# Organizational Structure of the Croatian Family Practice: A Longitudinal Study Based on Routinely Collected Data

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#### ABSTRACT

This study was undertaken with the main aim of determining the trends in the number of family doctors' (FD), gender and educational structure, working status and the number of patients per FD between 1995 and 2013. As the main source of data collection served the Croatian Health Service Yearbooks and Croatian Health Insurance Fund (CHIF) databases on practices and FDs contracting in 2013. Obtained results indicated that the number of contracted FDs increased until 2007, then decreased, and again increased until 2350 in 2013. Average number of patients on FDs list was 1987 in 2012. Less than 50% FDs were specialist in family medicine, 70.3% of them were self-employed with the CHIF contract, and 81% were women. 123 practices planned by the Network did not have contracting FD in 2013. The lack of FDs, the huge number of patients over the standard number, and the location of the missing practices within the rural communities, together make Croatian FM practices less accessible.

Key words: family practice, education structure, employment status, list size, Croatia

#### Introduction

Since the beginning of the 1950's, family medicine (FM) in Croatia has functioned as an integral part of the Health Centres, larger organizational structures responsible for the provision of primary health care (PHC) for the people living in a "catchment" area, usually of between 10 000 and 50 000 inhabitants. Family doctors (FD) were mostly responsible for the adult population, while pediatricians, school medicine doctors and gynecologists were responsible for pre-school children, school children and women, respectively. Only in remote areas and islands were FDs responsible for all population groups. FDs worked in teams, with a practice nurse and a public health nurse. Since 1990, several health care (HC) reforms have been introduced, and these have had certain implications for the organization and function of the FP.

The first change was the introduction of a free choice of doctors, generally implemented from 1993¹. The patients were given the right and responsibility to choose their own FD, pediatrician and gynecologist as their personal doctors. The FDs' responsibility for the patients

from a defined territory was replaced by responsibility for the patients on their lists, patients who had freely chosen them. The second change implemented was a restriction on government investment in the facilities and their decentralization in 1997<sup>2</sup>. The investment previously made by central government became the responsibility of the local government, which meant that local government became, not only the owners of the health center facilities, but also responsible for the organization and function of PHC at the local level.

Perhaps, the most important reform, which had significant implications for the FM, was the process of »privatization« which happened in 1996³. FDs as well as others PHC doctors became private entrepreneurs, with the obligation of contracting with the Croatian Health Insurance Fund (CHIF). Contractually, they became obliged to provide primary health care for the patients on their lists. As private entrepreneurs, they were contractually obliged to employ a nurse and other auxiliary staff as

team members. The public health nurses continued to work in the health centers and remained responsible for the population of a defined territory. However, this process of privatization has been implemented gradually, and therefore a certain number of FDs have continued working within health centers as employees, or salaried doctors, but with the same contractual rights and obligations as the private FDs. For the purposes of this article, the FDs who function on a private basis are called self-employed, and those employed within the health centers, employed FDs.

The self-employed FDs usually remain working at the same facilities or practices, initially rented, and from 2010, taken on a ten-year concession from the local government<sup>4</sup>. Those FDs with privately owned facilities/practices were also able to enter into a concession. However, only practices defined by the Network of Public FDs Practices, independently of ownership, were allowed to enter into a concession contract. The Network of Public Family Doctors Practices was first established in 1996, at which time they determined that there should be one FD per practice, and this has remained almost unchanged until now<sup>5</sup>. The planned numbers are usually established in relation to the geographical distribution of the population, geographical characteristics and local circumstances. The standard number of patients per FD has been changed several times, varying from 1500 to 1700 patients, and the plan for the future is that it shall be returned to a level of 1500 patients<sup>6</sup>.

Several studies have tried to investigate the organizational structure of the FM in Croatia, especially those structures related to the implementation of the HC reforms<sup>7,8</sup>. However, the scope of these studies was narrow and the follow-up period was short. This study was therefore undertaken with the main aim of determining the longitudinal trends in the number of FD teams, the gender and educational structure of the team members, their working status (self-employed or employed FDs), and the number of patients per FD between 1995 and 2013. The second aim was to consider whether the observed trends were related to the introduction of HC reforms.

# **Materials and Methods**

The study is observational and largely longitudinal, based on routinely collected data, available on the web-pages of the institutions responsible for their collection and publishing. The main source of data collection was the Croatian Health Service Yearbooks, issued by the Croatian Institute of Public Health, between 1995 and 2012<sup>9</sup>. The fact that the data in the yearbooks were collected in the same way from 1995 until 2012 was the reason for choosing this period for observation and study. The data used in the study were collected in the same way that they are presented in the yearbooks and for Croatia in total. Information about the number of FD teams and their level of education (FM specialists, basic medical and other doctors, college or high school educated nurses, among others) was collected for each year

of the period under investigation. The numbers of patients on the FDs' lists were collected as well, and the average number of patients per FD was calculated for the each year of the study period.

One of the study's aims was to determine the gender and age of the FDs, as well as their employment status, that is if they were self-employed, or employed by the health centers. Because this data was missing from the yearbooks, another database, from the CHIF web-pages, was searched. The data on gender and employment status were found and collected, but only for the year 2013<sup>10</sup>. Data relating to the FDs' ages were also missing. From the same database, data on the exact number of patients on the FDs' lists in 2013 were collected. The distribution of FDs according to the number of patients on their lists was calculated too. From the same CHIF web-pages, the data relating to the FDs' geographic distribution, and the location of their practices as planned by the Network, were obtained as well<sup>11</sup>. To give a clearer picture: a practice, as planned by the Network, has a physical meaning in that it is a facility in which one FD team works. In order to investigate whether there is a lack of FDs, the number of planned practices was compared with the number of contracting FDs currently working in these practices, but this comparison only has data from 2013. According to the planned organizational structure. Croatia is divided into 20 counties, with 125 cities and 422 rural communities. It was therefore possible to obtain the number of planned and of real contracting FDs, in relation to the location of their practices, and in particular whether they are located in the cities or in rural communities.

The collected data were analyzed using Microsoft Office (Excel). The results are presented graphically in tables reflecting number and frequency, while trends are displayed as line charts.

### Results

The results are presented in two parts. In the first part, the results of the computed data, obtained from the yearbooks for the entire period 1995–2012, are presented. In the second part, the results of the computed data obtained from the CHIF web-pages, relating to the number and location of the practices, as well as to the exact number of patients with contracting FDs in 2013, are presented.

Trends in the number of FDs teams, educational structure, and average number of patients

The number of FD teams in Croatia increased from 2,047 in 1995 to 2,377 teams in 2002, and after that decreased slightly to 2,262 in 2007, and then increased again, to 2,308 in 2012 (Figure 1).

In 1995, the majority of doctors working in FM had a basic medical education (54.7%), while 34.8% were doctors who had completed their specialist training in family medicine. The number of FM specialists was relatively stable until 2007, after which it increased to 47.5% in

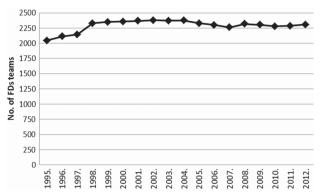


Fig. 1. Trends in number of family doctor teams in Croatia, 1995–2012.

2012. Consequently, the proportion of medical doctors has decreased since 2007. Around 10% of other doctors, mostly specialists in school and occupational medicine were also included within the FM. Since 2008, their numbers have slightly decreased. The majority of the practice nurses have finished their high school education, while a certain number do have a college education, although on a decreasing trend (Figure 2).

The average number of patients on the FDs' lists declined, from 1,850 in 1995 to 1,578 in 2000, and thereafter increased to 1,978 in 2010, when it was at its highest (Figure 3).

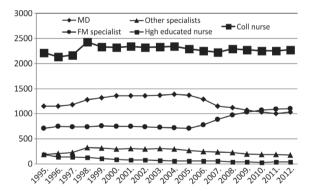


Fig. 2. Trends in the educational structure of family practice teams in Croatia, 1995–2012.

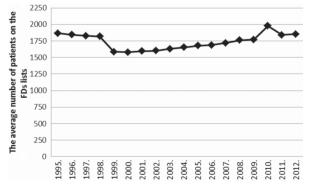


Fig. 3. Trends in the average number of patients on the FDs' lists in Croatia, 1995–2012.

The employment status, the exact number of patients on FD's lists and the location of the practices – CHIF data from 2013

Based on the CHIF data from 2013, it had contracted with 2,350 FDs (more than in 2012), and several additional practices, which did not yet have doctors, were contracting with the health center. Of the 2,350 contracting FDs, 1,653 (70.3%) were self-employed and 697 (29.7) were employed. 80.8% of the doctors were female. The data about gender were missing for 59 doctors.

The number of patients on the FDs' lists was not equally distributed among the doctors: In 2013 the number of patients on one FD's list could range from 1,000 to more than 2,100. 63% of employed FDs had less than 1,600 patients on their lists, while 73% of self-employed FDs had over 1,600 patients on their lists; among them 34% over 2,000 patients (Figure 4).

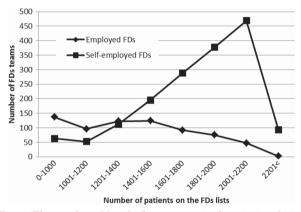


Fig. 4. The number of family doctor teams in Croatia in relation to the number of patients on their lists – CHIF data from 2013.

In 2013, 123 FD practices were short of a FD: they had been planned by the Network of Family Doctors' Practices, but in 2013 they did not have a contracting FD to work in them. Geographical differences across Croatian could be observed: Among the practices without doctors, 115 were planned for the rural communities and 38 for the cities. In other areas there were surpluses, where there were more contracted practices than had been planned; 28 of these were located in cities and 4 in rural communities. Differences between counties were also observed: In Zagrebačka County 18 practices were missing, in Slavonsko-brodska 16, and in Varaždinska County 11 practices, most of these in the rural communities (Table 1).

In some small communities, mostly the islands with as few as 499 inhabitants, practices were both planned and contracted. But in other communities, with more than 1,000 inhabitants, there were no planned practices and no contracting practices, including one with over 2000 inhabitants. There were even the communities with over 3,000 inhabitants with the planned practices, but no contracting FD (Figure 5).

TABLE 1							
THE NUMBER OF PLANNED AND CONTRACTED PRACTICES IN RELATION TO THEIR LOCATIONS							
(CITIES OR COMMUNITIES) IN CROATIA – CHIF DATA FROM 2013							

Counties	Planned	Contracted	Missed – total	Missed – cities	Surplus – cities	Missed – commun.	Surplus – commun.
Croatia	2462	2339	123	38	24	115	4
Bjelovarsko-bilogorska	66	67	1	0	1	0	0
Brodsko-posavska	92	76	16	1	2	17	0
Dubrovačko-neretvanska	82	78	4	1	1	4	0
Istarska	119	113	6	1	3	9	1
Karlovačka	76	76	0	0	1	1	0
Koprivničko-križevačka	65	57	8	0	1	9	0
Krapinsko-zagorska	76	76	0	0	1	3	2
Ličko-senjska	33	32	1	1	0	0	0
Međimurska	58	54	4	0	2	7	1
Osječko-baranjska	179	171	8	0	2	11	0
Požeško-slavonska	44	38	6	2	0	4	0
Primorsko-goranska	181	176	5	3	3	5	0
Sisačko-moslovačka	98	94	4	4	0	0	0
Splitsko-dalmtinska	272	263	9	1	5	13	0
Šibensko-kninska	68	64	4	2	0	2	0
Varaždinska	97	86	11	3	1	9	0
Virovitičko-podravska	48	45	3	1	1	3	0
Vukovarsko-srijemska	100	91	9	4	0	5	0
Zadarska	91	94	7	1	2	6	0
Zagreb	441	440	1	1	0	0	0
Zagrebačka	166	148	18	11	0	7	0

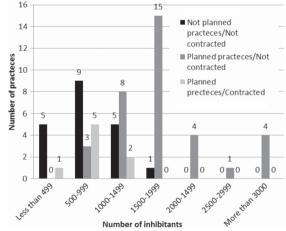


Fig. 5. Planned and contracted FDs in relation to the number of inhabitants of the settlement in which the practices should be located

## **Discussion**

The results of the study indicate that the number of FDs working in Croatian FM is insufficient. According to the Network of contracting FDs, they were short of 123 FDs in 2013. Consequently, the average number of pa-

tients per FD is increasing, with 1,978 patients per FD recorded in 2010, in comparison to the 1,700 defined by the Standards. In addition, large differences among the list sizes were recorded, with one-third of FDs having more than 2000 patients; these were mainly self-employed FDs, while those employed by the health centers had fewer than 1,600 patients. Regional differences were observed as well. But, the most important differences were observed between the cities and the rural communities: with the largest number of missing FDs being from practices located in the small communities.

The lack of FDs, the huge number of patients over the standard number, and the location of the missing practices within the rural communities, together make Croatian FM less accessible, especially to patients from the villages. It is not possible, from the results obtained, to draw concrete conclusions as to whether or not the introduction of health care (HC) reforms has had any influence, and if it has, to what extent. But, it is probable that the process of privatization, making the majority of FDs private entrepreneurs, responsible not only for patient care, but also for the business part of their work, did have a certain influence. It is documented in the literature that the reimbursement modalities do have influence on the organization and functioning of FPs<sup>12,13</sup>. Until 2004, FDs in Croatia were reimbursed only in relation

to the number of patients on their lists, as age-related fees per capita, meaning that the larger the list of patients the higher the amount of remuneration<sup>14</sup>. Therefore, it is not clear if the FDs tended to increase their patient lists as it would bring a higher income. In 2004, certain preventive procedures were reimbursed as a fee--for-service, but they were small relative to the higher reimbursement amounts<sup>15</sup>. Since 2004, fees for certain diagnostic and therapeutic procedures (DTPs) have gradually been implemented, but always under certain conditions<sup>16</sup>. For example, if one FD does not achieve a certain amount of reimbursement through the capitation fee defined by the contractor (CHIF) it is then possible to obtain 10-15% of that amount through the DTPs. It seems that such a reimbursement modality was not a motivational factor for the self-employed FDs to reduce the number of patients on their lists. The remuneration modalities are even more important, if the well-known fact is taken into account that the majority of Croatian FDs, like the Norwegians, favor the status of self-employment<sup>17</sup>.

The introduction of restrictions in government investment in health care facilities made the situation of FD practices, in the physical sense as being the space in which the FDs work, even more difficult. Some of the practices planned by the Croatian Network do not exist in reality. The counties and local communities are responsible for the provision of primary health care, including the health service infra-structures, and this includes the facilities, buildings and equipment<sup>4</sup>. However, there has always been a shortage of decentralized financial resources for such, usually huge, investments<sup>18</sup>. Special attention should be paid to the problems of the missing facilities and practices, because they are usually missing from the small communities, not in the cities, and in particular counties, creating inequalities in access to health care among Croatian citizens. While it is theoretically possible for an FD to enter the Network as a private owner of a facility, the costs will be greater than the earnings as determined by the CHIF contract. Therefore, the possibility of meeting public needs through private--public investment needs to be explored further in Croatia.

It is well documented in the literature that the availability of doctors is one of the main contributors to the quality of PHC. Shi et al. demonstrated that both total and specific mortalities are lower in those USA regions that have higher numbers of PHC doctors 19,20. The same situation with mortality is found in GB. Guilford and colleagues calculated that an increase of 15-20% in the number of general practitioners would lower the total mortality by 6%. Greater numbers of general practitioners have also been identified with lower numbers of hospitalizations from acute diseases, as well as from adolescent pregnancies<sup>21,22</sup>. Jarman presented data on hospital mortalities that relates more to the number of GPs than the number of hospital doctors<sup>23</sup>. The regional distribution of FDs has also been found to influence the overall health indicators: For instance, Macinko, Starfield and Shi calculated that 127,617 people could be saved from death if an equal distribution of PHC doctors could be established in the USA<sup>24</sup>. Generally, better access to PHC and a community orientation were related to better achievements in most of the common health care indicators, including the better self-health of the population<sup>25–27</sup>. All this evidence-based knowledge should be taken into account in planning a strategy to overcome the lack of FDs and the lack of facilities in Croatia.

The study results also drew attention to another group of challenges that should be taken into the consideration in future planning: The first is to reconsider the standard number of 1,700 patients per FD. According to the experience of other countries, a far smaller number of patients should be defined as the standard, but of course, this has to be determined in relation to the entire country's situation<sup>29,30</sup>. It is suggested that the planned number of 1500 patients per FD, as planned in the Strategy for the future, should be implemented<sup>6</sup>. The second is the educational qualifications of the FDs working in FM. Although, do to the ongoing Project of specialization in family medicine, the percentage of FDs having specialist training has increased to 47%, the majority of the FD doctors are still without any specialized FM training, or else are specialists in other specialities<sup>30</sup>. According to the EU regulations, every doctor working in FP should have completed a specialist training in family medicine, and this should be incorporated into the Croatian regulations, too. Today's standard of 50 FM trainees or residents per year is far less than is needed, and should be increased, together with the necessary financial resources<sup>31</sup>. This is even more important for Croatia since it has entered the EU, and it has in mind the processes of harmonization, including the level of cross-border health care<sup>32</sup>. The third challenge is the process of feminization happening in Croatian FM. In 1993, 63.5% of doctors working in FM were female, and in 2013 it was 80.8%, a situation that is happening all over the world<sup>33–35</sup>. Differences between male and female FDs are found in many aspects of the work. From the organizational point of view, the most important differences are the female FDs' preference for shorter working days, reduced out-of--hours service, regular and longer holidays, together increasing the need for more FDs<sup>36</sup>. The fourth challenge is the re-designing of the Network of FDs' Practices to match to the changes in the population and in the local circumstances.

This study is the first to observe the organizational changes that have occurred during the last 18 years. Its strength comes from the fact that it is based on the official national statistics data, used for different types of planning at a national and international level, and therefore providing valid comparisons. The consistent way in which the data were collected and are presented in the yearbooks permits the investigation of longitudinal time-trends for certain aspects of FM in Croatia. However, these trends are not enough to draw a complete picture of FM in Croatia. Other important aspects, such as the quality indicators, were not available from the routinely collected data presented in the yearbooks. There were

some inconsistencies between the data presented in the yearbooks and that obtained from the CHIF data-base, and these are also limitations of this study.

Despite their limitations, the study results can help stakeholders and decision-makers with future planning for PHC resources, especially the human resources, and in planning the facilities, as well as in reducing the observed inequalities in accessibility to PHC. Furthermore, the CHIF, as a contractor and spender of the public money, should be interested in collecting more data especially that related to the quality indicators, and should also make them publically available. These results could also be of great help in directing future research.

#### **Conclusions**

The results clearly indicate the shortage of FDs in Croatia, and consequently excessively large patient lists. The shortage of FDs and facilities are mostly in practices planned for the rural communities, and furthermore, regional differences are found. Almost half of the doctors are without specialist education in family medicine. The results should serve as resources for future PHC planning, and also help future research to delve more deeply into the structure and quality of Croatian family medicine.

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# ORGANIZACIJSKA STRUKTURA TIMOVA U DJELATNOSTI OM U HRVATSKOJ: LONGITUDINALNA STUDIJA NA TEMELJU RUTINSKI PRIKUPLJENIH PODATAKA

# SAŽETAK

Osnovni cilj studije je bio ispitati trendove kretanja broja, obrazovne strukture i vrste uposlenosti, te broja pacijenata u obiteljskoj medicini u Hrvatskoj, kao i odnos planiranih i ugovorenih tiomova. Osnovna baza za prikupljanje podataka su bili Hrvatski zdravstveno-statistički ljetopisi od 1995. do 2012. godine, a dodatno mreža ordinacija i broj liječnika obiteljske medicine (LOM) ugovorenih s Hrvatskim zavodom za zdravstveno osiguranje (HZZO) u 2013. godini. Broj ugovorenih timova LOM se povećavao do 2007, zatim se smanjivao, da bi u 2013. iznosio 2350. Prosječan broj pacijenata u 2012. je iznosi 1978. Manje od 50% su liječnici bez specijalizacije iz obiteljske medicine, 70,3% njih su privatnici u ugovoru s HZZO-om, a 81% su žene. 123 ordinacija koje su planirane mrežom nemaju ugovorenog LOM, uglavnom smještene na selima. Nedostatak ugovorenih LOM, velik broj pacijenata na njihoim listama, čini OM u Hrvatskoj manje dostupnom, osobito pacijentima s ruralnih podučja.