



Swedish Science Pioneers
Developing World Journal Series

Journal of Clinical Research & Governance

www.jcrg.sciencepub.se



Research Article

Development of Financial Indicators of Hospital Performance

Ali Janati^a, Samaneh Valizadeh^b, Mohammad Asghari-Jafarabadi^c

^a: Tabriz Health Services Management Research Center, Department of Health Services Management, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran

^b: Department of Health Services Management, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran

^c: Department of Statistics and Epidemiology, School of Health, Tabriz University of Medical Sciences, Tabriz, Iran

Correspondence

Samaneh Valizadeh
Department of Health Services
Management, School of Management
and Medical Informatics, Tabriz
University of Medical Sciences, Tabriz,
Iran
Tell: +98411-3352291
Email: samanehvalizadeh@yahoo.com

Keywords:

Financial indicator
Financial performance
Performance Appraisal
Hospital
Delphi Technique
Iran

Received: 2014-02-13

Accepted: 2014-04-08

DOI: 10.13183/jcrg.v3i0.121

Abstract

Purpose: To develop an appropriate set of financial performance indicators for use in Iranian hospitals.

Methods: This study consists of three steps. At the first step, using a literature review and three focus group discussions, the financial indicators that had been deemed to be important measures of hospital financial performance were identified. As the second step, a multidisciplinary panel of experts rated the indicators via two-round Delphi technique. Through the third step, the panel assessed the indicators at one consensus meeting.

Results: Among 102 indicators identified at the first step, 79 indicators were selected in the Delphi technique. In the panel consensus meeting, the positive consensus was achieved on the 34 indicators. Upon the experts' opinion, eight indicators were added after few modifications and 13 new indicators were developed. Finally, 55 indicators were selected as financial indicators for assessing the hospital performance.

Conclusion: This study developed a set of financial indicators for Iranian hospitals, that helps hospital managers to identify hospital financial trends over a period of time and compare their performance with peer hospitals. The information derived from these indicators, may guide plans and decisions to improve hospital financial performance.

©2014 Swedish Science Pioneers, All rights reserved.

Introduction

Today's healthcare providers face a complex environment that is changing rapidly. The rapid growth and change in technology, the aging population, increasing of chronic diseases and finally the rising healthcare costs causes serious financial challenges for healthcare providers. In order to deal with these challenges, healthcare organizations require sound financial management practices specifically monitoring their financial performance to be proactively able to overcome the financial distresses and efficiently and effectively achieve their goals [1-5].

On the other hand, patient's belief about the service quality is

positively associated with hospital's financial performance [6]. The literature, acknowledge that even if non-profit hospitals' objective is not the earning profit, they should consider financial variables as essential elements to accomplish their missions [5, 6].

Hospital managers need the valid financial measures to determine their current financial condition and plan to improve their performance [5]. Also, the recent trend toward using financial indicators for hospital executives evaluating is noteworthy [6]. Thus, using financial indicators for assessing hospitals' performance has become popular [5, 7, 8].

Since the 1980s, hospitals' financial performance analysis started to grow and the specific financial ratios that reflecting this industry's unique characteristics, were designed and employed [9]. Collecting and employing of financial indicators not only acts as a hospital internal management tool, but also provides information for external beneficiaries and for bargaining more funding. In addition, it enables hospitals to identify their financial trends over a period of time and make comparisons with peer hospitals. Thus, they can recognize their strengths and weaknesses [5, 10, 11].

To date some studies have been published that focused on identifying, designing and using of financial indicators for hospitals with respect to their unique and defined characteristics. This is the inevitable due to differences between hospitals in missions, goals, financing methods, the population needs, the payment systems, and ownership status and so on [8,12-16].

The purpose of this study was to use available literature and expert consensus to develop a set of financial indicators for Iranian hospitals.

Methods

The approach used to select the hospital financial indicators is depicted in [Figure 1](#).

Step 1: Literature review and focus group discussions

A comprehensive literature review was undertaken to identify the financial indicators that had been deemed to be important measures of hospital financial performance. PubMed, Web of Knowledge, Science Direct, SID and Magiran were searched. Some of Iranian unpublished studies were also reviewed. Articles published prior to 2000 were excluded from the searches. In total, 102 indicators were identified by literature review. [See References 1, 3-5, 7-9, and 12-37 for articles and publications used].

In this step, three focus group discussions with participating of professors of health services management, professors of health economics, hospital managers, and experts in budgeting and financial management of Tabriz University of Medical Sciences were established. In these sessions, 10 financial indicators was introduced which were similar to the extracted indicators from literature review. Focus group discussion is a qualitative research methodology in which a small group of participants

convene to discuss on a specific subject. The main feature of focus groups is the interplay between group members, as well as the interplay between them and the moderator. Its main purpose is to provide information about knowledge, attitudes and perspectives that individuals have about certain topics. Focus group discussion popularity is rising in medical and health researches [38,39].

Step 2: Delphi technique

The Delphi technique is a structured process to collect and summarize knowledge from a panel of experts which is done by questionnaire [40]. Expert is a person that is knowledgeable about a specific subject [41, 42]. Selecting different groups of experts assures a wide range of opinions [42, 43]. The first non-military application of Delphi technique was suggested in planning developing economies [44, 45]. In this study, we used two-round Delphi technique to collect experts' opinions on the indicators using two criteria: importance (whether the indicator is considered as an important measure of the hospital financial management) and feasibility (whether the indicator can be accurately calculated using hospitals' financial documents). The panel size was 25 including professors of health services management, professors of health economics, hospital managers and experts in budgeting and financial management of Tabriz University of Medical Sciences. In the first round, the expert panel was provided with a package that included the research purpose and method and a tabulated list of indicators, their definition and formula. In this package, indicators were categorized in 7 performance dimensions. The panel members were asked to rate indicators in terms of importance and feasibility on a 9-point scale. For each indicator, the experts' rating was summarized into a median rating. In round 1, indicators with the median score less than 4 were excluded, score >4 and <7 were selected to the second round of Delphi and indicators with score of >7 were accepted as the final indicators.

In round 2, 83 indicators were rated by panel's members and indicators with score >7 were selected on the Friedman's rating test.

Step 3: Panel consensus meeting

One panel consensus meeting was established to review and finalize the selected indicators in Delphi technique.

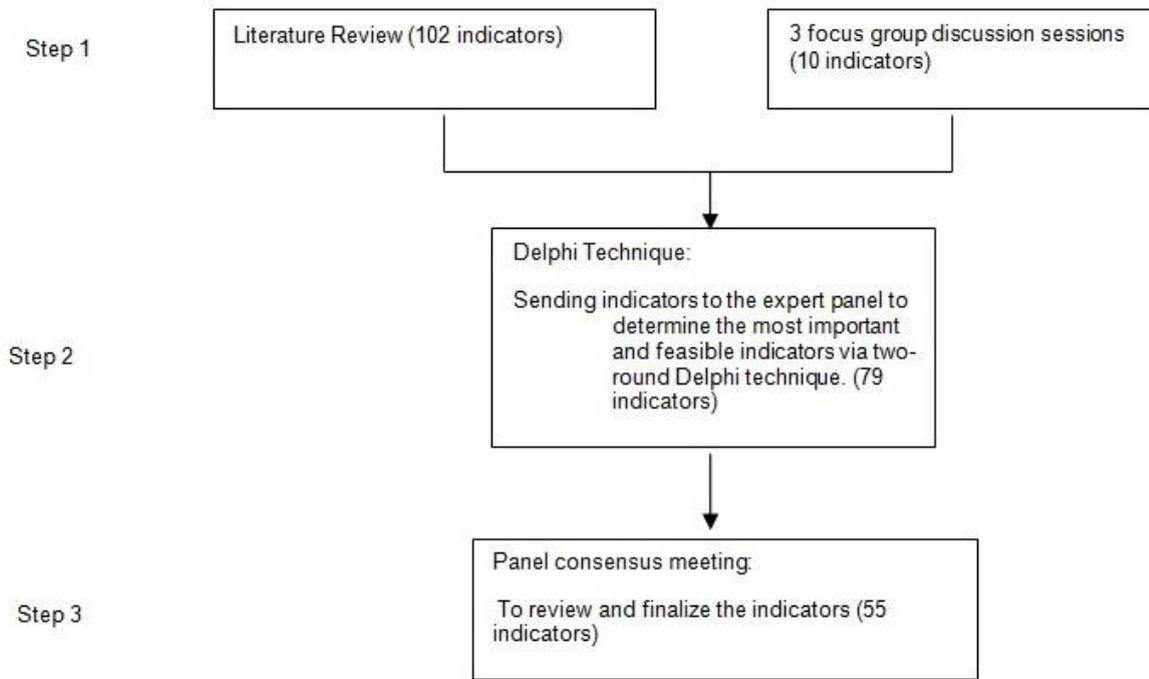


Figure 1. Approach for selecting hospital financial indicators.

Results

In total, 102 hospital financial indicators were identified from literature review and focus group discussions and distributed across 7 performance dimensions: 11 indicators were assigned to the domain of “profitability”, 6 to the “liquidity”, 21 to the “revenue”, 25 to the “cost”, 11 to the “capital structure”, 14 to

the “asset efficiency” and 14 to the “human resources”.

In the first round of the Delphi technique, 100% of the questionnaires were returned from the participants. For each indicator, median score was calculated. 19 indicators gained a median score > 7 in both of criteria.

Table 1. The list of final accepted hospital financial indicators.

Row	performance dimension	indicator
1	Profitability	Return on asset
2		Total margin
3		Operating margin
4	Liquidity	Current ratio
5		Quick ratio
6		Days cash on hand
7		Average payment period
8	Capital structure	Capital expense
9		Debt ratio
10		Debt service coverage
11		Long term debt to capitalization
12		Long term debt to total asset
13		Cash flow to total debt
14		Fixed asset financing
15		Cash flow to assets
16		New investments to total expenses
17	Revenue	Inpatient revenue percentage based on the hospital wards
18		Outpatient revenue percentage based on the hospital ambulatory units
19		Drug revenue to total revenues
20		Drug revenue to drug expense
21		Growth rate in the dedicated revenue
22		Dedicated revenues to total financial resources
23		Non-operating revenue
24		Rate of realization of hospital revenue
25		Rate of received revenue from the insurers
26		Dedicated revenue to total expenses
27	Cost	Cost per hospitalization based on the hospital wards
28		Cost per outpatient visit based on the hospital ambulatory units
29		Patient deductions

30		Total expenses to the total financial resources
31		Percentage of fraction in the insurers' reimbursement
32		Drug expenses to total expenses
33		Drug and supply expenses to total expenses
34		Cost of Energy to total costs
35		Salary per FTE based on personnel type
36		Percentage of personnel expenses to total financial resources
37		Percentage of personnel expenses to total expenses
38		Personnel expenses to total dedicated revenues (excluding drug revenues)
39		Staff personnel expenses to line staff expenses
40		Expended charges for Global surgeries to received revenue for Global surgeries
41		Welfare personnel costs to total hospital costs
42		Salary to total expenses
43		Training expenses to total hospital expenses
44	Asset efficiency	Total asset turnover ratio
45		Inventory turnover ratio
46		Depreciation rate
47		Average age of plant
48		Number of surgeries to operating rooms
49		Bed occupancy percentage
50		Bed turnover rate
51		Bed turnover interval
52		Average Length of stay
53		Available beds to licensed beds ratio
54	Human resources	Number of K-coefficient of surgeries per month to total surgeons
55		Number of personnel teaching hours

In round 2, 83 indicators were sent to the experts to rate. 22 experts returned questionnaires thus the response rate was 88%. In this round, 23 indicators were excluded. According to the two-round Delphi results, 79 indicators were retained and discussed in a panel consensus meeting to revise and finalize. In the panel consensus meeting, 8 indicators were revised based on the panel members' opinions and 37 were omitted. Also, 13 indicators were developed upon the experts' opinions. Finally 55 indicators were selected as financial indicators for assessing hospital performance (Table 1).

Discussion

The current study is aimed to develop a set of financial indicators for Iranian hospitals. Numerous studies demonstrate that various healthcare providers, have developed their own unique performance indicators and this is an uprising trend [7, 46, 47].

In one study to develop comparative financial indicators for "Critical Access Hospitals", 114 indicators were identified using the literature review. Among them, the 37 frequently used indicators were selected. The research expert panel evaluated the indicators using 3 criteria: usefulness, importance and feasibility. Finally they selected 20 financial indicators and categorized them into 6 financial performance dimensions: profitability, liquidity, capital structure, revenue, cost and utilization [8].

In the research that was performed in Canada, the key financial indicators for "Acute Care Hospitals" were selected. The literature review, focus group discussions and panel consensus meeting was conducted and 9 indicators identified as the key indicators for Acute Care Hospitals. These measures were distributed over 5 financial performance domains [12].

Researchers in the another study, have introduced 15 financial measures as part of a "hospital dashboard" and suggested that analyzing these indicators in combination, is an effective tool for assessing a hospital's financial performance [14].

A study on public hospitals was done in Turkey. The public hospitals are run by the Ministry of Health. The Ministry of Health is delivering the most primary and secondary health services in Turkey. Researchers achieved 5 key financial indicators for assessing and improving financial performance in

Turkish public hospitals [16].

One study surveyed the healthcare executives to identify performance indicators which are necessary for organizational assessment and improvements. 6 indicators were selected as the most important for the healthcare decision-makers [7].

In the current study, 102 hospital financial indicators were identified from literature review and focus group discussions. Then, we used two-round Delphi technique to collect experts' opinions on the indicators using two criteria: importance and feasibility. Finally in the panel consensus meeting, the retained indicator from Delphi study, were discussed to revise and finalize. Based on the panel members' opinions, 55 indicators were selected as financial indicators for assessing hospital performance.

Some of the final accepted indicators had been deemed to be important measures of hospital financial performance in many studies. But in case of some of them, there is less evidence support. This is may be due to the differences between Iranian hospitals and other hospitals in the financing methods, accounting methods, the payment system and ownership status. In addition, this is important to consider that the literature alone cannot provide a sufficient basis to select key financial indicators.

Some of the selected indicators in this study, like "bed occupancy rate", are not financial indicators by nature. However there is evidence that indicates some of non-financial measures like measures of efficiency, influence on hospital financial performance [9, 21, 48, 49]. So, the research experts consider them.

It is better to consider the relevant indicators in a financial performance dimension. This helps achieve an informed judgment about an organization's financial health. For example, profitability indicators may show a hospital has a profit but liquidity indicators may indicate it is not able to pay its bills [8, 12]. For this reason, we categorize the indicators into 7 financial performance dimensions.

Among Iranian hospitals, there is variation in the volume and type of services provided, ownership, mission and financing method, therefore the expert panel attempted to develop and select the indicators that able to measure financial performance of this wide range of hospitals. The expert panel suggested that some indicators should be defined according to hospital type. For example, the phrase of "dedicated revenue" was replaced

with the phrase of "total revenue" for nonpublic hospitals because "dedicated revenue" is specially used for the public hospitals. It is necessary to consider the differences to make judgment about hospitals' financial performance because they influence on the indicators value.

Conclusion

The current study is an attempt to provide policy makers and hospital managers with a set of comparative financial indicators designed specifically for Iranian hospitals to improve their organization's financial performance.

If hospitals be able to use the resources effectively, they can response to the population needs. Hospitals and governments for reducing costs, increasing profit and continuing operations need to monitor financial performance and forecast financial problems. The reviewed literature shows that the financial indicators are effective means for monitoring financial conditions and for predicting financial distresses. Finally, it should be noticed that indicators help detect the problems but they will not necessarily show the solutions.

Suggested indicators in this study should be evaluated through pilot studies to determine their effectiveness. The researcher intends to conduct a pilot study in teaching hospital in East Azerbaijan, Iran.

Conflict of interests:The authors declare no conflict of interest.

References

- Gapenski LC, Pink GH: *Understanding healthcare financial management*. fifth ed. United States of America: The Foundation of the American College of Healthcare Executives; 2007.
- Gapenski LC: *Healthcare finance: An introduction to accounting and financial management*. third ed. United States of America: The Foundation of the American College of Healthcare Executives; 2005.
- Parkinson J, Tzasis P, Porporato M: A critical review of financial measures as reported in the Ontario hospital balanced scorecard. *Journal of health care finance* 2007,34(2):48-56.
- Zelman WN, McCue MJ, Millikan AR, Glick ND: *Financial management of health care organizations: an introduction of fundamental tools, concepts, and applications*. Second ed. Malden, Mass: Blackwell; 2003.
- Suarez V, Lesneski C, Denison D: Making the case for using financial indicators in local public health agencies. *Am J Public Health* 2011,101(3):419-25. doi: 10.2105/AJPH.2010.194555.
- Pizzini MJ: The relation between cost-system design, managers' evaluations of the relevance and usefulness of cost data, and financial performance: an empirical study of US hospitals. *Accounting, Organizations and Society* 2006,31(2):179-210.
- Love D, Revere L, Black K: A current look at the key performance measures considered critical by health care leaders. *J Health Care Finance* 2008,34(3):19-33.
- Pink GH, Holmes GM, D'Alpe C, Strunk LA, McGee P, Slifkin RT: Financial indicators for critical access hospitals. *Journal of Rural Health* 2006,22(3):229-36.
- Watkins AL: Hospital financial ratio classification patterns revisited: Upon considering nonfinancial information. *Journal of Accounting and Public Policy* 2000,19(1):73-95.
- Novick LF, Morrow CB, Mays GP: *Public health administration: principles for population-based management*. 2 ed. Subbury, Massachusetts: Jones & Bartlett Publishers; 2008.
- Gruen R, Howarth A: *Financial management in health services*. London: School of Hygiene and Tropical Medicine; 2005.
- Pink GH, Daniel I, Hall LM, Mckillop L: Selection of key financial indicators: A literature, panel and survey approach. *Healthc Q* 2007;10(1):87-96. doi:10.12927/hcq.2007.18661.
- Watson D, Finlayson G, Jacobs P: Comparing apples to apples: the relative financial performance of Manitoba's acute care hospitals. *Healthcare management forum* 2002,15(4, Suppl):39-46. doi:10.1016/S0840-4704(10)60181-0.
- Cleverley WO, Cleverley JO: Scorecards and dashboards: using financial metrics to improve performance. *HealthcFinanc Manage* 2005,59(7):64-9.
- Younis MZ, Younies HZ, Okojie F: Hospital financial performance in the United States of America: a follow-up study. *Eastern Mediterranean Health Journal* 2006,12(5):670-8.
- Ozgulbas N, Koyuncugil AS: Financial profiling of public hospitals: an application by data mining. *International Journal of Health Planning and Management* 2009,24(1):69-83. doi: 10.1002/hpm.883.
- McCue MJ, Nayar P: A Financial Ratio Analysis of For-Profit and Non-Profit Rural Referral Centers. *Journal of Rural Health* 2009,25(3):314-9. doi: 10.1111/j.1748-0361.2009.00236.x.
- Kim TH: Factors associated with financial distress of nonprofit hospitals. *Health Care Manag (Frederick)* 2010,29(1):52-62. doi:10.1097/HCM.0b013e3181cca2c5.
- McCracken MJ, McIlwain TF, Fottler MD: Measuring organizational performance in the hospital industry: an exploratory comparison of objective and subjective methods. *Health services management research: an official journal of the Association of University Programs in Health Administration / HSMC, AUPHA*. 2001,14(4):211-9. doi: 10.1258/0951484011912717.
- Schuhmann TM: Hospital financial performance trends to watch. *Journal of the Healthcare Financial Management Association* 2008,62(7):59-66.
- Velez-Gonzalez H, Pradhan R, Weech-Maldonado R: The role of non-financial performance measures in predicting hospital

- financial performance: the case of for-profit system hospitals. *Journal of Health Care Finance* 2011,38(2):12-23.
22. Pink GH, Holmes GM, Thompson RE, Slifkin RT: Variations in financial performance among peer groups of critical access hospitals. *Journal of Rural Health* 2007,23(4):299-305. doi: 10.1111/j.1748-0361.2007.00107.x.
 23. O'Neill SM, Ettner SL, Lorenz KA: Are Rural Hospices at a Financial Disadvantage? Evidence from California. *J Pain Symptom Manage* 2009,37(2):189-95. doi: 10.1016/j.jpainsymman.2008.01.008.
 24. Pink GH, McKillop I, Schraa EG, Preyra C, Montgomery C, Baker GR: Creating a balanced scorecard for a hospital system. *Journal of Health Care Finance* 2001,27(3):1-20.
 25. Wang BB, Wan TT, Falk JA, Goodwin D: Management strategies and financial performance in rural and urban hospitals. *J Med Syst* 2001,25(4):241-55.
 26. Chen HF, Bazzoli GJ, Hsieh HM: Hospital Financial Conditions and the Provision of Unprofitable Services. *Atl Econ J* 2009,37(3):259-77. doi: 10.1007/s11293-009-9183-9.
 27. Koyuncugil AS, Ozgulbas N: Early Warning System for Financially Distressed Hospitals via Data Mining Application. *Journal of Medical Systems* 2012,36(4):2271-87. doi: 10.1007/s10916-011-9694-1.
 28. Ozmeral AB, Reiter KL, Holmes GM, Pink GH: A Comparative Study of Financial Data Sources for Critical Access Hospitals: Audited Financial Statements, the Medicare Cost Report, and the Internal Revenue Service Form 990. *Journal of Rural Health* 2012,28(4):416-24. doi: 10.1111/j.1748-0361.2012.00416.x.
 29. Harrison MG, Montalvo CC: The financial health of California hospitals: A looming crisis. *Health Affairs* 2002,21(1):118-26. doi: 10.1377/hlthaff.21.1.118.
 30. Bazzoli GJ, Chan B, Shortell SM, D'Aunno T: The financial performance of hospitals belonging to health networks and systems. *Inquiry-Blue Cross and Blue Shield Association* 2000,37(3):234-52.
 31. Carpenter CE, McCue MJ, Hossack JB: Association of bond, market, operational and financial factors with multi-hospital system bond issues. *Journal of Health Care Finance* 2001,28(2):26-34.
 32. Cleverley WO: The hospital cost index: a new way to assess relative cost efficiency. *Health Financ Manage* 2002,56(7):36-42.
 33. McCue MJ, Thompson JM, Dodd-McCue D: Association of market, mission, operational and financial factors with hospital's level of cash and security investments. *Inquiry-Blue Cross and Blue Shield Association* 2001,37(4):411-22.
 34. Nasiripour AA, Tabibi SJA, Begloo AG, Jadidi RA: Designing a performance evaluation model for Iranian public hospitals: using the balanced scorecard. *Journal of Arak University of Medical Sciences* 2009,12(1):95-106.
 35. Salehi MZ, Nasiripour AA: Financial performance evaluation of budget plan in social security hospitals of Tehran. *Medical Journal of Social Security* 2008,7(41):213-22.
 36. Aarabi SM, Razmjy M: *Financial strategy*. Tehran, Iran: Institute Iziran; 2009.
 37. Berger S: *Fundamental of healthcare financial management: a practical guide to fiscal issues and activities*. third ed. San Francisco, United States of America: Jossey-Bass; 2007.
 38. Wong LP: Focus group discussion: a tool for health and medical research. *Singapore Med J* 2008,49(3):256-61.
 39. Twohing PL, Putnam W: Group interviews in primary care research: advancing the state of the art or ritualized research? *Family Practice* 2002,19(3):278-84. doi: 10.1093/fampra/19.3.278.
 40. Wilson S, Hauck Y, Bremner A, Finn J: Quality nursing care in Australian paediatric hospitals: a Delphi approach to identifying indicators. *J Clin Nurs* 2012,21:1594-605. doi: 10.1111/j.1365-2702.2011.04004.x.
 41. Hasson F, Keeney S, McKenna H: Research guidelines for the delphi survey technique. *J Adv Nurs* 2000,32:1008-15. doi: 10.1046/j.1365-2648.2000.t01-1-01567.x.
 42. Keeney S, Hasson F, McKenna H: A critical review of the delphi technique as a research methodology for nursing. *Int J Nurs Stud* 2001,38:195-200. doi: 10.1016/S0020-7489(00)00044-4.
 43. Hutchings A, Raine R: A systematic review of factors affecting the judgments produced by formal consensus development method in health care. *Journal of Health Services Research & Policy* 2006,11:172-9. doi: 10.1258/135581906777641659.
 44. Landeta J: Current validity of the Delphi method in social sciences. *Technological Forecasting and Social Change* 2006,73(5):467-82.
 45. Ahmadi F, Nasiriani K, Abazari P: Delphi Technique: instrument for research. *Education in Medical Sciences* 2008,8(1):175-85.
 46. Meliones J: Saving money, saving lives. *Harvard Business Review* 2000,78(6):57-67.
 47. Johnson H, Frack S: Critical indicators for enterprise performance. *Health Forum Journal* 2001,44(1):42-3.
 48. Lawrence CM, Kurtenbach JM: Medicare reimbursement, debt financing, and measures of service efforts and accomplishments in the healthcare industry. *International Journal of Public Administration* 1995,18(2&3):355-81. doi:10.1080/01900699508525013/
 49. Gardiner LR, Oswald SL, Jahera JS: Prediction of hospital failure: A post-PPS analysis. *Hospital and Health Services Administration* 1996,41(4):441-60.

