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# Features of patients and their hospitalization in public hospitals of Eastern Macedonia and Thrace region

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*The economic crisis has made its presence felt in southern Europe the last five years and among other things has affected the provision of health services in Greece. It also seeks for economic reasons uniting of health care institutions of primary or secondary social care. In this study, we use data from the Pathology, Surgical, Obstetrics and Pediatric clinics for the years 2005 to 2011, drawn from the official statements of six public hospitals in Eastern Macedonia and Thrace region. We study certain quantifiable characteristics such as the number of inpatients meaning the days of inpatients'*

*hospitalization-, the number of inpatients without income or insurance and certain hospital evaluation indices such as bed coverage, interval change and patient's input rate. The ultimate goal is to use the results that emerge from this study to evaluate the health institutions and moreover, to form a basis for more rational planning and decision making.*

***Keywords:*** *Health care services, public hospitals, features of hospitalization, Greece.*

## Introduction

Both the overall level of population's health and the dissemination of health services are provided equally between the members, depending on the organization and operation of the health care system that determines the access and the quality of services (Charalampous and Tsitsi, 2010). The economic crisis has also created problems in the Greek health system funding, which threatens the viability of private insurance companies while at the same time charges the operation of public health service units due to increased demand, questioning their effectiveness; in addition patients neglect or delay to cover their insurances (Stuckler et al., 2009).

The pressure of the economic crisis on the government and the consumers-patients, who are threatened with loss of their income and insurance coverage, are stifling. This prevents the smooth and efficient running of the health service that depends directly on the social security and the social protection. The increase in negative health in combination with the partial or total loss of income make consumers – patients to seek treatment in public health service units. This results in greater spending and the need of increased funding from the already choked state budgets (WHO, 2009; Kyriopoulos and Tsiantou, 2009). Therefore, health services are required to operate as efficiently as possible despite spending cuts, which means reduced quality of services provided and low satisfaction of user's expectations (Erman, 2009). According to estimates of Kyriopoulos (2010), the outpatient visits have risen about 30% in public hospitals, while visits to private clinics have been limited to the absolutely necessary.

Florou et al. (2014) presented statistical data and evaluation indices of hospital units in the Eastern Macedonia and Thrace region, where the individual clinics were grouped in pathology, surgical and psychiatric sector. This paper, presents statistical data regarding public hospitals in the region of Eastern Macedonia and Thrace, in Northern Greece and data analysis of all hospital inpatients' for the years 2005 - 2011. Data include hospital, year and certain characteristics and indices for the Pathology, Surgical, Obstetrics and Pediatric clinic. These clinics are of great interest, as the first two are the ones with the largest number of patients, while the Obstetrics and Pediatric clinics are those with the lowest number of patients before the financial crisis period due to patients' preference to visit private doctors or clinics.

## Data description

We analyze annual data of six hospitals in the Region of Eastern Macedonia and Thrace, during the period 2005-2011. The analysis is based on data drawn from the official statements of the public hospitals of "Kavala", "Drama", "Komotini", "Xanthi", "Alexandroupolis" and "Didimotichon". Data from the hospitals of "Xanthi", "Alexandroupolis" and "Didimotichon" do not include full information for the period 2005 - 2011. These data were provided from the hospitals' administrative offices. Data that are presented on this paper include details about all the individual hospitals and the Pathology, Surgical, Obstetrics (Gynecology-Obstetric, Early and Incubator) and Pediatric clinics.

Data includes measurements of the total annual inpatient number, the total annual days of inpatients, the average days of inpatients' stay, the percentage (%) of emergency visits, the switching time, the patients' input rate, the percentage (%) of bed coverage, the inpatients without income, the inpatients without insurance, as well as the percentage (5) of hospitalized patients who live within the area of responsibility of each hospital, clinic and year.

Moreover, all tables include the percentage differences between measurements of the year 2005, that is the first year we have measurements, 2009, that is the year that the economic crisis started in Greece and 2011, - the last year we have measurements for.

# Data presentation

## Total number of inpatients and annual inpatient days

The annual inpatient number of each hospital is presented in table 1. The hospital with the higher number of patients is the one situated in the city of Alexandroupolis, which is a University hospital and includes specialized clinics that do not exist in the other hospitals of the region. . In this hospital are addressed approximately as many patients are aggregated at all other hospitals. It seems that the number of treated patients was higher in years 2010 and 2011in the most under study hospitals.

**Table 1:** Total annual inpatient number per hospital and year

| Hospital | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | 33825 | 33362 | 31519 | 32009 | 32092 | 32225 | 36893 | 9,1 | -5,1 | 15,0 |
| Xanthi | 27197 | 25303 | 25251 | 24431 | 19288 | 19716 | 22370 | -17,7 | -29,1 | 16,0 |
| Didimotichon | 8300 | 9413 | 9599 | 8547 | 8404 | 8776 | 8172 | -1,5 | 1,3 | -2,8 |
| Drama | | | | 14831 | 16020 | 15543 | 17344 | | | 8,3 |
| Komotini | | | | 12034 | 11706 | 11213 | 13187 | | | 12,7 |
| Alexandroupolis | | | | 70410 | 71180 | 74967 | 80308 | | | 12,8 |

In table 2 is presented the annual inpatient number per hospital, clinic and year. We observe that the number of patients has been increased in most hospitals and clinics for the period 2009 - 2011, except the Pediatric clinic where a reduction occurred. It is impressive the 73.7% increase in patients who were addressed to the Obstetrics clinic at the hospital of Didimotichon in 2005 - 2011. In Greece of economic crisis, many women no longer address to private Obstetric clinics.

**Table 2:** Annual inpatient number per hospital, clinic and year

| Hospital | Clinics | Year | % difference |
|---|---|---|---|

| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kavala | Pathology | 7870 | 7861 | 7472 | 6969 | 6445 | 7157 | 8547 | 8,6 | -18,1 | 32,6 |
| | Surgical | 3194 | 2966 | 2721 | 2706 | 2817 | 2877 | 3544 | 11,0 | -11,8 | 25,8 |
| | Obstetrics | 2152 | 2304 | 1925 | 2166 | 2268 | 2256 | 2379 | 10,5 | 5,4 | 4,9 |
| | Pediatric | 1693 | 1524 | 1347 | 1510 | 1411 | 1082 | 1015 | -40,0 | -16,7 | -28,1 |
| Xanthi | Pathology | 5364 | 4655 | 4601 | 5002 | 4237 | 5141 | 5771 | 7,6 | -21,0 | 36,2 |
| | Surgical | 4212 | 3751 | 3498 | 3104 | 2868 | 2678 | 3187 | -24,3 | -31,9 | 11,1 |
| | Obstetrics | 2497 | 2632 | 2610 | 2704 | 2565 | 2518 | 2540 | 1,7 | 2,7 | -1,0 |
| | Pediatric | 1736 | 1662 | 1764 | 1519 | 1528 | 1769 | 1714 | -1,3 | -12,0 | 12,2 |
| Didimotichon | Pathology | 3715 | 4061 | 3842 | 3198 | 2849 | 3143 | 3208 | -13,6 | -23,3 | 12,6 |
| | Surgical | 2533 | 2643 | 2545 | 2389 | 2725 | 2826 | 2041 | -19,4 | 7,6 | -25,1 |
| | Obstetrics | 562 | 684 | 959 | 982 | 1076 | 1050 | 976 | 73,7 | 91,5 | -9,3 |
| | Pediatric | | | | | | | 53 | | | |
| Drama | Pathology | | | | | 3820 | 4317 | 4499 | 4728 | | 9,5 |
| | Surgical | | | | | 2843 | 3148 | 2823 | 3683 | | 17,0 |
| | Obstetrics | | | | | 1257 | 1200 | 1227 | 1245 | | 3,8 |
| | Pediatric | | | | | 1154 | 1231 | 1194 | 985 | | -20,0 |
| Komotini | Pathology | | | | | 2856 | 2419 | 2444 | 2238 | | -7,5 |
| | Surgical | | | | | 2856 | 2419 | 2444 | 2238 | | -7,5 |
| | Obstetrics | | | | | 521 | 528 | 554 | 479 | | -9,3 |
| | Pediatric | | | | | 1142 | 1168 | 880 | 813 | | -30,4 |
| lexandroupolis | Pathology | | | | | 2812 | 2817 | 3075 | 2903 | | 3,1 |
| | Surgical | | | | | 2310 | 2343 | 2189 | 2565 | | 9,5 |
| | Obstetrics | | | | | 3156 | 3083 | 3094 | 3248 | | 5,4 |
| | Pediatric | | | | | 2158 | 2213 | 2134 | 2011 | | -9,1 |

Table 3 presents the number of annual inpatient days per hospital, clinic and year. The paradox is that while in some clinics (eg. Pathology and Surgical Clinics of Kavala's hospital, Surgical Clinic of Alexandroupolis' hospital) the annual number of patients has increased (Table 2), at the same time the total number of annual inpatient days has been reduced (Table 3).

**Table 3:** Total number of annual inpatient days per hospital, clinic and year

| Hospital | Clinics | Year | % difference |
|---|---|---|---|

| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kavala | Pathology | 18426 | 17860 | 16633 | 16684 | 16798 | 17038 | 18454 | 0,2 | -8,8 | 9,9 |
| | Surgical | 9481 | 8564 | 7901 | 7770 | 7959 | 7396 | 8447 | -10,9 | -16,1 | 6,1 |
| | Obstetrics | 6909 | 6918 | 6200 | 6254 | 6376 | 7107 | 7228 | 4,6 | -7,7 | 13,4 |
| | Pediatric | 4596 | 4376 | 3715 | 3969 | 3418 | 2985 | 2849 | -38,0 | -25,6 | -16,6 |
| Xanthi | Pathology | 13504 | 12381 | 12517 | 13292 | 11103 | 12292 | 14258 | 5,6 | -17,8 | 28,4 |
| | Surgical | 11945 | 11117 | 11273 | 9199 | 8929 | 9241 | 10664 | -10,7 | -25,2 | 19,4 |
| | Obstetrics | 7678 | 8033 | 7841 | 7975 | 7487 | 7220 | 7834 | 2,0 | -2,5 | 4,6 |
| | Pediatric | 3789 | 3710 | 3557 | 3155 | 2684 | 3148 | 3479 | -8,2 | -29,2 | 29,6 |
| Didimotichon | Pathology | 11604 | 12113 | 11656 | 11126 | 9713 | 10371 | 11274 | -2,8 | -16,3 | 16,1 |
| | Surgical | 9869 | 9799 | 10325 | 10179 | 10559 | 10729 | 9928 | 0,6 | 7,0 | -6,0 |
| | Obstetrics | 1515 | 2044 | 2907 | 2819 | 2913 | 2739 | 3004 | 98,3 | 92,3 | 3,1 |
| | Pediatric | | | | | | | 141 | | | |
| Drama | Pathology | | | | 15317 | 15687 | 9380 | 17709 | | | 12,9 |
| | Surgical | | | | 5487 | 5531 | 9819 | 5214 | | | -5,7 |
| | Obstetrics | | | | 5401 | 5064 | 5181 | 5043 | | | -0,4 |
| | Pediatric | | | | 3027 | 3218 | 2996 | 2894 | | | -10,1 |
| Komotini | Pathology | | | | 12218 | 12213 | 11253 | 11015 | | | -9,8 |
| | Surgical | | | | 9449 | 8844 | 8536 | 6889 | | | -22,1 |
| | Obstetrics | | | | 2407 | 2160 | 2224 | 1806 | | | -16,4 |
| | Pediatric | | | | 4017 | 3993 | 3036 | 2808 | | | -29,7 |
| Alexandroupolis | Pathology | | | | 16286 | 15466 | 15873 | 16005 | | | 3,5 |
| | Surgical | | | | 7515 | 7692 | 7096 | 6665 | | | -13,4 |
| | Obstetrics | | | | 14538 | 13923 | 14709 | 14823 | | | 6,5 |
| | Pediatric | | | | 6640 | 6759 | 6156 | 5910 | | | -12,6 |

In Table 4 we observe that the differences in mean days of inpatients' stay at the specific four clinics of hospitals do not relate to the year but mainly to the hospital and the clinic.

**Table 4:** Mean days of inpatients' stay per hospital, clinic and year

| Hospital | Clinics | Year | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| Kavala | Pathology | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Surgical | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Obstetrics | 3 | 4 | 4 | 3 | 3 | 4 | 3 |
| | Pediatric | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| Xanthi | Pathology | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Surgical | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Obstetrics | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Pediatric | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Didimotichon | Pathology | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Surgical | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | Obstetrics | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Drama | Pathology | | | | 2 | 2 | 2 | 2 |
| | Surgical | | | | 3 | 4 | 4 | 4 |
| | Obstetrics | | | | 4 | 4 | 4 | 4 |
| | Pediatric | | | | 3 | 3 | 3 | 3 |
| Komotini | Pathology | | | | 4 | 4 | 4 | 4 |
| | Surgical | | | | 3 | 3 | 3 | N/A |
| | Obstetrics | | | | 5 | 4 | 4 | 4 |
| | Pediatric | | | | 4 | 3 | 3 | 3 |
| Alexandroupolis | Pathology | | | | 4 | 4 | 3 | 3 |
| | Surgical | | | | 4 | 4 | 4 | 4 |
| | Obstetrics | | | | 3 | 3 | 3 | 3 |
| | Pediatric | | | | 3 | 3 | 3 | 3 |

N/A: not available data

**Inpatient without income or insurance**

The number of inpatient without income per hospital, clinic and year is shown in Table 5. The differences between 2009 - the initial year of economic crisis in Greece - and 2011 confirm an increase in the number of inpatients without income in most clinics of Xanthi's, Didimotichon's, Alexandroupolis' and Komotini's hospitals.

**Table 5:** Number of inpatient without income per hospital, clinic and year

| Hospital | Clinics | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | Pathology | 119 | 75 | 59 | 95 | 84 | 69 | 64 | -46,2 | -29,4 | -23,8 |
| | Surgical | 69 | 80 | 57 | 74 | 62 | 45 | 63 | -8,7 | -10,1 | 1,6 |
| | Obstetrics | 53 | 79 | 57 | 59 | 75 | 29 | 66 | 24,5 | 41,5 | -12,0 |
| | Pediatric | 90 | 83 | 66 | 47 | 54 | 33 | 37 | -58,9 | -40,0 | -31,5 |
| Xanthi | Pathology | 128 | 175 | 171 | 144 | 113 | 122 | 157 | 22,7 | -11,7 | 38,9 |
| | Surgical | 130 | 129 | 144 | 103 | 113 | 90 | 142 | 9,2 | -13,1 | 25,7 |
| | Obstetrics | 130 | 129 | 144 | 103 | 113 | 90 | 142 | 9,2 | -13,1 | 25,7 |
| | Pediatric | 202 | 194 | 192 | 144 | 136 | 193 | 154 | -23,8 | -32,7 | 13,2 |
| Didimotichon | Pathology | 80 | 114 | 112 | 93 | 88 | 117 | 120 | 50,0 | 10,0 | 36,4 |
| | Surgical | 66 | 59 | 67 | 31 | 36 | 47 | 42 | -36,4 | -45,5 | 16,7 |
| | Obstetrics | 66 | 59 | 67 | 31 | 36 | 47 | 42 | -36,4 | -45,5 | 16,7 |
| | Pediatric | | | | | | | 1 | | | |
| Drama | Pathology | | | | 81 | 104 | 85 | 80 | | | -23,1 |
| | Surgical | | | | 88 | 85 | 91 | 76 | | | -10,6 |
| | Obstetrics | | | | 98 | 76 | 97 | 91 | | | 19,7 |
| | Pediatric | | | | 63 | 54 | 53 | 26 | | | -51,9 |
| Komotini | Pathology | | | | 167 | 124 | 126 | 134 | | | 8,1 |
| | Surgical | | | | 145 | 104 | 121 | 122 | | | 17,3 |
| | Obstetrics | | | | 85 | 106 | 86 | 92 | | | -13,2 |
| | Pediatric | | | | 218 | 238 | 154 | 169 | | | -29,0 |
| Alexandroupolis | Pathology | | | | 86 | 78 | 110 | 107 | | | 37,2 |
| | Surgical | | | | 68 | 73 | 87 | 90 | | | 23,3 |
| | Obstetrics | | | | 66 | 79 | 76 | 98 | | | 24,1 |
| | Pediatric | | | | 225 | 238 | 179 | 185 | | | -22,3 |

Table 6 shows the percentage of inpatients without insurance per clinic and year. These types of data are only available for Kavala's hospital. It is clear that these percentages are estimated relatively low. The highest of them appears in Pediatric clinic in which approximately one out of twenty children's health care is not covered by medical insurance. Moreover, it is worth-mentioning the almost doubling percentages of medical uninsured women in the Obstetrics clinic, between years 2005 and 2011.

**Table 6:** Percent of inpatient without insurance per clinic and year

| Hospital | Clinics | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | Pathology | 0,75 | 0,9 | 0,65 | 1 | 0,8 | 1,15 | 1,1 | 46,7 | 6,7 | 37,5 |
| | Surgical | 2,4 | 2,1 | 1,95 | 1,95 | 2 | 2,1 | 2,65 | 10,4 | -16,7 | 32,5 |
| | Obstetrics | 0,9 | 1,4 | 1,5 | 1,5 | 1,8 | 1,7 | 1,6 | 77,8 | 100,0 | -11,1 |
| | Pediatric | 3,9 | 3,6 | 3,8 | 3,9 | 4,5 | 7,1 | 3,7 | -5,1 | 15,4 | -17,8 |

## Hospital evaluation indices

According to WHO report (2003), the evaluation indices are the instruments used to give insight into clinic's or hospital's operations and are quite useful for comparing both clinics and hospitals, with the predetermined operating standards.

These indices quantify the results of the operations for a period of time and can be helpful in the effort of a continuous improvement through highlighting the clinics or hospital's strengths and weaknesses. They are mainly indicators of qualitative and quantitative characteristics, such as the effectiveness and efficiency of health service units. They are also necessary for the evaluation process of any measures taken to improve the quality of these units. In particular, below are presented some hospital evaluation indices.

*Percentage of bed coverage*

The term "percentage of bed coverage" refers to the "total annual days of inpatients" *100 / (number of beds * 365). , Although Table 2 has shown that the number of patients increased between years 2005 and 2011, Table 7 shows that the percentage of bed coverage per hospital has been decreased at the same time period in most clinics under study. The Obstetrics clinic of Didimotichon's hospital is an exception, as it was consistent with the large increase of incidents that have been managed, as shown in Tables 2 and 3.

**Table 7:** Percentage of bed coverage per hospital, clinic and year

| Hospital | Clinics | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | Pathology | 73,5 | 71,5 | 67 | 68,5 | 72,5 | 67,5 | 69 | -6,12 | -1,36 | -4,83 |
| | Surgical | 52,5 | 47,5 | 44 | 43 | 44,5 | 40 | 54,5 | 3,81 | -15,24 | 22,47 |
| | Obstetrics | 47 | 48 | 44 | 40 | 39 | 44 | 44 | -6,38 | -17,02 | 12,82 |
| | Pediatric | 52 | 50 | 42 | 45 | 39 | 34 | 39 | -25,00 | -25,00 | 0,00 |
| Xanthi | Pathology | 89 | 86,7 | 90,5 | 94,9 | 80,3 | 83,1 | 91,4 | 2,70 | -9,78 | 13,82 |
| | Surgical | 73,2 | 69,9 | 71,1 | 57,3 | 55,9 | 55,9 | 63,8 | -12,84 | -23,63 | 14,13 |
| | Obstetrics | 61,9 | 64,7 | 63,2 | 64,1 | 60,3 | 58,2 | 63,1 | 1,94 | -2,58 | 4,64 |
| | Pediatric | 39,9 | 39,1 | 37,5 | 33,2 | 28,3 | 33,2 | 36,7 | -8,02 | -29,07 | 29,68 |
| Didimotichon | Pathology | 106 | 110,6 | 106,5 | 101,3 | 88,7 | 94,7 | 103 | -2,83 | -16,32 | 16,12 |
| | Surgical | 0 | 0 | 91,3 | 89,7 | 93,3 | 94,8 | 87,7 | | | -6,00 |
| | Obstetrics | 21,9 | 29,5 | 41,9 | 40,5 | 42 | 39,5 | 43,3 | 97,72 | 91,78 | 3,10 |
| Drama | Pathology | | | | 42 | 45 | 45 | 50 | | | 11,11 |
| | Surgical | | | | 34 | 38 | 37 | 36 | | | -5,26 |
| | Obstetrics | | | | 59 | 56 | 57 | 55 | | | -1,79 |
| | Pediatric | | | | 41 | 44 | 41 | 40 | | | -9,09 |
| Komotini | Pathology | | | | 68,1 | 68,3 | 62,9 | 61,6 | | | -9,81 |
| | Surgical | | | | 73,8 | 69,2 | 66,8 | 53,9 | | | -22,11 |
| | Obstetrics | | | | 32,9 | 29,6 | 30,5 | 24,7 | | | -16,55 |
| | Pediatric | | | | 54,9 | 54,7 | 41,6 | 38,5 | | | -29,62 |
| Alexandroupolis | Pathology | | | | 89 | 84,15 | 81,55 | 78,9 | | | -6,24 |
| | Surgical | | | | 61,5 | 63,4 | 59,63 | 62,17 | | | -1,95 |
| | Obstetrics | | | | 69,95 | 70,45 | 72,35 | 73,9 | | | 4,90 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Pediatric | 45,4 | 46,3 | 42,2 | 40,5 | -12,53 |

*Switching time*

Two composite indicators, which are used to interpret to what extent the infrastructure and services of each hospital are utilized for inpatients' hospitalization, are the "Change interval" and "Patient input rate" indicators (Hospital's operational restructuring plan, 2010).

The Change interval measures the rate of patient's alternation in a particular time period or the average number of days that the bed was left vacant. Calculated as: "(365/ patient input rate) – average length of hospitalization", and it is expressed in days. We only have data about Change interval for Kavala's, Xanthi's and Didimotichon's hospitals.

It is observed that the Pathology clinic has the lower Change interval and, in general, all four clinics of Kavala's hospital exhibit the highest values of Change interval. This may happen because the hospitals of Xanthi and Didimotichon are considered relatively small and their most severe cases are often sent to those of Kavala and Alexandroupolis, respectively.

**Table 8:** Change interval per hospital, clinic and year

| Hospital | Clinics | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | Pathology | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 0,0 | 0,0 | 0,0 |
| | Surgical | 3 | 3 | 4 | 4 | 4 | 4 | 2 | -33,3 | 33,3 | -50,0 |
| | Obstetrics | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 0,0 | 25,0 | -20,0 |
| | Pediatric | 2 | 3 | 4 | 3 | 4 | 5 | 4 | 100,0 | 100,0 | 0,0 |
| Xanthi | Pathology | 0,5 | 0,5 | 0,4 | 0,2 | 0,8 | 0,7 | 0,4 | -20,0 | 60,0 | -50,0 |
| | Surgical | 1,2 | 1,4 | 1,4 | 2,4 | 2,7 | 3,0 | 2,1 | 75,0 | 125,0 | -22,2 |
| | Obstetrics | 1,9 | 1,7 | 1,8 | 1,7 | 1,9 | 2,1 | 1,8 | -5,3 | 0,0 | -5,3 |
| | Pediatric | 1,9 | 1,7 | 1,8 | 1,7 | 1,9 | 2,1 | 1,8 | -5,3 | 0,0 | -5,3 |
| Didimotichon | Pathology | -0,2 | -0,3 | -0,2 | 0,0 | 0,4 | 0,2 | -0,1 | -50,0 | -300,0 | -125,0 |
| | Surgical | | | 0,4 | 0,4 | 0,3 | 0,2 | 0,6 | | | 100,0 |
| | Obstetrics | 9,5 | 7,1 | 4,2 | 4,2 | 3,7 | 3,9 | 3,9 | -58,9 | -61,1 | 5,4 |

*Patient input rate*

The Patient input rate measures the rate at which the available hospital beds are used in a given period of time. It is expressed as the number of hospitalized patients per bed per year and it denotes the extent of exploitation of hospital's infrastructure (Hospitals operational restructuring plan, 2010).

Data about Patient input rate are only available for Kavala's, Xanthi's and Didimotichon's hospitals. The highest values in these three hospitals occur inPathology clinic. The lower value of patient input rate is presented in the Obstetrics clinic of Didimotichon hospital. Generally, it seems that there is no particular time trend over the years of studying.

**Table 9:** Patient input rate per hospital, clinic and year

| Hospital | Clinics | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | Pathology | 95 | 95 | 93,5 | 90,5 | 92 | 81,5 | 81 | -14,7 | -3,2 | -12,0 |
| | Surgical | 63 | 58,5 | 54,5 | 53,5 | 57 | 53,5 | 75 | 19,0 | -9,5 | 31,6 |
| | Obstetrics | 51 | 50 | 45 | 43 | 42 | 44 | 46 | -9,8 | -17,6 | 9,5 |
| | Pediatric | 71 | 64 | 56 | 63 | 59 | 45 | 51 | -28,2 | -16,9 | -13,6 |
| Xanthi | Pathology | 85,7 | 89,4 | 97,3 | 103,4 | 91,1 | 92,9 | 84,9 | -0,9 | 6,3 | -6,8 |
| | Surgical | 82,9 | 79,7 | 74,4 | 64,7 | 59,9 | 54,0 | 63,5 | -23,4 | -27,7 | 6,0 |
| | Obstetrics | 73,4 | 77,4 | 76,8 | 79,5 | 75,4 | 74,1 | 74,7 | 1,8 | 2,7 | -0,9 |
| | Pediatric | 66,8 | 63,9 | 67,9 | 58,4 | 58,8 | 68,0 | 65,9 | -1,3 | -12,0 | 12,1 |
| Didimotichon | Pathology | 130,5 | 140,2 | 132,2 | 110,5 | 98,1 | 108,6 | 111,4 | -14,6 | -24,8 | 13,6 |
| | Surgical | | | 90,5 | 86,3 | 96,1 | 99,7 | 75,4 | | | -21,5 |
| | Obstetrics | 30,0 | 36,5 | 51,1 | 52,3 | 57,4 | 56,3 | 52,5 | 75,0 | 91,3 | -8,5 |

*Area of responsibility*

Every Greek public hospital has an area of responsibility, which in most cases is the geographical prefecture in which it resides. However, patients from neighboring prefectures or the rest of Greece, sometimes are hospitalized in Kavala's hospital, either because they happened to be in the prefecture of Kavala, or because they were unable to be treated by the hospital of their prefecture, or possibly because it is the hospital they prefer for hospitalization. Available data refer to the percentage of hospitalized patients who live within the area of responsibility only for Kavala's, Xanthi's and Didimotichon's hospitals.

It is confirmed that in all under study hospitals patients derived in overwhelming majority from each hospital's area of responsibility.. It is remarkable, though, that Didimotichon's hospital has no patients from regions outside of its responsibility area. This may happens because it is the smallest hospital in the region under study and the patients usually prefer to address for non-emergency first aid at a nearby and greater hospital.

**Table 10:** Percentage of hospitalized patients who live within the area of responsibility per hospital, clinic and year

| Hospital | Clinics | Year | | | | | | | % difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011-2005 | 2009-2005 | 2011-2009 |
| Kavala | Pathology | 93,75 | 93,7 | 94,35 | 93,95 | 93,65 | 93,95 | 93,6 | -0,2 | -0,1 | -0,1 |
| | Surgical | 91,45 | 91,45 | 90,55 | 91,7 | 90,75 | 90,45 | 90,75 | -0,8 | -0,8 | 0,0 |
| | Obstetrics | 93,7 | 93,3 | 94,4 | 95,8 | 93,05 | 94,55 | 90,6 | -3,3 | -0,7 | -2,6 |
| | Pediatric | 94 | 93,5 | 92,1 | 93,6 | 94,5 | 93,5 | 91,2 | -3,0 | 0,5 | -3,5 |
| Xanthi | Pathology | 93,8 | 95 | 95 | 93,3 | 93,8 | 94,6 | 94 | 0,2 | 0,0 | 0,2 |
| | Surgical | 93,3 | 93,8 | 93,6 | 93,2 | 92,1 | 92,9 | 93,2 | -0,1 | -1,3 | 1,2 |
| | Obstetrics | 93,1 | 94 | 93,5 | 92,9 | 93,3 | 93,9 | 93,7 | 0,6 | 0,2 | 0,4 |
| | Pediatric | 96,9 | 95,8 | 95,6 | 96,4 | 90 | 96,3 | 94,4 | -2,6 | -7,1 | 4,9 |
| Didimotichon | Pathology | 99,1 | 99,2 | 99,4 | 99,3 | 98,8 | 98,7 | 98,2 | -0,9 | -0,3 | -0,6 |
| | Surgical | 97,7 | 98,3 | 97,7 | 96,3 | 96,3 | 95,4 | 93,6 | -4,2 | -1,4 | -2,8 |

## Conclusions

This paper presented the percentage differences among measurements for the years 2005, 2009 and 2011. In most hospitals the number of treated patients appeared to increase in years 2010 and 2011. This is also observed for patients in most hospitals and clinics for the period 2009 - 2011, except the pediatric clinic where a reduction took place. Moreover, there is an increase in the number of inpatients without income in most of the clinics of Xanthi's, Didimotichon's, Alexandroupolis' and Komotini's hospitals. Additionally, significant is the increase of uninsured women in the Obstetrics clinic. However, the percentage of bed coverage per hospital has been decreased at the same period for these four clinics, as all hospitals are obliged to do so.

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