Cost of Producing a Medical Doctor at Chulalongkorn University

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Abstract

To illustrate the cost of producing a medical doctor through a 6-year curriculum and the analysis of the cost components of the Faculty of Medicine, could be used as key data for future planning, budgeting and preparation for the autonomous university.

The cost centers were categorized to be executive, education support and education unit. The simultaneous equation method was employed to allocate all costs from other associated cost centers to the education unit.

The unit cost per enrolled student was 2,161,124 baht and 8,217 Baht/Student Credit Hour (SCH), while the unit cost per graduate was 2,174,091 baht and 8,267 Baht/SCH. The labor cost accounted for 69.46 per cent, capital cost, 26.42 per cent and material cost, 4.12 per cent of the total medical doctor production cost. The three most costly departments were, : Department of Medicine (13.24%), Department of Obstetrics and Gynecology (11.73%) and Department of Paediatrics (9.87%). The cost-fee ratio (cost/fee) was 95 : 5 which suggested that medical students obtain 95 per cent subsidy from the government budget or the society. If the University becomes autonomous and less dependent on public budget, the fee may have to be adjusted higher to cover the cost. The percentage of drop out and repeat students was 0.00-0.88 per cent with a delay duration of about 6 months to one year only. The opportunity cost of six years' study for a student attending the medical school was 544,956 baht which raised the total cost per graduate to 2,719,047 baht from student/societal perspective.

Key word : Unit Cost, Medical Student, Economic Cost

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Limitation of resources is one of the major problems in the economy in the age of Globalization. Effective planning and policy making are strategically important at all levels. Regarding education planning, what is most needed in the process of policy making is accurate data covering the following issues: the personal and educational needs, education provisations, education expenditures and revenues. Hence, the cost analysis of education investment directly provides the needed data.

In every university, the cost of medical education is ranked top of all the faculties. Since the learning processes in medicine is both scientific and dependent on hospital facilities, i.e., it requires the use of costly equipment in laboratories and medical services more than other kinds of advanced education. At the same time, the medical curriculum is longer than those of other faculties.

The unit cost analysis of a medical student is used for assessing resources required in running the operation of all facilities in the faculty.

The unit cost analysis of medical education, Chulalongkorn University, the cost information was collected between 1 October 1999 and 30 September 2000.

The Faculty of Medicine of Chulalongkorn University and its departments gained useful data about the unit costs of medical students, which are needed for planning a medical training program, budgeting, as well as setting of tuition fees, according to the real value of resources used in the programs.

Education affects both human resources and a country's economics. Schultz stated that education increases work efficiency, develops human resources which is key to economic developments[1].

The economics of education is the study of how people and society choose, with or without the use of money, to employ scarce production resources and to produce various types of training in the development of knowledge, skills, mind, character and so forth[2].

Richard Perlman classified cost of education into two categories, namely: 1) direct cost which is the direct expenses for a student, e.g., tuition fee, transportation, books, etc. 2) indirect cost or opportunity cost..

Economists define cost as the value of resources used to produce something, including a specific health service or a set of services (as in a health program)[3]. An economist's way of thinking about cost is different from that of an accountant, who is concerned with the firm's financial statements. Accountants tend to take a retrospective look at a firm's finances, because they have to keep track of assets and liabilities, and to evaluate past performance. Accounting cost includes depreciation expenses for capital equipment, which are determined on the basis of the allowable tax treatment by the Internal Revenue Service. Economists - and we also hope managers - take a forward - looking view of the firm. They are concerned with what cost is expected in the future, and with how the firm might be able to rearrange its resources to lower its cost and improve its profitability. They must, therefore, be concerned with opportunity cost, the cost associated with opportunities that are foregone by not putting the firm's resources to their highest values.

An estimate of indirect costs due to the demands of a medical school, say a large teaching hospital, was investigated at Alfred Hospital. It showed that the total expenditure from 1974 to 1975 for Alfred Hospital was AU $ 21,900,000 (Australian Dollars), of which only AU $ 41,000 could be attributed to indirect costs that arose from student teaching and was incorporated into the total hospital expenditure[4]. The annual cost for each medical student, was the sum of direct university costs (AU $4,617), Tertiary Education Assistance Scheme (AU $1,200) and indirect costs (AU $44) - in aggregate AU $5,900. Thus, the cost of the six-year course for each student was approximately AU $35,500[5].

Estimated costs for medical student education appear to vary widely[6]; however, such variations derive from the different ways that the question is addressed. Costs can be categorized as instructional costs and total educational resource costs. Instructional costs, which can be distinguished further as marginal costs or proportionate-share costs, are those that can be related directly to the teaching program and its supports. Total educational resource costs are those costs that support all faculties deemed necessary to conduct undergraduate medical education in all of their activities of teaching, research, scholarship, and patient care. The authors' reviewed studies covered a period of over 20 years and it was found that instructional cost estimates of medical student education, when adjusted to a standard base year (1996 US dollars), fell within a fairly narrow range: most were between US $40,000 and US $50,000 per student per year. Estimates of total educational resource costs showed greater variation, but four of six estimates fell between approximately US $72,000

and US $93,000 per student per year. The authors note that the present directions of curricular innovation-small-group learning, investment in information technology, and clinical education in ambulatory sites-offer little solace to those concerned with mitigating the costs of medical student education[6].

Most medical schools in the United States were able to keep tuition fees at 4 to 6 per cent of their budgets. These budgets have increased at a rapid pace over the past 25 years. Total tuition costs in the United States between 1970 and 1990 increased from $ 63 million to $ 840 million. The total cost of tuition and fees between 1990 and 1996 alone increased from $ 11.1 million to $ 16.6 million, an increase of 50 per cent[7].

MATERIAL AND METHOD
Data collection

Data were collected from the Faculty of Medicine departments and the King Chulalongkorn Hospital. Two types of data were collected: Primary data: Came from the observation and questionnaires interview of the medical doctors, and for the con-

tribution of their work to the teaching of medical students. Secondary data: This type of data was collected from several units concerned: Faculty- the Secretariat Office, Division of Finance Division of Logistic, Division of Policy and Planning, Division of Building and Transport etc, King Chulalongkorn Hospital - Hospital Administration Office.

Population and sample

The target population comprising medical schools purposively selected the Faculty of Medicine, Chulalongkorn University.

Analysis of cost of education

The total cost was the summation of the labor cost, material cost and capital cost.

Allocation criteria

The cost allocation criteria for the administration and education supporting units as shown in Table 1 was used in the simultaneous equation method for cost allocation to all the education centers-the departments.

The total cost of a department
The total cost of each department was calculated by :

$$TCdj = Cd + Cwj \times 0.1$$

Where TCdj : Total cost of department j
       Cd   : Total faculty cost of department j
       Cwj : Total cost of inpatient and outpatient ward j

The total cost of medical student
The total cost of medical students was calculated by :

$$TCms = TCy1 + \sum_{j=1}^{n} TCdj$$

Where TCms : Total cost of producing medical students
       TCy1 : Total cost of producing medical students year 1
       TCdj : Total cost of department j
       TCs   = TCms/Average number of students enrolled per year

Where TCs   : Unit cost of a medical student
       TCsch = TCs/Cr

Where TCsch : Cost per student credit hour
       Cr   : Total credits of one medical student for a 6 year's course

Table 1. Allocation basis used in the study of Faculty cost.

Cost center	Criteria	Reason
Secretariat office	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel
Division of Administration	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel
Division of Building and Transport	Area used of each cost center	Cost allocation to each cost center is related to the area used
Division of Finance	Personnel of each cost Center	Cost allocated to each cost center is related to the number of personnel
Division of Logistic	Equipment and material cost of each cost center	Cost allocation to each cost center is related to the material and equipment they used
Division of Policy and Planning	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel
Division of academic and Research	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel
Library	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel
Division of Education Service	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel
Computer Unit	Personnel of each cost center	Cost allocated to each cost center is related to the number of personnel

Table 2. The total cost, unit cost and Baht per Student Credit Hour (SCH) of producing a medical doctor (not adjusted with dropout and repeat student).

Total cost	Unit cost	Baht/SCH
326,329,723	2,161,124	8,217

Table 3. The total cost, unit cost and Baht per Student Credit Hour (SCH) of producing a medical graduate (adjusted with dropout and repeat student).

Total cost	Unit cost	Baht/SCH
328,287,701	2,174,091	8,267

Table 4. The cost and percentage of the total cost labor cost, material cost and capital cost of producing medical doctors (not adjusted with dropout and repeat student).

	Baht	Per cent
Labor cost	226,678,855	69.4
Material cost	13,447,664	4.1
Capital cost	86,203,173	26.4
Total	326,329,722	100.0

For the cost of producing premedicine students the authors used the data from a previous study (Pinijasak S, 1991)[8]. She estimated the cost of producing an engineer for the first year in Chulalongkorn University, the curriculum of which also included study in the Faculty of Science, Political Science, Language Institute, Arts the cost/SCH was 843 baht and adjusted with an inflation rate of 30 per cent was 1,096 baht (data from CPI, department of Domestic Commerce, Ministry of Commerce).

The authors calculated the cost by multiplying credits that student studied in year 1 by 1,096 baht to be the total cost of year 1.

For the cost of producing a student from year 2 to year 6, the cost was collected from the departments which were related to teaching curricular and overhead cost centers.

The total cost of medical students from year 2 to year 6 was calculated by:

$$Cyi = \sum_{i=2}^{6}[Dij \times Cij/Nj]$$
$$(i = 2, 3, 4, 5, 6)$$

Where Cyi : total cost of producing students year i
         Dij : total cost of department j teaching students year i
         Cij : total credits of department j teaching students year i
         Nj : total credits of department j teaching students year 2-6

Hospital cost

Hospital cost was allocated to each department with related inpatient and outpatient activities. The authors used 10 per cent to allocate its cost to related departments, which was calculated from teaching proportion of the teaching staffs, fellows and residents.

The total hospital cost was calculated by:

$$Ch = \sum_{i=1}^{n}[Cwi \times 0.1]$$

(i = inpatient and outpatient ward that the medical student attended)

Where Ch : total hospital cost
         Cwi : total cost of inpatient and outpatient ward i

Economic loss from a dropout or delayed student

The analysis of cost of production as mentioned above was the cost calculated without adjusting the economic loss from dropouts or delayed students. To adjust this factor the authors added the dropout ratio and the average number of study years to assigned study year ratio to the formulas.

To estimate the cost per graduate with the calculation of the dropout and repeat medical student, Mark Blaud formula[9] was used as follows:

$$TCg = TCs \times [Y/N] \times [1/(1-d)]$$

Where TCs : Unit cost of medical student
         TCg : Unit cost of medical graduate
         Y : Average number of study years
         N : Number of assigned study years (6 years)
         d : Proportion of dropout students

Indirect cost of students

The indirect cost of students is the opportunity cost or income foregone from studying in the university. This indirect cost was calculated by using data from the Report of the labor force survey of the whole Kingdom round 3, August 2000[10].

The income that one should gain was calculated by assuming he/she went to work in his/her own situation that was male or female, aged 19-25, Bangkok Metropolis, North, Southern, Central or Northeastern Region for home, complete secondary school. The distribution to each sector was averaged and adjusted by the rate of unemployment which then should be the opportunity cost.

To estimate the indirect cost of students we used the formula as follows:

$$Copp = \sum_{i=1}^{907}[Inci \times (1-U)]$$

(i = medical student number 1 to number 907)

Where Copp : Indirect cost or opportunity cost or income foregone by medical students

Inci : Average income calculated from student age, home address, complete secondary school of medical student i[10].

U   : Unemployment rate

Sensitivity analysis

The authors used a different type of labor cost when increased by 70 per cent to estimate the unit cost, in the case of an autonomous university the labor cost had to increase.

The increase of salary in autonomous universities is because of the employment contract, which is signed for a short-term (nowadays civil servants are under permanent contract), the efficiency and productivity improvement and appraisal and the decrease in fringe benefits.

From the preliminary discussion of the autonomous university, the change in salary may be increased by 70 per cent.

RESULTS

The total cost, unit cost and Baht/SCH

The total cost of the university in producing medical doctors was 326,329,723 baht, the unit cost was 2,161,124 baht and Baht/Student Credit Hour was 8,217 as in Table 2. When adjusted for repeat and dropout students, the total cost was 328,287,701 baht, the unit cost was 2,174,091 baht and Baht/Student Credit Hour was 8,267 as in Table 3.

The labor cost, material cost and capital cost

Labor cost was the largest portion of the total cost, that is 69.8 per cent, the material cost was 4.1 per cent and the capital cost was 26.4 per cent as in Table 4.

The cost of producing medical students from year 1 to year 6

The cost of producing a medical students for year 1 was 6,628,608 baht, unit cost, 46,032 baht and 1,096 Baht/SCH.

Year 2: the total cost was 44,443,761 baht, unit cost 290,482 baht and 7,448 Baht/SCH.

Year 3: the total cost was 59,215,030 baht, the unit cost was 367,795 baht and 9,679 Baht/SCH.

Year 4: the total cost was 65,131,670 baht, the unit cost was 425,697 baht and 9,900 Baht/SCH

Year 5: the total cost was 87,402,437 baht, the unit cost 598,647 baht and 11,512 Baht/SCH.

Year 6: the total cost was 57,291,153 baht, the unit cost 381,941 baht and 7,639 Baht/SCH as shown in Table 5.

The cost of producing medical students from year 2 to year 6 by departments

The Department of Medicine was ranked the largest cost center for the student (13.2 %), whereas, the department of Obstetrics and Gynecology was second (11.7 %), and the department of Paediatrics the third (9.9 %), as shown in Table 6. The department of Medicine was the biggest budgetted (13.2%) because of the number of credits taught in the department.

The percentage of labor, material and capital cost of each department (Table 6) was as follows: The labor cost which were more than average were department of Psychiatry (85.1%), Laboratory Medicine (84.5%), Medicine (81.7%), Surgery (80.5%), Rehabilitation (79.7%), Orthopedics (78.5%), Anesthesiology (77.2%), Ophthalmology (77.1%), Otolaryngology (74.1%), Parasitology (71.4%) and Preventive Medicine (71.1%).

The analysis of economic loss from dropout and repeat students

The economic loss from dropout and repeat students was not a big problem in this Faculty, as repeat and dropouts were about 0.88 per cent for the repeat rate for half to one year and 0 per cent for dropouts as show in Table 7 and 8.

Table 5. The total cost, unit cost and Baht/SCH of producing a medical student from year 1 to year 6.

Student year	Total cost (baht)	Unit cost (baht)	Baht/SCH
1	6,628,608	46,032	1,096
2	44,443,761	290,482	7,448
3	59,215,030	367,795	9,679
4	65,131,630	425,697	9,900
5	87,402,437	598,647	11,512
6	57,291,153	381,941	7,639

Table 6. The cost of producing one medical doctor per year from year 2 to year 6.

Department	MC (%)	LC (%)	CC (%)	Total Cost (baht)	% of total cost (y2-y6)
Medicine	6.8	81.7	11.5	42,325,797	13.2
Obstetrics & Gynecology	4.8	62.7	32.6	37,496,693	11.7
Paediatrics	1.7	63.7	34.6	31,561,896	9.9
Surgery	4.1	80.5	15.4	25,839,553	8.1
Pathology	9.6	55.5	34.9	20,235,788	6.3
Microbiology	6.0	64.0	29.9	18,199,775	5.7
Radiology	2.7	80.1	17.3	15,385,012	4.8
Anatomy	4.1	53.4	42.5	14,230,229	4.5
Forensic Medicine	4.5	64.8	30.8	11,114,855	3.5
Biochemistry	1.3	43.5	55.2	11,221,025	3.5
Anesthesiology	0.5	77.2	22.2	10,218,098	3.2
Physiology	2.2	50.7	47.1	10,167,842	3.2
Orthopaedic Surgery	2.0	78.5	19.5	9,654,264	3.0
Preventive Medicine	2.1	71.1	26.8	9,564,870	3.0
Ophthalmology	5.6	77.1	17.4	9,095,200	2.8
Pharmacology	2.0	51.4	46.6	8,585,374	2.7
Psychiatry	2.1	85.2	12.8	8,080,680	2.5
Rehabilitation Medicine	2.2	79.7	18.0	7,761,473	2.4
Otolaryngology	6.1	74.1	19.9	7,561,633	2.4
Parasitology	3.0	71.4	25.6	7,600,666	2.4
Laboratory Medicine	4.2	84.5	11.3	3,800,394	1.2
Total	4.21	68.8	27.0	319,701,115	100.0

The unit cost of a graduate (adjusted) was 2,174,091 baht while the unit cost of a medical student (not adjusted) was 2,161,124 baht as in Table 3 and 2 respectively.

Indirect cost of student

The indirect cost of students is the opportunity cost or income foregone from studying in the university as in Table 9.

Sensitivity analysis

When the labor cost of the Faculty of Medicine was changed by 70 per cent increment of the total cost, the unit cost and Baht/SCH changed as in Table 10 and 11. The total cost changed from 324,435,403 baht to 478,470,596 baht and the unit cost changed from 2,148,579 baht to 3,168,679 baht, whereas, the Baht/SCH changed from 8,170 baht to 12,048 baht.

If the land value was included in the capital cost, the authors estimated the total cost could increase to 1,154,610,403 baht, the unit cost, 7,637,993 baht and 9,098 Baht/SCH. This is about 3.5 times the estimated cost (the land value was 75,000 baht/square meter)[11].

Table 7.   The number of students, number of incomplete students, dropouts and time delayed.

Year	Number of students	Number of incomplete students	Number of drop outs	Time delayed
1	144	0	0	0
2	153	3	0	1 year/student
3	161	0	0	0
4	153	2	0	$1/2$ year/student
5	146	1	0	$1/2$ year/student
6	150	2	0	$1/2$ year/student
Total	907	8	0	0.687 year/student

* Calculated from a medical student study in the year 2000 estimating the time delayed.
Source : Academic Affairs, Faculty of Medicine, Chulalongkorn University

Table 8.   Study status, average years of study and rate of loss of medical students in the year 2000.

Year	Number of students	Number of incomplete students	Average years of study (year)	Rate of loss (%)
1	144	0	1.0	0
2	153	3	1.020	1.96
3	161	0	1.0	0
4	153	2	1.006	1.307
5	146	1	1.003	0.684
6	150	2	1.007	1.333
Total	907	8	6.036	0.882

Note : 1. Average Years of Study
  = Years of study x No. student/total No. of students
  = (Years of study x No. of incomplete students + Assigned years of study x No. of passed students)/ total No. of students
  2. Rate of loss
  = No. of incomplete students/Total No. of students

DISCUSSION

The cost recovery is crucial for an autonomous university. From the study the labor cost covered about 70 per cent of the total cost. The unit cost of producing one medical student was 2,161,124 baht and 2,174,091 baht, if adjusted for repeat students. The tuition fee of a medical student from year 1 to year 6 was charged at a flat rate, about 20,000 baht per person per year or this is about 5.6 per cent of the total cost. Therefore, cost recovery would be a problem. The question is whether to collect 100 per cent of the total. The answer depends on whether university education is considered a private investment, or a social investment that needs to be subsidized at a certain percentage of the total cost. Since doctors also contribute to the whole society and to the welfare of

humankind, a certain amount should be allocated. In the United States, the tuition fees of most medical schools have been able to maintain their tuition at 4 to 6 per cent of their budgets. Currently, it seems to be the same rate as in Thailand (Ariyan, 2000), but the issue is, where does the rest of the cost come from?

For allocation of hospital costs to related departments, the authors used 10 per cent, the proportion, judged from the average teaching hours of all personnel in the medical school setting. Some studies used a greater proportion (30%), from the authors' experience, however, it was unfair to allocate such a large amount to the medical students. Since there are patient treatments which are major activities occurring in hospital wards.

Table 9. The indirect cost or opportunity cost or income foregone of a student.

Year	Opportunity cost/person/year
1	90,960
2	88,908
3	88,584
4	93,564
5	90,876
6	92,064
Total	544,956

From the analysis of each department (Table 6), the department of Medicine seemed to have the highest cost (13.2%), because of the number of credits required in the department. Obstetrics and Gynecology ranked the second, 11.7 per cent, and Paediatrics, 9.9 per cent, because of the number of credits taught in the departments.

For the economic loss from dropout and repeat students, the unit cost increased by 0.59 per cent. This was due to the small proportion of repeat students and zero per cent from dropouts.

The indirect cost of a student (opportunity cost) was about 90,826 baht/person/year and for the whole six years course was 544,956 baht/person. When adding the opportunity cost to the unit cost, then the unit cost was 2,706,080 baht.

From the present study, the labor cost could be the main problem for the management of the faculty.

The increase of salary could occur only when the efficiency of production increases, i.e., the increase in numbers of production, reduced resources etc.

The cost-fee ratio (cost/fee) was 95 : 5 which suggested that medical students obtain a 95 per cent subsidy from the government budget or the society. If considering that doctors contribute their practices to the whole society, not for private gain, or concern for equality in education, should be subsidised. According to the Universal insurance policy of the Thai Government, social welfare is to be provided to all people. This policy demands doctors to serve as healthcare providers; hence, their private gains are supposed to be reduced. This is why the Government subsidises for their payment. However, if they are regarded as personal gains, the amount of subsidy should be reduced.

The economy of scale could not be analyze by this study, a future study with serial data should be done then the economy of scale could be analyzed.

The limitations of study are the optimum size of production, which could not be analysed here. Could the number of students be increased without increasing the number of resources?

Capital cost was difficult to estimate: building and land which is used by each cost center, a rent rate was applied (using the rent rate of the Asset Management Office Chulalongkorn University for Samyan Commercial Building as reference), while the land was not accounted for. This could cause under estimation. If this underestimation is corrected, the

Table 10. The total cost, unit cost and baht per student credit hour (SCH) of producing a medical doctor and sensitivity analysis, if the labor cost was changed by 70 per cent (not adjusted with delay and dropout students).

Labor cost	Total cost	Unit cost	Baht/SCH
Labor cost unchanged	324,435,403	2,148,579	8,170
Labor cost increased 70%	478,470,596	3,168,679	12,048

Table 11. The total cost, unit cost and baht/person student credit hour (SCH) of producing a medical doctor and sensitivity analysis if the labor cost is changed by 70 per cent (adjusted with delay and dropout students).

	Total cost	Unit cost	Baht/SCH
Labor cost unchanged	326,382,015	2,161,470	8,219
Labor cost increased 70%	481,341,420	3,187,691	12,120

land value could be included in the capital cost. By doing this the estimated total cost could increase to 1,154,610,403 baht, the unit cost to 7,637,993 baht and the Baht/SCH 9,098 which is about 3.5 times the estimated cost,(the land value was 75,000 baht/ square meter) (Value Association of Thailand, 1997).

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ต้นทุนในการผลิตบัณฑิตแพทย์ของคณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ปี พ.ศ. 2543

ทศพร วิมลเก็จ, พบ, วทม*,

ภิรมย์ กมลรัตนกุล, พบ, วทม*, แกมทอง อินทรัตน์, ศบ, ปรด**

ศึกษาต้นทุนในการผลิตและวิเคราะห์ต้นทุนการผลิตบัณฑิตแพทย์หลักสูตรการศึกษา 6 ปี ของคณะแพทยศาสตร์ เพื่อใช้เป็นแนวทางในการวางแผน เตรียมงบประมาณ รวมทั้งจัดเตรียมในการออกนอกระบบราชการในอนาคต

หน่วยต้นทุนต่าง ๆ ในคณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย จะถูกจัดเป็นหน่วยต้นทุนทางด้านบริหาร ด้านสนับสนุนการศึกษาและด้านการศึกษา

ต้นทุนการผลิตต่อนิสิตแพทย์เท่ากับ 2,161,124 บาทต่อคนและ 8,217 บาทต่อนิสิตเครดิตชั่วโมง (SCH) ต้นทุนการผลิตต่อบัณฑิตแพทย์เท่ากับ 2,174,091 บาท และ 8,267 บาท ต่อนิสิตเครดิตชั่วโมง ต้นทุนทางด้านแรงงานสูง 69.46% ต้นทุนถาวร 26.42% และค่าวัสดุ 4.12% ของต้นทุนทั้งหมด ต้นทุนต่อภาควิชาที่สูงสุด 3 อันดับแรกได้แก่ภาควิชาอายุรศาสตร์ (13.24%) ภาควิชาสูตินรีเวชศาสตร์ (11.73%) และภาควิชากุมารเวชศาสตร์ (9.87%) อัตราส่วนของต้นทุนต่อค่าเล่าเรียนเท่ากับ 95 : 5 ซึ่งเท่ากับว่านิสิตแพทย์ได้รับการสนับสนุนค่าเล่าเรียนจากภาครัฐหรือจากสังคม 95% ถ้ามหาวิทยาลัยออกนอกระบบราชการจะทำให้งบประมาณสนับสนุนดังกล่าวลดลง ซึ่งอาจจะต้องมีการเพิ่มค่าเล่าเรียนเพื่อให้พอกับต้นทุน จำนวนนิสิตที่ต้องออกกลางคันและเรียนซ้ำชั้นเท่ากับ 0.00-0.88% ระยะเวลาที่นิสิตเรียนซ้ำชั้นเท่ากับ 6 เดือน ถึง 1 ปี เท่านั้น สำหรับค่าเสียโอกาสของนิสิตแพทย์ 1 คน จากการมาเรียนมหาวิทยาลัย 6 ปี เท่ากับ 544,956 บาท ซึ่งทำให้ต้นทุนในการผลิตบัณฑิต-แพทย์ 1 คน เท่ากับ 2,719,047 บาท

คำสำคัญ : ต้นทุนต่อหน่วย, บัณฑิตแพทย์, ต้นทุนทางเศรษฐศาสตร์

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