

Trends in the Morbidity of Pre-school Children Registered in Family Medicine and Primary Pediatrics in Croatia: 1995–2012

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ABSTRACT

Primary health care for pre-school children in Croatia is provided by the primary pediatricians (PPs) in urban, or family doctors (FDs) in rural areas. The main aim of the study was to determine the trends in morbidity as recorded by FDs, and those recorded by PPs, from 1995–2012. The study was based on the routinely collected, national statistics data from the Croatian Health Service Yearbooks. The results obtained clearly indicate that there are no differences in the morbidity patterns registered by FDs and PPs. The average annual number of diagnoses per child, and the most frequently registered diagnostic groups were almost the same for both services. The number of children under the particular service was the only difference, with a decreasing trend in family medicine and an increasing in pediatric service. The national routine health statistics system does not provide enough information to permit a deeper analysis of the childhood morbidity in two services.

Key words: pre-school children, morbidity, family medicine, primary pediatrics, Croatia

Introduction

Although health care systems in European countries show many similarities, they also show differences, arising from the historical, cultural, political and economic features of the respective countries¹. According to the available research, conducted across 29 European countries, in 41% of the countries family doctors (FDs) are the main providers of primary health care (PHC) for children, in 24% of countries primary pediatricians (PPs) are the main providers, while the both services are equally involved in 35% of countries².

PHC for pre-school children in Croatia has, for decades, been organized through dispensaries led by the PPs in urban areas, or by the FDs in rural and remote areas where PPs have not been available. The PP and FD services have been traditionally organized through the health centers, larger organizations responsible for the provision of PHC to the citizens of a local catchment area. PPs and FDs were previously responsible for the children of the defined area, mostly a relatively small community. But, since the beginning of the 1990s, a

number of regulations, or mini health care (HC) reforms, have been introduced. The first reform was to allow patients a free choice of doctors, and this was fully introduced in 1993³. Every Croatian citizen now had the freedom to choose his or her preferred PHC doctor. Parents were also given the right to choose a doctor for their children. The community approach was abandoned, and the PPs and FDs became responsible for the provision of both curative and preventive care for the children on their lists. In 1996, a second mini HC reform was introduced in the form of the privatization of the PHC. The PPs and FDs, as well as other PHC doctors, became private entrepreneurs with the responsibility to contract with the Croatian Health Insurance Fund (CHIF)⁴. They now became obligated to provide PHC for the insured citizens on their personal list: i.e. for the people who had freely chosen them as their personal doctors. But, from the beginning, the parents were advised to choose PPs for their children, and not FDs. The restriction regarding the choice of FDs initially referred to those FDs who did

not have a finished specialist training in family medicine⁵. Later, the restriction was extended to include all FDs. But, the parents from the villages and islands, where no PPs were available, had no possibility other than to choose an FD for their children. The restriction over the choice of FDs was sometimes so rigidly applied that children were removed from the FD lists by the CHIF. The preferential position given to the PP in child care was evident even through their remuneration: In Croatia there is a per-capita fee system, according to which FDs received a smaller remuneration per child on their lists than the PPs received⁶. In 2009, the reimbursement disparities between the FDs and PPs were removed. Additionally, in 2010, the FDs were allowed to accept the children over four years onto their lists⁷.

A number of small research projects were published designed to compare the quality of care provided by FDs with that provided by PPs. The most comprehensive study was done in the mid 1980s, comparing the child care provided at two health centers, one where FDs were the main providers, and another where PPs were. There were no big differences between them; some indicators were better in the FD service and others in the PP service⁸. In another study, the vaccination rates for children under the FD care were compared against the Croatian standard, but no differences were found⁹.

Because the studies conducted were small, both in number and in scope, the current study was undertaken in order to compare the characteristics of the PHC for children provided by FDs, with that provided by PPs. The morbidity data were selected as a comparator, because they are a good measure of the health status of the population, and in this study, of the health status of pre-school children. Furthermore, morbidity is not a static phenomenon; it is changeable, depending primarily on the characteristics of biological diseases, but also on the patients' understanding of ill health and their attitudes to the availability and utilization of health services. The main aim of the study was to determine the trends in morbidity as recorded by FDs, and those recorded by PPs, from 1995–2012, and to determine if there were any differences among the morbidity trends as recorded by the two groups.

Methods

The study was observational and retrospective, based on the routinely collected, national statistics data from the Croatian Health Service Yearbooks, from 1994 to 2012¹⁰. Data from the yearbooks were based on the family practice and primary pediatrics patients' medical records; until 2008 these were in paper form, and since then through electronic medical records. The data were reported to the Croatian Institute of Public Health, as a central bureau, in line with the Instructions for data registration and reporting¹¹. Following the Instructions, only the first visit of a patient suffering from a chronic condition in a calendar year is registered as a morbidity case. If a patient suffers from an acute disease, only the

first visit is registered as a morbidity case. All subsequent, follow-up visits are not registered as morbidity. This will continue until the disease is cured, and if the patient feels well the case will be closed. If the same patient returns in the consecutive year, for the same acute diagnosis, it is registered as a new morbidity case. Since 1995, the International Disease Classification, version X, (ICD-X) is used to register morbidity. However, not all diagnoses are reported within the yearbooks; they are presented in their main groups, and within the groups, are divided into several categories. Morbidity is reported according to the patient's age group: 0–6 years, 7–19 years, 20–64 years and over 65 years.

For the purposes of this research, the data were collected exactly in the way they were presented in the yearbooks and for sequential years. The number of diagnoses of the ICD-X classification groups were collected, but only for the patients' in the 0–6 years age group. Then, the average number of diagnoses per patient per year was calculated. The exact numbers of children under the FDs and PPs care were missing from the yearbooks, and therefore the number of children annually receiving preventive care was used for the calculation. The reliability of the number of children under the care of both services was obtained from the calculations, and was checked by comparing the numbers with the number of new-born children born in each year, also collected from the yearbooks. The annual variations were less than 5%. The data for children under the FDs preventive care were missing from the years 1995 to 1999; therefore they were calculated approximately from the total number of children from the particular calendar year. In addition, the specific morbidity rates within the four most frequently diagnosed groups, respiratory (J codes), factors influencing the health (Z codes), ear diseases (H codes) and infectious diseases (A codes) were calculated.

The epidemiological descriptive observational method used in the study was free from artificial manipulation of the study data (factors)¹². The collected data were analyzed using Microsoft Office (Excel and Access) software. The results are presented in the form of frequency, and the trends are displayed graphically as line charts.

Results

During the research period, from 1995 to 2012, the proportion of all children under the care of PPs was around 79%, with around 21% under the FDs care. The number of children under the care of PPs decreased until 2006, and thereafter an increasing trend was observed. The number of children under the FDs care increased until 2000, but since then there has been a decreasing trend (Figure 1).

The average annual number of diagnoses was around 4.5, with less than 4.5 in the primary pediatric service, and more than 4.5 in the family medicine (FM) service. Increasing trends in the number of diagnoses per child were observed in both services, especially after 2007 in the FM, and since 2010 in the pediatric service (Figure 2).

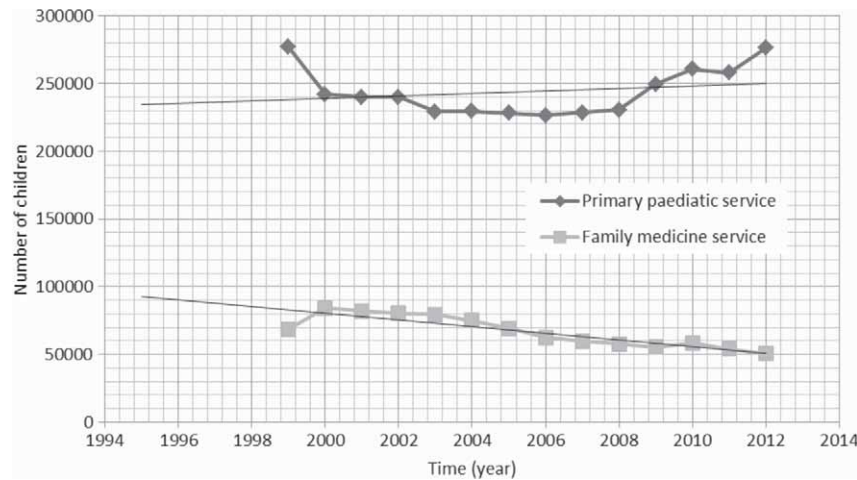


Fig. 1. Trends in the number of pre-school children registered at the family medicine and primary pediatric services in Croatia, 1995–2012.

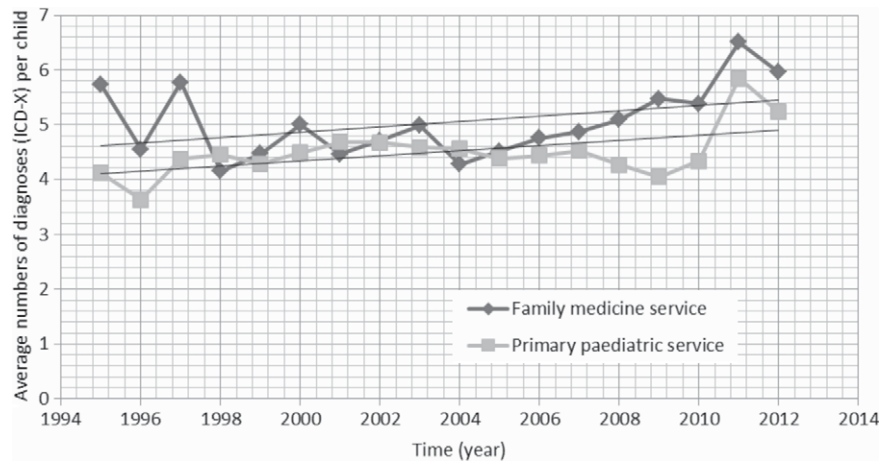


Fig. 2. Trends in the average numbers of diagnoses (ICD-X) per child in family medicine and primary pediatric services in Croatia, 1995–2012.

The most frequently registered diagnostic group during the entire research period (cumulative) was the respiratory disease group (J codes). In the FM service this made up 47%, and in pediatrics 50% of all diagnoses. The second most frequent group was the factors influencing health status and contact with health service (Z codes): in the FM service this was 12% and in pediatrics 13% of the total number of diagnoses. Next was diseases of the eye and ear, with H codes (in FM 8%, and in pediatrics 7%), and then infectious diseases, with A and B codes (these were 7% in both services) (Figure 3).

The average annual number of diagnoses of respiratory diseases in both services was between 2.0 and 2.5 per child, and in some periods fewer diagnoses were registered in FM, and in other periods in pediatrics. But the trend in the average number of respiratory diseases was decreasing in both services throughout the entire research period (Figure 4).

The factors influencing health status and contact with health service (Z codes) given as the reasons for the

visit, varied among FM and pediatric services from between 0.4 and 0.6 per child, with an increasing trend since 2007. In 2012, it had doubled, and was around 1.1 per child as the reason for the visit (Figure 5).

The average number of infectious diseases (bacterial, viral and of parasitic origin) was around 0.4 per child per year, with a continuously increasing trend in both services since 2000 (Figure 6).

Increased trends in ear diseases were observed in FM as well as in pediatrics, with an average of 0.25 diseases per child per year (Figure 7).

The specific morbidity was calculated for the four most frequently diagnosed groups: respiratory (J codes), factors influencing health (Z codes), eye and ear diseases (H codes) and infectious diseases (A and B codes). Because no differences were found between the FM and the primary pediatric services, the infectious diseases are presented here, as an example. Gastrointestinal infection showed an increased trend in both services, as well as

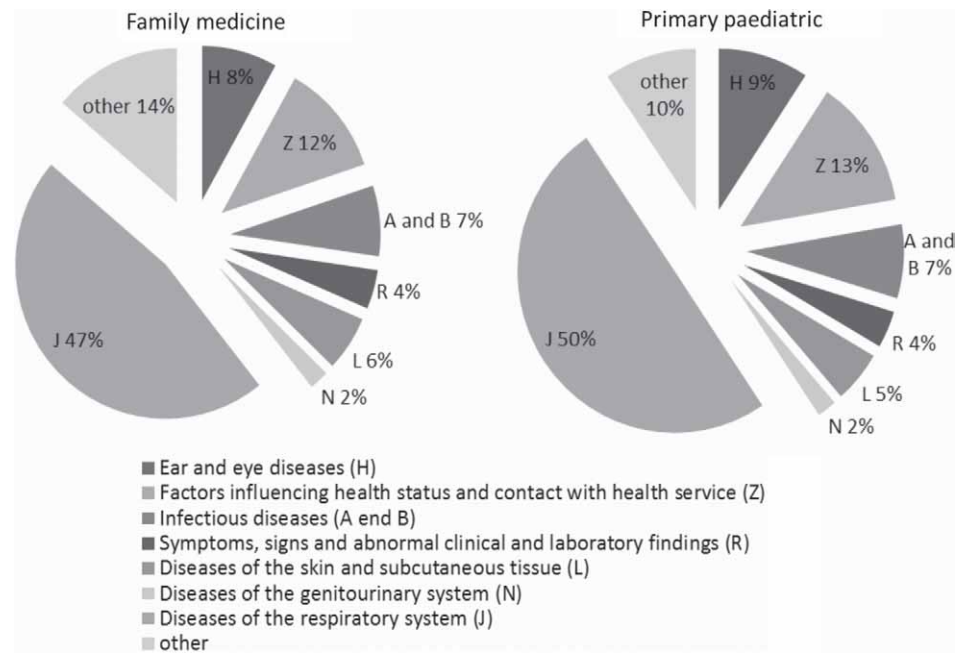


Fig. 3. A distribution of the most frequent diagnostic groups of pre-school children registered in family medicine and primary paediatrics from 1995–2012 (cumulative) in Croatia.

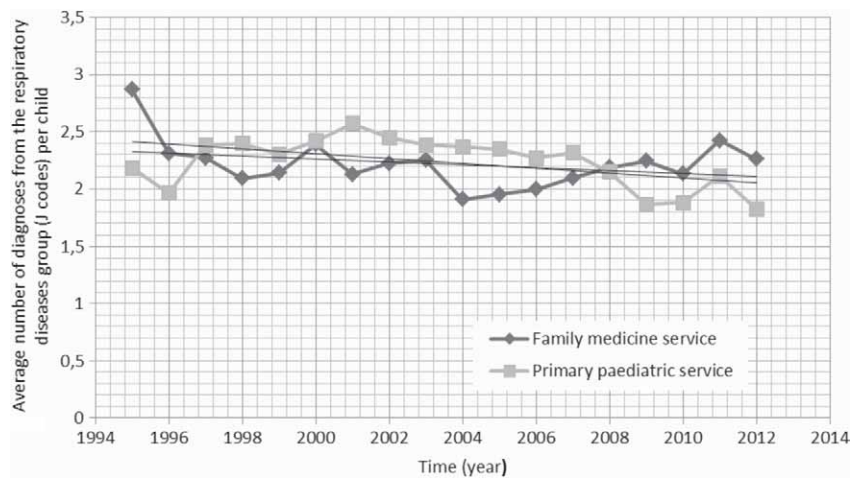


Fig. 4. Trends in the average number of diagnoses from the respiratory diseases group (J codes) per child registered in family medicine and primary paediatrics in Croatia, 1995–2012.

varicella (chickenpox), smallpox and rubella (German measles). In contrast, the diseases of parasitic origin showed decreasing trends in both the FM and primary paediatric services (Figure 8).

Discussion

The results obtained clearly indicate that there are no differences in the morbidity patterns registered in family medicine and in the primary paediatric service. The average annual number of diagnoses per child, and the most frequently registered diagnostic groups for the entire period investigated, were almost the same for both services.

The number of children under the particular service was the only difference, with a decreasing trend in FM and an increasing one in the paediatric service. A decreased trend in FM since 2000 was probable related to the introduction of the restrictions on family doctors (FDs) accepting children onto their patient lists. In 1998 a central computerized base of insured persons was established by the CHIF, which allowed an easy check of the patients on the doctors' lists. Some children were even removed from the FD patient lists. This continued until 2010, when regulation allowed FDs to accept the children over four years. The results of this regulation will become visible in the future.

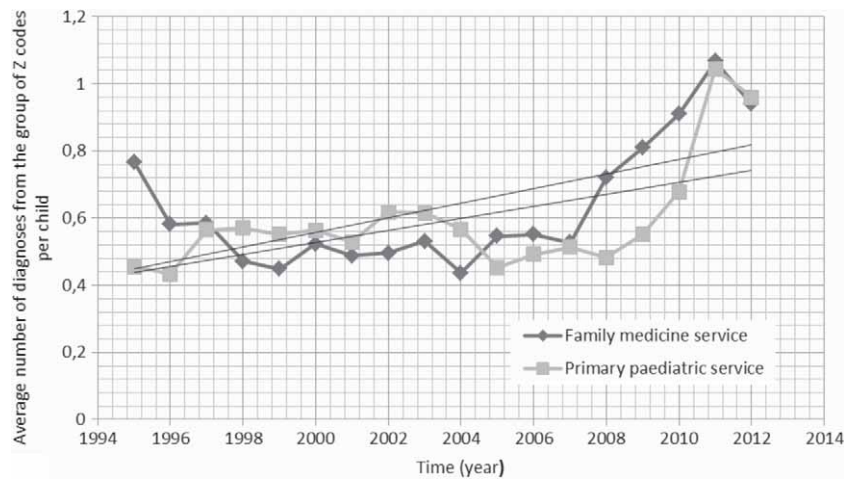


Fig. 5. Trends in the average number of diagnoses from the group of Z codes per child registered in family medicine and primary paediatrics in Croatia, 1995–2012.

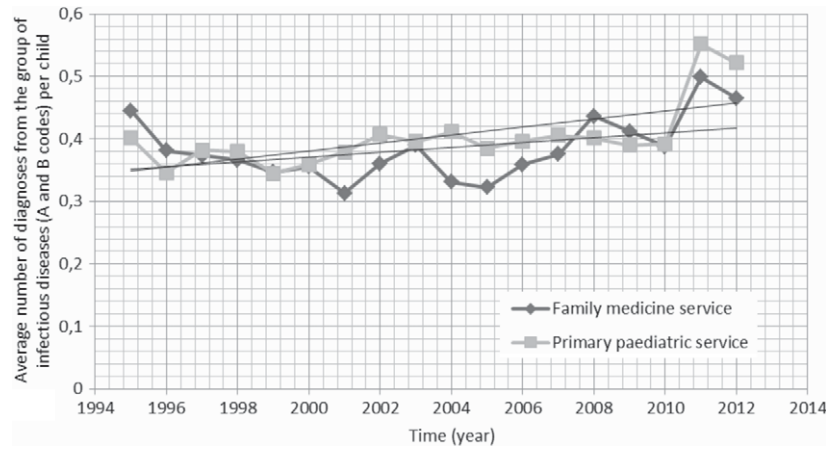


Fig. 6. Trends in the average number of diagnoses from the group of infectious diseases (A and B codes) per child registered in family medicine and primary paediatrics in Croatia, 1995–2012.

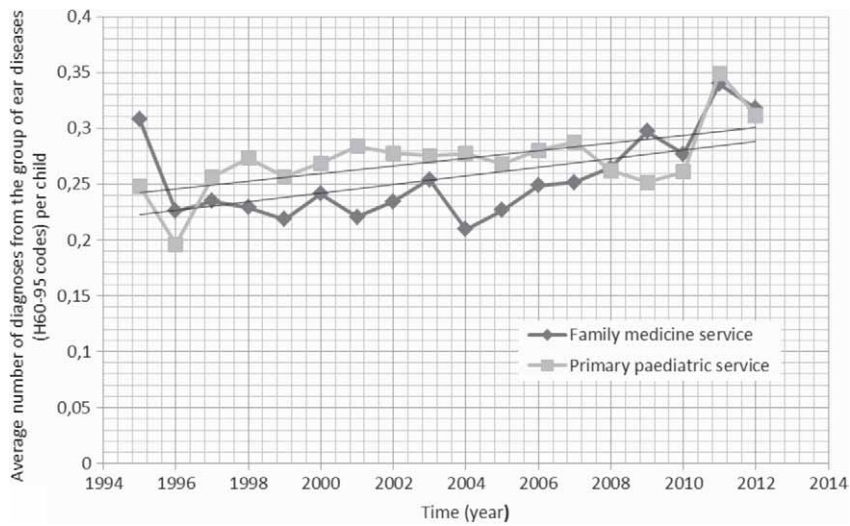


Fig. 7. Trends in the average number of diagnoses from the group of ear diseases (H60-95 codes) per child registered in family medicine and primary paediatrics in Croatia, 1995–2012.

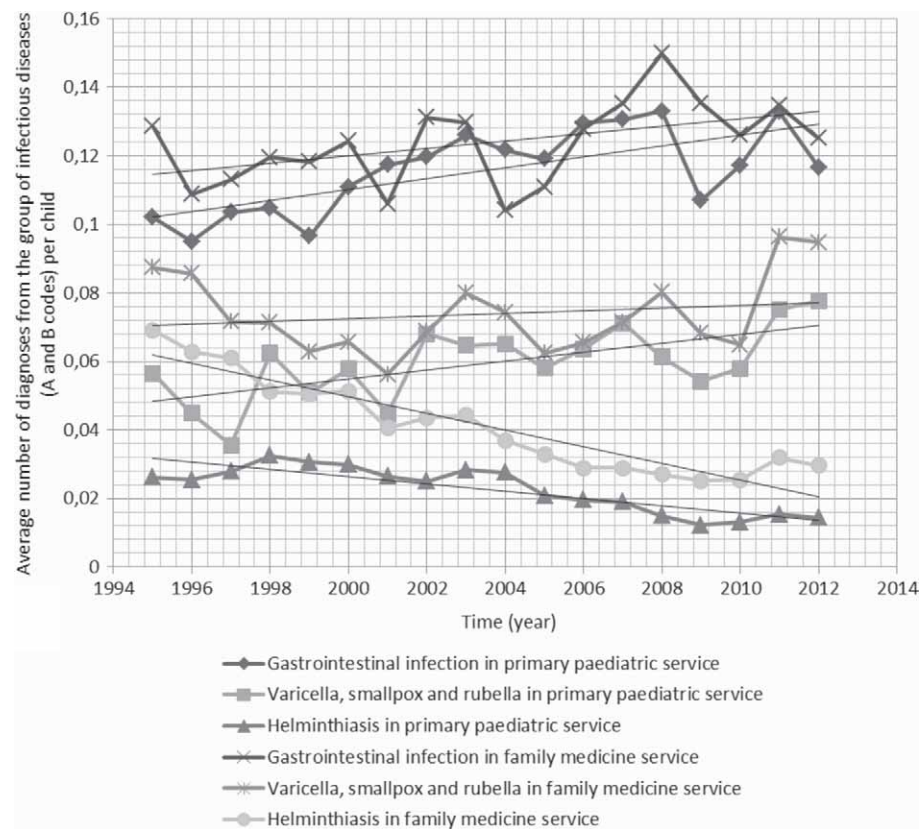


Fig. 8. Trends in the most frequently registered diagnoses from the group of infectious diseases (A & B codes) per child in family medicine and primary pediatrics in Croatia, 1995–2012.

The growing average annual number of diagnoses per child, as observed in both services after 2007 and 2010, could be related to the introduction of e-medical records. E-medical records obviously allow for better registration and reporting. But at the same time, computer software obliges the doctors to put some diagnostic code in for each patient visit, which could raise the number of diagnoses.

The most frequent reasons for the utilization of both services for pre-school children were respiratory diseases (J codes), the factors influencing health status and contact with health services (Z codes), the diseases of the ear (H codes) and infectious diseases (A and B codes). The study on frequent attenders at Croatian FM and pediatric services from 2007 also showed that respiratory diseases were the most frequent reason for a visit¹³. An Australian study also indicated that respiratory diseases were the most frequently registered reason for a visit, with decreasing trends, similar to those shown in our study¹⁴. The decreasing trend in respiratory diseases seen in other studies is usually explained as being due to the availability of information, better health literacy and the parents' awareness that respiratory diseases are very often self-limiting, and do not need to be seen by a doctor¹⁵. In comparison with Dutch studies, mental health problems were relatively infrequently registered in our study, while as with the Dutch, skin problems were also

frequently registered¹⁶. The high frequency of Z codes in our study is understandable, because many preventive activities have been registered under that code, as well as certificates for sick leave for the parents of sick children. Furthermore, Croatia is undergoing social change and an economic crisis, both of which often prompt the seeking of health care¹⁷. It is promising that infectious and parasitic diseases are decreasing, although acute gastrointestinal infections are increasing; this perhaps relates to changes in nutrition, and the frequent use of fast foods. Special attention needs to be paid to the increasing trend in preventable diseases, such as rubella, at a time when some parents are refusing the vaccination.

This study is the first one to follow the morbidity trends in pre-school children for such a long period of time, and this allows conclusions to be drawn as to which trends are permanent and which are temporary. It was possible to follow these trends because the data were drawn from the same sources, annual routine reports from all primary health care units. Data were collected and presented in the same manner for the entire study period, from 1995 to 2012. A further strength of the study is the fact that the data came from the national health statistics system, enabling national comparisons between areas, and international comparisons with other countries using the ICD-10 shortlist classification for morbidity¹⁸. However, it is important to emphasize that a

condensed morbidity list, with aggregation of some items, does not provide complete insight into population morbidity. While the data allowed the possibility of investigating the trends, a deeper understanding of an issue as complex as children's morbidity, was not possible. Another limitation was the inclusion of Z codes in the »morbidity« list, which includes a range of reasons for the contact with the health care services, possibly for a person who is not currently sick, or under circumstances in which the patient is actually receiving care at that time, or for some other reason that has some quite different bearing on the person's care. The main reason for using the Z group in the »morbidity« list for pre-school children is the registration of preventive check-ups in childhood. Another study limitation, connected with some missing data in the yearbooks, is the calculation of an average number of diagnoses for children receiving preventive care under the FDs and pediatricians, which is not an exact figure per patient.

However, setting aside the limitations, the results do indicate that there are no big differences in child morbidity as registered by FDs and PPs. The children's health problems are recognized in the same way by both sets of doctors, which allows the conclusion to be drawn that the regulations restricting FDs as the chosen doctor for children were not evidence-based. According to the results drawn from the same health information system, it appears that the organizational structure does not play an important role in the solving of children's health problems^{19,20}. Possible differences between FDs and PPs could be sought through the use of more specific diagnostic codes and more detailed research. The quality of doctors' education, and their competency in providing a high level of PH care to pre-school children, are obviously important factors^{20,21}. This is even more important at a time of worldwide economic constraints, when health care resources are limited, and this often has bearing on the more vulnerable population groups, such as the children²².

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The process of harmonization presently happening in all segments of life in EU countries, and especially the development of cross border health care, makes maintaining high standards of care even more important²³.

Conclusions

Utilizing existing data taken from the routine health information system, the results indicate there are no substantial differences in pre-school children's morbidity, whether registered for FM or for pediatric primary care. In the both services, the most frequent were respiratory diseases, but with a decreasing trend. The next major reason for primary health care visits were for preventive check-ups, registered as Z, according to ICD10. This topic deserves special attention as a subject for future research, as well as to indicate an area requiring specific education for doctors who work in children's PHC. Apart from the morbidity trends analyzes according to the ICD10 sub-groups, the national routine health statistics system does not provide enough information to permit a deeper analysis of the specific diagnostic entities and the determination of precise differences in childhood morbidity between the FM and pediatric primary care services. Many of these differences are not easily recognizable and further investigations are needed. The results of deeper analysis could be very interested, mainly differences across the years. It could be easily done through the electronic information system and the collection of data from patient's personal e-records.

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TRENDOVI KRETANJA POBOLA PREDŠKOLSKE DJECE ZABILJEŽENOG U OBITELJSKOJ MEDICINI I PRIMARNOJ PEDIJATRIJI U HRVATSKOJ: 1995–2012

S A Ž E T A K

Primarnu zdravstvenu zaštitu predškolske djece u Hrvatskoj provode primarni pedijatri (PP) u gradovima i liječnici obiteljske medicine, uglavnom na selima (LOM). Malo je istraživanja u kojima se uspoređuju učinci ovakve organizacije zdravstvene zaštite djece. Cilj ovog istraživanja je bio utvrditi trendove kretanja pobola predškolske djece zabilježenog u pedijatriji i u obiteljskoj medicini u periodu 1995–2012, na temelju rutinski prikupljenih podataka iz Hrvatskih zdravstveno-statističkih ljetopisa. Dobiveni rezultati su pokazali da nema razlike u morbiditetu zabilježenog u ove dvije djelatnosti što se tiče prosječnog broja dijagnoza po jednom djetetu godišnje kao i najčešćih grupa bolesti. Razlika je uočena jedino u broju djece, u pedijatriji broj djece raste, a u obiteljskoj medicini opada. Međutim, rutinski prikupljeni podaci nisu dovoljno precizni za dublju analizu pobola predškolske djece, pa time niti dublju analizu razlika između ove dvije djelatnosti, stoga su potrebna dodatna istraživanja.