INFLUENCE OF SOCIOECONOMIC AND DEMOGRAPHIC ENVIRONMENT ON PRIVATE HEALTH CARE PROVIDERS

Lana Kordić
University of Split, Faculty of Economics
Cvite Fiskovića 5, 21000 Split, Croatia
E-mail: lana.kordic@efst.hr

Abstract

Health care systems face pressure to increase the quality of health care at the same time with pressure to reduce public spending. The attempt to overcome the gap between needs and opportunities can be resolved through the introduction of public-private partnerships. Goals of this study are to investigate variation of the number, form and efficiency of private providers of general/family medicine services in primary health care and the contribution of socioeconomic and demographic environment on those variations, among counties. Socioeconomic and demographic factors are identified as independent variables that influence the health care need and utilization and consequently the decision of private entities to engage in the provision of health care services. This study extended previous studies because it has introduced socioeconomic and demographic variables. This may shed same new lights on the relationship between private providers of health service and efficiency of providing health service in primary health care.

Key words: *Health economics, Public-private partnership, Socioeconomic and demographic factors, Efficiency*

1. BACKGROUND

Nowadays we are witnesses of open debates on the sustainability, equity and efficiency of health care systems. Health care systems face pressure to increase the quality of health care at the same time with pressure to reduce public spending. As a response to these problems developing, Central and Eastern European countries (CEE countries) have implemented large-scale market oriented health care reforms. (Nemec and Kolisnichenko, 2006) Market-modeled restructuring of public institutions has dramatically transformed the organization and delivery of health services. Managerial ideologies and organizational mechanisms to enhance efficiency, accountability and competition have come to

dominate their activities. (Aronson and Smith, 2010) These changes resulted in narrowing the redistributive capacity of the state, de-politicizing the public realm and reducing citizenship entitlements. Unfortunately these reforms have not fully met the expectations. In Croatia, as in other developing countries, in recent decades we have witnessed a dramatic offloading and reducing health services and programmes. In their place there are several dispersed state, regulated by governments from a distance, funders and accreditors through a range of accountability and surveillance strategies. In these mixed economies of public and private welfare, the professional and administrative organizational cultures characteristic of the welfare state have been displaced by the ideology and distinctive practices of managerialism.

2. PUBLIC-PRIVATE PARTNERSHIP AS AN ANSWER TO CHALLENGES THAT FACE HEALTH CARE SYSTEMS

The market alone, in the case of comprehensive privatization, cannot answer most of the problems related to health care delivery. The attempt to overcome the gap between needs and opportunities in the health care systems can be resolved through the introduction of public-private partnerships (PPP). The term public-private partnership refers to forms of cooperation between public authorities and the world of business which aim to ensure the funding, construction, renovation, management or maintenance of an infrastructure or the provision of a service. (Commission of the European Communities 2004, p. 3) In order to ensure that health care systems continue to generate improved health care outcomes at a sustainable cost, changes are required in primary care, where providers have a role of gatekeepers. The necessity to adapt to a complex new environment places severe strains on primary care providers who deal with the lack of basic organizational and financial skills to run their practice as an integrated health business. At that point, private investors and health insurers recognize their interest in involvement in the provision of those services. Private entities see their investment as something that will be profitable in the long run. They see opportunities for value creation, for patients as well as for companies. (OECD, 2011) According to that, on the level of the whole health care system, a private entity is more likely to offer more-profitable services, i.e. services for young and healthy people and lucrative services. (Kordić and Arnerić, 2012) This study seeks to examine the contributions of socioeconomic and demographic environment contexts on the private providers of general/family health services in primary health care. Pristaš et al. (2009) in their paper argued that different mixtures of public and private financing and providing services have been introduced in developing countries, and despite existing universal coverage not all population groups have equal positions in case of equal health needs.

Because of all the above mentioned, goals of this study are to investigate variation of the number, form and efficiency of private providers of general/family medicine services in primary health care and the contribution of socioeconomic and demographic environment on those variations, among counties. This study is guided by the knowledge that socioeconomics and demographic environment are important factors that influence the decision of private entities to engage in the provision of health care services. Socioeconomic and demographic factors are identified as independent variables that influence the health care need and utilization and consequently the decision of private entities to engage in the provision of health care services.

Table 1: Rationale for inclusion demographic and socioeconomic variables.

Independent variables	**Rationale for inclusion**
Demographic variables	
Gender	Women and men have different attitudes and needs for health care services. Women are associated with positive attitude to health care which may have a positive influence on health care utilization and negative influence on the willingness of private providers to be involved in providing services.
Age	Age is associated with health status and need for health care. Children and elderly are associated with greater need and/or worse health status which may have a positive influence on health care utilization and negative influence on the willingness of private providers to be involved in providing services.
Socioeconomic variables	
Education	Education has two opposite potential influences on health care utilization: higher educational levels are associated with better health which may negative influence on health care use and positive influence on the willingness of private providers to be involved in providing services. On the other hand, higher educational levels are associated with positive attitude to health care which may have a positive influence on health care utilization and negative influence on the willingness of private providers to be involved in providing services.
Working status	Labor force participation has two opposite potential influences on health care utilization: higher time cost and better health associated with labor force participation may have negative influence on health care utilization and negative influence on the willingness of private providers to be involved in providing services. On the other hand, higher income and better private insurance coverage associated with labor force participation may have a positive influence on health care utilization and negative influence on the willingness of private providers to be involved in providing services.

Source: Author, adapted from Zhong (2010).

The aforementioned assumptions are built on the literature describing relationship between above stated variables through different conceptual models. (Schulz, A. J. et. al, 2005; Pristaš et al., 2009; Zhong, 2010) Demographic and socioeconomic status are complex terms sometimes shown as a combined index, but mostly through many component indicators shown in the Table 1, insurance as mostly measured indicators. Variation of the number, form and efficiency of private health care providers may arise, at least in part, through the effects of the socioeconomic and demographic

environments, exposure to stressful life conditions, health-related behaviors, social integration and social support. Private providers want to provide health services to younger, healthy people who will pose less cost to their health business. Table 1 describes pathways through which socioeconomic and demographic differences influence variation of the private health care providers. This model has guided author's efforts to examine contributions of aspects of the environment to patterns of private health care providers in Croatia. The study design is described below the article.

3. PUBLIC-PRIVATE PARTNERSHIP IN CROATIAN HEALTH CARE SYSTEM

After partial, limited privatization of primary health care, the patient's choice of primary health care physicians was made mandatory, in order to increase access to the primary health care system and to increase competition in health service quality and extent. In 2010 there were 6.223 private practice units in primary health care system (doctors' offices, laboratories, private pharmacies, private physical therapy practices and home care services) registered. Out of these, 2.561 were private doctors' offices, 1.848 of which were private practices in concession. There were 2.396 private dentists' offices – out of these 948 were in concession. (Croatian national Institute of Public Health, 2011) The government's intention was to unload a part of secondary health care burden to the primary level, which should have been followed by secondary and tertiary health care utilization decreases. (Pristaš et al., 2009) This model has been criticized as "reducing the health reform model" because of the fact that most initial measures had a main purpose to reduce health expenditures by burdening the worst off, while the health services quality remained at least doubtful. (Stipešević Rakamarić, 2007) One major problem is the imbalance between primary and secondary care. In most European countries, the primary institution resolves to protect approximately 75% of medical cases, while in Croatia primary care only solves 50% of cases. (Mihaljek, 2006)

3.2. Important questions which require answers

The relationship between socioeconomic and demographic environment and private health care providers is recognized but not well enough explored issues in developing countries such as Croatia.

For strategic health care management purposes, the comparison of environment and private health care providers between counties could provide valuable guidance for setting public health priorities and establishing effective locally tailored policies.

There are few important questions raised in the before mentioned debates.Whether the public-private partnerships are good for all patients? Whether the PPP result in reducing public expenditures, with overemphasized private profit that poses a threat to the quality of care? The attention paid to this issue is reflected in a large number of empirical studies conducted over the past decades. Due to lack of knowledge on public-private partnership, the current cooperation has not always had positive results, especially in developing countries.

4 EMPIRICAL FINDINGS ON THE INFLUENCE OF SOCIOECONOMIC AND DEMOGRAPHIC ENVIRONMENT ON PRVATE HEALTH CARE PROVIDERS

4.1. Variables and data

The goal of this study is to investigate variations of the number, form and efficiency of private providers of general/family health service in primary health care and the contribution of socioeconomic and demographic environment on those variations, among counties. In the first stage paper analyzed the relationship between private providers of general/family health service and efficiency of providing general/family health service in primary health care in Croatia. The objective was to compare the counties with defined indicators of efficiency for general/family medicine service in primary health care and the results compare with the number and structure of units in private practice in each county. The goal is to examine the efficiency in terms of inputs rather than expenditures on these inputs. However, the efficiency is often defined as the level of outputs that can be obtained from a given mix of inputs. The following efficiency indicators are defined:

1. Total number of users / total number of teams,
2. Total number of users / total number of health professionals,
3. Total number of users / total number of insured patients,
4. Total number of visits/ total number of teams,
5. Total number of visits / total number of health professionals,
6. Total number of visits/ total number of insured patients,
7. Total number of medical examination / total number of teams,
8. Total number of medical examination / total number of health professionals,
9. Total number of medical examination / total number of insured patients,
10. Total number of preventive examinations / total number of teams,
11. Total number of preventive examinations / total number of health professionals,
12. Total number of preventive examinations / total number of insured patients,
13. Total number of systematic examinations / total number of teams,

14. Total number of systematic examinations / total number of health professionals,
15. Total number of systematic examinations / total number of insured patients,
16. Total number of specialist examination/ total number of visits,
17. Total number of specialist examination / total number of medical examination;

This study extended previous studies because it has introduced socioeconomic and demographic variables. This may shed same new lights on the relationship between private providers of general/family health service and efficiency of providing general/family health service in primary health care. Therefore, in the second stage, study examine both, influence of demographic and socioeconomic variables on number and structure of general/family private provider in primary health care and efficiency of providing general/family health service in primary health care in Croatia. Selected variables in use were:

1. Gender - Number of women and men.
2. Age - Number of population within each age group (0-4, 5-9, 10-19, 20-44, 45-64, 64+). Age is defined by a series of categorical variables, according to age groups defined in primary health care in the purpose of paying the capitation.
3. Education - Number of population within each defined group (without school, primary school, secondary school, professional study, university study, magisterial study and doctoral study).
4. Working status - Number of employment people and average number of unemployment.

Data used for this analysis includes 21 Croatian counties. Data for efficiency indicators are collected from the Croatian Health Service Yearbook 2010. All data are collected from health facilities and practices in Croatia. Croatian National Institute of Public Health collects information via electronic data exchange. Information is continually exchanged with international institutions, e.g. with World Health Organization (WHO). (Croatian National Institute of Public Health, 2011) Data for demographic and socioeconomic variables are collected from and Statistical Yearbook of the Republic of Croatia 2011 and Census 2001 (Croatian Bureau of Statistics, 2011).

4.2. Results

Cluster analysis is one of the multivariate techniques whose primary purpose is to group objects based on the characteristics they possess. The goal of cluster analysis is to achieve a high degree of homogeneity within clusters and the greater heterogeneity between the clusters. Grouping of clusters begins by connecting pairs of observations in a cluster based on similarity. Euclidean distance is the most commonly recognized measure of distance, many times referred to as straight-line distance. Furthermore, in this paper a hierarchical clustering technique that begins with n clusters and ends with one cluster, is used. In each step, observation, i.e. county, or an existing cluster is absorbed into

another cluster. Within many hierarchical clustering methods Ward's method is used. In the Ward's procedure, the selection of which two clusters to combine is based on which combination of clusters minimizes the within-cluster sum of squares across the complete set of disjoint or separate clusters. (Hair, 2006)

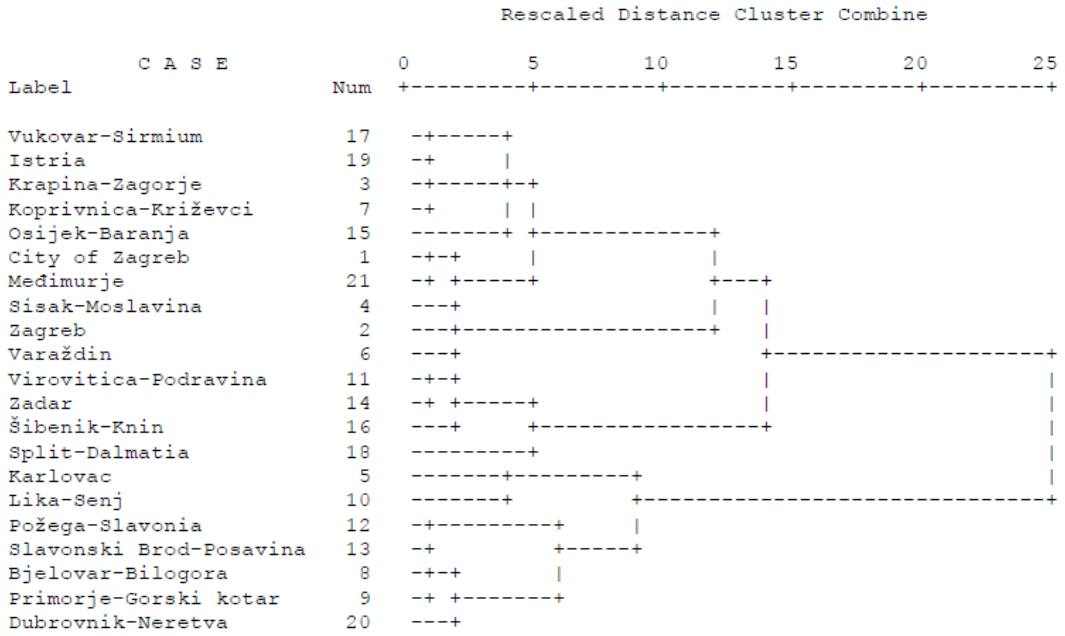

Figure 1: Dendrogram form hierarchical cluster analysis.

The aim is to group counties according to their efficiency indicators. Therefore, in first stage cluster analysis is used. It is expected that two clusters of counties will be formed (high and low efficient counties). The dendrogram shows that the optimal number of clusters is two.

First cluser consist of 14 counties (Vukovar-Sirmium, Istria, Krapina-Zagorje, Koprivnica-Križevci, Osijek-Baranja, City of Zagreb, Međimurje, Sisak-Moslavina, Zagreb, Varaždin, Virovitica-Podravina, Zadar, Šibenik-Knin and Split-Dalmatia). The second cluster consists of 7 counties (Karlovac, Lika-Senj, Požega-Slavonia, Slavonski Brod-Posavina, Bjelovar-Bilogora, Primorje-Gorski kotar and Dubrovnik-Neretva). Therefore, total of 21 counties where classified according hierarchical cluster analysis, and according to result one group of counties can be classified more efficiency and other group of counties can be classified as less efficient. The efficiency of each cluster can be obtained according to descriptive statistics computed for each cluster, which can be shown in Table 2. According to Table 2, all values for the majority of efficiency indicators are greater in the first cluster then in the second cluster. Furthermore, to test whether the obtained clusters differ significantly according to each efficiency indicator, F-test of difference between the two independent samples and corresponding analysis of variance (ANOVA) is used.

Table 2: Descriptive statistics of clusters with F-test of differences in means (efficiency indicators).

Efficiency indicators	Ward Method		F - test	p - value
	First cluster (14 counties)	Second cluster (7 counties)		
	Mean	Mean		
Total number of users / total number of teams	1391,0714	1254,7143	7,36	0,014
Total number of users / total number of health professionals	709,2143	633,2857	9,557	0,006
Total number of users / total number of insured patients	0	0	.	.
Total number of visits / total number of teams	11997,7857	9339,5714	28,636	0
Total number of visits / total number of health professionals	6119,2143	4719,2857	29,883	0
Total number of visits / total number of insured patients	6	4,8571	10,667	0,004
Total number of medical examination / total number of teams	7116,5714	5601	17,554	0
Total number of medical examination / total number of health professionals	3625,6429	2831,7143	21,112	0
Total number of medical examination / total number of insured patients	3,5714	2,7143	7,355	0,014
Total number of preventive examinations / total number of teams	7,4286	3,8571	0,489	0,493
Total number of preventive examinations / total number of health professionals	4,0714	3,8571	0,007	0,934
Total number of preventive examinations / total number of insured patients	3,0714	2,7143	0,134	0,718
Total number of systematic examinations / total number of teams	2,4286	0,8571	2,1	0,164
Total number of systematic examinations / total number of health professionals	1,0714	2,1429	1,063	0,316
Total number of systematic examinations / total number of insured patients	3,5714	4,8571	0,739	0,401
Total number of specialist examination/ total number of visits	0,26	0,27	0,289	0,597
Total number of specialist examination / total number of medical examination	0,43	0,43	0,001	0,976

Source: Author's calculations.

Although this is a test of differences between means of the two groups as t-test, the F-test can be used equivalently. In addition, the F-test is robust to heteroscedasticity of the variance between the two samples, so it is not necessary to conduct tests of homogeneity of variances. Eight of 17 indicators are statistical significant (all of them are significant at p-value less than 5%).

Table 3: Structure of general/family health care providers in primary care.

	More efficient counties	Less efficient counties	F - test	p - value
Total private practice / Total practice	80%	74%	1,304	0,268
Concession / Total private practice	85%	80%	1,668	0,212
Concession / Total practice	68%	59%	5,13	0,035

Source: Author calculations.

Total private practice in Croatia includes public practice, private practice in concession (concession is one model of PPP) and "pure" private practice. Comparison of the cluster according to structure of general/family health care providers in primary health care is presented in Table 3. According to Table 3 it can be concluded that more efficient counties in comparison to less efficient counties have higher

percentage of private providers in total number of general/family health care providers and higher percentage of concession in total number of private providers. Also, more efficient counties have higher percentage of concession in total number of general/family health care providers in comparison to less efficient counties. The difference between last one is 9% and it is statistically significant at p-value less than 5%.

In order to examine the influence of demographic and socioeconomic environment on private providers of general/family health service in primary health care, the demographic and socioeconomic characteristics of each cluster are presented in Table 4. From Table 4 it can be observed that almost all values for the majority of variables are expectedly better in more efficient counties then in the less efficient counties. To test whether the obtained clusters differ significantly according to each socioeconomic and demographic variable, F-test of difference between the two independent samples and corresponding analysis of variance (ANOVA) is used. According to number of population age 20 - 44 and population elder than 65 years, cluster differ statistical significant at p-value less than 5%.

Table 4: Descriptive statistics of clusters with F-test of differences in means (socioeconomic and demographic factors).

Socioeconomic and demographic variables	**Ward Method**		**F - test**	**p - value**
	First cluster	Second cluster		
	Mean	Mean		
Female	0,515	0,513	0,589	0,452
Male	0,485	0,487	0,589	0,452
0 - 4	0,048	0,047	1,095	0,309
5 - 9	0,048	0,046	1,253	0,277
10 - 19	0,117	0,116	0,009	0,924
20 - 44	0,337	0,324	5,187	0,035
45 - 64	0,276	0,275	0,011	0,919
65 +	0,171	0,187	4,546	0,046
Without school	0,022	0,025	0,175	0,68
Primary school	0,186	0,182	0,064	0,803
Secondary school	0,351	0,359	0,213	0,65
Professional study	0,028	0,03	0,31	0,584
University study	0,044	0,043	0,017	0,897
Magisterial study	0,002	0,001	0,199	0,66
Doctoral study	0,001	0,001	0,308	0,586
Total person in employment in business entities, 31.03.2010.	0,293	0,275	0,331	0,572
Average number of unemployed	0,07	0,078	0,528	0,476

Source: Author calculations.

3. CONCLUDING REMARKS

Findings from this paper indicate that counties with higher share of concession, as one model of private-public partnership, in total number of general/family care providers in primary health care are more efficient in comparison to counties with lower share of concession in total number of providers. The results confirmed that PPP is better solution for providing health care services than comprehensive privatization. Second finding of this analysis, in case of Croatian general/family health service in primary health care, shows that almost all values for the majority of variables are expectedly better in the counties with more efficient provision of general/family health care in primary health care then in the less efficient counties. But, differences is statistical significant (at p-value less that 5%) only according to number of population age 20 - 44 and population elder than 65 years.

Although the analysis presented here is limiting because it is based only on the case of primary health care in Croatia, it is conceptually "transferable" to jurisdictions characterized by comparable processes of restructuring and in comparable social locations. Implication for practice, theory and ongoing research can be drawn from these findings. In health care systems organized like the Croatian health care system, statistically significant influence of number, form and efficiency of private providers and socioeconomic and demographic environment on those variations can be expected in secondary and tertiary health care. This study has contributed to the critical literature on PPP in health care systems, to an understanding of motivation of private providers to get involved in providing same form of health care service. This study opens up important questions about private motivation which differ in different state regulation. From the view of health policy makers and governments, it is essential to understand the factors that contribute to understanding the involvement private health care providers, which help design health policy and state regulation in manner which can contribute to achieving public goals and best value for beneficiaries.

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