Introduction
Socio-psychological study on motivation of speciality choice in General Practice (GP), was carried out (1969-1971) within the framework of the research project »Role of Medical Education in Formations of General Practitioners«, at the Andrija Stampar School of Public Health, Medical School, University of Zagreb. The investigations of the student's socio-psychological characteristics (by means of a battery of sociological and psychological questionnaires) resulted in the conclusions that motivation to enter GP and to work in rural areas originate from the joint effect of the following factors: a) need to work with people; b) low interest in research work; c) peasant or working family background; d) rural origin and the preference to work and to live at rural settings; e) no contact to medical profession before the entering of medical school; f) plans to get married shortly after graduations.
The aim of this study is to investigate, thought the literature search, if those characteristics are stable along the longer period of time.

Methods
A preliminary literature review was carried out by MEDLINE database searching. The search terms used were combinations and variations of four key concepts: rural doctors, personal characteristics, medical student’s speciality choice, rural practice choice. After the removal of duplicates and the screening of titles and abstracts, 51 articles met the inclusion criteria, only research or review articles. The thematic analysis was used.

Results
The six main themes were recognised, and several pod-themes within each of them.1) Rural background including: rural upbringing, schooling, living for some time in rural areas, geographical and ethnic affinities. 2) Family influence, especially by the spouse’s rural background and co-location with spouses working place, proximity to extended family, family decision to work and live in rural areas. 3) Personal values of rural services, feeling of being needed, close relation with patients and community, longitudinality. 4) Predisposition for small community living, people's friendliness and the slow pace, environmental factors, outdoor recreations and others. Personal characteristics, such as: being male, married, low parental professional and educational status, lower academic rank, financial incentives, and self directed, caring and cooperative types of personality. 6. Speciality choice of family medicine and rural expose during medical education.

Conclusions
A refinery literature search indicates that the main characteristics of rural doctors are consistent and remain almost the same along the fifteen years period.

Poster presentations:
A regional variations in the trends of sick-leaves rates in Croatia: longitudinal study, 2000-2012

Nataša Ban-Toskić¹, Vesna Tabak², Hrvoje Tiljak³
¹Health Centre Zagreb-Centre, Family Practice, Martićeva, Zagreb, Croatia
²Family Practice Dr. Vesna Tabak, Zagreb, Croatia
³University of Zagreb, School of Medicine, Andrija Štampar School of Public Health, Department of Family Medicine, Zagreb, Croatia

Introduction
In Croatia, for more than six decades, sick-leave was recognised by the populations as the main working right and has been very well regulated. The sick-leave could be issued because of patients’ diseases or injuries or because of the disease in the family, particularly children, partner or family members. But, any absence from the working place, independently of reason and duration, should be justified by the doctors’ certificate, mainly by family doctors. The study aims were to determine the trends in sick-leaves rates from 2000 to 2012 and to investigate if there were any regional differences.

Materials and methods
A study was observational and retrospective based on the official Croatian Health Insurance Found (HIF) data available from the web-page, based on the FDs monthly reports from entire Croatia. It is contractual FDs obligation toward the CHIF to monthly reporting on the number of patients and the reasons for the sick-leaves. Based on this reports it is possible to obtained the data on the average annual number of patients on a sick-leave, the annual number of sick-leave days, the average duration (in days) of sick-leave per patients and the sick-leave rates, in total and separately for the sick-leaves on the employers account (those less than 42 days) and those on the CHIF account (over 43 days).

Results
Total sick-leave rate was varying between 3,3 in 2001 and 3,96 in 2007, and with decreased trend to 3,1 in 2012. The sick-leave rates under the responsibility of the CHIF was in between 1.7% and 2.6%, with slightly decreased trend after 2007. The sick-leaves rates under the responsibility of the employers were always lower, with trend variationsn between 1.3 and 1,96 and slightly decreased trend since 2007. A regional variations in the rates of sick-leaves were observed along the Croatia and are presented at Fig. 1, 2, 3, 4.

Conclusions
During the observed period, the trends in the sick-leave rates decreased, but with a great variations within the Croatian counties. The sick-leave rates as well as average sick-leaves days per patients were alway higher in some counties then in others, such as: Čakovec, Karlovac, Koprivnica, Sisak, Varaždin and Zadar. The observed county differences could not be explained by the results of this study, therefore, a new investigation is needed.
Are there any differences in the organization of public health nurse service in rural and urban regions in Croatia?

Zvonimir Bendeković¹, Dobrislav Šimić²
¹Health Centre of the Varaždin County, Family Practice Lepoglava, Lepoglava, Croatia
²Family Practice »Dr Dobrislav Šimić«, Bednja, Croatia

Introduction
Regional differences in the organisation of the health public nurse (patronage) service (PHN) were observed along the Croatia counties. But, we are not certain if those differences do exist in urban and rural regions.

Aim
The main aim of this study was to investigate if there are any differences in the organisational structure of PHN service between rural, semi-rural and urban regions in Croatia.

Methods
According to the Croatian Strategy for the Development of Rural Regions and using OECD criteria, Croatia is divided in 3 parts: rural (14 counties), semi-rural (6 counties) and urban (City of Zagreb County). Data on the number of PHN, education and employment statues for the rural, semi-rural and urban regions were obtained from the Croatian Health Service Yearbooks for the period 1995 to 2012.

Results
The number of PHN in Croatia increased from 729 in 1995 to 835 in 2012, with differences in rural and urban regions. The great increase is observed in rural regions (from 297 in 1995 to 421 in 2012) and less in urban area (from 127 in 1995 to 153 in 2012). At the same time, a decreased trend in number of PHN was observed in semi-rural regions (from 305 in 1995 to 261 in 2012). Accordingly, the number of inhabitants per one PHN in Croatia decreased, from 6656 in 1995 to 5131 in 2012. The greatest decrease was observed in the rural regions (from 9079 inhabitants per one PHN in 1995 to 4772 in 2012) and less in urban area. But the number of inhabitants per one PHN in semi-rural regions increased from 5443 in 1995 to 5784 inhabitants per one PHN in 2012. The percentage of college educated PHN increased in Croatia in total, except in urban area; again the greater increase in rural regions (from 56.9% in 1995 to 82.4% in 2012) and less increase in semi-rural regions (from 78.4% in 1995 to 94.6% in 2012). The number of PHN with full-time employment decreases at the similar degree in rural and semi-rural regions, except the City of Zagreb.

Conclusions
The results clearly indicated that there were rural-urban differences in the organization of PHN service in Croatia. The less acceptable situation is the number of inhabitants per one PHN in semi-rural regions and in the percentage of college educated PHN in rural regions.

No 3
Group-work with diabetic patients type 2: a preliminary results

Miro Bencic, Family Practice Brdovec, Health Centre Zagreb County, Zapresic, Croatia; e-mail: miro.bencic@zg.t-com.hr

Introduction
It is well known from the literature that the multifaceted interventions are necessary to be implemented in the chronic-diseases management. A group-work with diabetic's type 2 patients were introduced as an additional intervention to the usually care for diabetic’s in Brdovec family practice. Patients were offered once-monthly group meeting with practice and public nurse, when body weight and high (MBI), fast-blood glucose and blood pressure measurement were performed, followed with small-group discussion on behaviour habits of patients, including dietary, physical activities and use of medications.

Aims
The study aim was to investigate if there are differences in health care outcomes between the patients participated at the small-groups and patients under the regular diabetic care.

Methods and participants
The study is retrospective and case-control. The experimental group consists of 18 patients who regularly participated in small-group work during the entire 2014 and control group consist of 18 paired-patients under the regular diabetic care from the same practice, chosen according the age, gender and type of medication. Body-mass index (BMI), HbA1c measurements and personal satisfaction were used as outcome-measures.

Results
Out of 280 registered diabetic patients in Brdovec family practice, only 18 regularly participated in a small-group during the year 2014, 4 are mail and 14 female. In the beginning of follow-up period, average BMI in the experimental group was 28.50 and 28.29 at the end of follow-up period. At the same time, the average BMI in the control group was 28.33 in the beginning and 27.75 at the end of the follow-up period. The average HbA1c in the experimental group was 7.72% in the beginning and 7.41% at the end of follow-up period. The average HbA1c in the control group was 7.78% in the beginning and 8.06% at the end of follow-up period. The overall satisfaction with the personal involvement in the decision-making process as well as with the professional roles of nurses and doctor were higher in the experimental group then in the control group.

Conclusion
In spite of limited number of participants in the experimental group and short follow-up time, the preliminary results indicated a small improvement in HbA1c in the experimental group of diabetic’s. The personal satisfaction was much more present within the patients from the experimental group. The findings generally indicated that it would be worthy to motivate the great number of patients to participate in a small-group work.

No 4
Refusal of chemotherapy by a patient with advanced prostate cancer: case report

Daniela Daus-Šebedak
Family Practice “Dr. Danijela Daus-Šebedak”, Trg Sv. Antuna 6, Podvinje, Croatia

Introduction
Prostate cancer ranks high among the causes of death in the Western world. According to the Croatian Public Health Institute (CPHI) from 2011 prostate cancer in Croatia is the second most frequent cancer after cancer of trachea, bronchus and lung, with 1657 new cases per year. Each family physician can expect annually around 10 patients who are at an advanced stage of malignancy, and 4 to 7 new cases per year of patients of various localisations of cancer. The aim
of this paper was to present experiences and dilemmas of family physicians who care for patients in whom prostate cancer was detected at advanced stage of the disease and who refused all proposed treatments.

Case report

The patient, 77 years old, smoker, who had urological problems for four years, did not seek help from family doctor or urologist. At the first examination in family medicine digital rectal examination was performed, so apart from hemorrhoidal nodes, GP found increased, very resistant prostate with held sulcus. With the finding of PSA greater than 10,000 mg / L and urine culture results the patient was referred to a urologist who suggested a biopsy of the prostate. The patient did not answer in office nearly two months, and prostate biopsy has been postponed for the next two months due to the inflammatory altered hemorrhoids. Histopathology findings by biopsy of the prostate, establishes the advanced adenocarcinoma, Gleason score 9. Patient underwent static scintigraphy of skeleton and foci of increased uptake in the central skeleton and both femours were found. Patient was referred for consultation to two urologists, one recommended orchidectomy and the other recommended antiandrogen therapy. He was aware of the advanced state of his disease and consciously made the decision to refuse any active oncological treatment, accept treatment for the purpose of relief of pain and reduction of symptoms. It's was hard for me to accept that decision, I tried to talk to him about the possibilities of treatment in accordance with existing guidelines, their advantages and disadvantages. However, the patient was persistent in his decision, explaining the uncomfortable feeling if his testicles had been removed, but also concerned about caring for his wife who is due to knee osteoarthritis was almost motionless. Regardless of my efforts, both patient and patient's family, his wife and two daughters who did not live with them, accepted that decision. Soon the patient became inapetent, lost weight 12 kg and he began to feel pain, who initially responded well to NSAIDs. Soon there was a need for stronger analgetics, short-and slowly releasing morphine products in therapy were introduced. The patient tolerated opioid medication poorly due to constipation, which is why he was taking lactulose. These drugs have been replaced by fentanyl patches, first in smaller and later in larger doses. In the meantime urine retention occured, and permanent cateter was introduced. Although he lived in very difficult circumstances, palliative treatment palliative treatment was first conducted in his house, so he could take care of partly for his wife. However, over time he became cachectic, reduced mobility, with decubitus and was moved to a caregiving family. As his chosen doctor, I continued with palliative treatment. During disease he was extremely negativistic, sometimes rude to doctors fully aware that there is no cure for his illness. He died in caregiver's family, less than ten months from the moment he first visited the GP's office.

Discussion

In spite of my personal concerns, it was obvious that I had to respect his choice, because of patient’s right to accept or reject any diagnostic or therapeutic procedure, which is defined by the Act on Patients Rights. Furthermore, the obligation to respect patient’s rights is also defined by the Physicians Ethical Code, issued by the Croatian Medical Chamber. In caring for this patient probably my sense of "omnipotence" as a doctor was attacked, so I was asking myself about the futility of treatment for patients with advanced metastatic disease like this. The literature frequently reviewes the role of treatment, especially of chemotherapy in patients with metastatic stage of the disease at the end of life. According to studies, about 20% to 60% of patients with incurable stage of the disease are receiving chemotherapy despite doubts about its effectiveness and besides that palitive chemotherapy usually deteriorate quality of life, causing frequent visits
to emergency and frequent hospitalisations. A great help for me in dealing with my own concerns and emotions and patients reactions are participation in peer groups and according to the literature participation in Balint groups could help too.

Conclusion:

On the example of this patient, we wanted to point out the dilemmas faced by family doctors, caring for terminally ill patients who refused recomened therapy. Some of the concerns are rationally resolved, but others are irrational and lead to increased level of stress among health care professionals. A systematic approach to the problem could prevent the development of burn-out syndrome, which has upward trend worldwide.

No 5.
Number and structure of home visits in rural Family Practice Dubravica in 2010
Boris Medić, Health Centre Zagreb County, Dubravica, Zaprešić, e-mail: medicboris@gmail.com

Introduction: Home care and home visits are the integral part of family practice (FP). But, research results indicated that the number of home visits are steadily decreasing over the world. The similar situation is observed in Croatia, with 150 to 170 home visits per one family doctor (FD) annually. A rural FD in Dubravica were chosen by 1356 people, 714 (53%) female and 642 (47%) male, as their personal doctor, thus covering 75% of the total population of Dubravica community.

Aim A study aim was to analyze the number and the structure of home visits performed by FD in Dubravica in the year 2010 and compare them with the Croatian average.

Materials and methods: It was retrospective, AUDIT type of study, based on electronic patient’s charts. The data of home visits performed in 2010 were collected, including the number of visits, patient’ socio-demographic characteristics and the clinical characteristics of home visits.

Results: During 2010 there were 566 home visits to 109 patients (5.2 per patient) from which 414 (73%) are female and 152 (27%) are male patients. All together 467 (82.5%) home visits were done for people over 65 years of age. The majority of home visits were planned in advance (50.3) or on patients personal request (44.9%), while only 27 (4.8%) visits were emergency visits because of urgent health problems. Home visits because of chronic diseases were the most frequent (73%) and less for acute conditions (27%). The home visits were most often performed for the diseases of C-V system (34%), then of musculoskeletal (13%), symptoms and sings (10%), endocrine and metabolic diseases (8.5%) and mental illness and injuries 7%. Therapy was applied in 35% of home visits and 8% patient was sent to the hospital for further treatment. 63% home visits were done for patients who live further then 10 km away the practice and 49% of immobile patients. Home visits are frequently performed for certain patients; maximum number of home visits for one patient was 27.
Conclusion: Home visits at rural Dubravica FP were everyday work of FD; they were performed three times more than average in Croatia. They are mostly performed for chronic and immobile patients and those living far away from practice.

No 6
Diabetes mellitus morbidity and antidiabetic drugs consumption in Croatia: longitudinal study

Renata Pavlov¹, Ivančica Topličan²
¹Family Practice „Dr. Renata Pavlov“', Aleja lipa 2, Zagreb
²Family Practice „Dr. Ivančica Topličan“, Aleja lipa 2, Zagreb

Introduction: Non-communicable diseases, including diabetes mellitus (DM), are the major public health problems in the developed world. According to data from 2007, prevalence of DM in the age group 20-79 years was 6% and even higher in elderly. According to Croatian 2011 census, 17.7% of the population was elderly, and the estimated prevalence of DM in this age group was 15-20%.

Aim: The main study aim is to investigate trends of DM morbidity and trends in consumption of anti-diabetics in nine years period and to find out if there is any relation between those trends.

Method: The study is observational and longitudinal. Routinely collected data from Croatian health-statistics yearbooks, 2004-2012 were used; data related to the morbidity registered in family practice (FP), with ICD-10, in which endocrine diseases are under E cod, and DM under the codes E10-E14. The date on drug consumptions were also collected from the Annual Reports on Drug Consumption from HALMED (Agency for Medicinal Products and Medical Devices of Croatia), presented according to the ATC/DDD methodology, in which anti-diabetic’s are under A10 code. Pharmaceutical consumption is expressed as the number of DDD per 1,000 inhabitants per day (DDD/TID) and financial consumption in Croatian currency, kunas. The data were collected for the same period (2004-2012). We calculated the ratio of E diagnoses in total morbidity and DM diagnoses (E10-E14) within total E diagnoses. The ratios of increase were also calculated.

Results: In Croatian Family Practices a total morbidity increased 1.6 times from 2004-2012. Total number of E diagnoses increased as well by 2.4 times in the same period. The percentage of all E diagnoses in total morbidity also increased, from 4.1% to 5.8%. The highest increase was in the age group 7-19 years. Since 2004 the number of DM diagnoses increased from 128 710 to 256 038, or by 2.0 times. The highest increase of DM was in the age group over 65, by 2.3 times. From 2004 till 2012, pharmaceutical consumption of anti-diabetic’s increased from 31.34 to 59.36 DDD/TID, or by 1.9 times, equally, insulin and other anti-diabetics. Consecutively, financial cost increase from 144.7 millions kunas to 257.2 millions kunas.

Conclusions: Routinely collected data have shown the same amount of increase; in number of DM diagnoses as well as in consumption of anti-diabetics. It is difficult to say if the first could be call over-diagnosis and the second over-treatment?
Morbidity trend of dementia in elderly registered in Croatian family practice, 2001-2011.

Introduction

Old age implies many typical health care problems, including mental disorders, representing huge socio-economic problem for every society. Dementia is one of such problems with constant increase in many European countries.

Aims

The study aim is to explore the trend of dementia morbidity for patients older than 65 registered in family practice in Croatia for the period 2001-2011.

Method

From the Croatian Health Service Yearbooks (2001 – 2011) the morbidity data related to the mental disorders (F diagnoses, ICD-X version) were analysed by age, and specially morbidity data related to dementia (F00-F03) for patients older than 65. Population number and age structure in Croatia was analysed as well from the population census 2001 and 2011.

Results

There are 2.7 times increase in number of patients with mental disorders registered in family practice, in period 2001-2011. Among those, there are 1.7 times more patients with dementia in the same period. In 2001 dementia had its share of 2.5% in all mental disorders, and in 2011 a share of 1.5%, which indicates its decreasing trend in the overall mental disorders morbidity. But the number of patients increase; there are 1.9 times (87%) more patients older than 65 registered with dementia in the period 2001-2011.

Population census in 2001 and 2011 indicates that the population of Croatia has decreased for 3.4%, and population of elderly has increased for 30.4%. In 2001 there were 13.1% of people older than 65, and in 2011, 17.7% of them. 0.16% of all Croatia population in 2001 and 0.28% in 2011, suffered from dementia, i.e. the number of patients with dementia increased for 75%. 1.02% patients older than 65 in 2001 and 1.47% in 2011 suffered dementia, i.e. the number of them increased in 44%. It is higher than the increase percentage of people older than 65 in that period.

Conclusions

Croatia is facing the increase in number of people older than 65, as well as the increase of diseases troubling them, especially dementia. Although, the share of dementia in the overall mental disorders morbidity decreased, the number of patients with dementia rises faster than the number of people over 65. Therefore, it represents a huge health and social challenge in the future of the family doctors as well as for the entire society, especially in the times of economic crisis and the aging of Croatia’s population.

Key words: dementia, family practice, aging of population

Mirica Rapić1,2, Birgitta Maćešić, 1 Marina Rapić-Mrgan3
1Family Practice Dr. Mirica Rapić, Karlovac
2Foundation for the Development of Family Medicine in Croatia
3General Hospital Karlovac, Department of Paediatrics, Karlovac

Introduction
Obstructive pulmonary diseases (OPD) are characterised by shortness of breath, cough and sputum production. Chronic obstructive pulmonary disease (COPD) and asthma are the most prominent representatives of this group of diseases. A prevalence is growing up in developing countries, therefore average family doctor (FD) could expect more than 150 patients in his/her practices. Deterioration of quality of life, very often multiple drag therapy lasting along the whole life-span and highly ranking cause of death are main problems connected with this group of diseases.

The aims of this presentations was to determine the morbidity trends in OPD (asthma and COPD) in period 2005 to 2012 and to determine the consumption of specific drugs in the same period.

Methods and materials
This study was based on compiled data on morbidity and drug utilization. Morbidity data were obtained from Croatian Statistical Yearbooks, collection of morbidity data coming from all FM practices over the Croatia and based on ICD – X classification. Only data on J group (respiratory) and sub-group J40-J47 (obstructive, asthma and COPD) were collected for the period 2005-2012. Data on drug consumption (ATC/R codes, respiratory) and sub-group R03 (anti-asthmatics and bronchodilatators) were taken from annual reports of Croatian Agency for Medicinal Products and Medical Devices, from 2005 – 2012. Therapeutic consumption is presenting in number of defined daily doses per 1000 inhabitants per day (DDD/TID) and financial spending in Croatian kunas (HRK).

Results
In the entire observational period, the group of respiratory diseases (J diagnoses) is on a first place, with decreased trend in total morbidity; from 28% share in 2005, to 17% in 2012. The share of OPD in total respiratory morbidity increased, from 5.4% in 1995 to 6.1% in 2012, with decrease trend among young (7-19 years) and increased trend in elderly (over 65 years). Total utilisation, measured in DDD/TID and in HRK increased, and the greatest increase was observed in the group of ant asthmatics and bronchodilatators (R03 group). Therapeutically consumption increased from 15.5 DDD/TID in 2005 to 20.8 DDD/TID in 2012; around 40% of total consumption (R drugs). Financial spending on R03 group increased in 31.3%; from 129 958 891 HRK in 2005 to 189 002 251 HRK in 2012.

Conclusions
The increase in financial spending on the anti-asthmatics and bronchodilatators is much more (31.3%), then the increase of the group of obstructive pulmonary diseases (0.7%). Could this phenomenon be called as over-treatment is a question to be answered in the future research?

No 9
Time trends in the structure of public health nurse work in Croatian rural and urban regions: 1996-2012
Dobrislav Šimić¹, Zvonimir Bendeković²
¹Family Practice »Dr Dobrislav Šimić«, Bednja, Croatia
²Health Centre of the Varaždin County, Family Practice Lepoglava, Lepoglava, Croatia

Introduction
Regional differences in the functioning of public health nurse service (PHN) were observed over a time period and across Croatian counties.

Aim
The aim of this study was to investigate if there are any differences in the structure of everyday work of PHN service between rural, semi-rural and urban regions of Croatia.

Methods
According to the Croatian Strategy for the Development of Rural Regions and using OECD criteria, Croatia is divided into 3 parts: the rural (14 counties), the semi-rural (6 counties) and the urban (City of Zagreb County) region. The data on the number and structure of PHN visits to different patient groups for the rural, semi-rural and urban regions were obtained from the Croatian Health Service Yearbooks for the period 1996 to 2012.

Results
In the observed period, the average number of PHN visits increased from 1435.5 visits per a PHN in 1996 to 1826.5 in 2012. An increase was observed in the semi-rural (156%) and rural regions (132%), but the urban area marked a decrease (Fig 1). Differences were observed regarding the structure of visits to different patient groups. While the average annual number of visits per a PHN to pregnant women was on a decrease in the urban area, the number oscillated in the rural regions, and the number increased in the semi-rural regions (from 34 visits in 1996 to 45 in 2012) (Fig. 2). The annual number of visits to post-partum women increased across the regions, as well as the annual number of visits to new-born children. The annual number of visits to well-babies per a PHN decreased in the urban area, while it slightly increased in the rural and semi-rural regions (Fig. 3 and 4). The annual number of visits to chronic patients per a PHN remained stable in the urban area, but it doubled in the rural and semi-rural regions (fig 5).

Conclusions
The results indicate differences in the structure of PHN work in the rural and urban regions. The number of visits to women and children are always lower in rural regions. But, the increased number of visits to chronic patients observed in the rural and semi-rural regions should be further investigated as this type of visit does not fall within the scope of PHN work.

No 10
Trends in Statin Consumption in Croatia 2004 – 2012
Željko Vojvodić¹, Mladenka Vrčić-Keglević²
¹Family Practice „Dr Željko Vojvodić“, Bijelo Brdo, Osijek, Croatia
²Foundation for the Development of Family Medicine, Zagreb, Croatia

Introduction
In the last two decades prescribing of statins showed an increasing trend in all developed countries, therefore also in Croatia (where introduced in mid 1990-ies), as a result of improved understanding of benefits of this therapeutic group in prevention of cardiovascular mortality. Numerous well conducted clinical trials demonstrated their unquestionable efficacy in reduction
of cardiovascular morbidity and mortality, since their introduction in clinical practice, in thoroughly selected population groups. The rise of their utilization in the entire population has been took for granted, therefore, as desirable and beneficial, not only in secondary prevention, but even in some instances of primary, with the aim of controlling modifiable risk factors involved in atherogenesis and patogenesis of coronary heart disease.

The aim was to study trends in statin consumption in Croatia in a period from 2004 to 2012.

**Materials and methods**

Longitudinal observational study based on compiled data on the use of statins (ATC group C10AA), from annual reports of Croatian Agency for Medicinal Products and Medical Devices (HALMED), from 2004 to 2012. The utilization was expressed in both DDD/TID (defined daily doses per 1000 inhabitants) and financial expenses (EUR). Any changes in trends of consumption and financial costs were expressed in comparative numbers (percentages).

**Results**

The overall (outpatient + hospital) drug utilization in Croatia in the last 10 years was in constant rise. From the rate of 658.14 DDD/TID in 2002, it approached 926.9 DDD/TID in 2012 (40.7% rise). Hospital utilization was roughly between 2.98 – 3.67 % of the total drug consumption from 2004 to 2007, and around 0.5 DDD/1000/day between 2008 and 2012.

Statin consumption increased from 28.13 to 83.48 DDD/TID (196.7%), with sharp fall to 48.55 DDD/TID in 2011 (due to technical reasons – doubling of value of DDD). Simvastatin use increased at a rate of 64% until 2010, with some decrease afterwards. From the 8th position on the rank list of most frequently prescribed drugs in 2004, it dropped to the 17th. Atorvastatin use grew sharply until 2010, from 8.85 in 2004 to 47.92 DDD/TID in 2010 (440% rise), followed by decrease to 26.95 DDD/TID in 2012. From the 14th position on the rank list, it shifted to the 2nd in 2010. Fluvastatin was prescribed in lesser proportion, but again, with a trend of slight growth, from 1.47 in 2004 to 6.46 DDD/TID in 2012. Rosuvastatin, available since 2010, increased for 20 times, from 0.35 to 7.02 DDD/TID in 2012. It's ascent was apparently unaffected with the change in DDD value for statins, in 2011. (Fig. 1).

**Fig. 1. Trends in overall statin consumption in Croatia from 2004 – 2012 (in DDD/TID)**

The overall pharmaceutical financial expenditure (outpatient, including OTC + hospital) in 2004 was 3.82 billions of HRK (501 millions of EUR - exchange rate from 12.04.2014). The total costs remained relatively balanced from 2004 to 2007, while in the last few years increased to 665.3 millions of EUR in 2012 (32.7%). Approximately 90% of that amount were drugs on prescription regime (reimbursable).

Financial expenditure for statins expanded at much faster rate (by 53%), in comparison with the drug costs in total, from 21.2 millions of EUR in 2004 to 32.45 millions of EUR in 2012. Simvastatin and atorvastatin shared the greatest proportion in costs. Simvastatin expenditure decreased from 13.43 millions of EUR in 2004 to 6.6 millions of EUR in 2012, replacing its 1st position on the rank list of 25 top sales in 2004 with the 14th position in 2012. Atorvastatin sales, in the same period, advanced from 5.96 millions of EUR in 2004 to 14.95 millions in 2012 (150%), moving from the 11th position on the rank list in 2004 to the 1st position in the year 2008 already (Fig. 2). In the period of three years, rosuvastatin costs greatly advanced from negligible couple of thousands to significant 3,8 millions EUR, in 2012.

**Conclusions**

The total drug utilization in Croatian population was in constant rise. In that widespread increase in use of medicines, outpatient statin prescribing increased more than in other therapeutic group, with the greater rise of atorvastatin compared with simvastatin, and the greatest of rosuvastatin.
Financial expenditure of statins expanded at much faster rate, in comparison with the drug costs in total, which could have important consequences in future planning of health care.

Apart from possible unnecessary medicalization of health risks, there is a question related to the adverse effects. In Croatia, regretably, there is no systematic data on the adverse events attributable to statins, but elsewhere there is abundancy of such reports pointing out to potentially serious complications: statin myopathy, hepatic dysfunction, increased risk of developing diabetes, confusion, aggressive behaviour, cognitive disturbances, memory loss, immunoallergic skin reactions etc.