

台灣地區財團法人醫院財務報表之評估

The Evaluation of Financial Performance for Non-Profit Proprietary Hospitals in Taiwan

林進財¹ Chin-Tsai Lin
銘傳大學企業管理系

譚醒朝² Sing-Chew Tam
長榮大學會計資訊學系

張曉芬^{1,3*} Hsiao-Fen Chang
元培科技大學醫務管理系

¹ Department of Business Administration, Ming Chuan University

² Department of Accounting and Information System, Chang Jung Christian University

³ Department of Healthcare Management, Yuanpei University

摘要：近年來，醫療產業在資源有限的環境下經營，醫療院所紛紛將財務分析奉為圭臬，希望藉此提升財務績效，以達永續經營之目標，財團法人醫院也不例外。本文採用行政院衛生福利部公布之 36 家財團法人醫院財務報表進行財務績效分析，以探究影響財團法人醫院財務績效各因素構面之重要財務指標，並檢視不同型態財團法人醫院之財務績效的差異性。本文之研究結果顯示，財團法人醫院財務績效之財務構面，依其影響力大小排序分別為：投資狀況、償債能力、研究發展、社會服務、醫務利潤及捐贈狀況。投資狀況以大型、企業型以及醫學中心之醫院表現較佳；償債能力以宗教型醫院較佳；研究發展以大型醫院、位於北部及地區醫院較佳；社會服務以位於南部之宗教型醫院較佳；醫務收入以中、大型之區域醫院較佳。本研究建議財團法人醫院經營團隊除了專注於醫療本業之外，應以大型及企業型醫療院所為仿效對象，延攬專業人員從事彈性的財務運作及投資，以創造更多醫療本業以外的收入。

關鍵字：財團法人醫院、財務績效、財務比率、因素分析

Abstract: In recent years, a financial analysis is regard as a criterion for medical institutions while operating in a business environment with limited resources. Hoping by this, the hospitals can improve their financial performance, and further to achieve the goal of sustainable development. And there are no exceptions for non-profit proprietary hospitals in Taiwan. By analyzing the financial statements of 36 non-profit proprietary hospitals published by the Department of Health, this paper explores the key financial indicators which influence the financial performance of each non-profit proprietary hospitals

*Corresponding author



in all dimensions, and also examines the differences of financial performances between different sizes of non-profit proprietary hospitals. The results of the study show that the financial performance of non-profit proprietary hospitals in the financial dimension, in increasing order according to their influences, are investment, solvency, research and development, social service, medical profit and donation. For investment, large hospitals, enterprise hospitals and medical centers are better. As to solvency, religious hospitals are better. Large hospitals and district hospitals in the north have better research and development. Religious hospitals located in the south have better social services. And in terms of medical profits, medium or large regional hospitals perform better. Most of the enterprise non-profit proprietary hospitals in Taiwan are the one of the strategic business units. In addition to have inherent advantages, they also have better financial management and financial investment personnel. Therefore, hospitals have flexible financial operations and can earn high non-medical revenue.

Keywords: Non-profit proprietary hospitals; Financial performance; Financial ratio; Factor analysis

1. Introduction

The early medical industry in Taiwan are mainly public hospitals, however, since 1970, non-profit proprietary hospitals rose due to the National Health Insurance system in recent years, leading to pattern changes in medical industry. According to the Department of Health statistics in 2008, it shows that, from 1995 to 2008, the number of hospitals decreased from the 787 to 515. The decline rate is 34.6%. However, the number of non-profit proprietary hospitals increased from 46 to 68, a substantial increase of 32.3%. Thus, the types of the domestic medical market gradually transformed to non-profit proprietary-oriented.

Early non-profit proprietary hospitals do not specify that hospitals must make its financial statements public, mainly because the general public did not concerned the performance issue of hospitals management at that time. Since non-profit proprietary hospitals are non-profit organizations, they do not worry about whether they have to close down due to poor management. However, to provide a good quality of medical care, the hospitals must pay the bulk of the physicians, nurses and administrative staff the personnel costs, and also spend a lot of money to purchase specialized precision instruments, equipment and medicines. Therefore, even though they are not running for profit, it does not mean they do not attach importance to financial performance of the hospitals. Furthermore, the Department of Health Bureau implemented the total budget for the health insurance system, which makes the entire medical institution competition more intense. Coupled with the rise of consumer awareness, aging population and limited medical resources in recent years, the allocation of limited medical resources must be properly in order to reduce costs and enhance operational performance. Facing a number of pressures, non-profit proprietary hospitals must develop their management toward the profitable business management.

Domestic medical institutions can be divided into public and private medical institutions. Based on Medical Law under the provisions of Article 3, a public medical institution means the medical



institution established by the government authorities, public utilities or public schools, while a private medical institution in accordance with the provisions of Article 4 refers to the medical institution founded by the physician. Non-profit proprietary hospitals are subordinate to private medical institutions. In accordance with Article 5 of the Medical Law, a non-profit proprietary hospital refers to undertake the medical services for the purpose of medical institutions which they have certain property by the donor contributions, license by the central competent authority and registration to the Court. In general, non-profit proprietary hospitals are founded by the enterprises, medical schools or religious groups. Their philosophy is non-profit-oriented and they do not belong to any individuals or private groups. The total amount of foreign investments is limited according to the law. In terms of social responsibility, each year according to the law, hospital will be required annual medical income balance of 10% or more to handle the research and development, personnel training, health education and medical relief, community medical services, social services and other matters. Therefore, the board of the non-profit proprietary hospitals is equipped with the sound supervision and management of business development, and ensures whether it will reach its non-profit purpose.

After 1970, the rise of non-profit proprietary hospitals has far-reaching impact on domestic medical system. According to its property, non-profit proprietary hospitals can be divided into religious hospitals and general hospitals in general. If based on the establishment of the study subjects, the following can be subdivided into three main types: (1) Religious Hospital: established by the religious groups, which can be divided into three, traditional religions, Buddhism, and the church hospital, such as En Chu Kong Hospital, Buddhist Pu Mun Hospital and Changhua Christian Hospital (2) General Hospital: such as Kang-Ning General Hospital, Jen-Ai Hospital and Chang Bing Show Chwan Memorial Hospital. (3) Enterprise Hospital: established and donated by large enterprise groups, such as Chang Gung Memorial Hospital, Chi Mei Hospital and Cathay General Hospital.

Related studies on performance evaluation of non-profit proprietary organizations are rare before the year 2000 (Rojas, 2000). Venkatraman and Vasudevan (1986) observed that *organizational performance* can be divided into three different types, namely, *financial performance*, refers to the enterprise's economic goals, such as after-tax earnings, operating income; *business performance*, which is an integrated performance, the financial performance coupled with organizational trait performance which includes the quality of products, marketing effectiveness and other non-financial performance indicators; *organizational effectiveness*, in addition to containing the above two performance, it also includes the process to achieve goals, conflicts resolution, as well as the objectives of various stakeholders to meet, which is the most widely used definition of organizational performance.

Zeller (1997) selected 2,189 non-profit proprietary hospitals between 1989 and 1992 as study samples, and constructed the ratio of hospital performance by factor analysis. The study found that the profitability, fixed asset efficiency, capital structure, duration of fixed assets, working capital efficiency and solvency can examine the operational performance. Huang Yu Qi (2009) proposed that the measuring performance indicators can be divided into two categories, financial and non-financial



indicators. In addition, through a literature review of researches on organizational performance, most of the researches focused on the financial performance, and measured the financial factors as indicators, such as profitability, market share, return on assets, etc.

Yu Chun Yuan *et al.* (2007) combined three methods, Data Envelopment Analysis, Neural Network and Genetic Algorithm to analyze the efficiency of large medical institutions in Taiwan. Based on empirical results, it was found that enhancing internal management capacity and expanding the scale of hospitals will improve the efficiency of medical services, thus driving the increase in the quality of medical services. Wang Yuan Hui *et al.* (2005) employed Data Envelopment Analysis, Free Disposal Hull, and Du Pont Analysis to examine non-profit proprietary hospitals' financial input and output data during 1996 to 1998. The study also found that if samples were divided into two different sizes according to the total revenue, the large hospitals are more efficient. By this reasoning, it can be inferred that the rate of return and net profit margin of religious hospitals are between enterprise hospital and general hospitals, however, the total asset turnover and financial leverage are lower, showing that the management mentality of the religious non-profit proprietary are conservative.

Sun Wei (2006) found in his literature review that most of the domestic researches followed the logic of thinking and research methods of performance management. He also found that they focused mostly on performance evaluations of various types of non-profit proprietary organization and foundation in Taiwan. However, since the properties of organizations are different, the objectives of financial management are also different. Non-profit organizations are driven by a mission, which is the goal of entire organizations. And their major goal of financial management is to promote financial stability, towards the goal of social services and implement social responsibility. Lin (2010) analyzed the financial statements of non-profit proprietary medical centers in Taiwan in 2006 by Grey Situation Decision Method. The financial performance of hospitals have been evaluated and found that enterprise hospitals have better results.

In the efforts and appeals of the Taiwan Health Reform Foundation and related persons, the Department of Health expressly required all the non-profit proprietary hospitals should disclose their annual financial statements within 5 months by the end of the year in 2004. And it also proposed '*Financial Reporting Standards for Non-Profit Medical Organization*' on November 2005, in accordance with the generally accepted accounting principles, so that the public could understand the detailed usage of the contributions and supervise the effectiveness of the allocation of hospital resources.

This research intends to study the financial statements of non-profit proprietary hospitals in Taiwan which were audited by the CPA (Certified Public Accountant) and published by the Department of Health, and to analyze the report rate of financial statements for non-profit proprietary hospitals in order to achieve the following research goals: (1) Explore the important factors which have impact on the financial performance of non-profit proprietary hospitals. (2) Examine the financial performance differences between non-profit proprietary hospitals of different types.



2. Methodology

2.1 Study Subjects

Department of Health announced '*Financial Reporting Standards for Non-Profit Medical Organization*' by the end of 2005 to regulate the medical legal content and the format of financial information, so that the financial statements of each proprietary hospital are consistent and complete. In order to avoid external environmental factors of a particular year which cause interference (such as financial crisis, national health insurance payments, etc.), this paper adopted a total of three years (2008 to 2010) financial data published by the Department of Health as research data. By the end of 2010, a total of 50 published financial statements of non-profit proprietary hospitals. Excluding the hospitals currently not operating, and the newly established or operated without medical organization, a total of 36 non-profit proprietary hospitals are the subjects in this study.

2.2 Methods

In this paper, we extracted the common factors of financial variables by using the principal component analysis, which is one of factor analyses. And according to the criteria proposed by Kaiser (1960), we selected the factor whose eigenvalue is greater than 1, retained the variable in which its absolute value of factor loading is greater than 0.5 or more; then there are 15 variables retained in the first factor analysis. In the second factor analysis, we adopted maximum variation rotation (varimax) to select 6 factors. To better understand whether the financial performance of non-profit proprietary hospitals was significantly affected by the differences of hospital size, region, property and level, we used one factor analysis of variance to compare the differences.

2.3 Variable Definitions

The selected financial variables in this study are mainly based on '*Financial Reporting Standards for Non-Profit Medical Organization*' published by the Department of Health. In order to highlight the characteristics of non-profit proprietary hospitals and the variables that external users concerned, we add some variables (non-medical investment revenue accounted for net worth, non-medical investment revenue accounted for medical revenue, non-medical donation revenue accounted for net worth, non-medical other revenue accounted for net worth, non-medical donation expenses accounted for net worth and non-medical other cost accounted for net worth) for analysis. The definition of each financial variable and its calculation are shown in Table 1.



Table 1 Definition and formulas of financial variables

Financial Variable	Definition and Formulas	Expected Direction
Current Ratio	Current Assets/Current Liabilities	↑
Quick Ratio	(Current Assets –Inventories –Advance)/Current Liabilities	↑
Debt Ratio	Total Liabilities / Total Assets	↓
Cash Flow Ratio	Operational Net Cash Flow/[(Initial Current Liabilities + Final Current Liabilities)/2]	↑
Financial Leverage	Medical Benefit/(Medical Benefits - Interest Expense)	↑
Long-Term Capital to Fixed Assets Ratio	(Net worth + Long-Term Liabilities)/Net Fixed Assets	↑
Total Assets Turnover	Medical Net Revenue/[(Initial Total Assets + Final Total Assets)/2]	↑
Accounts Receivables Turnover Days	365/Accounts Receivables Turnover	↓
Inventory Turnover Days	365/Inventory Turnover	↓
Paid Points Accounted for Medical Revenue	Total Paid Points Value Adjustment/Medical Revenue	—
Examined Health Insurance Accounted for Medical Revenue	Examined Health Insurance /Medical Revenue	—
Social Service Expenses Accounted for Medical Revenue	Total Social Service Expenses/Medical Revenue	↑
Research and Development Expenses Accounted for Medical Revenue	Total Research and Development Expenses/Medical Revenue	↑
Social Service Expenses Accounted for Medical Cost	Total Social Service Expenses/s/Medical Cost	↑
Research and Development Expenses Accounted for	Total Research and Development	↑



Medical Cost	Expenses/Medical Cost	
Medical Net Profit Margin	Medical Net Profit/Medical Revenue	↑
Medical Gross Margin	Medical Net Margin/Medical Revenue	↑
Non-Medical Investment Revenue Accounted for Net Worth	Total Non-Medical Investment Revenue/ Net Worth	↑
Non-Medical Investment Revenue Accounted for Medical Revenue	Total Non-Medical Investment Revenue /Medical Net Revenue	↑
Non-Medical Investment Revenue Accounted for Total Revenue	Total Non-Medical Investment Revenue/Total Revenue	↑
Non-Medical Donation Revenue Accounted for Net Worth	Total Non-Medical Donation Revenue/Net Worth	↑
Non-Medical Other Revenue Accounted for Net Worth	Total Non-Medical Other Revenue/Net Worth	↑
Non-Medical Donation Cost Accounted for Net Worth	Total Non-Medical Donation Cost/Net Worth	↑
Non-Medical Other Cost Accounted for Net Worth	Total Non-Medical Other Cost/Net Worth	↑

3. Results

3.1 Descriptive Statistics

The study considered the hospital planning on Lin Mei Yin's paper (2001) and divided the size of hospitals by the number of beds. More than 1000 beds are large hospitals, there are 14; 300 to 1,000 beds are medium-sized hospitals, a total of 13; and less than 300 beds are small hospitals, the number of hospitals is 9. The region can be divided according to geographical area, a total of 18 in the north, 3 in the central, 10 in the south and 5 in the east. Hospital property is divided into three types: religious, general, enterprise-based established by corporation. The number of hospitals is 19, 10 and 7, respectively. Hospital level is based on the requirements of the Department of Health, which is divided into 8 medical centers, 12 regional hospitals and 16 district hospitals. They are shown in Table 2.



Table 2 Basic information on study subjects

Variable	Category	Number	Percentage (%)
Size	Large (more than 1000 beds)	14	38.89
	Medium (300-1000 beds)	13	36.11
	Small (less than 300 beds)	9	25.00
Region	Northern	18	50.00
	Western	3	8.33
	Southern	10	27.77
	Eastern	5	13.90
Property	Religious	19	52.78
	General	10	27.78
	Enterprise	7	19.44
Level	Medical Center	8	22.22
	Regional Hospitals	16	44.44
	District hospitals	12	33.34

We selected six factors by factor analysis in this paper. Based on the commonality of factors, they are named respectively as ‘investment’, ‘solvency’, ‘research and development’, ‘social services’, ‘medical profit’ and ‘donation’. The cumulative explanatory power is up to 94.04%. Among them, the explained variance of ‘investment’ is 21.41%, which is the highest. And it includes three financial variables, that is ‘non-medical investment revenue accounted for medical revenue’, ‘investment revenue accounted for total revenue’ and ‘non-medical net investment revenue accounted for net worth’. Second, the explained variance of the ‘solvency’ is 20.13%, including the following four financial variables: ‘current ratio’, ‘quick ratio’, ‘debt ratio’ and ‘long-term capital to fixed assets ratio’. The explained variance of ‘research development’ is 13.58%, including ‘medical research and development expenses accounted for medical revenue’ and ‘research and development expenses accounted for medical cost’. The variance of ‘social services’ is 13.38%, including two ratios ‘social services expenses accounted for medical cost’ and ‘research and development expenses accounted for medical cost’ while the variance of ‘medical profits’ is 13.11%, including two ratios ‘medical gross margin’ and ‘medical net profit margin’. Finally, the variance of ‘donation’ is 12.43%; it includes the ‘non-medical donation revenue accounted for net worth’. All of them are shown in Table 3.



Table 3 Factor name and financial variables

Factor	Factor Name	Financial Variables	Explained Variance (%)
1	Investment	Non-Medical Investment Revenue Accounted for Total Revenue Non-Medical Investment Revenue Accounted for Net Worth	21.41
2	Solvency	Current Ratio Quick Ratio Debt Ratio Long-Term Capital to Fixed Assets Ratio	20.13
3	Research and Development	Medical Research and Development Expenses Accounted for Medical Revenue Medical Research and Development Expenses Accounted for Medical Cost	13.58
4	Social Service	Social Services Expenses Accounted for Medical Cost Social Services Expenses Accounted for Medical Revenue	13.38
5	Medical Profits	Medical Gross Margin Medical Net Profit Margin	13.11
6	Donation	Non-Medical Donation Revenue Accounted for Net Worth Non-Medical Donation Cost Accounted for Net Worth	12.43
Total			94.04

3.2 Variance Ratio Test

3.2.1 Analysis of Financial Performance Difference between Hospitals of Different Sizes

From Table 4, there are significant differences between hospitals of different sizes in investment, research and development, and medical revenue. Their p values are 0.027, 0.000 and 0.001, respectively, indicating that they have reached significant levels. We used Scheffe's method for post hoc comparison then we found that the research and development on large non-profit proprietary hospitals are better than medium and small ones. While in the medical revenue, the medical revenue of



large and medium non-profit proprietary hospitals are higher than those of small hospitals.

Table 4 Analysis of financial performance difference between hospitals of different sizes

	Large		Medium		Small		F Test	Significance	Difference
	Average	σ	Average	σ	Average	σ			
Investment	0.32	1.54	-0.22	0.19	-0.18	0.16	3.721	0.027*	Large > Medium/ Small
Solvency	0.15	1.00	-0.23	0.89	0.10	1.12	1.656	0.196	
Research and Development	0.51	0.96	-0.12	0.94	-0.62	0.73	13.533	0.001***	Large > Medium/Small
Social Service	-0.05	0.47	-0.14	0.29	0.27	1.88	1.414	0.248	
Medical Revenue	0.19	0.37	0.22	0.34	-0.62	1.79	7.694	0.001***	Large/Medium > Small
Donation	0.17	1.55	-0.14	0.15	-0.07	0.44	1.040	0.357	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

3.2.2 Analysis of Financial Performance Difference between Hospitals of Different Regions

Table 5 Analysis of financial performance difference between hospitals of different regions

	Northern		Central		Southern		Eastern		F Test	Significance	Difference
	Average	σ	Average	σ	Average	σ	Average	σ			
Investment	0.20	1.37	-0.14	0.11	-0.19	0.27	-0.26	0.21	1.501	0.219	
Solvency	0.18	1.05	-0.43	0.68	0.25	0.76	0.11	1.27	1.873	0.139	
Research and Development	0.35	1.07	-0.40	0.37	-0.24	0.83	-0.54	0.90	5.259	0.002**	Northern > Eastern
Social Service	-0.25	0.50	-0.22	0.09	0.43	1.64	0.19	0.61	3.580	0.016*	Southern > Northern
Medical Revenue	-0.14	1.26	0.12	0.29	0.10	0.75	0.25	0.45	0.816	0.488	
Donation	-0.12	0.18	-0.16	0.12	0.28	1.86	-0.04	0.37	1.090	0.357	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$



For the hospitals of different regions, Table 5 shows that their research and development and social services are both different, and the p values are 0.002 and 0.016, respectively. It means that they have reached significant levels. Scheffe's method for post hoc comparison shows that the non-profit proprietary hospitals in the north have better research and development than those in the eastern part. However, the social services of the eastern non-profit proprietary hospitals are better than those in the north.

3.2.3 Analysis of Financial Performance Difference between Hospitals of Different Properties

Table 6 shows that non-profit proprietary hospitals of different properties have significant differences in investment, solvency and social service, their p values are 0.001, 0.043 and 0.019, respectively, indicating that they have reached significant levels. For different properties, post hoc comparison by Scheffe's method indicates that the investments of enterprise non-profit proprietary hospitals are significantly higher than the general and religious ones; however, in solvency, the religious non-profit proprietary hospitals are superior to general non-profit proprietary hospitals; and in social services, religious non-profit proprietary hospitals profit hospitals are significantly better than the general ones.

Table 6 Analysis of financial performance difference between hospitals of different properties

	Religious		General		Enterprise		F Test	Significance	Difference
	Average	σ	Average	σ	Average	σ			
Investment	-0.30	0.21	-0.18	0.17	1.07	1.92	20.629	0.001***	Enterprise > General/Religious
Solvency	0.22	0.92	-0.29	1.11	-0.19	0.94	3.242	0.043*	Religious > General
Research and Development	-0.06	0.96	-0.10	0.99	0.31	1.10	1.243	0.293	
Social Service	0.25	1.22	-0.34	0.70	-0.19	0.25	4.097	0.019*	Religious > General
Medical Revenue	0.13	0.58	-0.34	1.67	0.12	0.36	2.468	0.090	
Donation	0.13	1.36	-0.18	0.16	-0.08	0.19	1.022	0.364	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$



3.2.4 Analysis of Financial Performance Difference between Hospitals of Different Levels

From Table 7, the investment, research and development and medical revenue have significant differences between hospitals of different levels. And respectively, their p values are 0.001, 0.001 and 0.008. It shows that they have reached significant levels. By Scheffe’s method for post hoc comparison, we can find that, of different levels, medical centers have higher investments than regional and district ones. In research and development, the district hospitals are better than regional hospitals and Medical Center. While in the medical revenue, regional hospitals are better than district hospitals.

Table 7 Analysis of Financial Performance Difference between Hospitals of Different Levels

	Medical Center		Regional Hospital		District Hospital		F Test	Significance	Difference
	Average	σ	Average	σ	Average	σ			
Investment	0.75	1.92	-0.25	0.28	-0.16	0.16	10.190	0.001***	Medical Center > Regional/District
Solvency	0.19	0.77	-0.05	1.07	-0.06	1.05	0.574	0.565	
Research and Development	0.48	0.89	0.28	0.99	-0.70	0.68	17.690	0.001***	District > Medical Center/Regional
Social Service	-0.14	0.24	-0.01	0.44	0.11	1.65	0.450	0.639	
Medical Revenue	0.14	0.35	0.24	0.38	-0.41	1.59	5.023	0.008**	Regional > District
Donation	-0.03	0.25	0.09	1.46	-0.10	0.39	0.374	0.689	

*p<0.05 **p<0.01 ***p<0.001

4. Discussion and Conclusions

Affected by their financial performance of non-profit proprietary hospitals, the financial dimensions according to their order of influence are: investment conditions, solvency, research and development, social service, medical profit and donation.

The financial performance of each non-profit proprietary hospital has its advantages and disadvantages. Investment in large hospitals, enterprise hospitals and medical centers are higher; solvency is better in religious hospitals; research and development in large hospitals, located in the north and district hospitals are better; religious hospitals located in south have better social services; the large and the regional hospitals have better medical revenue. For overall financial performance, the large non-profit proprietary hospitals perform better and therefore these are consistent with the study results of Chun Yu (2007) and Wang Yuan Hui *et al.* (2005).

Hence, the study concluded that the following points:



1. The overall financial performance of large non-profit proprietary hospitals is better than other sizes of hospital. Apart from the large hospitals provide more complete and comprehensive medical services and facilities, Taiwanese people are more accustomed to large hospitals due to the trust of medical treatments. Hence, people tend to seek medical care far away from home.
2. The investment performance of the enterprise non-profit proprietary hospitals is far better than the general and religious hospitals. Most of the enterprise non-profit proprietary hospitals in Taiwan are the one of the strategic business units. In addition to have inherent advantages, such as extensive management resources, they also have better financial management and financial investment personnel. Therefore, hospitals have flexible financial operations and can earn high non-medical revenue.
3. Solvency and social services in religious non-profit proprietary hospitals are better. The nature of religion is to practice medical and to give relief, so that the medical institutions established by religious non-profit proprietary are moving steadily. Their debt ratio is low and usually located in relatively remote areas. Thus, giving full play to the characteristics of social services and filling the vacancies in uneven regional distribution of medical resources.
4. For research and development, large non-profit proprietary hospitals are better than other sizes of hospitals because of their better finance, advanced hardware and medical equipment. Since their inherent advantages, the advanced research tools, occupied and plus their acquired advantage, cluster effects with outstanding talent personnel and a large number of patient samples, the large non-profit proprietary hospitals in this study have greater hardware and software resources for research and development.

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