Chapter 5

RESULTS

According to the methodology designed in the previous chapter, the quality of care provided to the insured and non-insured patients of selected diseases at Viet-Tiep hospital was compared. This chapter provides the results achieved regarding the analysis of inpatient care, the prescribing pattern, and patient satisfaction.

5.1 Analysis of inpatient care

165 medical records were collected, of which 90 cases were appendicitis patients and 75 cases were pneumonia patients. The ratio between insured and non-insured patients were 27:63 and 33:42 for appendicitis and pneumonia, respectively. The proportion of males and females was almost equal (48.5:51.5). The mean of age of patients was 37 years. The quality of care was assessed by analyzing the medical records with regard to two aspects: medical procedures and length of stay.

5.1.1 Medical procedures

The explicit method was used when comparing each medical record with the national treatment guidelines in terms of physical examination, diagnosis, and prescribed drugs. CSP and CSD_I were defined for each case to reflect the level of conformity to the standard guidelines. Then they were compared between insured and non-insured patient groups for each selected disease.

For appendicitis, the level of the conformity for both insured and non-insured groups was quite high (see Table 5.1). CSP and CSD_I were not different between insured and non-insured patients (P value > 0.05). The classification of these indicators into 4 levels of conformity: excellent, good, medium, and bad gave the same result (see Table 5.2, 5.3).

For pneumonia patients, CSP and CSD_I were lower than the values for appendicitis patients. There was not difference between insured and non-insured patients for these indicators (P value > 0.05) (see Table 5.4). The same judgment was made according to the classification of these indicators into 4 levels of conformity: excellent, good, medium, and bad (see Table 5.5, 5.6).

Table 5.1   CSP and CSD_I by insurance status for
appendicitis patients

	Insured	Non-insured	P-value*
CSP (%)	92.34 (8.30)	91.47 (8.46)	0.700
CSD_I (%)	76.44 (16.31)	76.25 (15,03)	0.926

Note: Figures in parentheses are standard deviations.
(*) Significance level corresponds to the t-test
for respective variables.

Table 5.2   Level of conformity to the national treatment
guidelines by insurance status based on CSP
for appendicitis patients

Level	Insured	Non-insured
Excellent	74.1	71.4
Good	25.9	28.6
Medium	-	-
Bad	-	-

Table 5.3 Level of conformity to the national treatment
guidelines by insurance status based on
CSD_I for appendicitis patients

Level	Insured	Non-insured
Excellent	22.2	25.4
Good	40.7	39.7
Medium	37.0	34.9
Bad	–	–

Table 5.4 CSP and CSD_I by insurance status for pneumonia
patients

	Insured	Non-insured	P-value*
CSP (%)	76.34 (9.18)	76.28 (8.36)	0.745
CSD_I (%)	60.47 (9.44)	58.26 (9.35)	0.576

Note: Figures in parentheses are standard deviations.
(*) Significance level corresponds to the t-test
for respective variables.

Table 5.5   Level of conformity to the national treatment
             guidelines by insurance status based on CSP
             for pneumonia patients

Level	Insured	Non-insured
Excellent	–	–
Good	84.8	81.0
Medium	15.2	19.0
Bad	–	–

Table 5.6   Level of conformity to the national treatment
             guidelines by insurance status based on CSD_I
             for pneumonia patients

Level	Insured	Non-insured
Excellent	–	–
Good	30.3	26.2
Medium	69.7	73.8
Bad	–	–

Overall, there was not enough evidence to say that CSP and CSD_I are different between insured and non-insured patients. In other words, the quality of care regarding compliance to the standard guidelines was not different between insured and non-insured patients.

5.1.2 Length of stay

For appendicitis patients, LOS of the insured patients was longer (3.88 days) than the non-insured patients (P value < 0.05). The medical cost of insured patient, was accordingly higher than non-insured patient (P value < 0.05). The average cost per bed day of the insured was not different from the non-insured (P value > 0.05) (see Table 5.7).

The similar results were obtained for pneumonia patients. The LOS of the insured was longer (5.28 days) than the non-insured (P value < 0.05). The medical cost of insured patients was higher than for non-insured patients (P value < 0.05), while the average cost per bed day was not different (P value > 0.05) (Table 5.8). Since the appendicitis requires an operation, the cost of treatment is higher than for pneumonia.

The effect of different factors on LOS was investigated by using the multiple regression technique. Since the medical records do not provide income and severity data for each patient, this information was estimated. The estimation of the income of each patient was based on their age and occupation. According to the description of patient status at the time of admission, the severity level was evaluated for each case.

The regression was run for each case of the selected disease. The results of regressions showed no considerably different between appendicitis and pneumonia cases. The insurance enrollment, severe cases, moderate cases were associated with longer LOS in both cases (P value < 0.05) (see Table 5.9 and 5.10). The coefficient of insurance enrollment variable was quite large indicating that LOS tended to be clearly increased for insured patients. The income was likely not to affect LOS. The older patients tend to have longer LOS, although the association of age with LOS was not significant. The coefficients of CSP and CSD_I were negative. It means that the higher the level of compliance to the national treatment guidelines the shorter the LOS. However, the estimated coefficients were not statistically significant

Table 5.7   LOS and medical cost by insurance status for
appendicitis patients

	Insured	Non-insured	P-value*
LOS	11.48	7.60	0.004
	(7.20)	(3.06)	
Medical cost	449,867	314,498	0.005
	(207,022)	(136,320)	
Average cost	40,309	41,385	0.081
per bed-day	(2,524)	(2,747)	

Note: Figures in parentheses are standard deviations.
       (*) Significance level corresponds to the t-test
            for respective variables.

Table 5.8   LOS and medical cost by insurance status for
pneumonia patients

	Insured	Non-insured	P-value*
LOS	15.33	10.05	0.000
	(2.92)	(3.40)	
Medical cost	323,924	218,333	0.000
	(59,526)	(62,175)	
Average cost	21,260	22,323	0.086
per bed-day	(1,965)	(3,550)	

Note: Figures in parentheses are standard deviations.
       (*) Significance level corresponds to the t-test
            for respective variables.

Table 5.9   Multiple regression results for LOS of
             appendicitis patients

Variables	Coefficient	T-statistic	P-value
AGE	0.001	0.048	0.962
INC*	0.001	0.558	0.578
INS	4.421	7.131	0.000
SEV1*	2.667	2.960	0.004
SEV2*	10.071	7.529	0.000
CSP	−4.347	−1.050	0.297
CSD_I	−8.525	−3.841	0.176
No of observations	: 90		
Adjusted R-squared	: 0.763		
S.E of regression	: 2.429		

Table 5.10   Multiple regression results for LOS
              for pneumonia patients in hospital

Variables	Coefficient	T-statistic	P-value
AGE	0.041	2.257	0.027
INC*	0.004	−1.430	0.157
INS	5.303	12.648	0.000
SEV1*	3.182	4.150	0.000
SEV2*	9.092	9.123	0.000
CSP	−4.476	−1.832	0.071
CSD_I	−2.487	−1.046	0.299
No of observations	: 75		
Adjusted R-squared	: 0.821		
S.E of regression	: 1.750		

Note (*): Data used is hypothetical

because the significance levels of these coefficients were higher than 0.05 (see Table 5.9, and 5.10). The results were also not different from the expected association between independent variables and LOS.

5.2 Analysis of prescribing practice

250 prescriptions of two selected diseases were collected from OPD of Viet-Tiep hospital during the year 1996, of which 150 cases were URI and 100 cases were gastric ulcer. The prescribing practice of doctors was assessed by analyzing each prescription, based on the general indicators of prescribing practice (WHO, 1993) and the national treatment guidelines for URI and gastric ulcer diseases (MOH,1993).

5.2.1 General indicators of prescribing practice

For gastric ulcer patients, the average number of drugs prescribed and average cost per encounter for insured patients were lower than for non-insured patients (P value < 0.05)(see Table 5.11). All prescriptions contained at least one antibiotic drug. This showed an abuse of using antibiotic medicines in treatment this disease. The antibiotic should not be used routinely in gastric ulcer, according to the national standard guidelines, although there is clinical evidence that antibiotics can be curable. None of the encounters had any injected drugs. The percentages of drug prescribed by generic name and from the essential drugs list for the insured were higher than for the non-insured patients (P value< 0.05) (see Table 5.11).

The result was almost the same for prescriptions of URI patients. The average number of items prescribed and average cost per encounter for the insured were lower than the non-insured (P value< 0.05) (see Table 5.12). The percentage of drugs prescribed by generic name and prescribed from the essential drug list for insured patients were higher than for non-insured patients (P value< 0.05)(see Table 5.12). Antibiotics was given in all encounters. The percentage of encounters with an injection prescribed for insured patient was lower than for non-insured patients. This indicated that there was irrational use of injection drug for both insured and non-insured patients. There was no reason for injectable medicines to be used routinely in URI.

Table 5.11 General indicators of prescribing practice
          for gastric ulcer patients by insurance
          status

Indicators	Insured	Non-insured	P-value*
No of drugs	3.68 (0.63)	4.87 (0.74)	0.000
Cost	44,484 (15,587)	58,051 (13,151)	0.000
Generic drugs	73.44 (16.59)	58.63 (11.63)	0.000
Essential drugs	69.44 (17.25)	55.19 (11.37)	0.000
Antibiotic	100.00	100.00	
Injection	0.00	0.00	

Note: Figures in parentheses are standard deviations.
       (*) Significance level corresponds to the t-test
            for respective variables.

Table 5.12   General indicators of prescribing practice
             for URI patients by insurance status

Indicators	Insured	Non-insured	P-value*
No of drugs	3.83 (0.59)	4.67 (0.77)	0.000
Cost	32,77 (14,582)	51,501 (15,513)	0.000
Generic drugs	66.87 (18.65)	53.40 (12.88)	0.000
Essential drugs	59.93 (20.66)	50.58 (11.28)	0.004
Antibiotic	100.00	100.00	
Injection	13.30	18.30	

Note: Figures in parentheses are standard deviations.
        (*)   Significance level corresponds to the t-test
        for respective variables.

5.2.2 The level of compliance to the national treatment guidelines

CSD_o was determined for each prescription to reflect the level of conformity to the standard guidelines. The classification of CSD_o was 4 levels: excellent, good, medium, and bad showed that there were similar patterns for the insured and the non-insured in both gastric ulcer and URI (see Table 5.13 and 5.15). T-test results confirmed that this indicator was not statistically different between the insured and non-insured (P value > 0.05) (see Table 5.14 and 5.16).

5.3 Satisfaction of patient

The survey of patient satisfaction at OPD as well as IPD was designed to compare the level of satisfaction with care provided between the insured and non-insured. In this study the hypothetical data was used to demonstrate the methodology. Accordingly, the results in this section are not valid and thus cannot be used to draw a conclusion.

5.3.1 Satisfaction of outpatients

Supposed 60 questionnaires were collected from URI patients at OPD. The percentage of the insured was 20% in accordance with the general proportion of insured and non-insured in this disease. The ratio of male to female was 1:1. The mean of age of patients was 36 years.

The questionnaires were analyzed by insurance status. The educational level of the insured was higher than the non-insured (see Table 5.17). This figure is rational because in fact health insurance covers mostly people in the formal sector such as government employees, industrial workers, students etc. while people in the informal sector such as farmers, self-employed etc. seem not to be involved any health insurance scheme. There was no difference between insured patients and non-insured patients in terms of waiting time for consultation (see Table 5.17). The insured were less satisfied with health care service than the non-insured (P value of Chi-Square test was 0.049 < 0.05).

Logistic regression was used to study the association of different factors on patient satisfaction. The results provided the statistical significance for three variables including: Age, insurance enrollment, and

Table 5.13 The conformity level to the national
treatment guidelines for gastric ulcer
patients by insurance status

Level	Insured	Non-insured
Excellent	–	1.3
Good	84.0	84.0
Medium	16.0	14.7
Bad	–	–

Table 5.14 CSD_0 by insurance status for gastric ulcer
patients

	Insured	Non-insured	P-value*
CSD_0	0.73 (0.09)	0.75 (0.08)	0.649

Note: Figures in parentheses are standard deviations.
(*) Significance level corresponds to the t-test
for respective variables.

Table 5.15   The conformity level to the national
            treatment guidelines for URI patients by
            insurance status

Level	Insured	Non-insured
Excellent	-	3.4
Good	73.3	65.8
Medium	26.7	30.8
Bad	-	-

Table 5.16 CSD_o by insurance status for URI patients

	Insured	Non-insured	P-value*
CSD_o	0.71 (0.13)	0.73 (0.11)	0.552

Note: Figures in parentheses are standard deviations.
        (*) Significance level corresponds to the t-test
             for respective variables.

Table 5.17   Results of outpatient satisfaction by
insurance status[1]

Variables	Insured	Non-insured
EDU1[2] (%)	16.7	41.7
EDU2[3] (%)	41.7	27.1
EDU3[4] (%)	41.7	16.7
Urban resident (%)	75.0	47.9
Income (1,000 dong)	333,33	328.23
Medical cost (1,000 dong)	27.08	33.46
Waiting time (minute)	12.33	12.13
Satisfied (%)	33.33	64.60

Note: 1. The result in this table is based on
          hypothetical data
       2. Percentage of patients having the educational
          level of secondary school
       3. Percentage of patients having the educational
          level of vocational school
       4. Percentage of patients having the educational
          level of graduate and post-graduate

waiting time (P value < 0.05) (see Table 5.18). All of these variables had negative effects on patient satisfaction. It means that the older patient, the insured patient, the longer waiting time caused less satisfaction. Male, urban, and high educational level were negatively associated with patient satisfaction, although they were not statistically significant. It can be understood that for those people, a good quality of care was more expected more than for other people. Higher medical costs was associated with higher probability of satisfaction, however there was not enough evidence for a definitive conclusion (P value > 0.05) (see Table 5.18).

5.3.2 Satisfaction of inpatients

90 questionnaires of appendicitis patients were collected from IPD. The ratio of insured: non-insured was 30:70. The proportion of males was 47.8%. Mean of patient age was 35.

The insured patients were better educated than the non-insured (see Table 5.19). Medical costs and LOS for the insured were higher than for the non-insured. These figures were consistent with the results from analyzing medical records in the previous section. The percentage of insured patients satisfied with health care provided at IPD was higher than non-insured patients (P value of Chi-Square test was 0.047 < 0.05).

From the results of logistic regression for inpatient satisfaction, only insurance enrollment variable was statistically significant (P value < 0.05). The insured patients were satisfied with care provided than non-insured patients (see Table 5.20). The probability of patient satisfaction decreased with older patients, urban patients, higher educated patients; however, there was not statistical significance (P value > 0.05) (see Table 5.20). Longer stay, male and medical costs were also associated with increased probability of patient satisfaction, but they were not statistically significant.

5.4 Discussion of the results

The level of conformity to the standard guidelines at both IPD and OPD was not significant different between the insured patients and the non-insured patients. It may be explained that the national treatment guidelines require the essential treatment in

Table 5.18   Logistic regression results of satisfaction
              level for outpatient[1]

Variables	Coefficient	T-statistic	P-value
AGE	-0.182	-2.006	0.050
SEX[2]	-0.386	-0.231	0.818
RES[3]	-1.828	-1.380	0.174
INC	0.002	0.266	0.791
INS[4]	-4.174	-2.200	0.033
EDU1[5]	1.139	0.558	0.580
EDU2[6]	1.240	0.473	0.638
EDU3[7]	-0.394	-0.185	0.854
TIME	-0.843	-2.706	0.009
COST	0.111	0.981	0.331

No of observations   : 60

Log likelihood   : -12.648

Note 1. Data used is hypothetical.
      2. male=1; female=0
      3. urban=1; rural=0
      4. insured=1; non-insured=0
      5. secondary school=1; otherwise=0
      6. vocational school=1; otherwise=0
      7. graduate and post-graduate=1; otherwise=0

Table 5.19   Results on inpatient satisfaction by
              insurance status[1]

Variables	Insured	Non-insured
EDU1[2] (%)	11.1	30.2
EDU2[3] (%)	51.9	27.0
EDU3[4] (%)	37.0	23.8
Urban resident (%)	59.3	55.6
Income (1,000 dong)	339.70	332.90
Medical cost (1,000 dong)	437.74	348.51
LOS (day)	8.04	6.90
Satisfied (%)	70.4	47.6

Note: 1. The result in this table is based on
           hypothetical data
        2. Percentage of patients having the educational
           level of secondary school
        3. Percentage of patients having the educational
           level of vocational school
        4. Percentage of patients having the educational
           level of graduate and post-graduate

Table 5.20   Logistic regression results of satisfaction
              level for inpatient[1]

Variables	Coefficient	T-statistic	P-value
AGE	-0.046	-0.575	0.567
SEX[2]	0.790	0.577	0.566
RES[3]	-0.850	-0.541	0.590
INC	0.000	-0.113	0.911
INS[4]	4.411	2.408	0.018
EDU1[5]	1.039	-0.435	0.665
EDU2[6]	1.229	-0.479	0.633
EDU3[7]	-2.918	-1.133	0.261
LOS	3.424	-1.668	0.10
COST	0.017	0.518	0.606

No of observations   : 90

Log likelihood   : -13.029

Note   1. Data used is hypothetical.
       2. male=1; female=0
       3. urban=1; rural=0
       4. insured=1; non-insured=0
       5. secondary school=1; otherwise=0
       6. vocational school=1; otherwise=0
       7. graduate and post-graduate=1; otherwise=0

order to cure a certain disease. Therefore, the doctors usually comply with those requirements. This finding implies that the national treatment guidelines play a very important role in the standardization of quality of care at the hospitals.

At IP care, LOS of the insured patients was longer than the non-insured patients. The shorter LOS may reflect the better quality of care provided the other factors are constant. In this study, the payment method was not the same between insured and non-insured patients. In addition, the readmission rate as well as the final outcomes of the process of care concerned with the health status of patients were not assessed. Therefore, it cannot be said that quality of care for non-insured patients was better than for insured patients. The figures above suggest that the payment method of combination between fee-for-service and flat rate per bed-day without any ceiling created incentive for the hospital increase LOS for insured patients in order to get higher benefits. This result helped to understand why most of health insurance agencies in country worry about the possibility of bankrupt of IP fund. The medical costs for the insured patients at IPD tend to escalate over last 3 years. The payment method based on fee-for-service principle is likely to make the doctors and the insured patients happy but not the health insurance agency.

The result from analyzing general indicators showed the same pattern for both gastric ulcer and URI diseases, except for the percentage of injected medicines. It is likely that the cost of the insured was kept down by limiting the number of drugs, prescribing more general and essential drugs which are cheaper than brand names. This judgment can be explained by the payment method of heath insurance for outpatients. It is combination of fee-for-service and capitation. This payment mechanism had affects on behavior of doctors in prescribing practice. The drug prescribing practice of the doctors for the insured patients was better than for the non-insured patients. However, there was an overuse of antibiotic in treatment for both groups. The irrational use of antibiotics is a common problem in developing countries. It causes a large inefficiency in drug use since antibiotics are usually expensive. On the other hand, the side effect and adverse reaction of antibiotics are common concerns. In addition, the overuse of antibiotics leads to the resistance of bacteria to the drug.

The process of care, in this study, was mainly assessed through the medical procedures (for IP care) and the prescribing practice (for OP care). Nevertheless, there are several factors which have impact on them such as: the qualification of health professionals, the availability of equipments and drugs, the payment mechanism, the relationship between patient and doctor. Most of these factors are considered as the structural attributes. It means that there is a close dependence between the structure and the process of care. The structural attributes were omitted in this study since the main objective is to compare quality of care between the insured and the non-insured. On the other hand, another impact comes from the pharmaceutical industry and medical equipment suppliers. Various activities of the commercial promotion has affected, in some extent, behavior of the doctors in practice.

Since there was no available data for patient perspective, this study could not provide results about patient satisfaction. However, the effect of some factors on patient satisfaction was analyzed through the regression analysis. From the results of regression analysis, the affect of medical costs and LOS on patient satisfaction is contrary to what was expected. The perception about these factors may be different between the insured patients - who pay nothing when they receive health care services and the non-insured patients - who have to pay medical cost out of their pocket. In this study, the patients who are investigated include both the insured and the non-insured. Therefore, the association of medical costs and LOS with patient satisfaction may be mixed-up.