Chapter 4

RESEARCH METHODOLOGY

The literature review in previous chapter provided the author a basis to develop the methodology for present study. This chapter comprises three sections: conceptual framework, methodology, and source of data.

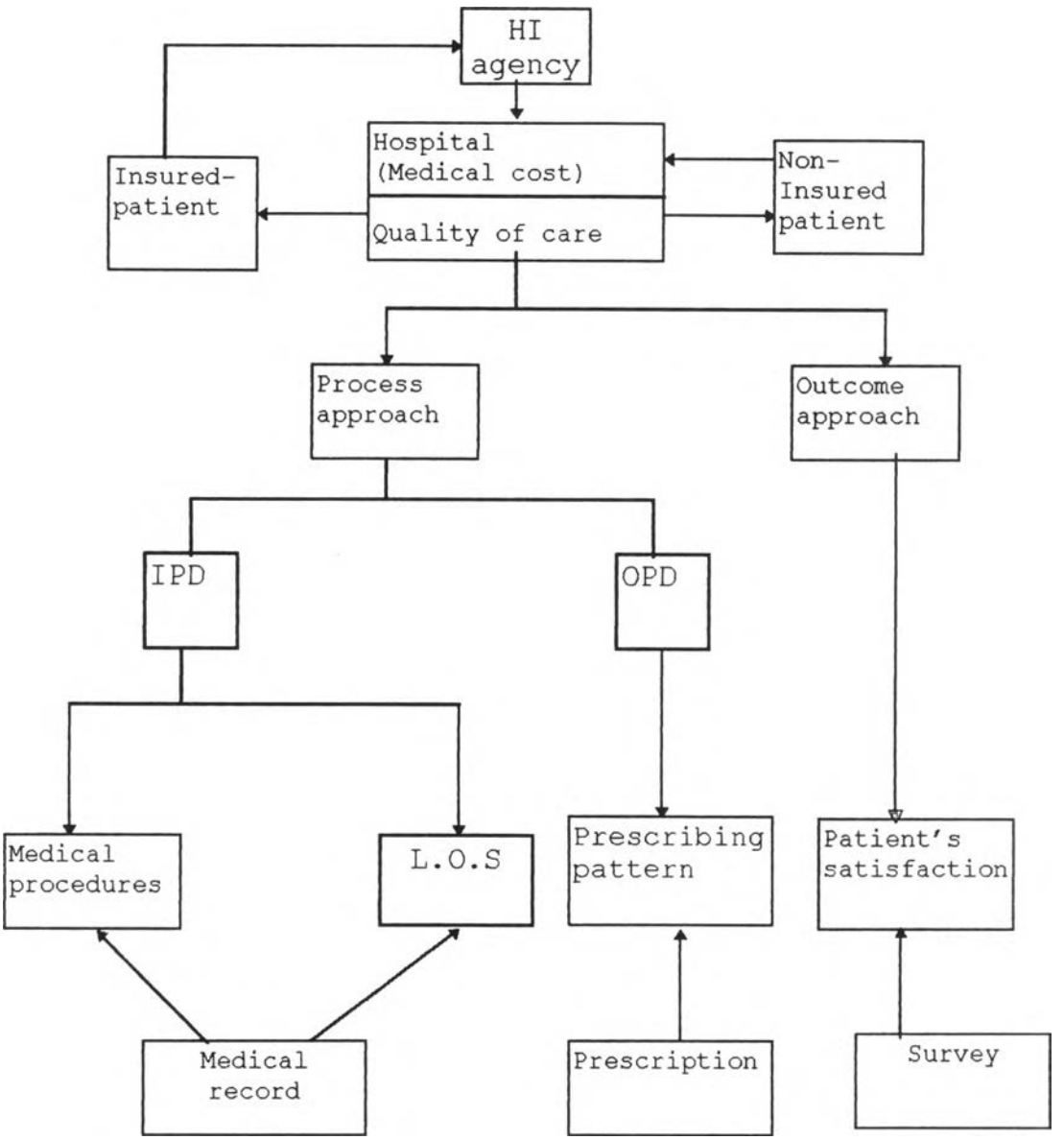
4.1 Conceptual framework

This study looks at the quality of care from the perspectives of consumer, provider, and purchaser. With the assessment of the process aspect, the quality of care is seen from the provider perspective. The satisfaction of patients with health care services provided reflects the quality perceived by the patients. The purchaser-health insurance agency at the same time pay attention to quality as well as the costs of health care services received by the insured patients (see Figure 4.1).

Both insured patients and non-insured patients mentioned in this study receive health services from the same hospital. The difference here is the method of payment. For non-insured patients, they have to pay themselves directly to the hospital, whereas, the medical costs of insured patients are paid by the health insurance agency to the hospital. The quality of care received by insured and non-insured are assessed and compared with each other.

In this study, the process and outcome approaches were used to assess the quality of care. The insured patients and the non-insured patients received the care at the same hospital so quality of care in terms of structural attributes such as facilities, quantity and quality of staff etc. can be considered the same for the two groups of patients. The quality of care was examined for both outpatient (OP) care and inpatient (IP) care. In fact, the payment method used by the health insurance agency applied to OP care and IP care are not the same. For OP care, the claims from the hospital for insured patients are paid by the health insurance agency based on real expenditures but these are not allowed to exceed the ceiling. The total of expenses must be within 45% of premium collection from the members who are registered in the hospital. It is called a capitation and fee-for-service combined payment. For IP care, the costs of health care are reimbursed on real expenditure without

Figure 4.1 Conceptual framework



any ceiling. It is paid on a fee-for-service principle for drugs, blood, transfusions, laboratory tests, X-rays, operations etc., and expenditure on consumable materials is paid for as a flat payment for bed per day. As mentioned in Chapter 3, the payment mechanism can influence how health services are delivered, so that if the payment to providers is by fee-for-service the service may be better than in a capitation or pre-prepaid system. Therefore, the comparison of quality of care between insured and non-insured patients may reveal different results for OP care and IP care.

The tracer method was applied to assess the process of care including analyzing medical records for IP care and analyzing drug prescriptions for OP care as well as the outcome aspect of quality of care regarding patient satisfaction. The patients are first classified by the area of health system into inpatient department (IPD) and outpatient department (OPD), then categories of patient are identified by diagnosis. According to the criteria of selecting tracers mentioned in the previous chapter, two diseases, upper respiratory infection and gastric ulcer were chosen to analyze drug prescriptions at OPD; two diseases, acute appendicitis and pneumonia were selected to analyze medical records at IPD. These diseases are the most common diseases listed in the 10 leading causes of morbidity in Haiphong province. At the same time, their treatment is available in the national treatment guidelines approved by the Ministry of Health.

For IP care, process of care was examined in terms of medical procedures and length of stay (LOS). Medical procedures refer to the diagnosis and treatment which patients received from the health provider, which are available in medical records. They include the examination, laboratory tests, X-rays, prescribed drugs The explicit criteria are based on the national treatment guidelines. The performed examination, laboratory tests, prescribed drugs were compared with what is required in the national treatment guidelines for each disease. The higher the level of compliance with the guidelines the better the treatment and care performed were considered to be.

The length of stay in IP care has been considered as a quality control and evaluation index of care (Sauras Herrranz et al, 1994). There are several factors having an impact on LOS. The age of the patient, the severity of disease at the time of admission, the type of disease, the payment method, and of course the performance of care

provided. To some extent, this reflects quality of health delivery: holding other factors constant, the better care may reduce LOS. On the other hand, LOS is also an important indicator that reflects the incurred medical costs. A shorter LOS leads to lower medical costs and vice versa. Short LOS may be a good sign reflecting good quality of care but may also reflect early discharge in order to avoid high costs, for example in the capitation system. In contrast, a long LOS may reflect bad quality of care and may be the result of unnecessary hospitalization in order to obtain high profit for the hospital in a fee-for service payment system. Therefore, LOS was included in analyzing medical records.

For OP care, analyzing prescriptions is essential as a measure of the quality of care (Siriwanarangsun, 1996). The indicators used here were prescribing indicators recommended by WHO (1993) including: average number of drugs/encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed from the Vietnam Essential Drug List, and average charge /encounter. It is suggested that the higher the proportion of generic names and essential drugs prescribed in a prescription the better the quality of care is, but the higher the proportion containing more than 1 antibiotic or an injection the lower quality of care is (Thompson and Edwards, 1991; Hogerzeil et al, 1993, quoted by Siriwanarangsun,1996).

The degree of a patient's satisfaction was used to measure the outcome of care. A survey was planned to get this response from patients who had received services from hospital at both OPD and IPD.

The nature of disease severity in the patient should be taken into account when comparing quality of care between two groups of patients. The severity can be judged by doctor for each case and classified into 3 levels: severe, moderate and mild. In reality, this kind of information is usually not available in medical records or prescriptions.

4.2 Methodology

4.2.1 Research design: This study is a cross-sectional study.

4.2.2 Outcome measurement

a. The quality of care at IPD

(1) Medical procedures: With reference to the diagnosis and treatment which patients received from health care provider, explicit measurement is applied. The performed examination, laboratory tests, prescribed drugs were compared with those listed in the national treatment guidelines for each disease. The outcome was measured by the degree of conformity which was determined as below:

* Analyzing the physical examination, the diagnosis reported in medical records to compare with standard guidelines in order to identify the percentage of conforming standard procedures as follow:

$$CSP = \frac{ASP}{TSP} \times 100\%$$

Where

CSP = % of conforming standard procedures
ASP = Number of actual standard procedures in medical record
TSP = Number of total standard procedures in the national treatment guidelines

* Analyzing drugs prescribed in medical records and comparing with standard guidelines in order to identify the percentage of conforming drug prescription for IP patients as follow:

$$CSD_I = \frac{ASD_I}{TSD_I} \times 100\%$$

Where

CSD_I = % of conforming standard drug prescription for inpatients
ASD_I = Number of actual standard drugs prescribed in medical record
TSD_I = Number of total standard drugs in the national treatment guidelines

Taking into account the fact that one drug may be prescribed under different names, all drugs were considered by their generic names.

According to CSP and CSD_I, the degree of conformity to the standard guidelines will be classified in to 4 levels: excellent, good, medium, and bad for each group of patients corresponding to the following range: 90% and above; 69%-89%; 40%-69%; less than 40%, respectively. The unit of measurement is percentage of medical records in each group of patients conforming to the national treatment guidelines to a certain degree. It is considered that the higher level of conformity with the national treatment guidelines associates with the better quality of care.

(2) Length of stay: This refers to the days counted from the day of admission to the day of discharge. It is available in medical records. Unit of measurement is 1 day.

(3) Inpatient satisfaction: In health care, patient satisfaction is linked to predetermined attitudes toward the medical care system as well as expectations and perceptions regarding the quantity and quality of care received (Rossiter et al,1989). The survey can provide the responses about overall satisfaction with health care received , then the degree of inpatient satisfaction is classified into 2 levels: satisfaction and dissatisfaction. The unit of measurement is the percentage of inpatient satisfied with the health care received.

b. The quality of care at OPD

(1) Prescribing pattern: This refers to the use of drugs by physician. Again, explicit measurement is applied. Each prescription for an outpatient will be analyzed based on the indicators of drug prescribing recommended by WHO(1993) including:

* Average number of drugs prescribed per encounter
* Percentage of drugs prescribed by generic name
* Percentage of encounters with an antibiotic
* Percentage of encounters with an injection prescribed
* Percentage of drugs prescribed from essential drug list
* Average charge per encounter

Unit of measurements are the number of drugs, the percentage prescribed by generic name, the percentage of

prescriptions with an antibiotic, the percentage of prescriptions with an injection prescribed, the percentage prescribed from essential drug list, and dong (Vietnam currency unit) corresponding to each indicator.

After analyzing the general prescribing pattern, then each prescription was compared with the standard guidelines for each kind of disease. The measurement was based on the degree of conformity through determining the percentage of conforming standard drug prescription for OP patients as follow:

$$CSD_O = \frac{ASD_O}{TSD_O} \times 100\%$$

Where

CSD_O = % of conforming standard drug prescription for outpatients

ASD_O = Number of actual standard drugs prescribed in the prescription

TSD_O = Number of total standard drugs in the national treatment guidelines

Taking into account the fact that one drug may be prescribed under different names, all drugs were considered by their generic name.

According to CSD_O, the degree of conformity to the standard guidelines will be classified in to 4 levels: excellent, good, medium, and bad for each group of patient corresponding to the following range: 90% and above; 69%-89%; 40%-69%; less than 40%, respectively. The unit of measurement is percentage of prescriptions in each group of patients conforming to the national treatment guidelines to a certain degree.

(2) Outpatient satisfaction: A survey is conducted to investigate the outpatient satisfaction about the health services provided. The degree of overall outpatient satisfaction is classified into 2 levels: satisfaction and dissatisfaction. The unit of measurement is the percentage of OP satisfied with the health care provided.

c. Medical cost: This is the cost from the hospital perspective, calculated by hospital fees. It includes: bed-day charges, lab tests, X-rays, blood, drugs, surgical, examination fee etc. It is measured in money terms. The unit of measurement is dong (Vietnam currency unit).

4.2.3 Data analysis: Epi-Info and Eviews programs were used to analyze data in this study

a. The analysis of inpatient care

(1) Medical procedures

The general characteristics of patients are described such as sex, age, insurance enrollment for each selected disease. The objective is to compare the medical procedures received by insured and non-insured patients. The medical procedures were examined by two proxy indicators: CSP and CSD_I. These indicators were compared between insured and non-insured patients by classification into four levels: excellent, good, medium, and bad. The un-paired Student's test was used to test the significant difference of CSP and CSD_I between two groups of patients. The significance level is 0.05.

In fact, for inpatient care, both insured and non-insured patients pay the hospital based on fee-for - service principles. The difference is that the non-insured patient pays directly to the hospital while the insured patients expenses are paid by the health insurance agency. The effect of third party payment may work here. The doctor is likely to prescribe more drugs, to request more laboratory tests etc. for insured patients. However, the national treatment guidelines indicate necessary physical examination, laboratory test, and drugs to cure the disease, which should constrain doctors to some extent. Therefore, it is possible that there is no difference between two groups of patients in terms of the conformity to the national treatment guidelines.

For CSP and CSD_I, the hypothesis is that there is no difference between the insured and non-insured patients.

(2) Length of stay

As mentioned earlier, LOS reflects the effect of payment method on quality of care as well as the medical costs occurred. From the point of view of the health insurance agency, this indicator is very important when examining the performance of the health provider. The objective is to compare LOS between the insured and non-insured patients for each selected disease. In addition, the association of the affecting factors on LOS is

studied.

Firstly, un-paired Student's test was used to test for any significant difference of LOS between two groups of patients for each selected disease. From the literature review, it is said that under fee-for service reimbursement system, due to the third party payment effect, LOS tends to be longer for the insured patient. Thus, the hypothesis proposed is that LOS for the insured patients is longer than LOS for the non-insured patients.

Secondly, the multiple regression is used to study the effect of different factors on LOS. From literature review, it is said that LOS can be affected by the age of patient, the severity of disease, the type of disease, the payment method, and of course the performance of care provided. The association of these factors on LOS can be identified by using model 1:

Model 1:

$$LOS = a_0 + a_1 INS + a_2 INC + a_3 SEV1 + a_4 SEV2 + a_5 AGE + a_6 CSP + a_7 CSD_I$$

The payment method based on fee-for-service the health insurance agency applies to IP care may create the incentive for the doctor to increase LOS of insured patient in order to get more benefits. Therefore, the insurance enrollment may positively associate with LOS. The patient who admits the hospital with severe status of disease tend to have longer LOS. Holding the other factors constant, the older patient is likely recovered later than the younger one. The patient with high income can afford high medical cost, thus the income may positively associate with LOS. Meanwhile, the better the conformity to the national treatment guidelines the sooner the good result come. Accordingly, CSP and CSD_I are expected to be negatively associated with LOS. The description of variables in model 1 and their expected association on LOS are presented in Table 4.1

b. Analysis of outpatient care

(1) General analysis of prescription

The general indicators of prescribing practice recommended by WHO were analyzed to compare between the two groups of patients. They are as follows:

Table 4.1 Description of the variables in multiple regression for LOS

Variables	Description of variables	Expected sign
INS	Insurance enrollment; dummy variable INS=1: having health insurance =0: not having health insurance	+
INC	Income of patient	+
SEV1	Severity of disease; dummy variable SEV1=1: moderate case =0: otherwise	+
SEV2	Severity of disease; dummy variable SEV2=1: severe case =0: otherwise	+
AGE	Age of patient	+
CSP	The percentage of conforming standard procedures	-
CSD_o	The percentage of conforming standard drug prescription for IP patients	-

* Average number of drugs prescribed per encounter
* Percentage of drugs prescribed by generic name
* Percentage of encounters with an antibiotic
* Percentage of encounters with an injection prescribed
* Percentage of drugs prescribed from essential drug list
* Average charge per encounter

In terms of rational prescribing, it is good if the average number of drugs, charge per encounter, the percentage of encounters with an antibiotic or injection are lower, while the percentage of drugs prescribed by generic name and from essential drug list are higher.

Student's test was used to test the significant difference of these indicators between the insured and non-insured patient groups. Significance level is 0.05. For outpatient care, there is a ceiling in payment for insured patients. Accordingly, the doctor has to keep in their mind the limitation when they prescribe for insured patients. The hypothesis is that the average number of drugs and charge per encounter, percentage of encounters with an antibiotic or injection of non-insured patients are higher than insured patients, and the percentage of drugs prescribed by generic name and from the essential drug list of non-insured patients are lower than insured patients.

(2) Prescription analysis of two selected diseases

The percentage of conforming standard drug prescription for OP patient (CSD_o) was determined for each encounter. Then this indicator was compared between insured and non-insured patients by classification into four levels: excellent, good, medium, and bad. The Student's-test was used to test for significant difference of CSD_o between two groups of patients. The hypothesis is that CSD_o of insured patients is lower than non-insured patients.

c. Satisfaction of patients

(1) Satisfaction of inpatient

The analysis was based on questionnaires collected from inpatients. The questionnaires collected were analyzed in terms of: general characteristics, the percentage of overall satisfied responses, the

percentage of satisfied responses to specific dimension. These characters were compared between insured and non-insured patients. Chi-square was used to test for significant difference of overall satisfaction between the two groups of patients. The payment method applied for inpatient is fee-for-service without any ceilling, the third party payment can make the insured patient more satisfy when receiving more drugs, more laboratory tests, more care and attention etc. The hypothesis for testing the significant difference of satisfaction between insured and noninsured inpatients is that the insured patient is more satisfied with health care provided than noninsured patient.

The level of patient satisfaction depends not only on insurance enrollment but also on many factors such as: age, education level, income, medical care and treatment etc. To study the association of those factors with the patient satisfaction at OPD, logistic regression was used in this study:

Model 2:

$$P_I = \frac{1}{1+ e^{-Z1}}$$

Where

P_I = Probability of IP satisfaction

$$Z1 = \text{Ln}\left(\frac{P_I}{1-P_I}\right)$$

$$= b_0 + b_1\ INS + b_2\ INC + b_3\ AGE + b_4\ SEX + b_5 COST + b_6\ EDU1 + b_7\ EDU2 + b_8\ EDU3 + b_9\ LOS + b_{10}\ RES$$

The expected associations of these variables with inpatient satisfaction in model2 are assumed based on the results of previous studies on inpatient satisfaction (see Table 4.2)

(2) Satisfaction of outpatients

The similar anlysis was based on questionnaires collected from outpatients. Because of limitation in payment at the outpatient care area, the insured patients may be less satisfied than non-insured patients when they receive less and cheaper drugs, less attention of doctor and nurse etc. The hypothesis is that the insured patients are less satisfied with health care provided than non-insured patients.

Table 4.2 Description of the variables in logistic regression for inpatient satisfaction

Variables	Description of variables	Expected sign
INS	Insurance enrollment; dummy variable INS=1: having health insurance =0: not having health insurance	+
INC	Income of patient	+
AGE	Age of patient	+
SEX	Sex of patient; dummy variable SEX=1: male =0: female	+
EDU1	Educational level of patient EDU1=1: secondary school =0: otherwise	+
EDU2	Educational level of patient EDU2=1: vocational school =0: otherwise	+
EDU3	Educational level of patient EDU3=1: graduate and post-graduate =0: otherwise	-
COST	Medical cost	-
LOS	Length of stay of patient	-
RES	Residence area; dummy variable RES=1: urban =0: otherwise	-

The logistic regression was applied again to study the association of affecting factors on the patient satisfaction at OPD with model 3.

Model 3:

$$P_o = \frac{1}{1+ e^{-Z2}}$$

Where:

P_o: Probability of IP satisfaction

$$Z2 = \text{Ln}\left(\frac{P_o}{1-P_o}\right)$$

$$= c_0 + c_1 \text{ INS} + c_2 \text{ INC} + c_3 \text{ AGE} + c_4 \text{ SEX} + c_5\text{COST} + c_6 \text{ EDU1} + c_7 \text{ EDU2} + c_8 \text{ EDU3} + c_9 \text{ TIME} + c_{10} \text{ RES}$$

The expected associations of these variables with outpatient satisfaction in model 3 are estimated based on the results of previous studies on outpatient satisfaction (see Table 4.3).

4.3 Data source of the study

The data used in this study consisted of both primary and secondary data.

Primary data could be obtained by conducting a survey on patient satisfaction.

Secondary data was obtained from the following sources:

(1) MOH of Vietnam and National Statistics Department: data on economic situation, health status of Vietnam and Haiphong
(2) Vietnamese Health Insurance Department: data on the situation of health insurance in Vietnam and Haiphong
(3) Health office and health insurance office of Haiphong: data on health insurance in Haiphong
(4) Viet-Tiep hospital: General information, medical records, prescriptions

A stratified random sampling technique was used to collect data (Figure 4.2). The data was collected within 1 year (1996). The unit of sample are encounter (for OPD), medical record (for IPD) and patient (for survey).

Table 4.3 Description of the variables in logistic regression for outpatient satisfaction

Variables	Description of variables	Expected sign
INS	Insurance enrollment; dummy variable INS=1: having health insurance =0: not having health insurance	-
INC	Income of patient	+
AGE	Age of patient	+
SEX	Sex of patient; dummy variable SEX=1: male =0: female	+
EDU1	Educational level of patient EDU1=1: secondary school =0: otherwise	+
EDU2	Educational level of patient EDU2=1: vocational school =0: otherwise	+
EDU3	Educational level of patient EDU3=1: graduate and post-graduate =0: otherwise	-
COST	Medical cost	-
TIME	Waiting time for consultation	-
RES	Residence area; dummy variable RES=1: urban =0: otherwise	-

In order to eliminate the confounding variables, some exclusion criteria should be mentioned here:

(1) The cases with complications
(2) Patients with age of over 60 or under 15
(3) Pneumonia caused by virus or other factors.

Questionnaire development: Patients will be interviewed by trained interviewers. For OPD the interview will be carried out at the time of waiting for drugs. For IPD the interview would take place on the last day of admission because patients are likely to be willing to express their opinion if they are about discharged. The most effective means of satisfaction assessment is by postal questionnaire. However, in Vietnam the rate of response to postal questionnaire is very low. The satisfaction was measured by different indicators between outpatients and inpatients. The questionnaire for inpatients, from literature review, will consist of questions concerning about following dimensions:

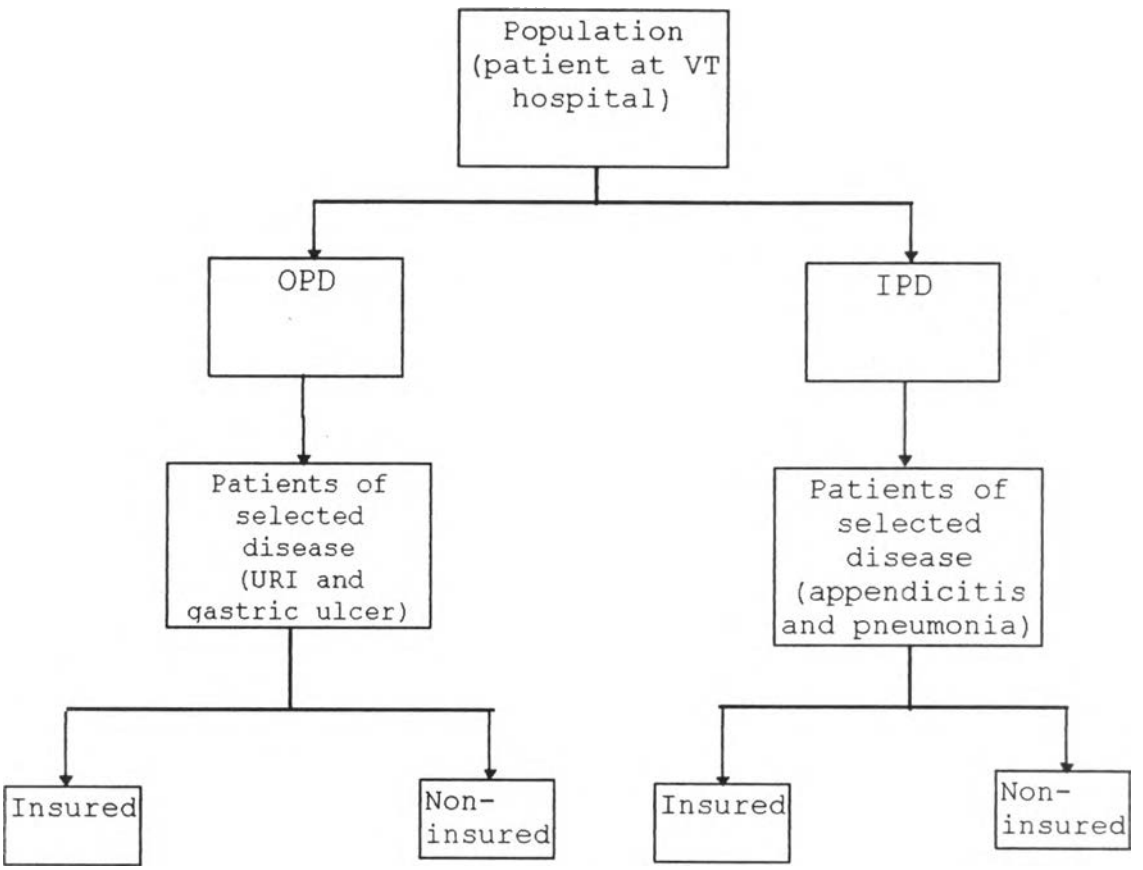
(1) General information such as: age, area of residence, education, sex, income, insurance enrollment, payment status etc.
(2) Treatment and care
(3) Courtesy of hospital staff.
(4) Information and communication activities
(5) Ward environment and facilities
(6) LOS and medical outcome

For outpatients, the questions will contain information about:

(1) General information such as: age, area of residence, education, sex, income, insurance enrollment, payment status etc.
(2) Waiting time
(3) Treatment and care
(4) Courtesy of hospital staff.
(5) Medical outcome
(6) Facility characteristics

Sample size: Calculation of sample size is required for medical records at IPD, prescriptions at OPD and this calculation will be applied for survey on patient's satisfaction at both IPD and OPD. According to the objectives of this study, in each tracer there are 2 groups of patients, insured and non-insured, which are independent each other. The quota technique was intended to be used here since there is not any available

Figure 4.2 Illustration of stratified sampling technique



information related to the means or the proportions of variables of interest. The number of samples required has to be great enough for statistical comparison: 10 % of total cases within one year was set for each tracer. The number of insured patients and non-insured patients in each group tracer was determined by their proportion. The results of these calculations are presented in Table 4.4.

Due to both time and financial constraints, the survey on patient satisfaction was not carried out. With the purpose of demonstrating the designed methodology, the hypothetical data was used in this study.

Table 4.4 The sample size calculated by applying quota technique

	URI	Gastric ulcer	Pneumonia	Appendicitis
Total cases (in 1996)	1528	1030	756	884
Proportion of insured: non-insured	20:80	25:75	45:55	30:70
Sample size (10% of total)	150	100	75	90
No of insured patients	30	25	33	27
No of non-insured patients	120	75	42	63