

OR^2: Household where there are three children under 5 years old.

OR^3: Household where there are two children under 5 years old.

OR^4: Household where there are two children under 5 years old and children play in the rooms. courtyards.

OR^5: Household where there are two children under 5 years old and play in the parks and open spaces.

OR^6: Household where there are three children under 5 years old and children play in the rooms, courtyards.

OR^7: Household where there are three children under 5 years old and play in the parks and open spaces.

OR^8: Household where there are two children under 5 years old and play in the courtyards and has a household density of 16-25 Sq.Ft./person.

OR^9: Household where there are two children under 5 years old and play in the open spaces and has a household density of 16-25 Sq.Ft./person.

OR^{10}: Household where there are two children under 5 years old and play in the courtyards and has a household density of < 16 Sq.Ft./person.

OR^{11}: Household where there are three children under 5 years old and play in the courtyards and has a household density of 16-25 Sq.Ft./person.

OR^{12}: Household where there are two children under 5 years old and play in the open spaces and parks and has a household density of < 16 Sq.Ft./person.

OR^{13}: Household where there are three children under 5 years old and play in the open spaces and parks and has a household density of 16-25 Sq.Ft./person.

OR^{14}: Household where there are three children under 5 years old and play in the courtyards and has a household density of < 16 Sq.Ft./person.

OR^{15}: Household where there are three children under 5 years old and play in the open spaces and parks and has a household density of < 16 Sq.Ft./person.

OR^{16}: Household where the density is 16-25 Sq.Ft./person.

OR^{17}: Household where the density is < 16 Sq.Ft./person.

OR^{18}: Household with two < 5 children and have a household density of 16-25 Sq.Ft./person.

OR^{19}: Household with three < 5 children and have a household density of <16 Sq.Ft./person.

OR^{20}: Household with two < 5 children and have a household density of < 16 Sq.Ft./person.

OR^{21}: Household with three < 5 children and have a household density of 16-25 Sq.Ft./person.

2: UNIT OF ANALYSIS: CHILD

The variables that were significant in the household model are also significant in the child model except household density and where the children > 5 years play. In addition to the household and enviornmental characteristics the child's own individual characteristics i.e. age and nutritional status are included in the model.

In the child model, the estimated odds for a child who is third degree malnourished and is the youngest child was 10.27. This model had a higher odds ratio than the household model. The reason is that this model takes into account the childs own nutritional status and age.

The maximum estimated odds ratio obtained because of the child's own individual charactersistics i.e. age and nutritional status was 1.82 in model No.13 (OR^{18}), if the child is the youngest child and is third degree malnouished.

If this is combined with the number of children under 5, the estimated odds ratio increases to 5.9 in model 20 (OR^{14}), if there were three under 5 children and was the youngest child and was also third degree malnourished.

The maximum estimated odds ratio obtained because of the house and enviornment independent of the child's characteristics was in model No. 18, with an odds ratio of 4. If density was included in the model the odds ratio decreased to 3.9.

An analysis of the different combinations of household and the child's characteristics shows that the child's characteristics independently does not have a very high odds ratio unless it is malnourished and the youngest child. The household characteristics do have an higher odds ratio independently but when it is combined with the child's characteristics the number of children under 5, the odds ratio increases to 10.27

FINAL MODEL:

LOGIT w2_ch q11a q14 q22 q31 q45 q53 q65 humd_dif agecat q27

Iteration 0: Log Likelihood =-454.75789
Iteration 1: Log Likelihood =-416.44115
Iteration 2: Log Likelihood =-415.91742
Iteration 3: Log Likelihood =-415.91673

Logit Estimates — Number of obs = 698
chi2(10) = 77.68
Log Likelihood =-415.91673 — Prob > chi2 = 0.0000

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
w2_ch					.3567335
q11a	.4952872	.1751085	2.828	0.005	.534384
q14	-.2895381	.1198689	-2.415	0.016	2.022923
q22	.5415901	.2060026	2.629	0.009	1.148997
q31	.6464185	.1923961	3.360	0.001	1.249284
q45	.408105	.1951403	2.091	0.037	.2234957
q53	.5525364	.252405	2.189	0.029	.1232092
q65	.7080316	.3409532	2.077	0.038	.0601719
humd_dif	.6668571	.1888614	3.531	0.000	.2664756
agecat	-.3422737	.1138226	-3.007	0.003	2.140401
q27	.4575263	.1236774	3.699	0.000	.5859599
_cons	-1.683135	.5023984	-3.350	0.001	1

TABLE 3: COEFFICIENTS OF VARIABLES IN THE CHILD MODEL:

	1	2	3	4	5	6
CONSTANT	-.5895698	-.8109302	-.4406425	-1.103424	-2.013271	-2.084715
Q11a		.4032306	.4228692	.4686317	.5729645	.5462851
Q14			-.1895183	- .2097843	- .2227268	- .2293014
Q22				.5848372	.6045695	.5831295
Q31					.6780988	.6891664
Q45						.4643
Q53						
Q65						
Humd_dif						
Agecat						
Q27						
Dens3						
Log Likelihood	-454.7578	-451.5556	-450.1156	-445.6310	-438.9775	-435.9982

	7	8	9	10	11	
CONSTANT	-2.139186	-2.123879	-2.155721	-1.509474	-1.683135	
Q11a	.519583	.510365	.537103	.527363	.495287	
Q14	- .250733	- .265769	- .287622	- .2961867	- .2895381	
Q22	.615636	.596079	.517191	.5452207	.5415901	
Q31	.690588	.699726	.685799	.6670608	.6464185	
Q45	.465078	.460875	.415474	.4106507	.408105	
Q53	.559512	.497885	.575646	.6172164	.5525364	
Q65		.637556	.693412	.6892464	.7080316	
Humd_dif			.588164	.6148149	.6668571	
Agecat				- .3039914	- .3422737	
Q27					.4575263	
Dens3						
Log Likelihood	-433.3529	-431.5825	-426.5596	-422.8361	-415.9167	

TABLE 3: (continued) **COEFFICIENTS OF VARIABLES IN THE CHILD MODEL**

	12	13	14	15	16	17
CONSTANT	- .127815	- .545667	- .80508	- .98002	-1.23672	-1.38006
Q11a						.347848
Q14	- .170241					
Q22						
Q31		.527439				
Q45			.496271	.444745	.465903	.429984
Q53			.454173	.539806	.541285	.500961
Q65			.634748	.679421	.637634	.618141
Humd_dif				.612287	.606837	.628764
Agecat	- .311095	- .300245				
Q27	.465391	.458763				
Dens3					.130106	.109847
Log Liklehood	-442.5487	-438.3771	446.8433	-441.0158	-440.2141	-437.9909

	18	19	20	21	22	23
CONSTANT	-1.17159	-1.273149	-.8879868	-1.450878	-1.709259	- 2.647701
Q11a	.36409	.4594019	.4801818		.398316	.5040744
Q14			-.1994325			
Q22				.42087	.4636136	.4941302
Q31		.6133051	.6224747			.6700006
Q45	.41033			.430065	.3910344	.4049931
Q53	.49731			.57662	.5328134	.5318116
Q65	.65215			.637885	.6013201	.6329225
Humd_dif	.63413			.5611837	.5806285	.561888
Agecat		-.2892824	-.2916384			
Q27		.4410894	.4379831			
Dens3						
Log Liklehood	-438.5552	-435.7475	-434.2322	-438.7387	-435.84555	-429.57303

TABLE 4: ESTIMATED ODDS RATIO OF THE CHILD MODELS:

	1	2	3	4	5	6	7	8	9	10	11
Constant	.554	.44	.64	.33	.13	.12	.11	.11	.11	.22	.18
Q.11a		1.5	1.5	1.59	1.77	1.72	1.68	1.66	1.71	1.69	1.6
Q.14			.82	.81	.80	.80	.79	.76	.75	.74	.78
Q.22				1.79	1.8	1.75	1.85	1.81	1.67	1.72	1.7
Q.31					1.79	1.99	1.99	2.0	1.98	1.94	1.9
Q.45						1.59	1.59	1.58	1.51	1.5	1.5
Q.53							1.74	1.64	1.77	1.85	1.7
Q.65								1.89	2	1.99	2.02
Humd_dif									1.8	1.84	1.94
Agecat										.73	.71
Q.27											1.58
ODDS RATIO											
OR^1		.66									
$0R^2$			.81	.77	.68	.96	1.58	2.8	4.8		
OR^3			.67	.62	.54	.77	1.23	2.1	3.6		
OR^4										1.9	
OR^5										1.4	
OR^6										1.4	
OR^7										1.0	
OR^8											9.2
OR^9											8.6
OR^{10}											6.6
OR^{11}											6.8
OR^{12}											4.5
OR^{13}											9.6
OR^{14}											10.3
OR^{15}											7.2

TABLE 4: (continued) **ESTIMATED ODDS RATIO OF THE CHILD MODELS**

	12	13	14	15	16	17	18	19	20	21	22	23
Constant	1.1	.57	.44	.37	.29	.25	.30	.27	.41	.23	.18	.07
Q.11a						1.4	1.43	1.58	1.6		1.5	1.6
Q.14	.84								.81			
Q.22										1.5	1.6	1.6
Q.31		1.69						1.84	1.86			1.9
Q.45			1.64	1.56	1.59	1.53	1.50			1.5	1.5	1.5
Q.53			1.57	1.7	1.7	1.65	1.64			1.8	1.7	1.7
Q.65			1.88	1.9	1.9	1.85	1.91			1.9	1.8	1.8
Humd_di				1.8	1.8	1.87	1.88			1.7	1.8	1.7
Agecat	.73	.74						.74	1.33			
Q.27	1.6	1.6						1.55	1.54			
Dens3					1.1	1.1						
ODDS RATIO												
OR^{8}	.86								1.2			
OR^{9}	1.4								.82			
OR^{10}	.63								.87			
OR^{11}	.73								.96			
OR^{12}	.5								.71			
OR^{13}	1.0								1.36			
OR^{14}	1.6								5.9			
OR^{15}	.85								1.1			
OR^{16}		1.15						.95				
OR^{17}		.85						.71				
OR^{18}		1.82						1.4				
OR^{19}		**1.34**						**1.1**				
OR20					**3.6**	**3.9**						
OR^{21}					**3.1**	**3.5**						
ODDS RATIO (MODEL)			**2.2**	**3.6**			**4**			**3.2**	**3.5**	**3.2**

ESTIMATED ODDS RATIOS OF THE MODELS WITH THE COMBINED EFFECT OF THE VARIABLES:

The following are odds ratios for the categories of the variables included in the model, in addition to the variables that are already within the model but are not mentioned below.

OR^1: Child in the model where the head of the household earns less than or equal to Rs. 1500.

OR^2: Child in the model that has one other under 5 sibling.

OR^3: Child in the model that has two other siblings under 5.

OR^4: Child in the model that has one other siblings under 5, and is under 1 year.

OR^5: Child in the model that has two other siblings under 5, and is under 1 year old.

OR^6: Child in the model that has one other siblings under 5, and is between 1-3 years old.

OR^7: Child in the model that has two other siblings under 5, and is between 1-3 years old.

OR^8: Child in the model that has one other siblings under 5, and is under 1 year and is second degree malnourished.

OR^9: Child in the model that has one other siblings under 5, and is under 1 year and is third degree malnourished.

OR^{10}: Child in the model that has one other siblings under 5, and is between 1-3 years old and is second degree malnourished.

OR^{11}: Child in the model that has two other siblings under 5, and is under 1 year old and is second degree malnourished.

OR^{12}: Child in the model that has two other siblings under 5, and is between 1-3 years old and is second degree malnourished.

OR^{13}: Child in the model that has one other sibling under 5, and is between 1-3 years old and is third degree malnourished.

OR^{14}: Child in the model that has two other siblings under 5, and is under 1 year old and is third degree malnourished.

OR^{15}: Child in the model that has two other siblings under 5, and is between 1-3 years old and is third degree malnourished.

OR^{16}: Child is under 1 year and is second degree malnourished.

OR^{17}: Child is between 1-3 years old and is second degree malnourished.

OR^{18}: Child is under 1 year old and is third degree malnourished.

OR^{19}: Child is between 1-3 years old and is third degree malnourished.

CONCLUSION

CONCLUSION

After doing the bivariate, multivariate analysis and the predictive modelling the major variables that are very strong risk factors for a household/child to have an illness are grouped into four categories, i.e individual, family, housing and environmental factors. The following variables have shown statistical significance in the bivariate analysis and also in the logistic regression model where they have been controlled for by other variables.

INDIVIDUAL:

Age and nutritional status of children under 5 years.
These have shown to have an effect individually as well as when combined with the household variables in the logistic model where they have increased the estimated odds ratio to 10.27 when all other factors have been controlled. They also did show a linear trend in the bivariate analysis i.e as the age of the child increased the chances of the child getting an illness decreased. Similarly, the nutritional status of the child deteriorated, his chances of getting an illness increased.

FAMILY:

Income of the head of the household, number of children under 5 years, place where children under and over 5 years play. These were all significant in the bivariate analysis but when put in the logistic regression model, their contribution to household and child illness is demonstrated.

HOUSING:

Housing structure, where the cooking was done, and density were significant variables for a household and child to have illness. The independent and combined effect of these variables was seen in the logistic model along with the child's own individual characteristics.

ENVIRONMENTAL:

Cleaning of the sewers of regularly, presence of sewers in the neighborhood, difference between external (atmosphere) and internal (room) humidity. These factors were significant in the bivariate and both of the logistic regression models. They seem to enhance the effect of the child's own individual risks in having illness.

All the variables mentioned above have a significant role in household and child morbidity. The effect of these variables has been demonstrated independently as well as in combination in the logistic regression and predictive modelling. The child's own individual characteristics come into play if the child is the youngest and below 1 year of age and is malnourished. All the variables act synergistically to increase the household and child morbidity.

APPENDIX

LIST OF TABLES

TABLE NO:	TITLE:	PAGE:
	SECTION 1: BACKGROUND	
I	Major Cities of Pakistan	7
II	Urban Population Growth in S. Asia	7
III	Intra-urban Differentials in Socio-economic Indicators	9
	SECTION 2: DATA	
I	Illness Within Households	18
II	Burden of Illness	18
III	Number of Children Sick in the household	19
IV	Youngest Child Prime Target	19
V	Ages of Children	20
VI	Illness Stratified by Age	20
VII	Illness Stratified by Nutrition Status	21
VIII	Types of Illnesses	21
IX	Disease Stratified by Age	22
X	Disease Stratified by No. of Children	23
	SECTION 3: BIVARIATE ANALYSIS	
7	Age of Mother	24
7H	Age of Father	24
8W	Mother's Education	25
8H	Father's Education	25
8W-1	Mother's Education/Income	26
8H-1	Father's Education/Income	27
9W	Mother's Occupation	28
9H	Father's Occupation	28
9H-1	Father's Occupation/Income	29
10W	Employment Status (Mother)	30
10H	Employment Status (Father)	30
10H-1	Employment Status Father/Income	31
11	Income-Head of Household	32
12	Income-Other Members of Household	33
13	Total Family Income	34
14	Number of Children under 5	35
14-1	No. of Children under 5/Income	36

9		
17	No. of People Within Households	37
18	Ownership of House	37
19	Length of Residence	38
20	Rent	38
21	Housekeeping	39
22	Cleaning of Sewers	40-41
22-1	Cleaning of Sewers/Income	42
31	Where Children Play	43
32	Where Children over 5 Play	44
35	School Going Children	45
40	Business Operating in Plot	45
41	Type of Business	46
42	Disposal of Garbage	46
43	How Far Garbage is Disposed	47
44	Human/Animal Waste Near Dwelling	47
45	Sewers in Neighbourhood	48
Q45	Sewers in Neighbourhood/Income	49
46	Responsible for Cleanliness	50
47	Courtyard Floor	51
50	Stagnant Water	51
51	Level of Tidiness	52
52	Number of Rooms	52
53	Condition of Structure	53
53-1	Condition of Structure/Income	54
54	Animal Husbandry	55
55	Containment of Animals	55
56	Disposal of Animal Wastes	56
56-A	Frequency of Disposal	56
57	Disposal of Refuse	57
58	Refuse within Childrens Reach	57
59	Common Latrines	58
60	Shared Courtyards	58
61	Sources of Drinking Water	59
63	Storage Utensils	59
64	Water Supply	60
65	Where Cooking Done	60-61
67	Type of Fuel	61
68	Number of Times Cooked	62
69	Hours Cooking	63
70	Lighting	63
72	Area of Plot	64
73	Area of Courtyard	65
81	Temperature	66
81-1	Temperature Difference	67
82	Humidity	66

82-1	Humidity Difference	68
82-2	Humidity Difference-External	69
82-3	Humidity Difference-Internal	70
72-A	Density	71
78	Area of Rooms	72
80	Volume of Rooms	72
83	People Sleeping/Room	72
83-A	Persons/Room	73
83-B	Volume of Room/Person	74
78-1	Density of Rooms	75

SECTION 4: SINGLE VARIABLE ANALYSIS

I	Summary of Single Variable Analysis	88
II	Combination of Variables - Summary	97-98

SECTION 5: INDIVIDUAL DISEASE ANALYSIS

DIARRHOEA

14	No. of Children under5	99
22	Cleaning of Sewers	100
	Density	100
65	Where Cooking Done	101

ACUTE RESPIRATORY ILLNESS (ARI)

14	No. Children under 5	102
	Humidity	103
	Volume of Rooms	103
	Area of Courtyard	104
53	Structure of House	104
	Temperature	105
	Humidity	105

SECTION 6: MULTIVARIATE ANALYSIS

1.	Coefficients of variables in the house model	109-10
2.	Estimated odds ratios of the house model	111-12
3.	Coefficients of variables in the child model	117-18
4.	Estimated odds ratios of the child model	119-20

SECTION I

1. Questionnaire No. ---------
2. Field Site ---------
3. Household No. ---------
4. Family Number. ---------
5. Date of Interview ---------
6. Religion ---------

Respondent's Name (WIFE)	:	Name of Head of Household (HUSBAND)
Women's Age (7-W)	:	Mean age of Women 28.6 years $\pm$ 6.5
		Median age of women 28 years.
Husband's Age (7-H)	:	Mean age of men 32 years $\pm$ 7.5
		Median age of men 31 years.
Education (8-W)	:	(49.4% illiterate
		3% educated above 5 years
		48% educated between 1-5 years)
		Mean 1.06 $\pm$ 1.77
		Median 1 year
Education (8-H)	:	(36.5% (147) illiterate
		59.7% (240) educated between Class 1-9
		3.9% (16) = and > 10 class)
		Mean 2.01 $\pm$ 2.781 years.
		Median 1 year

Occupation (9-W) : 78.2% (315) Housewifes

21.8% (88) working mothers
Of these working mothers, majority were household assistants and cleaners.

39 (44.3%) Cleaners
35 (39.77%) Household Assistants.

Occupation (9-H) :

1. Cleaner	174 (43.2%)
2. Painter	8 (2%)
3. Constuction	16 (4%)
4. Carpenter	6 (1.5%)
5. Religious worker	--
6. Teacher	2 (.5%)
7. Clerk	2 (.5%)
8. Tailor	12 (3%)
9. Professional	37 (9.2%)
10. Household Assist.	9 (2.2%)
12. Driver	42 (10.4%)
13. Chowkidar	5 (1.2%)
14. Other(Specify)	98 (22.1%)

Employment Status (10-W) :

1. Full Time Employee	63 (15.6%)
2. Part Time Employee	52 (12.9%)
3. Unemployed	285 (71.1%)

Employment Status (10-H) :

1. Full Time	85.4% (344)
2. Part Time	12.9% (52)
3. Unemployed	1.7% (7)

11. Income from HH head : Mean Rs. 1542 $\pm$ 733
Median Rs 1300

12. Income from other members: Mean Rs. 940 $\pm$ 782
Median Rs. 700

13. Total Family Income: Mean Rs. 1849 ± 942.755
Median Rs. 1500

People living within the house:

14. Children < 5 years: Mean 1.73 ± .711
Median 2

14A Children between 5-12 years: Mean 1.002 ± 1.426
Median : 0

15. Others between 12-21 years Mean 1.462 ± 1.8
Median : 1

16. Above 21 years. Mean : 2.479 ± .986
Median: 2

17. Total No. of individuals living in this house

Mean 6.685 ± 2.278
Median: 7

18. How long have you lived in this house on this site?

Mean: 16.484 ± 9.556 years
Median: 15 years.

19. Do you own this house?

1. Yes : 84.1% (339)
2. No : 15.9% (64)

20. If No, then how much rent do you pay?

Mean rent Rs. 466.4 ± 553.349 (should drop the outlier)
Median Rs. 400

CLEANLINESS MAINTAINECE:

21. Painting.

1. No	:	18.1% (73)
2. Sometimes	:	51.9% (209)
3. Regularly	:	30% (121)

21a. If regularly, then how many times per year.

Mean : 1.803 $\pm$ .737
Median: 2.00

22. Cleaning of the gutters.

1. No	:1% (4)
2. When needed	:83% (332)
3. Regularly	:15.9% (64)

22a. If regularly, then how many times per year.

Mean : 5.3440 $\pm$ 4.26
Median: 2

23. Any other method. No clear response.

23a. If regularly, then how many times per year. -----

CHILDREN'S HEALTH STATUS (AGE 0 - 5)

General Information		Youngest Child (a)	Second Youngest Child (b)	Third Youngest Child (c)
24. Sex	1=Male,	205 (50.9%)	111 (47.5%)	38 (61.3%)
	2=Female	188 (46.7%)	113 (48.5%)	21 (33.9%)
	Unknown	10 (2.5%)	9 (3.9%)	3 (4.8%)
25. Birth Date		--------	---------	--------
26-W Weight		--------	--------	------
26-M Month (weighed)		--------	--------	------
27. Nutritional Status				
(Normal=4,		207 (51.4%)	119 (51.1%)	31 (50%)
Grade I=1,		163 (40.4%)	88 (37.8%)	28 (45.2%)
Grade II=2,		29 (7.2%)	24 (10.3%)	3 (4.8%)
Grade III=3		4 (1%)	2 (.9%)	---
Malnutrition)				
28. Vaccination Status				
(Complete=1,		205 (50.9%)	188 (80.7%)	50 (80.6%)
Incomplete=2		80 (19.9%)	30 (12.9%)	8 (12.9%)
None=3,		31 (7.7%)	11 (4.7%)	4 (6.5%)
Appropriate		87 (21.6%)	4 (1.7%)	----
for age=4)				

29. Did your child have any illness in the last two weeks?

1). Diarrhoea	34 (8.4%)	4 (1.7%)	____
2). Cough > 3 days	26 (6.5%	12 (5.15%)	5 (8.1%)
3). Fever > 5 days.	37 (9.2%)	21 (9.01%)	4 (6.5%)
4). Skin problems	20 (5%)	8 (3.43%)	1 (1.6%)
5). Fractures	1 (.2%)	_____	
6). Burns	____	1 (.42%)	
7). Ear infections	3 (.7%)	4 (1.7%)	
8). Others	9 (2.2%)	2 (.9%)	
Combination of Sickness	34 (8.43%)	23 (9.87%)	1 (1.6%)
9). No Sickness	240 (59.6%)	158 (67.8%)	51 (82.3%)

30. Did your child have any -------- -------- ------illness in the last one month?

1). Diarrhoea	32 (7.94%)	4 (1.7%)	2 (3.2%)
2). Cough > 3 days	21 (5.2%)	10 (4.3%)	3 (4.83%)
3). Fever > 5 days.	33 (8.18%)	18 (7.725%)	1 (1.6%)
4). Skin problems	15 (3.72%)	9 (3.9%)	1 (1.6%)
5). Fractures			
6). Burns	1 (.2%)		
7). Ear infections	4 (1%)	3 (1.3%)	
8). Others	5 (1.2%)	6 (2.6%)	
Combination of Sickness	16 (3.97%)	12 (5.15%)	2 (8/06%)
9). No Sickness	276 (68.48%)	171 (73.4%)	53 (85.5%)

SECTION III

USE OF SPACE:

31. Where do your children under 5 years play?

1.	Rooms	37 (9.2%)
2.	Courtyard	151 (37.5%)
3.	Lanes	89 (22.1%)
	Courtyard and Lanes	95 (23.6%)
	Rooms and Courtyard	27 (6.7%)

32. Where do your children over 5 years of age play?

1.	Courtyard	35 (8.7%)
2.	Lanes	166 (41.2%)
3.	Park	21 (5.2%)
4.	Open spaces (vacant plot area)	27 (6.7%)
5.	Other	3 (.7%)
	Courtyard and Lanes	112 (27.8%)
	Lanes and open spaces	23 (5.7%)

33. Where are your formal social gatherings held? e.g. weddings, funerals, etc.?

1.	House	17 (4.2%)
2.	Lanes	84 ((20.8%)
3.	Halls	214 (53.1%)
4.	Open spaces	40 (9.9%)
5.	Others	6 (1.5%)
	Lanes and Hall	19 (4.7%)
	House and Lanes	11 (2.7%)

34. Where do your informal social gatherings take place?

1.	House	153 (38%)
2.	Lanes	95 (23.6%)
3.	Halls	45 (11.2%)
4.	Open spaces	31 (7.7%)
	House + Lanes	46 (11.4)
	Lanes and Halls	11 (2.7%)
	Lanes and open spaces	9 (2.2%)

35. Do your children go to school?

1.	Yes	207 (51.4%) - go to school
2.	No	196 (48.6%) - No school

36. If yes, where do they do their homework?

1.	Home	151 (72.6%)
2.	Neighbor,s house	2 (1%)
3.	Roof	6 (1.5%)
4.	Courtyard.	19 (9.1%)
	Home + courtyard	17 (8.1%)
	Home + Roof	8 (3.8%)

37. Where do you do your shopping i.e. groceries, vegetables etc.?

1.	Shop in the neighborhood	62 (15.4%)
2.	Market place	58 (14.4%)
3.	Street vendor	188 (46.7%)
	Market + shop	10 (2.5%)
	Street vendor + Market	51 (12.7)
	Street vendor + Market	31 (7.7%)
	Other _____	

38. Do you have a kitchen garden?

1.	Yes	14 (3.5%)
2.	No	390 (96.5%)

39. If yes, where?

1.	Verandah (courtyard inside house)	8 (57.1%).
2.	Immediately outside the house.	2 (14.3%)
3.	Other	1 (7.1%)
	Verandah + outside house	3 (21.4%)

40. Do you have any sort of business operating from within your plot?

1.	Yes	25 (6.2%)
2.	No	379 (93.8%)

41. If yes, which of the following:

1.	sewing center	1 (4%)
2.	grocery shop	1 (4%)
3.	Pan shop	7 28%)
4.	Other	14 (56%)
	Pan shop and other	1 (4%)

42. How do you dispose of your garbage?

1.	Dump outside house	94 (23.3%)
2.	dump anywhere	34 (8.4%)
4.	collected by garbage disposal unit	243 (60.3%)
5.	Other	20 (5%)
	Burn + any other	1 (.2%)
	Dump anywhere and collected by garbage disposal unit	2 (.5%)

43. If garbage is dumped, how far is the dwelling from the dumping ground (in Meters)

Mean: 262.119 $\pm$ 220.655 Meters

Median: 200 Meters

44. Is there human or animal waste within 20 meters of the dwelling unit?

1.	heavy defecation.	39 (9.7%)
2.	some defecation.	170 (42.0%)
3.	no excreta visible	194 (48.1%)

45. Are there sewers in the neighborhood?

1.	flowing	66 (16.4%)
2.	stagnant	21 (5.2%)
3.	over-flowing	2 (.5%)
4.	Non-existent	314 (77.9%)

46. What land around your house do you feel responsible for keeping clean ?

1.	House	11 (2.7%)
2.	Built area and courtyard.	76 (18.9%)
3.	2 + area immediately in front of your house.	243 (60.3%)
4.	Other	2 (.5%)
	House, Built area and Courtyard	19 (4.7%)
	Built area, Courtyard and immediately in front of house	29 (7.2%)
	Built area, Courtyard and immediately in front of house + others	21 (5.2%)

SECTION IV

PHYSICAL CHARACTERISTICS OF THE PLOT, COURTYARD AND HOUSE

OBSERVATION

47. What is the courtyard floor material?

1.	Dirt & Pebble	66 (16.4%)
2.	Cement	321 (79.7%)
3.	Pebble	4 (1%)
4.	Other	10 (2.5%)

48. Are they any structures to protect from the sun and heat?

1.	Yes	225 (55.8%)
2.	No	178 (44.2%)

49. If yes, what is it made of?

1.	Canopy	15 (6.7%)
2.	Branches	40 (17.8%)
3.	Others	31 (13.8%)
4.	Cemented.	122 (54.2%)
5.	Asbestos Sheets.	14 (6.2%)
6.	Combination i.e. (branches and others) (others and cemented)	3 (1.3%)

50. Are they pools of stagnant water in the courtyard?

1.	Yes	26 (6.5%)
2.	No	377 (93.5%)

51. How would you rank the level of tidiness of the courtyard?

1.	Poor	31 (7.7%)
2.	Fair	265 (65.8%)
3.	Good	107 (26.6%)

52. Number of rooms in the house?

1.	One:	325 (80.6%)
2.	Two	69 (17.1%)
3.	Three	8 (2%)
4.	Four	1 (.2%)

53. Condition of the structure

1.	very well maintained	62 (15.4%)
2.	reasonably maintained	295 (73.2%)
3.	somewhat badly maintained	23 (8.2%)
4.	very badly maintained	13 (3.2%)

54.Is the courtyard used for animal husbandry?

1.	Yes	37 (9.2%)
2.	No	366 (90.8%)

55. If yes, How?

1.	Free wandering in the courtyard	15 (40.5%)
2.	In a closed space	22 (59.5%)

56. Are animal wastes disposed of?

1.	Yes	38 (43.7%)
2.	No	49 (56.3%)

56a. If yes, how often?

1.	Daily	30 (78.9%)
2.	Every other day	7 (18.4%)
3.	Other	1 (2.6%)

57. Are household refuses temporarily disposed in the courtyard?

1.	Yes	198 (49.3%)
2.	No	205 (50.7%)

58. If yes, are they kept out of children's reach?

1.	Yes	185 (93.4%)
2.	No	13 (6.6%)

59. Are they common latrines in the plot?

1.	Yes	397 (98.5%)
2.	No	6 (1.5%)

60. How many people share this courtyard?

Mean: 7.119 $\pm$ 2.870 people.
Median: 7 people

61. What is the source of your drinking water supply?

1.	individual connection	27 (6.7%)
2.	shared water connection	363 (90.1%)
3.	Wells	
4.	peddlers	
5.	others (specify)	3 (.7)
	Combination:Individual connection + shared water connection + Wells	10 (2.4%)

67. What fuel do you use for cooking ?

1.	Kerosene	283 (70.2%)
2.	Wood	67 (16.%6)
3.	Gas stove	24 (6%)
4.	Cow dung	1 (2%)
5.	Charcoal	----
6.	Other	1 (.2%)
	Kerosene & Gas stove	2 (.5%)
	Kerosene & Cow dung	1 (.2%)
	Wood & Gas stove	2 (.5%)

68. How many times do you cook per day ?

2. 309 (76.7%)
3. 94 (23.3%)

Mean: 2.23 $\pm$ .423
Median: 2

69. How long does it take you to cook all the meals?

Mean: 2.881 $\pm$ 1.172
Median: 3

70. What type of lighting facilities are you using?

1.	kerosene	10 (2.5%)
2.	oil/candle	
3.	petromax	
4.	electricity available to the structure	393 (97.5%)
5.	others (specify)	

71. Cooling

1.	electric fans	400 (99.3%)
2.	None	3 (.7%)

MEASUREMENTS:

72. Plot:

Frontage: Mean 14.43 $\pm$ 5.75 ft
Depth: Mean 27.81 $\pm$ 8.49 ft

Plot area Mean: 485.02 $\pm$ .67 sq ft^2

73. Dimensions of main courtyard.

Length: 15.97 $\pm$ 7.05 ft.
Width : 14.33 $\pm$ 5.55 ft.

Area of Courtyard : Mean: 279.55 $\pm$ 241.12 sq ft^2

74. External Temperature

Mean: 94.076 $\pm$ 3.094 F
Median: 93.9 F

75. External Humidity

Mean: 37.117 $\pm$ 14.274
Median: 34

Time of Measurement:------

Date of Measurement ------

76. Length (468 rooms):

Mean:11.31 ± 3.324 ft.
Median: 11.1 fts

Length of rooms in the house. (403 Houses)

Mean: 13.20 ± 4.74 ft.

77. Width (468 Rooms) :

Mean: 12.168 ± 3.218 ft.
Median: 11.5 ft.

Width of the rooms in the house. (403 Houses)

Mean: 14.20 ± 6.83 ft.

78. Area (468 Room):

Mean: 137.878 ± 50.892 sq ft.
Median: 129.185 sq ft.

Covered area of House (403 houses) i.e sum of each houses rooms divided by no. of houses.

Mean: 160.80 ± 77.57 sq ft.

79. Height (468 Rooms):

Mean: 9.391 ± 1.248 ft.
Median: 9.355 ft.

Height of rooms in the house (403 houses)

Mean:10.96 ± 3.85 ft.

80. Volume (468 Rooms):

Mean: 1301.778 $\pm$ 540.387 ft^3
Median: 1230.9 ft^3

Volume of rooms in the house (403 houses)

Mean: 1518.20 $\pm$ 804.76 ft^3

81. Temperature (Rooms):

Mean: 92.572 $\pm$ 3.665 F
Median: 92.7 F

82. Humidity (Rooms):

Mean:39.823 $\pm$ 12.625
Median : 37

83. How many persons sleep in this room

Mean: 5.72 $\pm$ 2.273
Median: 5

OBSERVATION:

84. What are the wall materials made of?

1.	Concrete blocks.	466 (99.1%)
2.	Wood	1 (.2%)
3.	Others	2 (.4%)
	Concrete Blocks and wood.	1 (.2%)

85. What are the roof materials made of?

1.	Concrete slab.	287 (61.1%)
2.	Corrugated iron	28 (6%)
3.	Asbestos	83 (17.7%0
4.	Others	59 (12.6%)
	Concrete Blocks and Corrugated Iron	7 (1.5%)
	Concrete Blocks and others	4 (.4%)
	Corrugated Iron and Asbestos	1 (.2%)

86. What are the floor materials made of?

1.	Concrete	423 (90%)
2.	Stamped mud	9 (1.9%)
3.	Linoleum	35 (7.4%)
4.	Others	1 (.2%)
	Concrete and Stamped Mud	1 (.2%)
	Concrete and Linoleum	1 (.2%)

87. Are they any windows ?

1.	Yes	422 (91.5%)
2.	No	39 (9.5%)

88. If yes, what are they made of?

1.	Cement	11 (2.6%)
2.	Glass	17 (3.9%)
3.	Iron	58 (13.5%)
4.	Wood	120 (27.8%)
5.	Other	6 (1.4%)
	Iron and Wood	135 (31.3%)
	Cement and Wood	8 (1.8%)
	Glaass, Wood and Iron	16 (3.7%)
	Glass and Wood	35 (8.1%)

C0MPUTED VARIABLES:

SICK_2W : Households that had an illness in the last 2 weeks

Sick	1 = 190 (47.1%)
Not sick	0 = 213 (52.9%)

SICK_1M : Households that had an illness in the last one month.

Sick	1 = 154 (38.2%)
Not sick	0 = 249 (61.8%)

SICK_WM : Households that had an illness in the last 2 weeks and one month.

Sick	1 = 213 (52.9%)
Not sick	0 = 190 (47.1%)

H_ILL_2W : Households that had number of children ill in the last two weeks.

1 : One child sick	136 (33.7%)
2 : Two children sick	49 (12.2%)
3 : Three children sick	5 (1.2%)
0 : No child Sick	213 (52.9%)

H_ILL_1M : Households that had number of children ill in the last one month.

1 : One child sick	116 (28.8%)
2 : Two children sick	32 (7.9%)
3 : Three children sick	6 (1.5%)
0 : No child sick	249 (61.8%)

H_ILL_WM : Households that had children ill in the last two weeks and one month.

1: child sick in the last two weeks and one month	131 (32.5%)
2: child sick in the last two weeks or one month	82 (20.3%)
0: No child sick in the last two weeks and/or one month	190 (47.1%)