

**Analysis of factors associated with
profitability of Kazakhstani state hospitals
and polyclinics.**

Master of Public Health Integrating Experience Project Utilizing Professional Publication Framework

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Contents

Acknowledgements.....	- 2 -
Executive summary	- 3 -
Introduction	- 4 -
Methods	- 5 -
Variables.....	- 6 -
Results	- 7 -
Discussion.....	- 11 -
Strength of the study	- 12 -
Limitations of the study	- 12 -
Reference list.....	- 14 -

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Executive summary

The following study analyzed factors affecting profitability of medical state enterprises. The primary interest of the study was the effect of corporate governance on financial performance of oblast level hospitals and primary care clinics. It was found that the presence of a supervisory board for the hospital or clinic is associated with decreased probability of producing net positive income (37% less chance) in these organizations. Also it was found that characteristics of supervisory boards like number of people in the board and meetings held by supervisory boards are not associated with profitability of state medical enterprises. The profitability of state medical organizations also differed between regions of the country and between organizations located in cities and rural regions.

Introduction

Corporate governance is a set of policies, practices and processes by which a company is navigated, administered and controlled [1]. The main purpose for establishing corporate governance in an organization is to distribute responsibilities between board of directors, managers, shareholders, auditors and other stakeholders based on their key competencies and skills [2]. Corporate governance plays an important role in a company's overall performance, as it participates in the development of an organization's vision, goals and objectives and controls almost every sphere of management, from strategic planning and internal processes to performance measurements and corporate culture [3, 4]. Effective governance also requires regular supervisory board meetings with adequate membership size for improved financial performance [14, 15].

In Kazakhstan, governmental medical organizations were previously mainly State institutions – non-profit organizations that were fully dependent on the State for its budget without the possibility of managing their own finances and accumulating income and introducing any motivational instruments to improve quality of services. To initiate progress and increase quality of care provided by governmental medical organizations, ownership-type of State medical organizations was changed from State institutions to state enterprises [5]. State enterprises, in contrast to State institutions, have more autonomy, manage their own finances, independently determine wages and operate in a competitive environment. Thus, for effective management of these medical enterprises, corporate governance was introduced into the healthcare system by the Decree of the Government of the Republic of Kazakhstan in 2011 [6].

By the end of 2016 there were 527 State medical enterprises and 274 of them (52%) had supervisory boards. A total of 257 out of 274 (93%) had functional supervisory boards that held at least one meeting during the year. The Ministry of Health is planning to increase the

share of medical enterprises with supervisory boards to 80% by 2020 to grant more functional autonomy to these organizations. However, only 28% of these supervisory boards held four or more meetings, even though the minimum number of meetings held by a supervisory board should not be less than four in a year; this indicates that only a formal implementation of supervisory boards has occurred in many cases, with most medical institution supervisory boards not achieving full functionality [5].

Corporate governance increases financial effectiveness of organizations and profitability [7-9]. This factor should be of the highest interest for the new State medical enterprises providing medical services to improve healthcare quality through effective financial management. It is vital for the new State medical enterprises to generate sufficient income to assure a high quality of healthcare, which requires training of medical personnel, purchasing updated technologies and improving healthcare service conditions, which cannot be obtained without additional expenditures. Thus, by the following research project, I evaluated the two following research questions:

1. Is profitability associated with the presence of a supervisory board in State hospitals and primary care clinic enterprises ?
2. What are some of the factors associated with profitability of government hospitals and primary care clinic enterprises??

Methods

A cross-sectional study design was applied during the research, given the available data was cross-sectional. There were 618 State healthcare enterprises by the end of 2016 nationally. This included both hospitals and primary care clinics. Information on characteristics of corporate governance in these healthcare enterprises were provided in the form of secondary data by the Republican Management Center for Health Development in the Ministry of

Health of the Republic of Kazakhstan. Financial statements were obtained from the Depository of Financial Statements of the Ministry of Finances of the Republic of Kazakhstan [10].

Only regional-level State hospital and primary care clinic enterprises were included in the study. Republican-level medical organizations and specialized specialized hospitals and clinics, including tuberculosis, oncology and rehabilitation were not included in the scope of this study.

The data were analyzed using Stata 12.0 statistical package [11]. Bivariate analysis was used to summarize information on these medical enterprises and to identify statistically significant differences for associations of independent variables, including hospital versus clinic, having a supervisory board, urban versus rural, and region (north, east, south or west) with the outcome variable return-on-assets (ROA), dichotomized by a dummy variable for positive and negative values (representing a measure of net gain versus net loss respectively while adjusting for total assets). Results were not adjusted for confounding in the bivariate analysis. Statistical tests included chi-square and Fisher's exact. Statistically significant independent variables were carried over for multivariate regression analysis to control for confounding due to other covariates included in the model. Given that the rarity assumption was violated, multivariate Poisson regression with robust equal variances was utilized in the multivariate analysis in lieu of multivariate logistic regression to produce unbiased adjusted prevalence rate ratios. [12].

Variables

To see associations between having a supervisory board and profitability, State medical enterprises were characterized by four primary variables, as follows: 1. organizational type (hospital or primary care clinic), 2. having a supervisory board (yes/no), 3. location (urban/rural) and 4. region of the country (north/east/south/west). State medical enterprises

with a supervisory board were further characterized by variables that included the following:

1. number of members of the supervisory board, and
2. number of meetings held by the supervisory board in one year.

The number of meetings held in one year for State medical enterprises with supervisory boards was dichotomized into two values, as follows: 1) less than four meetings and 2) four meetings. According to the Law of the Republic of Kazakhstan “On state property”, a supervisory board for a State enterprise should hold at least four meetings per year [13]. The number of members on the supervisory board was also dichotomized into two values, as follows: 1) less than five members on the supervisory board and 2) five or more members on the supervisory board. The outcome variable – indicator of an organization’s profitability, was represented by return-on-assets (ROA), which shows how productively an organization is using its assets financially. The value of ROA is calculated by the formula [16]:

$$ROA = \frac{Net\ income}{Total\ assets} * 100\%$$

This is a measure of profitability while adjusting for size of total assets. For the dichotomized outcome variable, State medical enterprises with ROA higher than zero were classified as “profitable” and those with a value of ROA less than or equal to zero were classified to be “non-profitable”. All data included in the study were obtained from reports of medical organizations for the year 2016.

Results

A total of 234 organizations were included in the analysis (139 hospitals and 95 primary care clinics), as can be seen in table 1. A total of 66 (47.5%) hospitals and 29 (30.5%) had supervisory boards. In the bivariate results from table 1, not controlling for confounding, the profitability of medical enterprises was statistically significantly different between hospitals and primary care clinics (p-value 0.018), between enterprises with and without a supervisory

board (p-value < 0.001), between urban and rural medical enterprises (p-value < 0.001) and between the four regions of the country (p-value < 0.001).

Table 1. Bivariate analysis of independent variables

Variable	Type	ROA > 0, n=126	ROA =< 0, (n=108)	p-value
Organization	Hospital (n=139)	66 (52.4%)	73 (67.6%)	0.018
	Primary Care Clinic (n=95)	60 (47.6%)	35 (32.4%)	
Supervisory Board	Yes (n=95)	36 (28.6%)	59 (54.6%)	<0.001
	No (n=139)	90 (71.4%)	49 (45.4%)	
Location	Urban (n=129)	84 (66.7%)	45 (41.7%)	<0.001
	Rural (n=105)	42 (33.3%)	63 (58.3%)	
Region	North (n=79)	57 (45.2%)	22 (20.4%)	<0.001
	East (n=20)	3 (2.4%)	17 (15.7%)	
	South (n=97)	54 (42.9%)	43 (39.8%)	
	West (n=38)	12 (9.5%)	26 (24.1%)	

In table 2, multivariate analysis, adjusting for confounding due to covariates, showed that state enterprises with a supervisory board had a 37% less chance of being profitable (PRR = 0.63, p-value < 0.001). Similarly, organizations located in rural regions had 50% less chance of closing the year with a positive financial result (PRR = 0.5, p-value < 0.001). Regional differences also affected probability of producing positive net income. Compared to state enterprises located in North Kazakhstan, hospitals and primary care clinics in East Kazakhstan produced positive net income a fifth the frequency (PRR = 0.18, p-value =

0.002), enterprises located in the south side of the country had 36% less chance of being profitable (PRR = 0.64, p-value = 0.001) and medical enterprises in west Kazakhstan were profitable almost two time less frequently (PRR = 0.55, p-value = 0.023).

There was an interaction between type of the medical enterprise and location of the medical enterprises. Primary care clinics located in rural regions had 2.1 times greater chance of closing year with positive financial statement (PRR = 2.1. p-value < 0.001).

Table 2. Multivariate analysis of factors associated with profitability of medical state enterprises using Poisson regression with robust equal variances

Variable	Type	Prevalence RR	p-value
Organization type	Hospital	1.00	0.813
	Primary Care Clinic	0.97	
Supervisory Board	No	1.00	<0.001
	Yes	0.63	
Location	Urban	1.00	<0.001
	Rural	0.5	
Region	North	1.00	0.002
	East	0.18	
	South	0.64	
	West	0.55	
Organization type & Location Interaction			
	Rural Primary CareClinic	2.10	<0.001

A multivariate analysis of factors associated with profitability of State enterprises with a supervisory board (table 3) showed that location in East and West Kazakhstan had 85% and 49% less chance of producing positive net profit, respectively (PRR = 0.15, p-value = 0.048 and PRR = 0.51, p-value = 0.034). Neither the number of members on the supervisory board,

nor the number of meetings held annually by the supervisory board was associated with profitability of the medical enterprises.

Table 3. Multivariate analysis of factors associated with profitability of medical state enterprises with a supervisory board. Poisson regression with robust equal variances

Variable	Type	Prevalence RR	p-value
Organization type	Hospital	1	0.629
	Primary Care Clinic	0.89	
Location	Urban	1	0.159
	Rural	0.53	
Region	North	1	0.048
	East	0.15	
	South	0.67	
	West	0.51	
# of Members on Supervisory Board	<4	1	0.652
	≥4	1.12	
# of Meetings Annually by Supervisory Board	<4	1	0.126
	4	0.26	

Among State enterprises without supervisory boards (table 4), the picture is similar to the previous models, with state medical enterprises located in rural regions having 35% less chance of having a positive net income by the end of the year as compared to medical organizations in urban areas (PRR = 0.65, p-value = 0.006). Medical enterprises in East Kazakhstan had a fourth the chance of being profitable as compared to medical enterprises in the north of the country (PRR = 0.24, p-value = 0.028). Also, rural primary care clinics had almost two times higher chance of being profitable in contrast to hospital located in urban areas (PRR = 1.89, p-value = 0.001).

Table 4. *Multivariate analysis of factors associated with profitability of medical state enterprises without supervisory board. Poisson regression with robust equal variances*

Variable	Type	Prevalence RR	p-value
Organization type	Hospital	1	0.272
	Polyclinic	0.81	
Location	City	1	0.006
	Rural	0.65	
Region	North	1	0.028
	East	0.24	
	South	0.95	
	West	0.47	
Organization type & Location	City hospital	1	0.001
	Rural polyclinic	1.89	

Discussion

The following paper analyzed factors affecting profitability of State medical enterprises governed by oblast (regional) level authorities. It was found that having a supervisory board is associated with a decreased probability of producing net positive income (37% less chance). This could be due to the structure and competencies of the supervisory board. Klein showed that performance is highly associated with board committee structure [17]. It should be noted that according to the Law on State property, the supervisory boards should have at least three members. Considering that there were a total of 274 State medical enterprises with a supervisory board across the regions of Kazakhstan in 2016 and that the number of these enterprises is going to be increased almost 2.5 times by the end of 2018, the lack of competent professionals for inclusion as members into these boards may be a serious problem. Even though the number of members in each supervisory board and number of meetings held annually by these boards was not associated with profitability of the

enterprises, professionalism and experience of separate members could be the key factor guiding organizational progress. Also, report by the Republican Center for Health Development indicated that State medical enterprises with a supervisory board are 32% less efficient compared to joint-stock companies providing medical services [5]. This could be explained by flaws in the normative legal acts regulating activities of supervisory boards. For example, the authority of supervisory boards is limited by 11 designated competencies, in contrast to a board of directors that have a minimum 18 designated competencies, according to Law of the Republic of Kazakhstan “On joint-stock companies” [18].

Differences in profitability of medical state enterprises in different regions of the country could be the result of different economic conditions of oblasts and the number of rural localities in these regions. According to the Order #725 of the Minister of Health of the Republic of Kazakhstan “On tariffs for providing medical services”, medical organizations in rural regions, especially primary care clinics are paid using higher tariff brackets for provision of services as compared to medical organizations in urban areas [19]. This could also explain the doubling of the chance of being profitable for primary care clinics located in rural regions.

Strength of the study

The primary strength of this study is that it is the first research conducted on the topic in the territory of Kazakhstan with the potential for assessing ongoing healthcare reform. Also, the study covered medical organizations from 15 regions of the country (Karagandy oblast was not included due to incomplete data), providing national coverage.

Limitations of the study

The cross-sectional study design allows identification of one-time prevalence rate-ratio, but does not provide temporality for determination of causality. The limited number of enterprises and the small number of medical enterprises in individual regions can also unduly

bias the final result. Additionally, organizational progress and increases in net profitability as associated with corporate governance duration is not possible in this study. A significant proportion of medical organizations experienced a number of reorganizations with other healthcare reforms in the country that took place in previous years that can also confound the results.

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