Morbidity Trends Registered in Croatian Family Practice in the Period 1995–2012

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A B S T R A C T

Monitoring changes and trend of morbidity is important to develop strategies and health care policies. Therefore, this study was undertaken with the main aim to investigate the overall morbidity trends recorded in Croatian family practice (FP) in period 1995–2012. The data were collected from the Croatian Health Service Yearbooks, 1995 to 2012. Obtained results clearly indicated that the number of patients, annually visiting FP was relatively stable while the number of diagnoses continuously increased, with average 2.1 diagnoses per patients in 1995 to 3.7 diagnoses in 2012. The most often registered are the groups of respiratory, cardiovascular and musculoskeletal diseases. Although all ICD-groups of diseases recorded an increase, some groups have more prominent increase: R diagnoses (symptoms and sings), C diagnoses (malignant), E diagnoses (endocrine and metabolic) and Z diagnoses (other reasons for FP encounter). For deeper understanding of the changes in the particular diagnoses the further research is needed.

Key words: *morbidity, trends, family practice, Croatia*

Introduction

Monitoring changes and trend of morbidity is important to develop strategies and policies in health care system. Therefore, the recording of morbidity as the activity of family practice (FP) through individual records (notes) of the patient is an important source of information for monitoring the incidence of certain diseases or conditions, epidemiological research and monitoring of the health of the population, to propose measures primary, secondary and tertiary prevention[1]. In addition, keeping up to date records of each patient promotes better care by connecting history of the patient with the identified changes in disease and provides insight into the development of possible complications and co-morbidity status[2].

Morbidity patterns are dependent of many factors and therefore changeable and required to be followed up. Of course, the most prominent factors are those related to physical causes of disease, for example, microbial agents and growing bulk in scientific knowledge and practical experiences related to them. The important factors are those related to the patients such as age, gender and socioeconomic status[3]. The aging of the population,

presence of factors that pose a risk for a variety of chronic diseases, an increase in the prevalence of health risk, socio-economic, cultural, scientific' and other changes affect the pattern of morbidity[4]. Croatia is confronting with the ageing population and has been passing thought many social and economic challenges. The changes within the health care system and the possibilities to answer the growing health care costs, especially important in Croatia, could have some implications on the morbidity trends.

From the another side, morbidity data and time-trends usually serve as the bases for more complex calculations, such is the Global Burden of Diseases, Injuries and Risk Factors Study (GBD), the scientific effort to quantified the levels and trends of health loss due to the diseases, injuries and risk factors. GBD serves to inform evidence-based policy-making and health system design[5].

Until now, there was no large-scale study in Croatia investigating the morbidity trends over the longer period of time. Therefore, this study was undertaken with the

main aims: to investigate the overall morbidity trends recorded in Croatian FP in period 1995–2012; to determine the trends in specific disease categories which exhibited the most prominent changes, and to estimate if certain changes within the health care system or within the society could have possible influence on the trends.

Materials and Methods

The study is observational and retrospective, based on routinely collected data, yearly published in the Croatian Health Service Yearbooks (Croatian Institute of Public Health) from 1995 to 2012[6]. The morbidity data were registered based on the Instructions how to use report forms for primary and secondary health care[7]. Due to those instructions, only the first visit of a patient suffering from a specific 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 continues until a disease is cured. If the same patient returns in the consecutive year for the same or other acute diagnosis, it is registered as a new morbidity case. In Croatia, the International Disease Classification, version X, (ICD-X) is used for coding of morbidity data. All recorded diagnoses are shown in the leading categories of diseases according to the classification and only some are shown separately within each category. Morbidity is registered according to the patient's age group: 0–6 years, 7–19 years, 20–64 years and 65+ years.

The number of patients annually attending FP and the number of the registered diagnoses according to the ICD-X classification were collected. The total morbidity due to the patients' age and the average number of diagnoses per patient were calculated. Then the structure of morbidity was calculated in relation to the age of patients for the ten most common groups of diseases and specific diagnoses within these groups.

The epidemiological descriptive observational method free from artificial manipulation of the study data (factors) was used in the study[8].The collected data were analyzed using Microsoft Office (Excel and Access) software.

Results

The number of patients per year who visited the FP is relatively stable, 2.96 million in the 1995 and 3.22 in the 2012. Double increased in the number of diagnoses was observed, from 6.1 million recorded in the 1995 to 11.9 in 2012, when the highest number of diagnoses was recorded (Figure 1).

In 1995 the average number of diagnoses per patient was 2.1 while in 2012 was 3.8. In particular, the sudden increase in diagnoses was recorded after 2007 (Figure 2).

The highest number of recorded diagnoses was in the age group 20–64 years. The results indicate a double increase in the number of recorded diagnoses in 2012 comparing to 1995 in the age groups 20–64 years and 65+

years. In 1998 there was increase in number of recorded diagnoses in age group 7–19 years and later on the trend is stable (Figure 3).
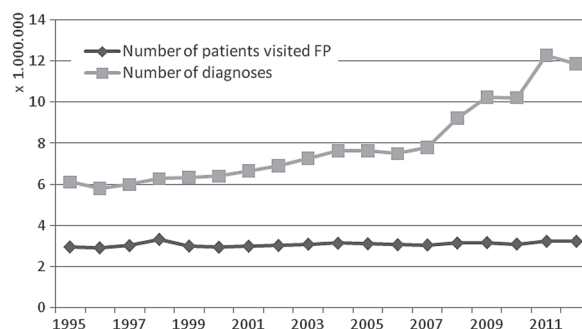

Fig. 1. Trends in the number of patients visited family practice and the number of established diagnoses in Croatia, 1995–2012.
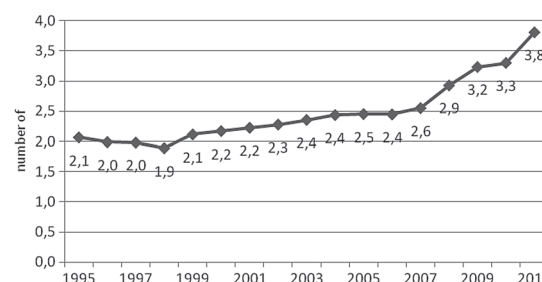

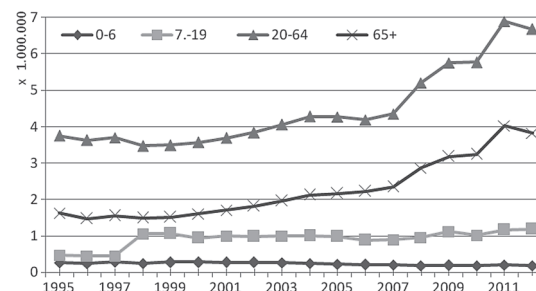*Fig. 2. Trend in the average numbers of diagnoses per patient in Croatian family practice, 1995–2012.*

Fig. 3. Trends of total morbidity according the patients' age registered in Croatian family practice, 1999–2012.

Although all groups of diagnoses recorded increased, some groups have increased more, some less (Table 1). The most prominent growth is recorded in ICD-group C (neoplasms, 4.1 times), group E (endocrine, nutritional and metabolic diseases, 3.9 times), group Z (factors influencing health status and contact with health services, 3.2 times) and group R (symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, 5.1) (Table 1, Figure 4).

In further elaboration, we analyzed the share of each diagnosis in the group of those who have increased the most. These are the specific diagnoses in ICD-groups C, E, R and Z, as shown on the following Figures 5–7.

TABLE 1
THE NUMBER OF REGISTERED DIAGNOSES IN FAMILY
PRACTICE ACCORDING TO ICD-GROUPS IN CROATIA AT THE
BEGINNING AND THE END OF THE FOLLOW-UP PERIOD AND
RATIO OF THESE VALUES (2012/1995)

ICD-10 disease group	1995	2012	2012/1995
A00-B99	188175	400891	2.10
C00-D48	78445	319458	4.07
D50-D89	88685	133928	1.51
E00-E90	174441	686035	3.93
F00-F99	365850	686670	1.87
G00-G99	95749	192010	2.00
H00-H59	280798	552890	1.96
H60-H95	153189	299736	1.95
I00-I99	797431	1447498	1.81
J00-J99	1433963	1761037	1.22
K00-K93	332962	607202	1.82
L00-L99	302189	623979	2.06
M00-M99	752157	1362200	1.81
N00-N99	389821	734024	1.88
O00-O99	40179	51125	1.27
P00-P96	472	1437	3.04
Q00-Q99	6354	18842	2.96
R00-R99	132218	674776	5.10
S00-T98	253695	516496	2.03
Z00-Z99	249395	799652	3.20
All	6116737	11869836	1.94

the number of diagnoses was recorded in groups of stomach and cervical cancer (Figure 5).

Fig. 5. Trends in the number of specific diagnoses within ICD-group C registered in Croatian family practice, 1995–2012. C16 – stomach cancer, C20 – rectal cancer, C33-C34 – tracheal, bronchial and lung cancer, C43 – melanoma, C50 – breast cancer, C53 – cervical cancer, C81-C97 – leukemia and lymphoma.

The overall increase in the group of endocrine and metabolic diseases is primarily due to an increase in diseases classified as other, diseases of thyroid gland (4.6 times) and increased number of diabetes (2.7 times) (Figure 6). After 2007 there was a decline in the number of diagnoses of obesity.

Fig. 6. Trends in the number of specific diagnoses within the ICD-group E registered in Croatian family practice, 1995–2012. E00-E07 – disorders of thyroid glands, E10-E14 – diabetes mellitus, E65-E66 – obesity, E-others.
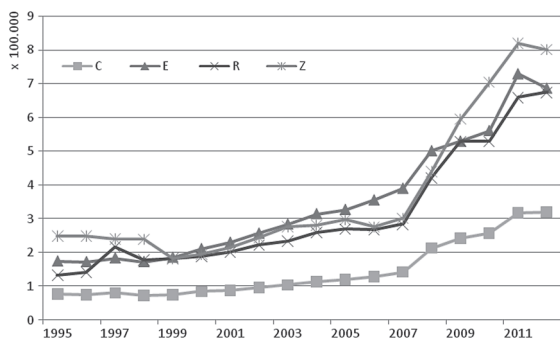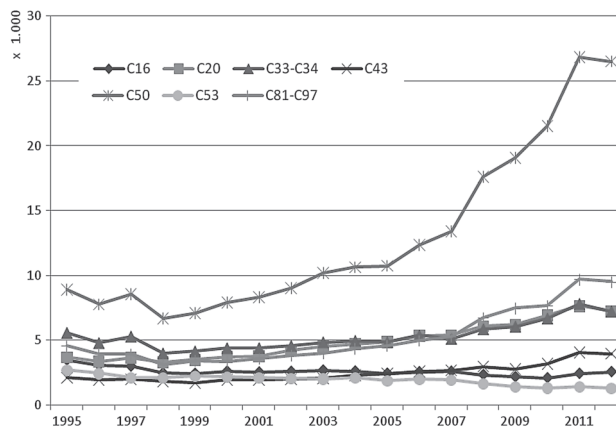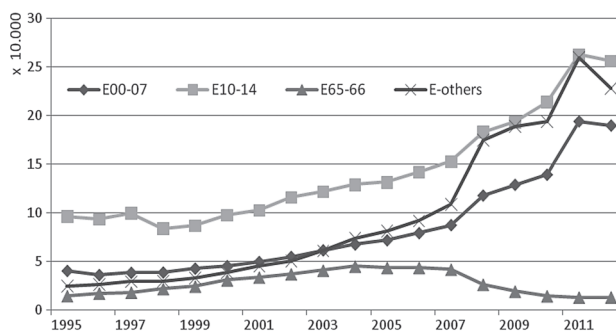
Fig. 4. Morbidity trends in four ICD-groups with the most prominent growth registered diagnoses in Croatian family practice, 1995–2012. C – neoplasms, E – endocrine and metabolic diseases, R – symptoms, signs and abnormal findings, Z – factors influencing health status.

The largest changes in the group of neoplasms occurred in recording the diagnosis of breast cancer, 3.0 times more (especially women over 65), leukemia and lymphoma group 2.1 times more, rectal cancer 2.0 times and melanoma and other malignant neoplasms of skin 1.9 times. Moderate increase is recorded in the tracheal, bronchial and lung cancer, and skin malignant melanoma (especially population up to 64). The decrease in

In 2012 the number of recorded diagnoses in the ICD-group R (symptoms, signs, and other abnormal findings) was five times higher than in 1995, except for the diagnosis R54 (senility) (Figure 7).

Within the Z group, the family problems as the reasons to visit FP were increased more than 5.5 times, than the problems related to infectious diseases and to the different types of investigation and diagnostics, 3.6 respectively 3.5 times more. But, the problems related to the socio-economic reasons decreased for almost 2 times.
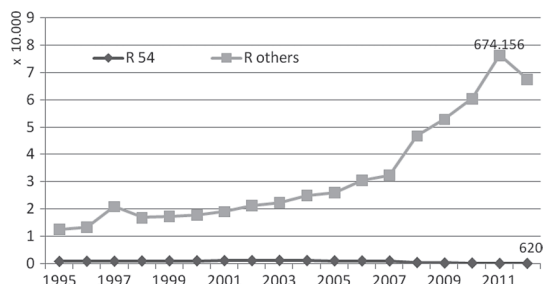
Fig. 7. Trends in the number of specific diagnoses within the ICD-group R registered in Croatian family practice, 1995–2012. R54 – senility, R others – other symptoms, signs and abnormal findings.
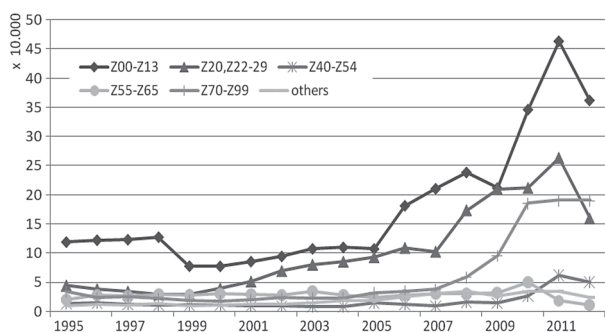

Fig. 8. Trends in the number of specific diagnoses within ICD--group Z registered in Croatian family practice, 1995–2012. Z00-Z13 – health services for examination, Z20, Z22-Z29 – potential health hazard, Z40-Z54 – specific procedures, Z55-Z65 – socioeconomic and psychosocial health hazards circumstances, Z70-Z99 – health hazards related to family and personal history.

Discussion

Obtained results clearly indicated that the number of patients, annually visiting family practice (FP) was relatively stable during the entire follow up period. But the number of diagnoses continuously increased, with average 2.1 diagnoses per patients in 1995 to 3.7 diagnoses in 2012. In addition, in 2012 the average number of registered diagnoses per one resident in Croatia was four diagnoses. Similar results with the burden of chronic conditions and multi-morbidity as a growing public health problem is seen in other developed countries[9,10].

It is not clear from our results why patient have more diagnoses annually? According to the study on workload of family doctors (FDs), the reason could be the large number of visits in Croatia FP; or doctors have a need to make the diagnoses[11]. Especially sharp increase in the number of diagnoses was observed since 2007 which may be connected with the introduction of e-medical records. Consequently it could mean a better registration of diagnosis especially in people with multiple chronic diseases as well as some other researches showed[12,13]. But, it also could mean that the FDs are obliged by the computer softer to put a diagnosis; meaning that each patient's visits must be followed by a diagnostic category. It is espe-

cially important under the notion that people with more established diseases use health care more frequently which increases the rate of health care utilization and costs in the health system[14,15].

In our research the most often registered are the groups of respiratory, cardiovascular and musculoskeletal diseases, indicating a certain consistency in the patient's need for a FP service[15]. It is not easy to make a comparison to the primary care research from other countries, because the International Classification for Primary Care was mostly used, and its container slightly different disease categories. Anyway, in the Danish FP, musculoskeletal, psychological and respiratory diseases were the most common reasons for the encounter and frequently registered diagnoses, with the decreased trend in respiratory diseases [16]. The decreased trend in respiratory diseases were observed in other studies, while in our study respiratory diseases show increased trend[17,18].

Although all ICD-groups of diseases recorded an increase, some groups have more, some less growth. Prominent increase in diagnoses was recorded in four ICD--groups. The group of R diagnoses, referring on the symptoms, signs and abnormal findings increased by 5.1 times, C diagnoses referring to the malignant diseases 4.1 times, E diagnoses, endocrine and metabolic diseases 3.9 times and Z diagnoses 3.2 times.

The most dramatic changes occurred within the group of R diagnoses (symptoms and sings). Soler and Okes commented that R codes or symptom diagnoses are inherent to FDs, because they very often deal with health problems at the earliest stage of development, at high level of diagnostic uncertainty. It allows the FDs to avoid using an inappropriate and unproven disease diagnosis which does not yet fit, thus keeping disease classes clean. Symptom diagnoses reflect the patient's request for care. Documenting them as such prevent patients from being prematurely or incorrectly labeled with an uncertain diagnosis, potentially preventing harm by preventing unnecessary anxiety or inappropriate interventions[19].

In our study we observed a prominent increase in thyroid diseases and diabetes in the group E diagnoses and similar data have been published in some European countries[20,21]. Unfortunately the results are not consistent with the data of the national registry for diabetes, where in 2012 the number of people with diabetes was significantly lower[22]. Because FDs are required to report diabetic's patients to the national register, the in-consistencies remained unclear and should be investigated. An unexpected drop in the diagnosis of obesity after 2007 is likely to be associated with insufficient recording of this diagnosis.

The time period, in which it is shown the trend of mortality in this study, was the post-war periods in Croatia, a period of socio-economic transition and a number of other changes that have undoubtedly affected the health of the individual[23]. In such cases, FDs recorded a diagnoses related to family and other issue as a part of the increased number of reported Z diagnoses. Additionally, within Z diagnoses noticed a prominent increase

diagnosis groups, related to different types of preventive check-ups, observations on suspicion on certain disease states and screening check-ups. The first jump of the increased number of these notes was diagnosed in 2006 and another in 2010 which coincides to the introduction of national screening programs of breast and colon cancer, which must have had some influence on these rises. The suspicious results of those screening programs are usually required additional examinations such as ultrasound of the breast, colonoscopy, cytology or hysto-pathological tests. Accordingly, it was expected that there will be an increase in the number of diagnoses related to breast cancer and rectal cancer which is evident from the results (C diagnoses). Another subgroup Z diagnoses, which includes exposure to or contact with infectious diseases and various prophylactic measures, had an increase in the number of diagnoses in 2000 with a steady upward trend and a pronounced rise in the number in 2008. The explanation for this can be seen in the fact that since 1998, FDs have a population of school children in their care and in 2007 began the informatization of family medicine. However, this requires further research.

In Slovenia which data are based on ICD-10, factor influencing health status (Z codes) was on the first place in 1999, followed by the respiratory, musculoskeletal and circulatory diseases[15]. In UK, based on ICD-9, from 1991 to 2001, a reduction in prevalence of infectious diseases and accidents was observed, as an increase of some degenerative disorders and little change in the prevalence of mental disorders, diseases of the skin and diseases of the musculoskeletal system[18].

Finally, the increase in the number of registered diagnoses can be partly explained by the population aging, which has important implications for primary health care and care for people with multiple chronic conditions[24,25].

The study is based on the national statistics data, usually used for the national and international planning, therefore the obtained results could be easily comparable with those from another country implying the ICD-10 revision classification. The morbidity data were collected in the same manner during the entire follow up period allowing investigation the time-trends, although, according to Estebal-Vasallo findings[26], there were no differences between family doctors e-medical records and national epidemiological surveys. The observed morbidity trends should not be miss-matched with the morbidity in theoretic meaning. They mainly represent the reasons of FP utilization; therefore they represent the scope and breadth of the FP as health care discipline[27]. The general morbidity trends and only the trends of the chosen specific diagnoses were presented in this article. However, for better understanding of the morbidity patterns, it should be studied in details, which is out of the scope of the ordinary publishing articles.

In conclusion, our analysis of morbidity shows a prominent increase in the number of registered diagnoses in family medicine, and at the end of the period, on average, almost four diagnoses registered per patient. Patients with multiple diseases increase the burden in primary health care. Therefore, to determine the morbidity pattern with the aim of comprehensive care for patients should be one of the future public health researches.

Acknowledgements

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TRENDOVI KRETANJA POBOLA ZABILJEŽENOG U OBITELJSKOJ MEDICINI U HRVATSKOJ U RAZDOBLJU 1995.–2012. GODINE

S A Ž E T A K

Praćenje promjena u morbiditetu populacije polazna je osnova u planiranju zdravstvene zaštite. Osnovni cilj ovog istraživanja bio je utvrditi trendove kretanja morbiditeta registriranog u obiteljskoj medicini razdoblju od 1995. do 2012. godine. Podaci su prikupljeni iz Hrvatskih zdravstveno-statističkih godišnjaka za to razdoblje. Dobiveni rezultati nedvojbeno su ukazali na činjenice da je broj pacijenata koji su posjećivali obiteljsku medicinu bio relativno stabilan, ali je broj dijagnoza po pojedinom pacijentu porastao s 2,1 u 1995. na 3,8 u 2012. godini. Respiratorne, kardiovaskularne i muskuloskeletne bolesti bile su najčešće. Iako je broj dijagnoza u svim dijagnostičkim grupama porastao, najveći porast ipak je zabilježen u grupi R (simptomi, znakovi i drugi abnormalni nalazi), C (maligne bolesti), E (endokrine i metaboličke bolesti) i Z (drugi faktori kao razlozi dolaska). Detaljna analiza trendova kretanja pojedinih bolesti nije bila cilj ovog istraživanja, pa bi daljnja istraživanja bila potrebna sa svrhom planiranja zdravstvene zaštite.