

CHAPTER III

RESEARCH METHODOLOGY

1. Research Design

The research design was a cross-sectional descriptive and inferential study. It measures exposures and effects at the same time. A total of 180 mothers were interviewed using structured questionnaire and 211 children under five were studied. Information on children's exposure to sources of indoor air pollutants (passive smoking and wood cooking or heating), their prevalence of respiratory illness, and socio-demographic characteristics of household were obtained. For each child under age five, the mother was asked if the child had been ill with a cough in the last 2 weeks or 6 weeks period preceding the survey interview. For children who had been ill with cough in last 2 weeks or 6 weeks, the mother was additionally asked if the child, when ill with cough, breathed faster than usual with, short and rapid breaths. Exposure to smoke was measured indirectly by ascertaining type of fuel used for cooking or heating. The survey used four classifications of main cooking and heating fuel—wood, kerosene, electricity and liquid petroleum gas (LPG) in this study.

2. Study Population

For cross sectional study, the study population consists of children under five. Selections of the subjects were based on the following criteria.

1. Mothers having child less than 5 year and mothers attending for Mothers and Child Clinic.
2. Only mother willing to participate in the survey were included.

3. Study Site

The study site was four health centers in Thimphu. Thimphu was selected as there are household using the biomass fuel (wood) for cooking or heating and households using clean fuel for heating or cooking.

4. Sample Size

The calculations of sample size was calculated by using Epi-info 2000 software for cohort/ cross-sectional study (Fleiss, 1981)

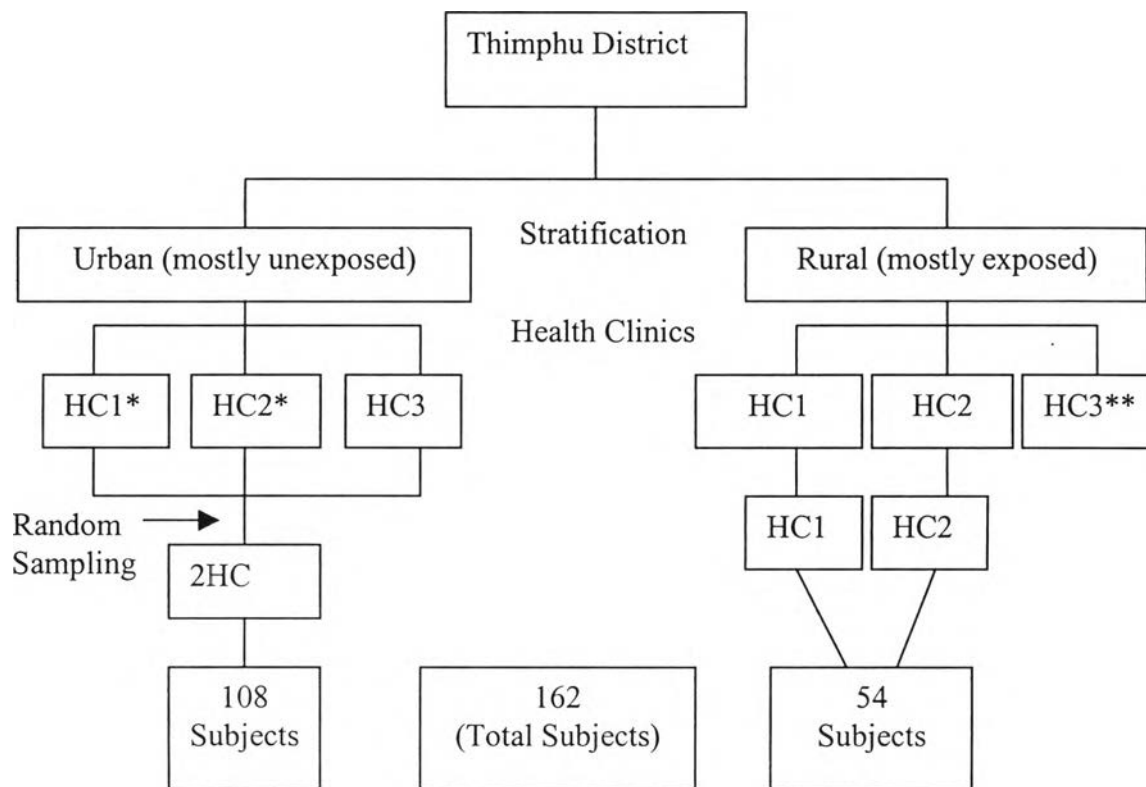
The expected percentage of the prevalence of ARI from exposure of high pollution fuel was taken as 54% and percentage of prevalence of ARI from low pollution fuel was taken as 30% base on Zimbabwe study (Mishra, 2003).

Ratio of unexposed to exposed was taken as 2:1. Confidence interval of 95% was taken. This means that probability of making type 1 error is only 0.05. It means that there is a 5% chance that result that indicate a difference between groups is false, or that there is a 95% confidence that difference detected is a true difference. Power of

80% was taken. This means power to detect difference. It means that there is a 20%(0.2) chance that a true difference will not be found or there is 80% chance that the study will find the difference.

5. Sampling Technique

Thimphu district was stratified into urban and rural areas. Based on previous personal observations, the urban area was thought to have relatively few households with indoor biomass smoke exposure, and the rural area was expected to have many households with such exposure. Thus, the rural setting was the sampling unit for the “exposed” condition and the urban setting was the unit for the “unexposed” condition. Both urban as well as rural area have three health centers each. All these health centers provide Mother and Child health services. The figure (3) below shows the distribution and stratification of health centers. The health centers were selected by simple random sampling for urban (mostly unexposed).



Minimum Sample size $(108+54=162)$

Figure 3: Sampling Technique

HC: Health centers

*Selected

**HC3 is excluded because not feasible as it was located in remote area.

For rural (mostly exposed), two health centers were selected not by simple random. Health center 3 (HC3*) was excluded because this is health centers is difficult to reach. The mothers having under five children attending, Mother and Child Clinics were included. Mothers who bring sick children with respiratory illness were not included in the study. To get a sample of 162 subjects, 108 subjects were taken from two selected urban health Centers (mostly unexposed) and 54 subjects were taken from

two rural health centers (mostly exposed), to form a total of 162 subjects. Ratio of unexposed to exposed was taken 2:1 because of unavailability of exposed subjects and to increase accuracy of findings. Actually, to increase the statistical strength of the study, 120 was taken from urban (mostly unexposed) and 60 from rural (mostly exposed) for a total of 180 mothers. Mothers were interviewed in the health centers.

6. Instruments for Data Collection

Structured standardized questionnaire was used administered by a trained for collecting data and from each of under-five the mothers were interviewed. A total of 180 mothers of children were interviewed. The interviewers were trained for two days to do the structured questionnaire interview. Trainees from Royal institutes of Health Sciences and one higher secondary student in Thimphu were enrolled as interviewers for the study. They were trained to use same language and terminology consistently while interviewing. The interviewer was trained to demonstrated the sign of rapid and short breathe when mother face problems in answering the question on this signs. Information on children is collected directly from the mothers. Questionnaire contains questions on (1) General household situation (2) about study child (3) about child's mother and (4) other questions. (Appendix D). This survey was carried out during the months of February/March 2005.

7. Content Validity

The instrument was reviewed by experts to carry out content validity for this study to make the questions valid and reliable. Their comments were noted and changed made accordingly with discussion with the adviser.

8. Reliability

Reliability test of the questionnaire was done with 10 mothers of children underage of 5 similar to the actual samples. It was found consistent. Respondents have no problems in answering the questions.

9. Ethical Considerations

Clearance to conduct research in Bhutan at Thimphu Health centers was formally accorded by Ministry of Health. Also relevant clearances from all other local administrations were obtained to conduct this study. Due consideration was accorded to the protection of human subjects. The researcher and interviewer explained the purpose of the study. The interviewer obtained informed consent from each respondent (in this case, mothers of children) before asking questions. They were ensured that strict confidence of their information will be maintained and all documents would be destroyed after the termination of the study. They were told that they have the right to refuse or participate in the study. For willing participants, a verbal consent was taken. No body declined to participate in this study.

10. Data Analysis

Data were coded, processed and analyzed using SPSS for Window's software package. Most of the data were converted into dummy variables. Descriptive statistics was used for demographic features. Mean, standard deviation, median and percentages were applied as statistical tools to describe the findings. Chi-square test was applied to test associations between independent and dependent variables.

11. Limitation of Study

1. This is a cross sectional study design measures the exposure and effects at a particular point time and not over time.
2. This study result cannot be generalized to general population of children under five in Bhutan.

12. Expected Benefits

1. The researcher can disseminate the results of research to policy maker and other relevant health care provider.
2. The program implementers and health workers can use it to improve the programs in the future by developing appropriate health messages and relevant interventions.
3. The program can use the baseline data for future planning activities and comparisons.
4. Study results may help to create awareness to general public on effects of indoor pollution for taking appropriate steps to prevent respiratory problems in children