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Article

The Impact of Economic Crisis on Chronic Patients' Self-Rated Health, Health Expenditures and Health Services Utilization

Anastasios Skroumpelos *, Elpida Pavi, Katerina Mylona and John Kyriopoulos

Department of Health Economics, National School of Public Health, 196 Alexandras Avenue, Athens 115 21, Greece; E-Mails: epavi@esdy.edu.gr (E.P.); katerina.mylona@gmail.com (K.M.); jkyriopoulos@esdy.edu.gr (J.K.)

* Author to whom correspondence should be addressed; E-Mail: skroubelos@gmail.com; Tel.: +30-213-201-0240; Fax: +30-210-644-9571.

Abstract: There is evidence that the economic crisis in Greece has substantially affected patients and health care services, with chronic patients forming a particularly vulnerable group. The aim of this study was to investigate whether and in what way the current economic environment has affected patients with selected chronic conditions. A cross sectional study was carried out with a sample size of 1200 patients suffering from hypertension, diabetes and chronic obstructive pulmonary disease (COPD). Following a large family income decrease (35.4%) in the last 3 years, chronic patients reported decreased spending for various expenditure categories in order to maintain their ability to finance their health care needs. Among the disease groups studied, statistically significant differences were found for self-rated heath (SRH), out-of pocket health expenditures, health services utilization and the perceived need for physician services. Although need for physician visits for issues related to the chronic condition has largely been reported as met, this was achieved by increased out-of-pocket expenditures and large family budget cuts for essential household goods and services. Austerity measures and reduction of public health expenditure by the state appear to have led to high private expenditures and to *de jure* or *de facto* insurance coverage loss for primary care services.

Keywords: economic crisis; health status; health services utilization; unmet need; out-of pocket expenditures; Greece

1. Introduction

Following the international economic downturn, Greece entered a severe financial crisis in 2008 which threatened the country's economic stability [1]. In response to this, a series of austerity measures were introduced in order to reduce deficit and improve the county's credibility to the international capital markets [2].

Health care was one of the main sectors targeted in order to reduce public spending and achieve future primary surplus. According to officially published data, public spending has been reduced by 23.1% between 2009 and 2011 [3]. According to our own estimations, public spending has been further decreased in 2014, which corresponds to an overall decrease of 28.6% compared to 2009.

It is noted that, even before the economic crisis, public share (69.7%) of total health expenditure was relatively small. The remaining 30.3% was mostly covered by out-of pocket payments and, to a lesser extent, by private health insurance, which accounted for approximately 6% of total private spending [3]. In 2011, public share was decreased to 68.3%, and consequently households' expenditures on health rose to 31.7% [3].

Under the economic crisis, disposable income is continuously decreasing, unemployment increased by more than 200% compared to 2008, while in 2011 more than 23% of the population was living below the poverty threshold [4]. Hence, households' ability to finance health care has been significantly reduced which raises major concerns regarding access to health care.

Furthermore, there is evidence to suggest that the current economic conditions have largely affected population health. The economic crisis has been found to affect self-reported health status [5], and the incidence of acute myocardial infractions [6], major depression [7] and suicide attempts [8].

Chronic diseases represent a substantial share in total burden of disease and consequently absorb significant health care resources. Thus, the aim of this study was to explore the impact of crisis on health and health expenditures' management of patients suffering from hypertension, diabetes and chronic obstructive pulmonary disease, as well as the effect on health services utilization.

2. Experimental Section

A cross sectional study was carried out with a sample size of 1200 patients suffering from diabetes type II, hypertension and chronic obstructive pulmonary disease (COPD). These diseases were chosen on grounds of epidemiology and disease burden [9], as well as their socioeconomic impact on the Greek healthcare system [10–12]. The sample size was determined according to the prevalence of each condition. Each disease group sample was estimated at 400 patients which is the minimum sample size (385) for population size above 600,000 when expected response distribution is set to 50%, acceptable margin error to 5%, and confidence interval to 95%. It is noted that each chronic patients group under study has a higher than 600,000 prevalence in Greece.

Patients were approached through their treating physician. Specifically, 120 physicians were randomly selected through the official list of the National Medical Association of Greece, based on specialty and geographical distribution. Starting on a predefined day, among his/her consecutive patient visits, each physician selected 10 patients based on the set of 10 random numbers between 1 and 20 which had been given to him by the study authors. Selected patients were informed about the

objectives of the study and provided with the patient consent form. If the random-number-patient selected had any co-morbidity related to the other three conditions under study, he/she was excluded and the next patient was recruited by the physician. Fieldwork was carried out during February 2013.

All patients who gave their consent to participate in the study were contacted via telephone and were interviewed on the basis of a structured questionnaire. Participants answered a series of closed and open type questions, including age, gender, total monthly family income (as an ordinal variable, Table 1), monthly family income decrease since 2010 (measured as a continuous variable), self-rated health status (measured on a scale 0–100), extent to which they had decreased spending for various expenditure categories including specific health care services (on a 4-point scale ranging from "not at all" to "very much"), and extent to which they had decreased out-of-pocket expenditures for physician visits, pharmaceuticals, lab tests and nursing home care. Health care utilization was assessed for the 6 months' period prior to the study. Participants were asked about number of times they had visited a physician or they had been admitted to a hospital for issues related or not to their chronic condition, as well as the number of times they had felt the need to visit a physician for an issue related to their condition or another health issue.

Table 1. Sample size and patients' distribution by sociodemographic characteristics and disease category.

	All patients		Hypertension		Diabetes		COPD		Chi square test
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
	1200	**100.0**	**400**	**25.1**	**400**	**25.1**	**400**	**25.1**	
Gender									$x^2 = 3.685$
Male	539	44.9	166	41.5	180	45.0	193	48.3	df = 2 $p = 0.158$
Female	661	55.1	234	58.5	220	55.0	207	51.8	
Total	*1200*	*100.0*	*400*	*100.0*	*400*	*100.0*	*400*	*100.0*	
Age (yrs)									
<14	0	0.0	0	0.0	0	0.0	0	0.0	
15–29	13	1.1	2	0.5	4	1.0	7	1.8	
30–44	106	8.9	23	5.8	30	7.5	53	13.2	$x^2 = 27.229$
45–59	423	35.4	150	37.9	130	32.5	143	35.8	df = 8
60–74	444	37.1	163	41.2	155	38.8	126	31.5	$p = 0.001$
>75	210	17.6	58	14.6	81	20.2	71	17.8	
Total	*1196*	*100.0*	*396*	*100.0*	*400*	*100.0*	*400*	*100.0*	
Income									
No income	17	1.4	4	1.0	5	1.2	8	2.0	
1–300 €	21	1.8	10	2.5	7	1.8	4	1.0	
301–500 €	79	6.6	30	7.5	28	7.0	21	5.2	
501–750 €	212	17.7	70	17.5	77	19.2	65	16.2	$x^2 = 11.414$
751–1.000 €	342	28.5	122	30.5	111	27.8	109	27.2	d.f. = 14
1.001–1500 €	300	25.0	92	23.0	99	24.8	109	27.2	$p = 0.653$
1501–2000 €	152	12.7	46	11.5	52	13.0	54	13.5	
2001–3000 €	77	6.4	26	6.5	21	5.2	30	7.5	
Total	*1200*	*100.0*	*400*	*100.0*	*400*	*100.0*	*400*	*100.0*	

Analysis of variance (ANOVA) followed by multiple *t*-tests and Bonferroni correction, as well as a series of one sample *t*-tests and paired *t*-tests were performed in order to investigate mean differences between groups and the statistical significance of the means calculated for the variables described above. All analyses have been performed using STATA 2009 software.

3. Results

Of all 1200 patients who participated in the study, 400 suffered from hypertension, 400 from diabetes and 400 from COPD (Table 1). The various patient groups differed significantly as far as age was concerned ($p = 0.001$) but there were no differences in relation to gender ($p = 0.158$) and income ($p = 0.653$). In relation to age, hypertensive and diabetic patients tended to be older than 60 years of age at a higher proportion than COPD patients.

3.1. Income and Out-of-Pocket Health Expenditures

The average reported family income per month was 1083.30 € (95% CI: 1052.10€, 1114.60 €), which was not found to differ significantly among disease groups ($p = 0.164$) (Table 2). The average 3-year income loss (since 2010 when austerity measures were introduced) was 592.70 € (95% CI: 551.30 €, 634.10 €), which corresponded to a 35.4% total 3-year decrease. However, it appears that austerity measures had a uniform effect on the disease groups as the average 3-year income loss did not differ significantly among them ($p = 0.657$).

Patients were further asked to what extent they had decreased spending on various expenditure categories. The vast majority of them stated that they had decreased spending for all expenditures categories except for health (Table 3). Specifically, of the patients for whom the various expenditures categories were applicable or were reported that represented a need, 56.4% stated that they had not decreased spending for health. However, 20.2% reported that they had decreased health care expenditures much and very much. Similar extent of decreased spending reported 53.9% of patients regarding education, and 47.7% regarding food and nutrition. Nonetheless, concerning other household expenditures, more than 90% stated that they had reduced expenditures for personal care and cosmetics, gifts, personal footwear, personal clothing, entertainment and trips. Of the patients, 88.1% claimed their expenditure for housing and accommodation had decreased since 2010 while the respective figure for expenditure concerning every day transport and telecommunication was 76.6% and 76.1%, respectively.

Regarding health care expenditures, respondents were asked how much they had reduced out-of-pocket expenditure for physician visits, lab tests, their chronic disease drugs, complementary drugs, and nursing home care. Of those who did have to spend for or used the aforementioned services, 18.3% reported having decreased spending "much and very much" for physician visits, 16.5% for lab tests, 6.7% for chronic disease drugs, 12.1% for complementary drugs, and 33.3% for nursing home care (Table 2). Expenditure reduction for the specific health care services did not vary significantly among disease groups.

Table 2. Impact of economic crisis on patients' family income and out-of-pocket health care expenditures, by disease category.

	All patients		Hypertension		Diabetes		COPD	
	Mean	**CI 95%**	**Mean**	**CI 95%**	**Mean**	**CI 95%**	**Mean**	**CI 95%**
Monthly family income 2013 (€)	1083.3	1052.1, 1114.6	1061.3	1006.8, 1115.7	1061.9	1009.4, 1114.4	1126.9	1071.3, 1182.5
Monthly family income decrease since 2010 (€)	592.7	551.3, 634.1	567.8	509.9, 625.6	614.9	526.3, 703.5	596.4	528.9, 663.8
Amount spent for physicians the last 6 months (€)	76.6	66.5, 86.7	77.1	60.2, 94.1	56.7	44.6, 68.9	94.9	73.5, 116.4
Amount spent for hospitalization the last 6 months (€)	14.3	4.2, 24.5	6.8 *	−2.1, 15.6	21.4 *	−2.3, 45.2	14.5 *	−1.9, 30.9
Amount spent monthly for pharmaceuticals (€)	38.0	35.6, 40.5	24	21.2, 26.8	39.5	34.6, 44.5	51	46.5, 55.5
Patients (%) reporting decreased spending for:	Not at all/a little	Much/very much	Not at all/a little	Much/very much	Not at all/a little	Much/very much	Not at all/a little	Much/very much
physician visits	81.7%	18.3%	82.1%	17.9%	80.4%	19.6%	82.5%	17.5%
examinations	83.5%	16.5%	83.0%	17.0%	82.2%	17.8%	85.3%	14.7%
chronic disease drugs	93.3%	6.7%	93.1%	6.9%	92.5%	7.5%	94.2%	5.8%
complementary drugs	87.9%	12.1%	87.6%	12.4%	87.4%	12.6%	88.7%	11.3%
nursing home care	66.7%	33.3%	69.4%	30.6%	70.6%	29.4%	59.4%	40.6%

* not significant (p-value > 0.050).

Table 3. Distribution of patients reporting extent of decreased spending for various expenditure categories.

| Expenditure categories | To what extent have you decreased spending | | | | | | | | | |
| | not at all | | a little | | much | | very much | | Total | |
	n	%	n	%	n	%	n	%	n	%
trips	26	2.5	36	3.4	144	13.7	845	80.4	1051	100.0
entertainment	17	1.5	46	4.2	172	15.7	864	78.6	1099	100.0
personal clothing	19	1.6	48	4.2	201	17.4	888	76.8	1156	100.0
personal footwear	30	2.6	62	5.4	193	16.8	863	75.2	1148	100.0
gifts	20	1.8	80	7.0	248	21.7	794	69.5	1142	100.0
personal care and cosmetics	27	2.4	70	6.3	168	15.2	839	76.0	1104	100.0
accommodation/housing	40	3.7	88	8.2	185	17.2	764	70.9	1077	100.0
telecoms	106	9.1	156	13.4	362	31.1	540	45.0	1164	100.0
every day transports	108	9.4	161	14.0	316	27.4	567	49.2	1152	100.0
education	123	34.2	43	11.9	49	13.6	145	40.3	360	100.0
food/nutrition	191	16.1	431	36.2	395	33.2	173	14.5	1190	100.0
health	673	56.4	279	23.4	176	14.8	65	5.4	1193	100.0

When all disease groups were considered together, they reported having spent on average 76.60 € (95% CI: 66.50 €, 86.70 €) for physician visits, 14.30 € (95% CI: 4.20 €, 24.50 €) for hospital admissions, and 38.00 € (95% CI: 35.60 €, 40.5 €) for their monthly pharmaceuticals during the last 6 months (Table 2).

For primary care physician visits, average out-of-pocket expenditure differed significantly among patients suffering from the conditions investigated ($p = 0.009$). It was reported to be 56.70 € for diabetic patients, 77.10 € for hypertensive patients, and 94.90 € for patients suffering from COPD. The Bonferroni correction showed that the average amount reported to have been spent for primary care physicians visits differed statistically significantly only between the diabetes and the COPD group.

For hospital admissions, average out-of-pocket expenditure was reported at 6.80 € for patients suffering from hypertension, 14.50 € for patients suffering from COPD and 21.40 € for patients suffering from diabetes. According to one sample t–tests, average reported out-of-pocket expenditure for hospitalizations for each of the groups can be assumed as zero, and according to ANOVA no statistically significant difference was found among disease groups ($p = 0.519$).

Finally, according to ANOVA ($p = 0.000$) and the Bonferroni correction, average reported monthly pharmaceutical out-of-pocket expenditure appeared to differ at a statistically significant level between all disease groups. Specifically, the COPD group reported spending the largest amount for pharmaceutical treatment (51.00 €) followed by the diabetes (39.50 €) and the hypertension groups (24.00 €).

3.2. Self-Rated Health and Health Care Utilization

In 2013, self-rated health (SRH) was reported to have a mean score of 62.2 (95% CI: 61.0, 63.4) on a scale of 0 to 100, for all patients (Table 4). In detail, hypertensive patients' self-rated health score was reported to be 64.3 (95% CI: 62.2, 66.4), diabetic patients' score was 61.9 (95% CI: 59.9, 63.9) and COPD patients' score was 60.4 (95% CI: 58.4, 62.4). Health status differed significantly among the disease groups ($p = 0.028$) and in particular between the hypertension and the COPD group

(p = 0.025). For 2012, SRH had been reported to be 64.8 (95% CI: 63.7, 66) for all patients, 67.4 (95% CI: 65.4, 69.4) for the hypertension group, 63.8 (95% CI: 61.9, 65.8) for the diabetes group and 63.4 (95% CI: 61.4, 65.5) for the COPD group. Similarly, according to ANOVA and Bonferroni correction, SRH for 2012 was found to differ significantly between hypertension and the COPD group (p = 0.019) and between the hypertension and the diabetes group (p = 0.043). The SRH deterioration between 2012 and 2013 was tested with paired sample t-test and was found to be statistically significant for all disease groups and for each group individually (p < 0.050). SRH deterioration did not differ significantly between disease groups (p = 0.215).

On average, for all patients, the reported number of times they had visited a physician for an issue related to their chronic condition within 6 months prior to the survey was 2.49 (95% CI: 2.35, 2.64) (Table 4). COPD patients had visited a physician 2.87 times (95% CI: 2.59, 3.14) which is statistically significantly higher than the 2.35 average number of visits performed by hypertensive (p = 0.014) and diabetic patients (mean = 2.26, p = 0.002). As far as physician visits for a health issue not related to their chronic condition was concerned, for the overall study sample the average was 0.93 (95% CI: 0.82, 1.04) visits during the preceding 6 months. According to the ANOVA, there were no significant differences among the disease groups' performed visits (p = 0.648). However, total visits for all reasons were found to differ significantly between the COPD group and the hypertension (p = 0.045) and diabetes group (p = 0.005) The number of hospital admissions in the 6-month period prior to the study for an issue related to patients' chronic condition was on average 0.46 (95% CI: 0.36, 0.57) for the overall study sample, while for an issue not related to their chronic condition it was 0.31 (0.24, 0.37). Total number of admissions was reported to be on average 0.77 (95% CI: 0.64, 0.89) (Table 4). The ANOVA revealed that there were no statistically significant differences among disease groups regarding the average number of admissions for an issue related to the chronic condition (p = 0.050), neither for another health issue (p = 0.757) nor for all admission causes (p = 0.150).

Finally, patients were asked to recall how many times, during the preceding 6 months, they had felt the need to visit a physician for their chronic condition or its complications, and for an issue not related to the chronic condition, irrespective of whether they had actually satisfied that need. On average, for all patients the need to visit a physician for an issue related to their condition was felt 2.29 times (95% CI: 2.04, 2.54) (Table 4). This need was felt 2.01 times (95% CI: 1.65, 2.36) by the hypertensive patients, 1.90 times (95% CI: 1.68, 2.13) by the diabetic patients and 2.93 times (95% CI: 2.32, 3.54) by the COPD patients. The only significant differences found were once again between the COPD and the hypertension group (p = 0.008) and COPD and the diabetes group (p = 0.002). According to Bonferroni correction, all other differences between the groups could be assumed as equal to zero. The average number of times all patients felt the need to visit a physician for a non-chronic condition related issue was reported at 1.09 (95% CI: 0.97, 1.21). This need did not differ statistically significantly among the disease groups (p = 0.721). In total, the number of times all patients felt the need for a primary care visit for all health issues was found to be 3.38 (95% CI: 3.07, 3.69). Similarly, this varied significantly between the COPD and the hypertension group (p = 0.021), and between the COPD and the diabetes group (p = 0.008).

3.3. Unmet Need of Health Care Utilization

In order to investigate the possibility of unmet need, a new variable was developed representing the difference between the number of times patients felt the need for a primary care visit minus the number of the actual visits performed. The difference between perceived need and actual use of physician services related to patients' chronic condition was found at −0.21 for all patients (Table 5). Based on one sample t-test, this difference was not found to be statistically significant ($p = 0.083$), indicating that for all study patients' primary care needs were reported as being met. However, this was not the case for hypertensive (mean unmet need = −0.37, $p = 0.027$) and diabetic patients (mean unmet need = −0.36, $p = 0.001$) who appeared to utilize physician services more times than the reported perceived need. In contrast, the difference between perceived need and actual utilization for the patients suffering from COPD ($p = 0.754$) can be assumed equal to zero. However, despite that overall patients' perceived need has been found as being met, according to descriptive statistics of the unmet need variable, 21.7% of all patients appeared to underutilize primary care services given their reported perceived need.

Mean unmet need for the overall study sample for a health problem not related to their chronic disease was 0.13 which was found to be statistically significant (p-value = 0.000), indicating that need was not always satisfied when all patients were considered. When disease groups were examined separately, unmet need was observed for the diabetes (mean = 0.15, $p = 0.001$) and the COPD group (mean = 0.16, $p = 0.007$), while this was not the case for the hypertensive patients (mean = 0.08, $p = 0.220$) whose need appeared to be mostly satisfied. In total, the difference between perceived need for physician visits for all reasons and actual visits was found not to be significant for all patients (mean = −0.09, $p = 0.518$) and for each group separately ($p > 0.050$). This could indicate that, in total, patients' need is met in most of the cases. Nevertheless, 22.77% of all patients appeared to underutilize primary care services. In particular, this is observed for 24.9% of hypertensive patients, 22.8% of diabetic patients and 20.7% of COPD patients.

4. Discussion

According to the analysis, economic crisis appears to have affected substantially patients' available family income as, on average, patients' income was reported to have been reduced by more than 30% since 2010 when the first Memorandum of Understanding (MoU) between the Greek Government and the European Commission, the European Central Bank and the International Monetary Fund was introduced. This income reduction did not vary significantly between the disease groups investigated. Decrease of monthly family income is not an unexpected finding given that between 2009 and 2013 in Greece, per capita Gross Domestic Product (GDP) decreased by 19.6% and per capita net national available income decreased by 27.3%. Unemployment increased by 162.3% between December 2009 [4] and December 2013.

Table 4. Health status and health care services utilization.

	All patients		Hypertension		Diabetes		COPD	
	Mean	**95% CI**	**Mean**	**95% CI**	**Mean**	**95% CI**	**Mean**	**95% CI**
Health status score								
Self-rated health (2013)	62.2	61.0, 63.4	64.3	62.2, 66.4	61.9	59.9, 63.9	60.4	58.4, 62.4
Self-rated health (2012)	64.8	63.7, 66.0	67.4	65.4, 69.4	63.8	61.9, 65.8	63.4	61.4–65.5
Health services utilization								
No. of primary care visits the last 6 months:								
for chronic condition	2.49	2.35, 2.64	2.35	2.12, 2.58	2.26	2.04, 2.49	2.87	2.59, 3.14
for another health issue	0.93	0.82, 1.04	0.94	0.74, 1.14	0.86	0.68, 1.05	0.99	0.82, 1.17
for all reasons	3.43	3.24, 3.62	3.29	2.98, 3.60	3.13	2.81, 3.44	3.87	3.50, 4.22
No. of hospital admissions the last 6 months:								
for chronic condition	0.46	0.36, 0.57	0.31	0.22, 0.40	0.44	0.31, 0.57	0.63	0.37, 0.90
for another health issue	0.31	0.24, 0.37	0.33	0.20, 0.47	0.27	0.18, 0.37	0.31	0.21, 0.41
for all reasons	0.77	0.64, 0.89	0.64	0.48, 0.82	0.72	0.54, 0.89	0.94	0.65, 1.23
Perceived need for health services								
No. of times perceived need for primary care visits was felt during the last 6 months:								
for chronic condition	2.29	2.04, 2.54	2.01	1.65, 2.36	1.90	1.68, 2.13	2.93	2.32, 3.54
for another health issue	1.09	0.97, 1.21	1.05	0.83, 1.23	1.05	0.84, 1.26	1.16	0.96, 1.36
for all reasons	3.38	3.07, 3.69	3.06	2.63, 3.50	2.95	2.61, 3.30	4.09	3.38, 4.80

Table 5. Perceived need and actual use of physician services (Need-Use).

Reason for physician visits	All patients			Hypertension			Diabetes			COPD		
	Mean difference	**95% CI**	**Need *vs.* Use**	**Mean difference**	**95% CI**	**Need *vs.* Use**	**Mean difference**	**95% CI**	**Need *vs.* Use**	**Mean difference**	**95% CI**	**Need *vs.* Use**
for chronic condition	−0.21	−0.45, 0.03	**Need = Use**	−0.37 *	−0.7, −0.04	**Need < Use**	−0.36 *	−0.57, −0.15	**Need < Use**	0.09	−0.50, 0.69	**Need = Use**
for another health issue	0.13 *	0.06, 0.19	**Need > Use**	0.08	−0.05, 0.20	**Need = Use**	0.15 *	0.06, 0.23	**Need > use**	0.16 *	0.04, 0.27	**Need > Use**
for all reasons	−0.09	−0.36, 0.18	**Need = Use**	−0.31	−0.68, 0.06	**Need = Use**	−0.23	−0.48, 0.02	**Need = Use**	0.25	−0.42, 0.92	**Need = Use**

* *p*-value < 0.005.

As a result of the reported family available income decrease, more than 70% of patients reported that they had proceeded to large spending cuts for most of the expenditure categories. Although to a lesser extent, even expenditures for essential needs as accommodation/housing, food and education appeared to be significantly reduced. The effect of economic crises on diet and alcohol consumption behaviors has been reported previously [13]. Some decrease of accommodation expenditure is an expected finding given that property and rent prices declined significantly due to the crisis. The new index of apartment prices decreased by 28.5% in the years between 2009 and 2013 [14].

Despite the fact that 1 out of 5 patients claimed that they were forced to substantially reduce spending for their health condition, health seemed as the last expenditure category which one would be willing to decrease spending for. Similar findings were reported in the Greek National Household Budget Survey of 2012 compared to 2011, where spending was decreased mainly for non-essential goods and services (over −15.0% for clothing-footwear, recreation and culture, restaurants and hotels, *etc.*), while for health the decrease was −8.6% [15]. Thus, our finding that out-of-pocket health expenditures were affected to a lesser extent than other goods categories is in line with the national findings for the general population and this applies particularly for chronic patients.

This essentially points to the assumption that, in the current economic circumstances, budget cuts for all other-than-health goods and services probably support health care financing. Indeed, our findings at micro level are supported by the national figures for health expenditure, according to which the public share of health expenditure in Greece decreased from 69.7% in 2009 to 68.3% in 2011, while the private share increased from 30.3% in 2009 to 31.7% in 2011 [16].

According to respondents, the greater spending reduction was directed to nursing home care services and to a lesser extent to physician services, lab tests and pharmaceuticals, which suggests that efforts were made in order to maintain the financing and subsequent utilization of services considered important. There is anecdotal evidence in the country that older people and chronic patients previously living in long term care facilities were taken back at family homes and are taken care of by families.

For the 6-month period prior to the study, monthly out-of-pocket expenditures for primary care physicians, hospital admissions and pharmaceuticals appear to represent approximately 5% of the monthly family income for the overall study sample. Even though this seems a low figure, it has to be noted that out-of-pocket heath care expenditures were found to be statistically significantly higher for the COPD patients, corresponding to their reported higher need for and use of physician services.

The investigation of the unmet need hypothesis revealed that during the 6-month period prior to the study, on average patients' primary care need was actually being satisfied, especially so for services concerning their chronic condition and its complications. However, the analysis showed that on average all patients underutilized services for issues not related to their condition and this was particularly observed for the diabetes and COPD groups. Furthermore, although total need for primary care visits appeared to be largely met there was still a considerable minority (22.7%) who underutilized physician services given their need. In order to satisfy their need, patients reported spending 26.9 € per visit (95% CI: 22.6, 31.4) which means that they covered either the full physician cost or quite a large share of it.

The finding that self-rated health deteriorated between 2012 and 2013 is supported by published literature on the negative effect of crises on health [5,13]. It is interesting that this deterioration was found unanimously for all chronic patient groups under study.

4.1. Study Limitations and Study Strengths

Sample size estimation was based on the fact that each chronic patients' group under study has a higher than 600,000 prevalence in Greece and did not use the specific prevalence of each disease. However, its size allowed the necessary statistical analysis to be carried out with power and *p*-value as originally set, and comprised of a two-stage random sampling technique.

The questionnaire used was purpose made and was tested for face validity only. Still, it included a number of questions based on a previously used questionnaire in a national survey [5]. The previous 6-months period for assessing health care utilization was chosen in order to minimize recall bias.

Concern was raised by one reviewer on the data concerning income. However, it has to be noted that the abrupt and steep decline of the income of the Greek population as a result of unemployment or specific legislation on salary and pensions cuts in both public and private sectors has been deeply and painfully experienced by the population, a fact which on the one hand minimizes recall bias and on the other is corroborated by national statistics on income decreases.

The original study included an additional Alzheimer's patient group. Following reviewers' concerns, this patient group was excluded from the analysis given its significantly higher-age profile which would pose validity issues during its direct comparison with the other patient groups due to age-related comorbidities, and the potential disease and social support benefits which would buffer the crisis effect.

Regarding study strengths, it is noted that almost all the main findings of the present study (which are based on micro level data) are supported by both other literature and relevant official statistics at macro level.

4.2. Study Implications

Due to ageing, chronic patients are and will increasingly continue to form a significant proportion of the general population in Greece, and an especially important vulnerable to the economic crisis group. The present study has shown that health policy for chronic diseases in Greece merits a significant priority, particularly due to economic crisis. Equitable access to primary care, and effective prevention and chronic disease managed care schemes should be considered for development. Cuts of public share of health expenditure and cost-sharing tools for increasing efficiency of the health care system should be assessed with particular attention as to their potential impact on raising barriers to chronic care access.

5. Conclusions

Although patients' available income has substantially been reduced, patients make efforts so that essential health care services utilization is maintained. This is achieved by significant budget cuts for all household and personal goods and services, and by increased out-of-pocket spending to finance relevant health services. As previously shown, the cost per visit appears quite high. This cannot be justified in the Greek health care system, which claims to offer universal coverage through both pillars of social insurance and a state-funded health system. Economic crisis has led to a significant reduction of the public share of health expenditure, and obviously to the reduction of health services supplied by

social insurance. Consequently, social insurance and government budget cuts actually put a burden on households' budgets even though these have substantially been reduced.

The picture drawn from the above leads to the conclusion that, at least as far as chronic patients are concerned, health insurance coverage for primary care services has *de jure* or de *facto* been lost to a large extent. Nevertheless, although self-reported health status has been deteriorating, amidst the economic crisis, chronic patients seem so far to manage to keep the level of care needed by prioritizing their health over other living standard needs. However, the question arising is for how long chronic patients will be able to finance their health and to satisfy their needs given that the macroeconomic environment in Greece is not expected to improve in the near future and health care reforms are mostly oriented to comply with the imposed targets for expenditure cuts.

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Conflicts of Interests

The authors declare no conflict of interest.

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Author Contributions

AS and JK formed the research question and initiated the study. AS contributed to the statistical analysis. All authors contributed to the interpretation of the results and to the writing of the manuscript.

References

1. Arghyrou, M.G.; Tsoukalas, J.D. The Greek debt crisis: Likely causes, mechanics and outcomes. *World Econ.* **2011**, *34*, 173–191.
2. European Comission. Economic and Financial Affairs. Available online: http://ec.europa.eu/ economy_finance/assistance_eu_ms/greek_loan_facility/ (accessed on 25 November 2013).
3. Hellenic Statistical Authority (EL.STAT). Health expenditure [In Greek]. Available online: http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A2103/PressReleases/A2103_SHE35 _DT_AN_00_2011_01_F_GR.pdf (accessed on 25 November 2013).
4. Hellenic Statistical Authority (EL.STAT). Statistical Database. Available online: http://www.statistics.gr/portal/page/portal/ESYE (accessed on 25 November 2013).
5. Zavras, D.; Tsiantou, V.; Pavi, E.; Mylona, K.; Kyriopoulos, J. Impact of economic crisis and other demographic and socio-economic factors on self-rated health in Greece. *Eur. J. Public Health* **2013**, *23*, 206–210.

6. Makaris, E.; Michas, G.; Micha, R.; Gkotsis, D.; Panotopoulos, C.; Pisimisis, I.; Svoronos, D.; Tsichlis, I.; Koudounis, G.; Asimakis, G.; *et al*. Greek socio-economic crisis and incidence of acutebmyocardial infarction in Southwestern Peloponnese. *Int. J. Cardiol.* **2013**, *168*, 4886–4887.

7. Madianos, M.; Economou, M.; Peppou, L.E.; Patelakis, A.; Stefanis, K. Major depression in the era of economic crisis: A replication of a cross sectional study across Greece. *J. Affect. Disord.* **2013**, *145*, 308–314.

8. Economou, M.; Madianos, M.; Peppou, L.E.; Theleritis, C.; Patelakis, A.; Stefanis, K. Suicidal ideation and reported suicide attempts in Greece during the economic crisis. *World Psychiatry* **2013**, *12*, 53–59.

9. Minas, M.; Koukosias, N.; Zintzaras, E.; Kostikas, K.; Gourgoulianis, K.I. Prevalence of chronic diseases and morbidity in primary health care in central Greece: An epidemiological study. *BMC Health Serv. Res.* **2010**, *28*, 252–259.

10. Athanasakis, K.; Ollandezos, M.; Angeli, A.; Gregoriou, A.; Geitona, M.; Kyriopoulos, J. Estimating the direct cost of Type 2 diabetes in Greece: the effects of blood glucose regulation on patient cost. *Diabetic Med.* **2010**, *27*, 679–684.

11. Geitona, M.; Hatzikou, M.; Steiropoulos, P.; Alexopoulos, E.C.; Bouros, D. The cost of COPD exacerbations: a university hospital-based study in Greece. *Respir. Med.* **2011**, *105*, 402–409.

12. Leal, J.; Luengo-Fernandez, R.; Gray, A.; Petersen, S.; Rayner, M. Economic burden of cardiovascular diseases in the enlarged European Union. *Eur. Heart J.* **2006**, *27*, 1610–1619.

13. Kentikelenis, A.; Karanikolos, M.; Papanicolas, I.; Basu, S.; McKee, M.; Stuckler, D. Health effects of financial crisis: omens of a Greek tragedy. *Lancet* **2011**, *378*, 1457–1458.

14. Bank of Greece. Statistics. Available online: http://www.bankofgreece.gr/Pages/el/Statistics/realestate/indices.aspx (accessed on 4 May 2014).

15. Hellenic Statistical Authority (ELSTAT), 2013. National Household Budget Survey. Available online: http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A0801/PressReleases/A0801_SFA05_DT_AN_00_2012_01_F_GR.pdf (accessed on 4 May 2014).

16. Hellenic Statistical Authority, System of Health Accounts. Available online: http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A2103&r_param=SHE35&y_param=TS&mytabs=0 (accessed on 4 May 2014).