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«Assessing networked leadership in educational institutions»

Abstract

This paper investigates and construes leadership in public education management in Greece, while acknowledging leadership as a critical determinant of organizational effectiveness and success. However, educational administration is compromised by conflicting interests, inconsistencies and paradoxes. At the same time, bureaucratic hierarchy and discipline seek to reconcile with professional principles, the discretion of staff and expertise. Under these circumstances, leadership usually achieves modest results. It seems that it could be useful to employ new, nonhierarchical management patterns, where the manager-leader is best conceived as a network agent that orchestrates the actors in administration to concerted praxis.

Keywords: leadership assessment; networked management; school manager

2435 words (excluding references and figures)

I.   INTRODUCTION

Research Problem/Hypothesis

Both research (Bell 2007; Bennis 1989; Conger and Kanungo 1988; Fullan 2001; Heck and Hallinger 2005; Hersey and Blanchard 2000; Hickman 1992; Hoy and Miskel 2005; Kotter 2001; Kouzes and Posner 1995; Leithwood, Jantzi and Steinbach 1999; Μπουραντάς 2005: 282; Πασιαρδής 2004: 110; Pont, Nusche and Moorman 2008; Yukl 2009) and conventional wisdom acknowledge management and leadership of an organization or service as a critical factor of organizational and educational effectiveness and success. Nowadays, successful achievement of objectives, quality improvement and efficient functioning of administration presuppose not just shaping and strengthening stability, but also organizational change and adaptation. This requires strong leadership.

However, in Greece, leadership in educational organizations is often rather weak. Indeed, inefficient evaluation and accountability, strict adherence to norms and hierarchies, tight resources, improper staff management and selection, politicization and particularism in administration, clientelism, patronage and corporatism are assumed as barriers to leadership. Consequently, organizational and administrative underdevelopment, low productivity, mismanagement, and lack of a modern spirit are detected (Karagiannis 2014). In these conditions, managers lack the required autonomy and freedom of action (OECD 2012: 502-503)[1] and are not facilitated to adopt leadership behavior and act effectively as decision makers, inspirers and change agents.

On the other hand, it is understood that the educational work is delivered by a "community of equals" holding specialized knowledge and autonomous behavior. Furthermore, the nature of education and its management structures and the interplay between its constituents are horizontal and of a cross-sectional nature. Vertical organizational structures cannot cope with the multidimensional and complex problems and needs. Responding to the need of adaptation to current circumstances would prompt to open organizational concepts (Νονάκα και Τακεούτσι 2001: 206). Or, as Fullan (1993: 33-38) put it, to the synthesis of aggregate and decentralization powers, to the balance between individualism and collective diversity, to the directional command line (bottom-up and vice versa). A genuine and ongoing collaboration and communication between those engaged in organizational behavior is then required, which tends to become more like a network-formed structure, with a horizontal and equal, rather than hierarchical, command and rule (Μακρυδημήτρης 2004: 135-136, 147). Most probably, the manager-leader is best perceived as a participative network agent (networker) or as Plato's "weaver" (Μακρυδημήτρης 2004: 68ff., 130ff.; 2008).

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[1] High school autonomy is common practice in the developed world (Eurydice and Eurostat 2012: 49 ff; OECD 2010: 70-71). Often, the role of central government is downscaled in favor of the local organizations (Felipe, Fasih and Patrinos, with Santibáñez 2009; Honingh and Hooge 2009; Hudson 2007; Ozga 2009; Rhodes 1997; 2007). The issue of autonomy should be seen in relation to the kind, level, scope and consequences of the accountability it entails (Leithwood, Edge and Jantzi 1999).

In this way, organizational networking and communication technocracy emerge, with collective management bodies, policy communities and networks being purposeful as administrative tools that complement strict hierarchies and vertical, centralized control. Networked administration prefers methods such as cooperation/working group, network, committee, team of experts, consultation, deconcentration of responsibilities to hierarchical layers, functional differentiation and interdependence, uniform action planning, prearranged goal-setting.

Network analysis emphasizes the continuity in the relationship between interest groups and departments of administration (Bevir and Rhodes 2003: 22). The networked leadership pattern involves groups (networks) that bear a strong resemblance to policy communities (Rhodes and Marsh 1992: 182, 186). It is the positions and roles that partners assume and the relationships among them, rather than people who occupy them, that designate the network (Marsh and Smith 2000).

Research Objective

The purpose of this paper is to investigate and assess leadership in public (secondary and tertiary) education management in Greece. The suitability of the current management-leadership pattern is examined, as opposed to new, flexible and horizontally structured administrative patterns.

Research Questions

1. How is leadership manifested in educational management? What results does it produce?
2. Are traditional, hierarchic management patterns of the Weberian, classical bureaucratic organization and service convenient? OR perhaps a new management and leadership paradigm is needed, given the diffuse of knowledge and the anti-hierarchical logic that governs the professionals?
3. How are networks formulated in educational administration? What problems is management attempting to resolve through horizontal networked management methods?

II. EMPIRICAL RESEARCH

Leadership Assessment Template

By reviewing relevant literature on patterns and dimensions of leadership behavior and/or leadership assessment models (Avolio, Bass, and Jung 1999; Bass 1985; Bass and Avolio 1994; Bennis and Nanus 1985; Conger 1989; Conger and Kanungo 1988; 1994; Kent, Crotts, and Aziz 2001; Kotter 1990a; 1990b; 2001; Kouzes and Posner 1993; 1995), the dominant (positive, effective) leadership behaviors have been identified.

[Insert Figure 1 about here]

Drawing upon the above review, a (provisional) analytical Template which uses four criteria (components) to assess leadership, was constructed: I. People and

groups (PE), II. Ameliorative change (CH), III. Ethical commitments (CU), IV. Activation (MO). Each criterion encompasses two or three management practices that express specific leadership behaviors. The components and practices shape the independent (environmental) variables, while leadership is the dependent variable (outcome). The TEMPLATE contains interlinked statements, which convey indicative assumptions about how leadership is manifested. The transformational perspective (Burns 1978: 20) of the TEMPLATE is distinctive.

[Insert Figure 2 about here]

The more a manager is disposed to perform these behaviors and the higher the frequency and intensity these behaviors occur, the more leadership is expected to be enhanced.

Sampling

The subjects of the sample (n = 55) were selected purposefully (Gall, Gall and Borg 1999: 294-296; Patton 2002: 230-242) using recommendations (LeCompte and Preissle 1984: 76-77). Multiple cases were studied - nine secondary schools situated in the vicinity of Athens and ten organizational units of the University of Athens (three faculties, five departments, two subdivisions). Two schools were identified as best or exemplar or paradigmatic cases (Goetz and LeCompte 1984; Miles and Huberman 1994) and were deliberately included in the sample because they were uncommon and reinforced the findings. The subjects were both managers and teaching staff who do not hold management positions.

Gender participation was balanced. Pluralism in fields of specialization was ensured. Large age and experience ranges were accommodated.

Data Collection

The empirical evidence was collected during winter 2013 in the subjects' workplace, with four methods: one-to-one interviews, group interviews (only for school teachers), open discussion and observation.

The main research tool was a questionnaire, which mainly included semi-structured questions. The questionnaire was not provided, since it served as a guiding tool for the collection of data. Before use, the questionnaire was tested for its conceptual validity, was pilot tested, was evaluated for its statistical reliability (alpha=0,90) and was reviewed by external evaluators (peer debriefers) (Guba and Lincoln 1989: 237; Lincoln and Guba 1985: 283; 308-309).

The degree of agreement with the statements of the TEMPLATE was measured on a 5-point Likert-type scale: 0 = none, 1 = low, 2 = moderate, 3 = high/very high, 4 = extremely high.

Furthermore, evidence was drawn from: websites of surveyed organizational units and schools, promotional material (commemorative CDs/DVDs, brochures), advertisements in local newspapers and magazines, school newspapers, calendars of activities, memorabilia albums, awards and distinctions, computer applications in use, extant and past projects and activities. Unplanned discussions with parents, learners, visitors, and partners that I had the opportunity to meet were utilized.

[Insert Figure 3 about here]

It has been endeavored to ensure that the questions elicit the desired information without prejudging the answers, or leading to desired responses, or even revealing the researcher*'s* intentions. Questions spur sharing of personal evidence, detect causes and demand a judgmental thinking and substantiation of positions expressed. A balance is followed between two interpretative approaches, namely variance theory and process theory (Mohr 1982).

Methodology

Both qualitative and quantitative methods of analysis were used (Brewer and Hunter 1989; 2006; Creswell 1994; 2005; Tashakkori and Teddlie 2003). Data were ordered not only by education level, but also by variable (leadership practice), staff category and case. The attempt to describe and construe leadership was oriented toward diversity and variables, as well as procedures (Maxwell 1992).

Qualitative analysis followed three distinct stages, namely data reduction, data display, and conclusion drawing/verification (Miles and Huberman 1994: 10-12). Statistical packages were used, such as SPSS, Atlas.ti and Excel. Lisrel was employed for the sake of constructing a metric model of Confirmatory Factor Analysis. Non-parametric statistical tests and procedures suitable for ordinal data (leadership measured on a Likert-type scale) have been primarily applied. However, the cumulative leadership scale (total scores or weighted sums of many questions) is expressed by descriptive statistical measures[2]. Homogeneity of observations was additionally tested by the use of quantified leadership measurements, leadership z-scores, scatter plots and box plots of variables, and Categorical Principal Components Analysis. Moreover, correlation statistics were used to measure the association between leadership variables and leadership index (Kendall's tau and Spearman's rho), leadership across educational levels and sexes (Mann-Whitney test), leadership and biographical data, and managerial categories and educational levels (Kruskal-Wallis test & Kendall's tau and Spearman's rho). Other statistical forms employed include bivariate analysis, sensitivity analysis of observations, and qualitative exploration and interpretation through dynamic analysis, problem analysis and causal factor analysis.

III.   CONCLUDING REMARKS

Findings/Conclusions

This paper identifies the dominant variables (practices) of positive leadership behavior. Almost all of the variables are people-oriented. The only variables with explicit dedication to task and results are EM (effective management) and partially NE (networked management).

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[2]The assumption that aggregated, Likert-type data represent continuous measurements is common practice. See, for example, Avolio *et al.* (1999), Conger and Kanungo (1994), Kent *et al.* (2001) and Kouzes and Posner (1993).

The TEMPLATE was to a large extent validated in practice, which indicates that all leadership components are vital and act synergistically, although not commensurate.

Following the findings from the statistical analysis: Managers are quite collaborative, but hardly innovative. They sufficiently achieve to build trust (refers to school counselors), but do not create a common, well-defined and concrete organizational vision. They do not particularly promote an adaptive improvement and do not take a dynamic part in shaping the cultural and ethical context. They do not adequately recognize, praise or encourage great efforts, high performance or success and do not exercise management very effectively.

It is evident that leadership performance is rather poor.

Differences in leadership performance in relation to biographical data are not statistically significant and do not associate linearly.

Another interesting finding is that leadership performance of the two sexes does not seem to vary[3].

Working in networks is not common practice. Networks are formed, almost exclusively, on a voluntary basis or as a result of an administrative mandate. Thus, it is not of their primary interest to support improvement. It is also clear that networks are deficient in organization and operation. The functions of planning and programming are superficially and unprofessionally exercised. Pivotal leadership roles (coordinator, conciliator, facilitator, arbitrator, observer, critical thinker) allocated to members are poorly defined, overlap between the competent persons or are rather randomly distributed. Furthermore, differentiation of tasks is unnecessarily low. Ineffective delegation of roles and tasks is observed. The share of power between decision makers is based on hierarchical grounds. The confined and introvert character of networks and their subordinate role curtail their corresponding share of responsibility for results.

[Insert Figure 4 about here]

Merit/Significance

This piece of writing serves as a useful resource for educational leaders, practitioners, researchers and policy makers. It brings new insights into leadership behavior. Overall, this piece furthers the discussion over what is important in leadership (leadership ingredients) and to what degree. The documentation and reflections apposed here aspire to spur further research, re-conceptualization or meta-analysis of leadership.

Besides, the Leadership Assessment Template (hereafter TEMPLATE), a novel theoretical analysis tool, may be practically employed in organizations, in activities such as self-evaluation, selection of candidates for training, promotion of improvement interventions, strategy development/planning, policy formulation, design of staff incentive schemes, and recruitment and personnel selection.

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[3] Yukl (2009: 547-549) noted that literature on gender differences in leadership behavior does not lead to clear conclusions.

Limitations and Delimitations

The definition of a phenomenon (leadership) and its determinants cannot always be empirically supported. Even if logical or semantic links between given behaviors are theoretically substantiated, these behaviors may not be present in their entirety, particularly in dissimilar conditions (Brewer and Hunter 2006: 119-120).

One thing that is to be acknowledged is that a direct comparison of research results with those of other related research would not be expedient, due to the fact that novel leadership assessment tools have been used here. To complicate matters more, appreciating the relative contribution of a manager is painful and may lead to a flub. An additional concern in the Greek case has been the low availability of performance indicators and data on assessments, evaluations and appraisals, while this information is rarely understood in a uniform manner.

Last but not least, the sample size was relatively small, as is usually the case in qualitative research, so it is proper to draw conclusions with caution. The findings are by definition context-sensitive and are not meant to be generalized.

Recommendations for future research

Alternative methodological choices, such as multilevel analysis (individual, dyadic, group or organizational level), exploration of negative or undesirable leadership behaviors or a focus on causal analysis could come as reasoned and advantageous. Also, each leadership practice (variable) could be studied separately.

It appears interesting to expand the sample in size and/or scope to include parents, administrators and stakeholders from several geographical areas and organizational levels, in the public or private sphere.

In the context of a comparative study, counterpart organizations or peers in Greece and other countries could be compared. Another possibility is the comparison of findings of similar works across time to check their validity.

Lastly, leadership data could be integrated into econometric or social models so as to be correlated to micro (e.g. technology, strategy, size, knowledge, perceptions etc.) or macro perspectives (e.g. culture, innovation, mortality, human rights, expenditure, political stability etc.).

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FIGURE 1

Key Leadership factors in homologous scholarly work

Bass (1985), Bass and Avolio (1994), Avolio et al. (1999)	*Bennis and Nanus (1985)*	*Conger and Kanungo (1988; 1994), Conger (1989)*	*Kent et al. (2001)*	*Kotter (1990a, 1990b, 2001)*	*Kouzes and Posner (1993; 1995)*
Intellectual stimulation		Empowering others to achieve the vision			Challenging the process
	Vision	Articulating a vision	Visualizing Greatness	Establishing direction	Inspiring a shared vision
Individualized consideration		Commitment and sensitivity of members' needs	Empowering the "We"		Enabling others to act
Idealized Influence (Attributed Charisma)	Deployment of self		Managing One's Self	Aligning people	Modeling the way
Inspirational leadership	Trust through positioning	Building trust	Care and Recognition	Motivating and inspiring	Encouraging the heart
Idealized Influence (Perceived Charisma)	Meaning through communication	Communicating an inspiring vision	Communicating for Meaning		

FIGURE 2

Leadership Assessment Template (provisional version)

Leadership component	Nr.	Leadership practice
I. People and Groups (PE)	1	Cooperation development (CO)
	2	Networked management (NE)
II. Ameliorative change (CH)	3	Adaptive improvement (AD)
	4	Ingenuity and Innovation (IN)
	5	Effective management (EM)
III. Ethical commitments (CU)	6	Establishment of vision (VI)
	7	Values formation (VA)
IV. Activation (MO)	8	Trust building (TR)
	9	Encouragement and Recognition (EN)

FIGURE 3

Matching questionnaire's questions, variables and research questions

Nr.	Question	Corresponding to:		
		Leadership practice*	*Leadership component **	*Research question***
-	General and biographical data (First part) (…)	-	-	-
1	Which elements constitute the "effective conduct" of a manager?	-	-	1, 2, 3
2	What are the major challenges and problems faced by managers?	-	-	2, 3
3	To what extent is there a team spirit and teamwork? Please comment.	CO	PE	1, 2
4	Do you work in networks? (If yes) Please describe their powers, composition and organization. What results do they produce?	NE	PE	1, 2, 3
5	Has/have your school(s)/unit(s) of responsibility developed partnerships with other bodies? (If yes) Please describe.	NE	PE	1, 2, 3
6	To what extent are conditions in place that encourage (individual/group) improvement? Please describe.	AD	CH	1, 2
7	Do you apply new ideas, approaches or procedures? (If yes) Please describe.	IN	CH	1, 2
8	On what evidence would you rely to see how effectively your school(s)/unit(s) of responsibility operate? How satisfied are you?	EM	CH	1, 2. 3
9	To what extent is a teacher/professor inspired by common direction and vision? Please describe.	VI	CU	1, 2
10	Are specific values, ethical principles or morals promoted in your workplace? (If yes) Please describe.	VA	CU	1, 2
11	Please describe the interpersonal trust climate.	TR	MO	1, 2
12	How do you react to (individual/group) great efforts or success?	EN	MO	1, 2
-	Free space (Third part) (…)	-	-	1, 2, 3

Legend
* See figure 2 ante
** See section II ante

FIGURE 4

Leadership Asssessment Template (final version)

Leadership component	*Nr.*	*Leadership practice*
I. People and Groups (PE)	1	Cooperation development (CO)
II. Ameliorative change (CH)	2	Adaptive improvement (AD)
	3	Ingenuity and Innovation (IN)
	4	Effective management (EM)
III. Ethical commitments (CU)	5	Establishment of vision (VI)
	6	Values formation (VA)
IV. Activation (MO)	7	Trust building (TR)
	8	Encouragement and Recognition (EN)

The importance of the economic appraisal of public control and prevention strategies in Greece in the era of economic crisis

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Abstract

The aim of the present paper is to evaluate the economic effectiveness of public control and prevention strategies to tackle two recent epidemics in Greece. Results from the implementation of Cost-Benefit Analysis (CBA) and Cost Effectiveness Analysis (CEA) are presented for; a) prevention strategy against the 2010 West Nile Virus outbreak in the Region of Central Macedonia and b) control expenditures against the 2011 Malaria outbreak in the Prefecture of Lakonia. CBA is performed by comparing public prevention costs with averted costs that would have arisen from health and nuisance impacts in the subsequent years, while CEA emphasizes on costs required to avert health impacts. CBA and CEA are examined in relation to their potential in informing public decision making in the Greek health sector in the era of financial crisis.

Introduction

The 2010 West Nile Virus (WNV) outbreak in Central Macedonia and the 2011 Malaria outbreak in Lakonia were associated with certain medical impacts which induced the implementation of public health prevention and control strategies (Danis *et al.* 2011; Pervanidou *et al.* 2014). These strategies possess the characteristics of public goods and are usually examined for their effectiveness in achieving specific health objectives and their capacity to boost social welfare (John *et al.* 1987; von Hirsch *et al.* 2009). Their application aims to contribute significantly towards protecting the public against the outbreak of epidemic diseases, improving quality of life and reducing losses in various economic activities.

Prevention and control cost categories as well as data on the health impacts were collected and analyzed in collaboration with the Hellenic Centre for Disease Control and Prevention (HCDCP), the Hellenic National Blood Centre, public health agencies and private companies specializing in mosquito control activities. A separate Cost of Illness approach was carried out for the estimation of medical costs and productivity losses, as well as for the calculation of averted health impacts. Furthermore, Willingness To Pay for the elimination of nuisance impact costs through mosquito control programmes, are used as an input in the (CBA). The target of this paper is to estimate the efficiency of two public health control interventions under the welfarist (CBA) and extra-welfarist (Cost-Effectiveness Analysis; CEA) approaches and evaluate their ability to inform public policy advisors.

Methods

Estimation of public control and prevention costs

The annual public control and prevention costs examined in this study consist mainly of: (a) annual mosquito vector control activities; (b) contingency costs incurred by HCDCP in response to the two epidemics; and (c) costs of the additional screening of blood donations that is required because of the risk of transmission of WNV through blood transfusion. Regarding vector control activities, exact market prices were provided directly by regional and municipal authorities and private companies. The costs incurred by HCDCP for each year from 2010 to 2013 were extracted from official HCDCP reports and databases, while the cost of additional blood safety testing, imposed because of the WNV outbreak, was provided directly by the Hellenic National Blood Centre.

Estimation of health impact costs

The methodology employed for the evaluation of the health impact costs arising from the two outbreaks, divided between medical costs and productivity losses, was based on cost of illness (COI) analysis (Segel 2006). In a COI analysis the burden of a disease on society is estimated in financial terms using both direct and indirect measures.

Direct costs consist mainly of medical care, both inpatient and outpatient, and are estimated on the basis of market prices. Estimation was carried out according to the

National DRGs (Diagnosis Related Groups) Indicators as published in the 3054/18-11-2012 Official Government Gazette of the Hellenic Parliament. The Average Daily Hospital Care Cost (according to DRG) in public hospitals of Greece equals approximately 207€/ per day and was multiplied by total inpatient care days.

On the other hand, indirect costs represent the costs related to loss of productivity due to morbidity. These were estimated only for earnings lost during the reported days of sickness. The total absenteeism cost was evaluated for age groups older than 18 years old and the value of a lost working day was multiplied by total sick days. The cost of a lost working day for people in the 18 to 65 years age range was calculated according to the median equivalised net income (Eurostat, 2013a) for the reference years (2011-2013) divided by 220 working days. For people aged 65 years and over, the cost of a lost working day was calculated from median hourly earnings (Eurostat, 2013b) for 2010, adjusted for inflation by the Consumer Price Index and then multiplied by 8 working hours.

Estimation of nuisance impact costs

The assessment of nuisance impact costs from mosquito species responsible for the outbreak of the WNV epidemic provides an important monetary metric for the evaluation of utility provided by prevention programmes. Its estimation was based on a Contingent Valuation Method (CVM) study conducted in 2004 (Bithas *et al.* 2014). A sample of 1049 households was interviewed in the Region of Eastern Macedonia and Thrace for the purpose of eliciting residents' Willingness to Pay (WTP) for improving the public mosquito control programme through the application of more efficient methods of controlling mosquito populations. Respondents were asked to state the maximum amount of money that they would be willing to pay in order to eradicate the mosquito problem in their area. The influence of various factors (socio-economic, demographic, nuisance levels and the main problems caused by mosquitoes) on the WTP amounts was investigated.

Estimation of Cost Benefit and Cost Effectiveness Evaluation

Two of the most common approaches for evaluating health-related strategies are cost-benefit analysis and cost-effectiveness analysis (WHO 2003; Weinstein *et al.* 1996). The main objective of these tools is to inform policy makers as to whether a given programme, policy or intervention should be undertaken or continued, and to evaluate any arising social betterment that amounts to a potential Pareto improvement (Mishan 1975). In the present study, a CBA of the 2010 WNV Control Strategy is conducted by comparing the costs of public prevention programmes with the associated benefits resulting from (a) avoided health impacts and (b) the avoided nuisance in households due to the implementation of these programmes (Kalaitzopoulou *et al.* 2014).

In addition, a Cost-Effectiveness Analysis (CEA) of the Malaria Prevention Strategy is presented. CEAs are an aid to public decision making and their main importance lies in their ability to evaluate and rank prevention programmes and policies on the basis of the "costs required for achieving an outcome". The conduct of CEA in the health sector is associated with the "extra-welfarist" approach in which priority is given to health betterment and the achievement of pure health outcomes (Brouwer *et al.* 2008). In this study, a CEA test was based on the estimation of the number of

potentially avoided Malaria cases that would offset the prevention costs; this number is then compared with the number of cases actually avoided (Bithas *et al.* 2014b). This comparison offers an evaluation of the prevention costs exclusively on the basis of the health impacts achieved.

Analysis and Results

The overall costs associated with the two epidemics are presented in Tables 1 and 2. Higher costs in the first years are justified as a contingent response to the expansion of the outbreaks. However, it appears that costs in the main categories (preventions costs and COI) fall significantly during the following years. This could be also interpreted as a result of the epidemics being partially controlled; however there are inadequate data within this study to justify it.

Results of Medical costs and Productivity losses for the recorded Malaria cases

The total medical costs for the treatment of 53 diagnosed cases in the prefecture of Lakonia in public hospitals for 2011 was about 0.05 mil € while productivity losses were estimated at around 0.04 mil €, giving a total cost of 0.09 mil € (Table 1). Costs fell significantly in the following years as the recorded cases treated were 8 in 2012 and 2 in 2013. The average COI per case ranges from around 1700€ (2011) to 2750€ (2013).

Table 1. Cost of Illness for Malaria Outbreak in Lakonia (2011-2013)

	2011	2012	2013
Public Prevention Costs		384,099 €	176,500 €
HCDCP Project Costs		290,954 €	168,107 €
Total Prevention Costs		**674,099 €**	**344,607 €**
Hospitalisation Costs	51,500 €	6292 €	3523 €
Productivity Losses	40,061 €	10,793 €	1971 €
Total Cost of Illness (Medical Cost and Productivity Losses)	**91,561 €**	**17,085 €**	**5494 €**
Hospitalised Cases	53	8	2
Cost Per Case	**1728 €**	**2136 €**	**2747 €**

Results of Medical costs and Productivity losses for the recorded WNV cases

The total COI for the year of the WNV outbreak (2010) was estimated at about 0.9 mil €. These costs included the hospitalization of 260 recorded WNV cases, 25 of which needed further hospitalization in intensive care which added an extra cost of 0.16 mil €.The total COI for the following year was estimated at about 0.12 mil € for

the hospitalization of 30 cases, two in intensive care. Subsequently, 18 cases were recorded and treated in 2012 with only one case requiring further hospitalization in intensive care. The total COI for this year amounted to about 0.07 mil €. Finally, in 2013, 22 cases were diagnosed, two in intensive care, and the COI was approximately 0.08 mil €. The health costs averted per year were calculated based on the total COI per year minus total COI of the outbreak year (Table 2).

Table 2. Cost of Illness for WNV outbreak in Central Macedonia (2010-2013)

	2010	**2011**	**2012**	**2013**
Hospitalised Cases	260	30	18	22
Cases treated in Intensive Care Units	25	2	1	2
Hospitalization Costs	524,576 €	74,070 €	44,878 €	38,916 €
Hospitalization Costs in Intensive Care Units	162,300 €	14,200 €	7100 €	20,700 €
Total Medical Costs	**686,875 €**	**88,270 €**	**51,978 €**	**59,616 €**
Productivity Losses	229,553 €	30,636 €	19,047 €	17,195 €
Total Cost of Illness (Medical Cost and Productivity Losses)	**916,429 €**	**118,905 €**	**71,025 €**	**76,811 €**
Cost Per Case	**3524 €**	**3963 €**	**3946 €**	**3491 €**

Results of a Cost Benefit Analysis of the WNV prevention strategy

Based on the data (Table 3) concerning the main cost categories (prevention costs, COI, WTP), a CBA test was employed in order to evaluate the benefit of WNV control strategy in the following years. The benefit was estimated on the basis of averted health costs and avoided mosquito nuisance costs. The benefit from mosquito reduction, according to WTP per household, was calculated to be approximately 6 mil € per year (Table 4).

Table 3. WNV Economic costs per category and year from 2010 to 2013

Year	**2010**	**2011**	**2012**	**2013**
Costs for mosquito vector control	3,954,000 €	4,012,000 €	3,982,000 €	3,000,000€
Costs incurred by HCDCP	1,750,000 €	-	20,000 €	52,000 €
Additional blood safety testing	596,000 €	588,000 €	-	-
Total prevention costs	6,300,000 €	4,600,000 €	4,002,000 €	3,052,000€
Hospitalised Cases	260	30	18	22
Total Cost of Illness (Medical Cost and Productivity Losses)	**916,429 €**	**118,905 €**	**71,026 €**	**76,811 €**
Cost of Illness per Case	3524 €	3963 €	3945 €	3491 €
Health Costs Averted Per year		**797,524 €**	**845,403 €**	**839,618 €**

When prevention costs are evaluated only on the basis of averted health costs, a clear net cost ranging from 5.5 mil € to 3.2 mil € results. However, when avoided nuisance costs are also included in the analysis, there is a net socioeconomic benefit, from 0.5 to around 3 mil € (Table 4). It should be noted that according to recent studies (Dickinson *et. al.* 2012; Halasa *et. al.* 2014), the nuisance factor (rather than the disease factor) represents the factor with the highest WTP in citizens' stated preferences, implying a higher utility level when control programmes are viewed from the welfarist approach.

Table 4. Net economic outcome of prevention costs in relation to avoided health impacts and avoided nuisance costs

	2011	**2012**	**2013**
Prevention costs in previous year (€)	6,300,000	4,600,000	4,002,000
Averted health impacts (compared to 2010) (€)	797,524	845,403	839,618
Net economic result (Averted health impact costs minus Prevention costs) (€)	-5,502,476	-3,754,597	-3,162,382
Averted nuisance costs (€)	6,099,184	6,099,184	6,099,184
Total averted costs (health plus nuisance) (€)	4,117,929	4,165,808	4,160,023
Net Economic Result (Total Averted Impact Costs minus Prevention Costs) (€)	**596,708**	**2,344,587**	**2,936,802**

Cost-Effectiveness Analysis of the Malaria prevention strategy

The employment of the CEA test aims to evaluate the effectiveness in terms of the number of potentially hospitalized cases avoided. Specifically the effectiveness index is the result of dividing the average public prevention cost by the average COI per case / year. This approach seeks to estimate the number of Malaria cases that could have potentially been treated (hospitalized) by the average amount of prevention costs induced per year and consists of a programme comparison across years. As appears from Table 5, the potentially treated cases were estimated to be 316 in 2012 and 125 in 2013. This figure is also the result of the costs being neutralized in the following years. The implementation of the Malaria prevention strategy is of outmost importance for public policy makers especially considering the need to eliminate the outbreak. However, examined under the extra-welfarist approach, for which health outcomes is the primary goal to be achieved, policy makers are responsible for the final decision regarding the most adequate programme.

Table 5. Cost effectiveness index for potentially treated Malaria cases

	2011	2012	2013
Total Prevention Costs		674,099 €	344,607 €
Cost of Illness per case	1728 €	2136 €	2747 €
Potentially hospitalised cases per year		**316**	**125**
Actually Hospitalised Cases	53	8	2

Discussion

Some of the limitations of the present study are associated with the uncertainty regarding the number of cases prevented due to the control programmes and the actual nuisance reduction that can be attributed to these programmes. As a consequence, through the implementation of both CBA and CEA in the present study, it is difficult to provide precise indicators of benefit and effectiveness levels. The CVM estimates incorporated in the CBA, indicate that substantial social benefits may accrue in the study area from the implementation of improved control programmes, hinting at a higher monetary value of utility over health. However, conducting a well designed survey employing sound methodological tools is necessary for a more precise definition of the metric value of utility. On the other hand, considering that the size of the epidemic in the absence of prevention measures is virtually unpredictable, collaboration with public policy makers, such as ECDC (2012), is essential to determine the importance of the application of a post-epidemic strategy mainly on the basis of the public health safety criterion. The employment of different methodologies, such as Quality of Adjusted Life Years (Weinstein *et al.* 2009) and Value of a Statistical Life (Viscusi *et al.* 2003), would provide alternative indicators of the monetary valuation of health outcomes. However, which particular evaluation tool to use should be decided in accordance with the demanded outcomes and societal goals (e.g. utility vs health).

The application of an updated economic analysis on the effectiveness of public health control and prevention programmes seems well timed, bearing in mind a significant restructuring of the public health sector in Greece (e.g. the health care system and the publicly funded strategies) and the fiscal crisis apparent in the European South (Ifanti *et. al.* 2013). The estimation of the societal welfare of the public health strategies, is essential in order to assess the necessity of the continuation of the various programmes in the immediate future according to the welfare criteria. However, the justification for the implementation of public health strategies can be evaluated under the spectrum of different economic perspectives and criteria; normative vs positive economics, welfarist vs extra-welfarist approaches etc. (Hurley 2000, McGuire *et. al.*

1993). Statements in favor of the importance of public health interventions can be found in seminal works of positive economics: *"Nor is there any reason why the state should not assist the individuals in providing for those common hazards of life against which, because of their uncertainty, few individuals can make adequate provision"* (Hayek 1944: 125), while other approaches (Mishan 1998) remain sceptical about the reception of their contributions by public decision makers.

As health care remains the main concern of policy makers, all theoretical perspectives could contribute towards the selection and application of the most appropriate public health interventions. Positive analysis can provide a fruitful ground for normative questions, while a critical self-reflection of normative analysis can shift to a better understanding of the values and perspectives found in society (Hurley 2000). Differences across various theoretical approaches should not be viewed as mutually rejecting but as a contested ground for posing those questions that can ensure a fruitful collaboration among different sectors, especially in times of intense societal crisis.

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Cyprus in crisis: Recent changes in the pharmaceutical market and options for further reforms without sacrificing access or quality of treatment

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Abstract

The pharmaceutical market in Cyprus has been characterised by high volume and a steep increase in per-capita expenditure over the past decade. Most importantly, the market is fragmented due to the absence of universal health insurance, and the uninsured have to rely exclusively on the private market. The objective of this study is to examine the weaknesses of the Cypriot pharmaceutical market before the financial crisis; to discuss the measures recently introduced after recommendations by the Troika; and to propose interventions that can improve access to pharmaceuticals and efficiency without compromising health outcomes. Apart from the introduction of new pharmaceutical policies, we also recommend the swift implementation of universal health insurance.
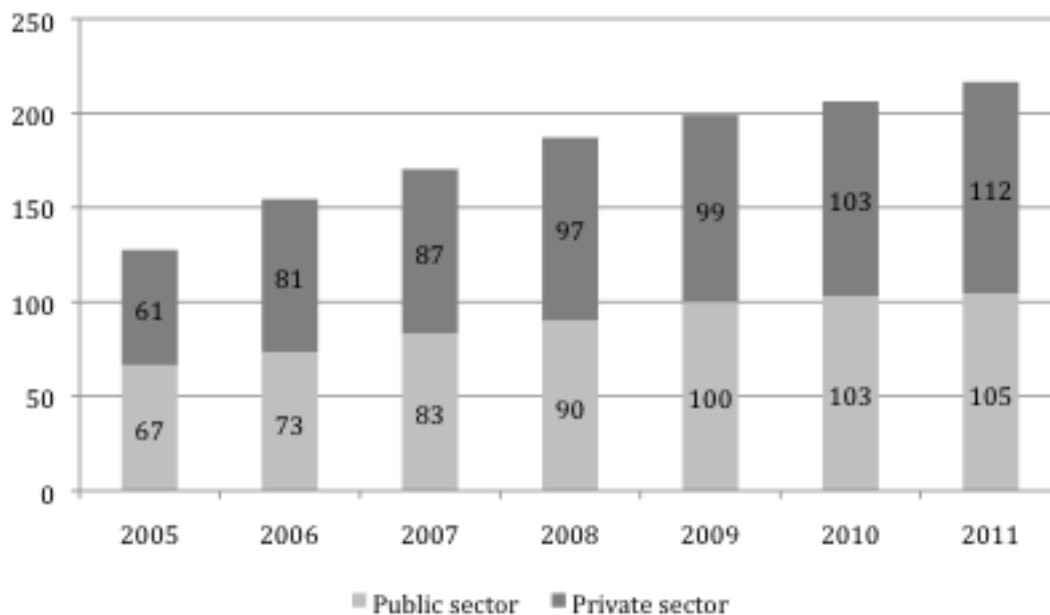
1. Introduction

In 2013 Cyprus became the fourth Euro zone country to resort to IMF, EC and ECB (the so-called Troika) funding as a result of the financial crisis. The Troika recommended the implementation of reforms, in (among others) the pharmaceutical market.

What makes the pharmaceutical market in Cyprus unique is that there is no universal health insurance scheme (NHIS). While employees in the public sector, people with an annual income below a certain threshold and patients suffering from certain chronic diseases are covered by public health insurance (85% of the population [Petrou 2009]), anyone who does not fall within these groups has to rely on the private sector. Cyprus is also the only EU country where out-of-pocket expenditure is higher than public health expenditure (Figure 1) (OECD 2012).

Therefore, it is important to include the private health sector in Cyprus in the discussion, because part of the population relies exclusively on this. In addition, patients who are covered by public health insurance often have to resort to the private market and pay out-of-pocket, as a result of unsatisfactory waiting times (Andreou, Pashardes et al 2010) .

Figure 1. Pharmaceutical Sales in Cyprus, by sector (private or public) in million Euros

Source: Ministry of Health of Cyprus, unpublished data

Regardless of the macroeconomic environment, governments should always seek to increase efficiency and reduce waste in health markets, in order to increase access to care without sacrificing outcomes. This means that either the same level of treatment can be achieved at a lower cost (thus releasing funds for other needs), or additional services can be provided at the same cost. Especially in a country like Cyprus, reducing waste can help fund the expansion of health insurance to the entire population. In this context, a country in crisis can implement measures that increase

efficiency, rather than simply resorting to -potentially hazardous for public health-blunt cuts (Stuckler, Basu et al 2010; McKee, Karanikolos et al 2012; Quaglio, Karapiperis et al 2013).

2. The Cypriot Pharmaceutical Market before the Crisis

Cypriot pharmaceutical market differs significantly compared to other EU countries, with regards to lack of a universal health system and exclusive procurement of drugs for public sector via tenders.

Patients covered by public health insurance can receive pharmaceuticals for free from public pharmacies. Prior to the crisis there were no volume-control measures in place, resulting in overprescribing and overconsumption of drugs(ECDC 2011). 39% of all prescriptions included more than five products (CPA 2011) while patients could also receive OTC drugs and vitamins for free. Apart from costs, drug overconsumption has been associated with adverse drug reactions and increased risk of hospitalization (Köberlein 2013). The complete absence of demand-side measures exacerbated this phenomenon: Intergraded prescribing guidelines for physicians were limited, and there were no physician budgets nor any prescribing monitoring; in addition there were no incentives for rational prescribing, or user charges as in other countries (PPRI 2011).

While tenders are popular for the procurement of medicines in most hospital markets in the EU, these are only used for a limited number of products in few outpatient markets, such as the Netherlands and Germany. In Cyprus, however, the procurement of all drugs in out-patient and hospital markets for the public system is done via tenders, whereas the bidder offering the lowest price wins the right to supply the entire market for two years (Petrou and Talias 2014a). In general, when there is no monopoly power at the molecule or therapeutic level, tendering leads to lower prices than reference pricing or price caps, and shifts in market shares (Blankart and Stargardt 2012; Kanavos, Seeley et al 2004), meaning that for such markets in the public sector, the Cypriot authorities have taken advantage of all possibilities for price reductions. However, this is not always the case, as some drugs are on patent, which may lead the government to purchase drugs at the therapeutic class level, whereas one drug per class is purchased. If the product is the only drug in a therapeutic class, the provider has additional market power, and the tender will not lead to any significant price cuts, due to monopoly power. In any case, public expenditure on pharmaceuticals in Cyprus appears to be mainly volume rather than price-driven (Petrou 2014a).

Prices for in-patent drugs are determined based on an international reference pricing system. The price is determined as the average of available prices in Austria, Sweden, France and Greece, plus 3 percent to cover importing costs, on top of which a 37% pharmacist mark-up applies. As price revisions occur at longer intervals, compared to other EU countries (Dylst, Vulto et al 2011) private sector prices in Cyprus remain relatively high.

For off-patent markets, generic drugs are 20 percent cheaper than the originator price. This directly translates to relatively high prices, given that in other EU countries reference prices push generic prices down (Stargardt 2011; Kanavos, Costa-Font et al 2008), while price caps limit prices directly to a lower fraction of the originator price than 80 percent (e.g. 50 percent in France; 52% in Austria [Vogler 2012]).

3. Policy Changes recommended by the Troika

The Troika recommended the development of clinical guidelines as an important tool for rational prescribing (Woolf et al 1999;Grimshaw and Hutchinson 1995). As a result, guidelines for ten health conditions been delivered and ten more are currently being developed (Clinical Pathways 2013). The implementation of guidelines is in accordance with Troika's recommendation to render GPs as gatekeepers (Starfield, 1994).

There was little room for further price reductions in the public sector as a result of tendering, at least for products with substitutes. Consequently, the Troika focused on the implementation of adjacent policies that can enhance the efficiency of the system through the implementation of cost effectiveness analysis for the ten most costly products and some conditions with expensive treatments. While cost effectiveness analysis is a prerequisite in assessment of pharmaceuticals for inclusion in the formulary in the majority of EU countries (PHIS 2010),HTA, (Drummond et al. 2011; Garrido 2008) was only recently introduced in Cyprus.

As a way to address volume, the Troika requested the introduction of demand side control measure in the public sector. A 0.50-Euro co-payment fee per prescription was implemented to tackle moral hazard and overprescribing. User charges are not a preferred option during economic downturns because they provide barriers to healthcare. However, the 0.5-euro prescription fee is low, and in any case much lower than other EU countries. Given the low cost, this co-payment works more as a way to address moral hazard, rather than a way to actually finance the health budget. It is worth noting that a number of patient categories are already exempt from co-payments (Hynd, Roughead et al. 2008) and this exemption should be expanded further to vulnerable socio-economic groups, as also suggested by Cylus et al (2012).

The Troika recommended new income criteria for public health care beneficiaries, reducing health insurance coverage even further. Uninsured people will have to pay for their healthcare entirely out of pocket (Petrou 2014b)

With regards to the private sector, the Ministry of Health introduced price reductions in order to reduce the financial burden (although this was not explicitly demanded by the Troika). We found only a modest 5.8% weighted reduction in total expenditure when we compared 1,691 commonly prescribed products under the old and new pricing system. Moreover, prices below 10 Euros were frozen. This is of major importance since 47% of total private wholesale pharmaceutical expenditure falls in this category. In addition, OTC products will be priced freely.

In this context, pharmacists' remuneration in the private sector changed from a flat percentage to a regressive margin, which may remove the incentive to dispense more expensive medicines (37% for EPR below 50 euros, 33% for EPR between 50 and 250 and 25 % for EPR over 250 Euros). A prescription fee of 1 Euro was also implemented, cancelling out part of the benefit of the new pricing scheme. This has a negative impact on private sector patients, without being combined with any new activities of pharmacists such as cognitive services and management of chronic conditions (Farris 2008).

The introduction of the regressive pharmacy profit margin has a limited effect on the profitability of private pharmacists, since the lowest profit margin tier (25%) pertains to medicines which are mainly dispensed by public sector pharmacies.

Consequently, private sector pharmacists also reacted positively, and the one-Euro prescription fee may have contributed to a positive reception of the measures.

4. Options for further Policy Changes towards Efficiency

4.1 Public sector

The special nature of the Cypriot pharmaceutical market leaves little room for many of the available supply-side drug policies that are implemented in other EU countries. Cyprus optimised tendering system, so interventions must be sought elsewhere. However, new drugs can achieve higher prices due to the lack of direct substitutes with comparable clinical outcomes, which makes the tendering process ineffective. In this case there may be room for alternative pricing policies, such as risk-sharing and managed entry agreements, in which case coverage depends on clinical evidence and the available budget. These have been applied "where risk and uncertainty about value are very high in relation to the cost of the treatment, and the result is a very high cost per unit of health gain, which is deemed unaffordable by health insurers" (Kanavos, Ferrario et al 2013). Via this mechanism, manufacturers may have to lower their prices, provide discounts or adjust the cost-effectiveness ratio (Willis, Persson et al. 2010; Ferrario and Kanavos 2013). In Italy, current outcome related risk sharing schemes generated savings up to 50% for innovative products (Espín, Rovira et al. 2011) while in the UK a non outcome coverage decision provides that NHS will cover the cost of first 14 injections, and any subsequent costs burden the supplier (Walker et al 2012). In the same context, a value based pricing scheme, according to which the price should be aligned to the clinical value of the product, could be selectively implemented, as some authors propose (Petrou and Talias 2014b).

To address overprescribing (Köberlein 2013), health authorities can introduce interventions at the demand side. These can include financial incentives for physicians to encourage rational prescribing, such as budgets.[PPRI; Kanavos, Vandoros et al. 2011). Although budgets can reduce overprescribing (Busse, Schreyögg et al. 2005) , if they are not carefully designed and adjusted for each physicians' patients' demographic and other characteristics, they may provide a barrier to access to care. In addition, information campaigns can inform patients of the dangers of overconsumption of drugs, as overprescribing may be driven by demanding patients (Kravitz, Richard et al. 2005). Of course the preparation of clinical guidelines for all major diseases must go forward as planned and, once ready, carefully followed by physicians, as these can also prevent a switch in prescribing from off-patent towards in-patent medicines (Vandoros 2013). It is also essential that e-prescribing is implemented across the country, so that prescribing is monitored and appropriate feedback is sent to physicians. Finally, appropriate detailing and marketing regulation must be adopted: Pharmaceutical Marketing activities have not been regulated apart from an ethics code agreed among seven R&D Companies and there is some evidence that aggressive promotion of some products may accelerate their early uptake and induce supply-side demand (Gagnon and Lexchin 2008; Kesselehim 2011; Vinod and Rao;2000).

Further implementation of HTA seems challenging for a small country but a combination proposed by Vandoros and Stargardt (2013), which limits external price referencing to countries that already apply HTA and then adjusts for the local market

needs and characteristics could be a rational starting point. An alternative could be the introduction of two versions of HTA with regards to Budget Impact Analysis of products: (a) Full version for estimated sales above a certain threshold; and (b) rapid (light) version for estimated sales below this threshold (Petrou and Talias 2013).

4.2 Private sector

While the public sector appears to demonstrate relatively low prices in most cases, things are totally different in the private sector. Given that these patients have no other option, this part of the market also deserves attention, until NHIS is implemented. First, setting generic prices at the 80% level of originators is relatively high and the potential for further savings for private-sector patients is foregone. Different generic policies can be adopted, such as lower price caps or internal reference pricing. Both these mechanisms also work as a price floor apart from a price ceiling, but they normally lead to lower prices than 80% of the originator price, which is the case in Cyprus (Kanavos, Cost-Font et al. 2008). Free generic pricing has resulted in even lower generic prices in the UK and US (Kanavos, Cost-Font et al. 2008;Kanavos and Vandoros 2011) but this is not recommended for Cyprus' small market. For in-patent markets, external reference pricing can work well, as long as prices are updated frequently and adjusted for local market characteristics.

OTC drugs provide treatment for minor and frequent conditions and as such they constitute an important segment of pharmaceutical care. It appears that the fact that the market in Cyprus is small, and the presence of other market characteristics cannot enhance competition, as prices have recently been increasing.

In addition, the recent introduction of a pharmacist fee seems to have been unnecessary, since it was not substantiated by the introduction of additional pharmacist activities (Vogler 2012).

5. Discussion and Policy Implications

We have discussed the policy measures that have been adopted in the Cypriot pharmaceutical market and have recommended measures for further changes in order to increase efficiency without sacrificing access to care. Our recommendations for the public sector include risk-sharing for innovative drugs; restrictions on marketing and detailing; e-prescribing at the national level; and demand-side measures such as clinical guidelines, physician budgets, and prescription monitoring. For the private sector we recommend internal reference pricing or lower price caps for generic drugs, and more frequent revisions of prices under the external reference pricing scheme for in-patent originators (Table 1).

Table 1. The Troika's main recommendations on pharmaceuticals

Issue	Health Sector	Current state	Troika's approach	Drawbacks/ Barriers	Author's Comments
Pricing	Private	External Reference Pricing	Not explicitly raised yet (although price reductions were implemented due to the crisis)	Low prices may lead to shortages of medicines due to reduced profitability of industry, which is aggravated by the fact that it is a small and unattractive market.	Significant reductions can be achieved under a unified market in the context of a National Health System. Frequent price revisions and lower generic prices.
	Public	Tendering (based on reference pricing)	Reduced agreed budget for public health expenditure is not exceeded	Limited room for further price reductions	Introduction of supplementary approaches to further enhance system such as risk sharing and managed entry agreements
Cost sharing	Public	Not applicable	Introduction of capped fixed co-payment fee to reduce medically unnecessary demand for pharmaceuticals	May restrict access to health care	Cost sharing can help address the problem of overusing medicines, which has been dominant in the public sector. Socioeconomic conditions must be taken into account so that it does not work as a barrier to treatment.
HTA	Public	Selectively	Introduction of intergraded HTA to selected pharmaceuticals and consumables	Economies of scale (human resources). A time-consuming process that requires resources and capacity.	Referencing countries that have HTA. Alternatively, two versions (rapid and full) based on Budget Impact Analysis (BIA).

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Clinical Guidelines and medical audit	Public	Prescribing guidelines for high value products	Implementation of guidelines and medical audit for ten high volume and value diseases	Education, monitoring and audit are essential. It must be decided how divergence from guidelines will be addressed.	Essential measure that must be prioritised.

The private sector has been ignored in the effort to rationalise the pharmaceutical market. Nevertheless, the importance of this segment is underlined by the fact that a part of the population is not covered by public health insurance. The ultimate goal should be to swiftly shift towards a system of NHIS. The exclusion of patients from public health insurance, due to revision of eligibility criteria is in the exact opposite direction, and can only have a negative effect on the population's health.

While the authorities work towards increasing efficiency with the implementation of (mainly) demand measures, it is crucial that any savings that occur are re-invested in the health sector as there is great need for additional funding elsewhere in the healthcare system (Gené-Badia, Gallo et al. 2012). Previous studies have shown that in other recession countries, the populations' health deteriorated, either directly [Karanikolos, Mladovsky et al. 2013;Kentikelenis, Karanikolos et al. 2011;Vandoros, Hessel et al. 2013; Hessel, Vandoros et al. 2014) or indirectly (Vandoros, Kavetsos et al. 2013). In order to prevent a public health disaster, any interventions adopted must increase efficiency without sacrificing quality of or access to healthcare.

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