CHAPTER 7

DISCUSSION

This chapter presents the analysis of break-even point for catheter unit, analysis of responses to questionnaire of individuals WTP, and expected benefit.

7.1 Break-even analysis

From the study of the catheter unit in the fiscal year 2003, it was found that the variable cost was the highest cost. By analysis of the variable cost, it was shown that materials from centre store contributed the highest portion (51%). From Table 6.5 in the previous chapter, study has found that the number of patients who visited the catheter unit in 2003 was more than the required number so as to reach the break-even point, the number of patients who had the diagnosis test was 1557, while the break-even point is 656 patients. The balloon patients were 163, while the break-even point is 69 patients. The pacemaker patients were 23, while the break-even point is ten patients.

Table 7.1: Summarized the results

	Break-even point Number of patients	Number of patients requested
FC = $270,903.00 (44%)		
VC =$ 342,641.21 (56%)		
Diagnosis	656	1557
Balloon	69	163
Pacemaker	10	23

From Table 6.5 in the previous chapter, catheter unit works more efficiency than the required break-even point to cover the expenses. These results are similar to what was said in the article by Souzdalnitski et al.2004, to show that the practice of APS treats 278 patients monthly while the break-even point in APS practice is 16 patients a month. These results are similar to what that said in Chotiwan et al. 1995 article in which most required tests in Chulalongkorn Hospital were higher than the break-even point.

Government has offered a subsidy of $480,548.50 to the catheter unit, taking into consideration that the economic revenue of the catheter unit are $987,500.00 and this means that the governments subsidy to the catheter unit is really covered by the revenue of the catheter unit and the difference between the revenue and the expenses is $373,955.37. This means that government can support the catheter unit revenues before spending on this unit from the government's revenues as the facts manifest in 2003.

7.2 Willingness to pay

From table number 6.6 in the previous chapter which explains the effect of independent variables on diagnosis, balloon, and pacemaker, study has found that some of these independent variables are insignificant. This refers to the fact that the study sample is too little compared with the Palestinian society and the inability of the sample to represent the Palestinian society accurately.

From Table 6.11, study shows that education level affects the willingness to pay and this result is similar to what was said in the article by Katon, Frick 2003.

Table 6.12 shows that the income level affects the willingness to pay and this result is similar to what was said in the article by Masued et al. 2003. This table shows also the relations between the income level and WTP in regard to diagnosis, balloon, and pacemaker. Mean value has been used whose effect is measured with the break-even point.

As for the group whose income is less than $300, the WTP for diagnosis, balloon, and pacemaker is $240, $388, and $648 respectively. Following the same method in the computation break-even point in the previous chapter, the equivalent output is 6149, while the actual equivalent number is 2451.13. This means that costs exceed the revenue with $161,125.00.

For the group whose income between $300-600, the WTP for diagnosis, balloon, and pacemaker is $285.62, $551.04, and $982.29 respectively, the equivalent output for

these prices is 3121.82, while the actual equivalent number is 2451.13. This means that costs exceed the revenue with $56,421.70.

For the group whose income between $601-900, the WTP for diagnosis, balloon, and pacemaker is $292.30, $542.30, and $1,100 respectively, the equivalent output for these prices is 2959.26, while the actual equivalent number is 2451.13. This means that costs exceed the revenue with $44,738.30.

For the group whose income is more than $1,500, the WTP for diagnosis, balloon, and pacemaker is $375, $850, and $1,600 respectively. The equivalent output for these prices is 1600.79, while the actual equivalent number is 2451.13. This means that the break-even point is less than the equivalent output. This shows that there is surplus with a $145,680.80.

Table 6.6 shows that the study has manifested that individual's rate whose income in under poverty line, i.e. less than $300 is 30.7%. Income between $300-600 is 43.2%, income between $601-900 is 11.7%, income between $901-1,200 is 7.2%, income between $1,201-1,500 is 3.6% and income more than $1,500 is 3.6%. Then, can those who get medium income and the rich cover their own costs and the Poor's costs.

According to the Diagnostic test, Table 7.2 illustrate that all groups are willing to pay more than cost. Based on the result obtained from the survey findings, it shows that there is net revenue from the diagnostic test amounting to $11,855.52; this revenue has been obtained as follows:

$\sum$Net revenue= (WTP-cost)*freq.

Table 7.2: The relationship between WTP and unit cost

Income (USD)	Freq.	%	WTP	Unit cost	Difference	Total
Less than 300	34	30.7	240.38	155.70	84.68	2,879.28
300-600	48	43.2	285.63	155.70	129.93	6,236.64
601-900	13	11.7	292.30	155.70	136.60	1,775.80
901-1200	8	7.2	162.50	155.70	6.80	54.40
1201-1500	4	3.6	163.75	155.70	8.05	32.20
More than 1500	4	3.6	375.00	155.70	219.30	877.20
Total	111	100				11,855.52

Figure 7.1 shows the net revenue at different price levels. The current price of diagnostic test is $500. According to survey result, 26 people are willing to pay the current price of $500 for the diagnostic test. The net revenue from this people can be estimated as $8,951.80 as shows in the Figure 7.1. Table 7.3 illustrate net revenue from people who are willing to undertake diagnostic test at different price levels.

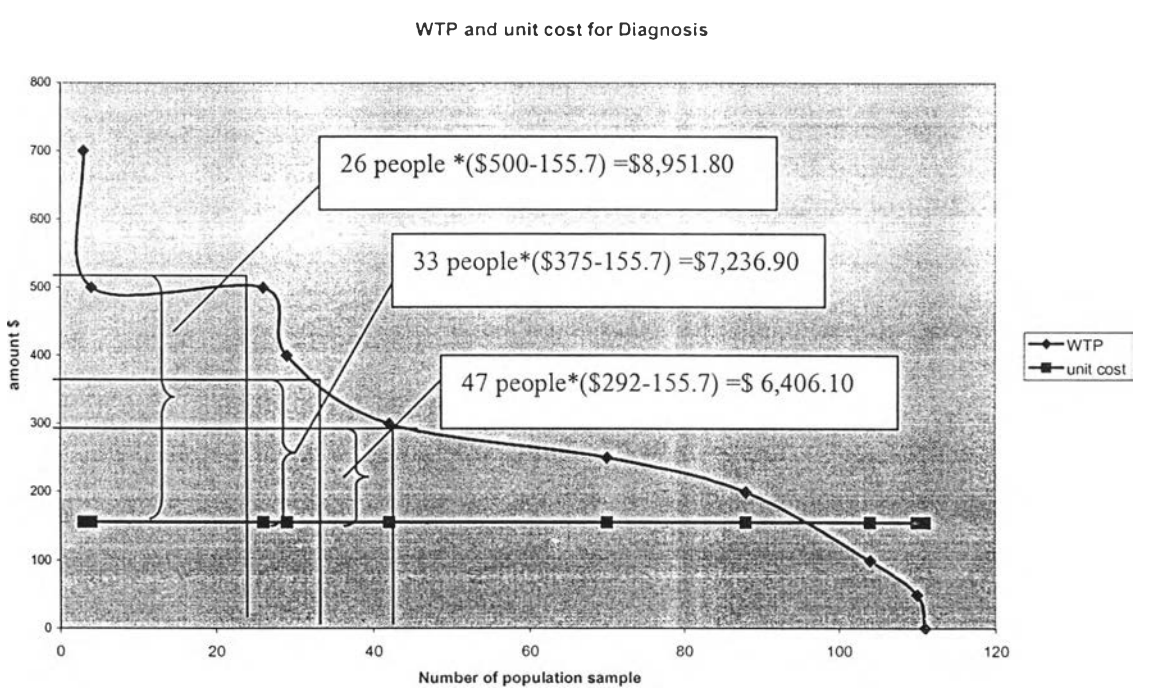

Figure 7.1: WTP and unit cost for Diagnosis

Table 7.3: The relationship between WTP and net revenue

Number of people	WTP (USD)	Unit cost(USD)	Net revenue (USD)
26	500.00	155.70	8,951.80
33	375.00	155.70	7,236.90
47	292.00	155.70	6,406.10
70	240.00	155.70	5,901.00

From the figures in the Table 7.3, it could be seen that at higher price level, the net revenue is higher which means that this catheter unit is unlikely to raise net revenue by reducing the price. Even at lower price level, more people are willing to undertake the diagnostic test; the net revenue is lower when comparing with the net revenue of higher price level with less number of people. Accordingly, it can see that the catheter unit maximizes its net revenue from diagnostic test at price of $500, but beneficial for patients increase when prices decrease.

For the Balloon, people whose income is more than $1,500 are willing to pay $850, while the cost is $541.33, then the difference is $308.67. Poor people are willing to pay $388 for the balloon operation with a difference of $153.30. Then a patient whose income is more than $1,500 leaves a difference which can cover the difference in costs for two poor patients. According to the percentage of patients whose income more than $1,500 they can cover 23.5% of poor Balloon patients.

People whose income is between $300-600 are willing to pay $551.04, while the cost is $541.33, and then the difference is $9.71. Poor people are willing to pay $388 for the balloon operation with a difference of $153.30. Then there are 16 patients whose income between $300-600 leaves a difference which can cover the difference in cost for one poor patient. People whose income is between $601-900 are willing to pay $542.30, while the cost is $541.33, then the difference is $1, this means these patients can only covers they costs. The group whose income between $901-1,200, and the group whose income between $1,201-1,500 are willing to pay less than costs for balloon. These results mean that the rich patients can't cover all poor patients for balloon treatment. Table 7.4 below illustrates the results of relationship between WTP and net loss. Based on the

figures deficit in the Table 7.4, it could be seen that from balloon operation, the catheter unit incurred total net loss of $5,095.68.

Table 7.4: The relationship between WTP and unit cost

Income (USD)	Freq.	%	WTP	Unit cost	Difference	Total
Less than 300	34	30.7	388.00	541.33	-153.33	-5,213.22
300-600	48	43.2	551.04	541.33	9.71	466.08
601-900	13	11.7	542.31	541.33	0.98	12.74
901-1200	8	7.2	412.50	541.33	-128.83	-1,030.64
1201-1500	4	3.6	400.00	541.33	-141.33	-565.32
More than 1500	4	3.6	850.00	541.33	308.67	1,234.68
Total	111	100				-5,095.68

Figure 7.2 shows that the net revenue at some of different price levels. According to the net revenue calculated at different price levels, it could be seen when price decreases, it beneficial for patients. Table 7.5 illustrates net revenue from people for balloon operation.

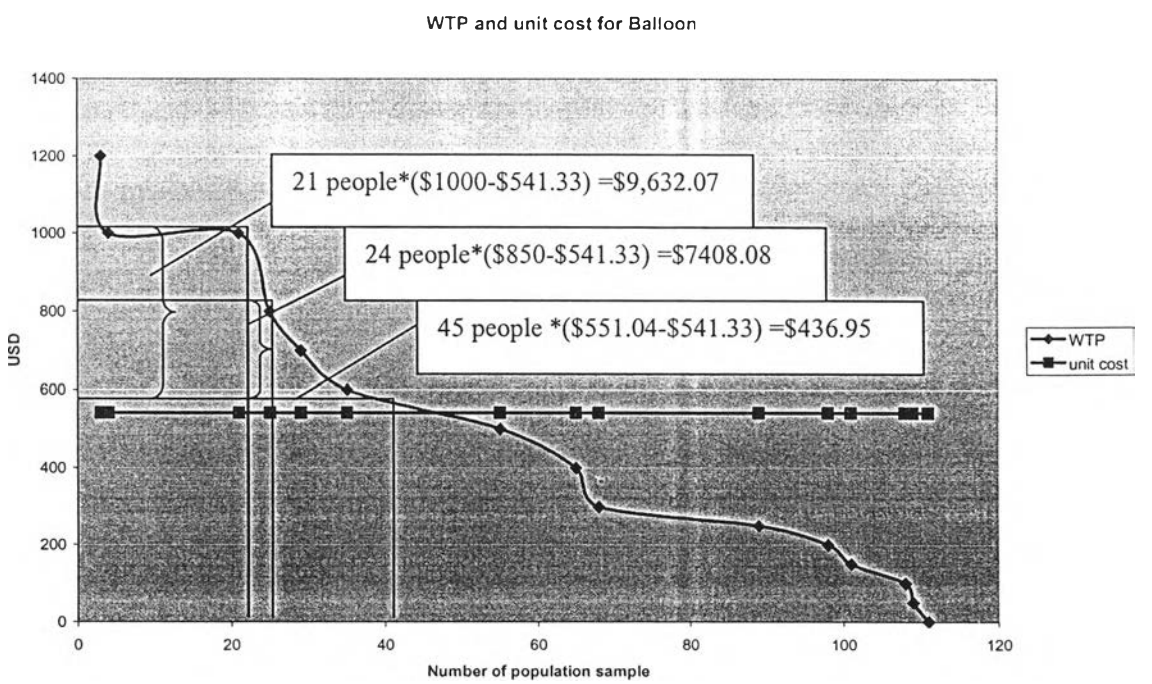

Figure 7.2: WTP and unit cost for Balloon operation

Table 7.5: The relationship between WTP and net revenue

Number of people	WTP (USD)	Unit cost(USD)	Net revenue(USD)
21	1,000.00	541.33	9,632.07
24	850.00	541.33	7,408.08
45	551.04	541.33	436.95

Regarding the Pacemaker operation, from the figure illustrate in Table 7.6, it could be seen that all income groups are willing to pay less than costs; accordingly the catheter unit incurred net loss amounting to $117,216.62 from the pacemaker operation.

Table 7.6: The relationship between WTP and unit cost

Income (USD)	Freq.	%	WTP	Unit cost	Difference	Total
Less than 300	34	30.7	648.00	1,953.14	-1,305.14	-44,374.76
300-600	48	43.7	982.29	1,953.14	-970.85	-46,600.80
601-900	13	11.7	1,100.00	1,953.14	-853.14	-11,090.82
901-1200	8	7.2	812.50	1,953.14	-1,140.64	-9,125.12
1201-1500	4	3.6	800.00	1,953.14	-1,153.14	-4,612.56
More than 1500	4	3.6	1,600.00	1,953.14	-353.14	-1.412.56
Total	111	100				-117,216.62

Figure 7.3 below illustrate the WTP and unit cost for pacemaker. From the result, it could be revealed that the catheter unit earns net revenue only at the current price of $2,000. Further it could be found that any decrease in price more than $50 leads to incurring net loss. However, some of this loss can be revealed by revenue earns from diagnosis function. Table 7.7 illustrates net revenue/loss from people for pacemaker operation.

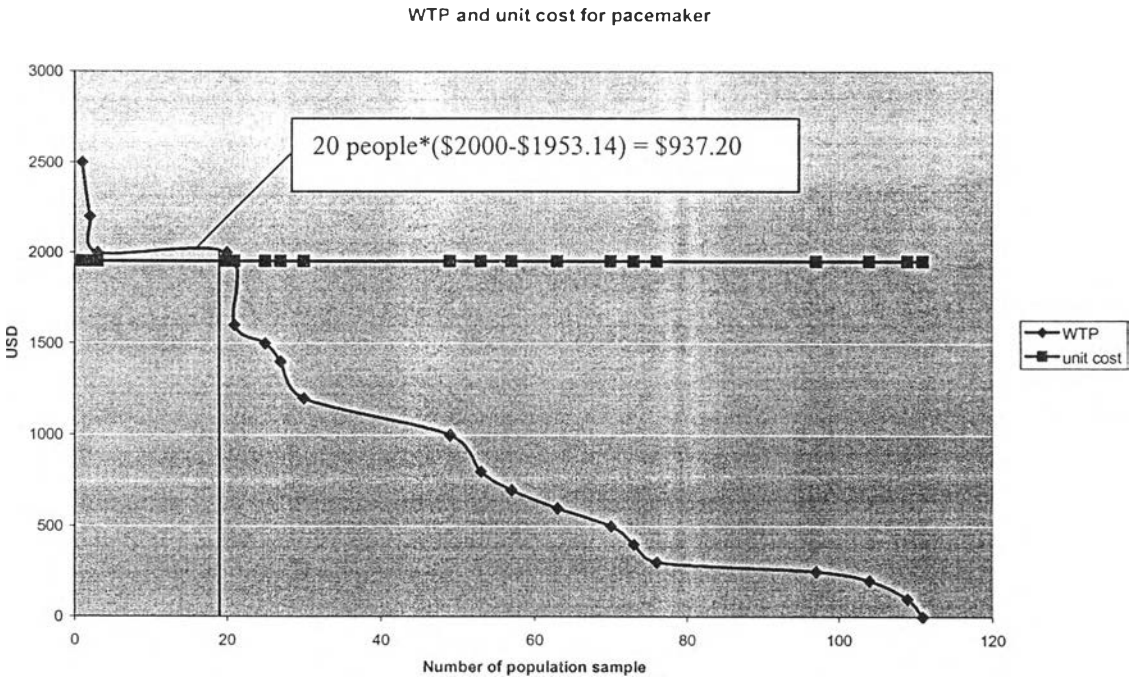

Figure 7.3: WTP and unit cost for Pacemaker

Table 7.7: The relationship between WTP and net revenue/loss

Number of people	WTP (USD)	Unit cost(USD)	Net revenue / loss (USD)
20	2,000.00	1,953.14	937.20
21	1,600.00	1,953.14	-7,415.94

Table 5.1 shows that uninsured patient's forms 39 from 1743 patients who visited catheter unit in 2003, and then can those uninsured patients who pay full price cover their costs and the Poor's cost?

As the Diagnosis test, uninsured patients pay $500, while the cost is $155.70. The difference is $344.30. Poor patients pay 40$, the difference is -$115.70. Then uninsured patient leaves a difference which covers the difference in cost for 2.97 poor patients. There are 32 uninsured patients for diagnosis test; they can cover the difference in cost for 95 poor patients.

As the Balloon operation, uninsured patients pay $1,000, while the cost is $541.33. The difference is $458.67. Poor patients pay $80, the difference is -$461.33.

Then uninsured patient leaves a difference which covers the difference in cost for one poor patient. There are 2 uninsured patients for balloon; they can cover the difference in cost for 2 poor patients.

As the Pacemaker operation, uninsured patients pay $2,000, while the cost is $1,953.14. The difference is $46.86. Poor patients pay $160, the difference is -$1,793.14. There are 5 uninsured patients for pacemaker, but they can't cover the difference in cost for poor patients.

7.3 Expected Benefit

Expected benefit from the catheter unit includes the economic value for both the patients and the government. By using sensitivity analysis for 5, 10, 15, and 20 years, economic benefit can be calculated for each CVD patient and for the government.

Calculating the economic benefit of a patient can be obtained by multiplying the years saved by GDP per capita which is $896. If the treatment in the catheter unit results in preserving the patient's life (years saved) for five years, then the economic benefit is $4,480.00. For ten years is $8,960.00. For 15 years is $13,440.00, and if the treatment results in preserving the patient's life is 20 years, the economic benefit is $17,920.00. The expected economic benefit for the government can be calculated by using the following equation

$$EB = (1-x) * -\$23 + x\left[\frac{yearssaved * GDPpercapita - \$23}{employee / population}\right]$$

$$EB = (1-20\%) * -\$23 + 20\%\left[\frac{5years * \$896 - \$23}{54\%}\right] = \$1,636.25$$

This shows that the government achieves an expected benefit in addition to the benefit obtained from the difference between the revenues and the costs. Everyone is expected to visit the catheter unit, patients having CVD make 20% and the expected benefit will be $1,636.25 if the patient's life is preserved for five years. For ten years is $3,295.50. For 15 years is $4,954.75, and for 20 years is $6,614.