NIJZ National Institute of Public Health

Public Health Achievements in Slovenia

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Ljubljana, 2021

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Design: Tadeja Horvat, Ajda Bertok

Photos from: iStock, Adobe Stock, Shutterstock, Freepik

Publisher: National Institute of Public Health, Trubarjeva cesta 2, 1000 Ljubljana

Place and year of publishing: Ljubljana, 2021

Web edition

Web address: www.nijz.si

Kataložni zapis o publikaciji (CIP) pripravili v Narodni in univerzitetni knjižnici v Ljubljani

COBISS.SI-ID 80994819
ISBN 978-961-6945-50-9 (PDF)

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Foreword by Janez Poklukar, Minister of Health of the Republic of Slovenia

Health is a fundamental value for Slovenia. As a society, we strive to create conditions in which people have access to the best healthcare and have sufficient opportunities to enjoy a healthy lifestyle at all stages of life and in all environments. In different areas of public health, we have recorded successes that can be compared internationally and established exemplary cooperation with other ministries and civil society, particularly where success requires going beyond the healthcare system to address the needs of the most vulnerable groups in a way that is appropriate to them.

We are aware that taking a life-course approach to strengthening and maintaining health starts even before birth. Slovenia has one of the lowest infant mortality rate in the world due to providing healthcare for pregnant women at the primary level and well-planned antenatal and postnatal care. The high accessibility of quality healthcare and preventive healthcare for all population groups is reflected in a steady increase in life expectancy. High vaccination coverage is maintained through well-designed vaccination programmes; preventive dental check-ups during childhood and adolescence contribute to good oral health in adults. Healthy, hot meals are provided for all children and adolescents in schools and kindergartens to help them grow healthily; a healthy lifestyle is also encouraged through the promotion of exercise and a range of programmes offering professional support to children facing problems as they grow up. Slovenia is also serious about meeting its international commitments on tobacco control; in 2017, with a strict ban on smoking and the sale of tobacco products already in place, Slovenia introduced plain packaging for cigarettes and licensing for retailers of tobacco products.

At the local level, health promotion centres have been introduced in community health centres, and general practitioner team capacities have been strengthened with the part-time employment of an additional registered nurse who is responsible for comprehensive and integrated patient care in terms of both the prevention and treatment of chronic disease. As early as in 2002, Slovenia introduced a programme for the early detection of cardiovascular risk factors in adults, which has significantly contributed to reducing mortality from these diseases. The implementation of organised screening for cervical, breast and colorectal cancer has helped us significantly improve results in recent years in both the prevention and treatment of these types of cancer.

Equality in health has traditionally been very important in Slovenia. We are aware that universal access to healthcare is an essential but not the only condition for effectively addressing the needs of the most vulnerable population groups. In order to ensure timely access to healthcare services and participation in preventive programmes, mental health promotion programmes and early disease detection programmes for these population groups, we have successfully linked public health and primary healthcare with other stakeholders in the local community, such as non-governmental organisations, social work centres, kindergartens and schools.

In addition to health indicators, this publication sets out many examples of good practice of which we can be proud. Some of them are the result of projects, while some have already become systemic solutions. The COVID-19 pandemic has presented us with new and different challenges and provided us with an opportunity to additionally enhance the traditionally strong public health system in Slovenia and upgrade it with innovative solutions. Furthermore, I see the Slovenian Presidency of the Council of the European Union in the second half of 2021 as an opportunity to strengthen cooperation within the European Union in all areas of public health, particularly in working together to find innovative solutions so that we can be better prepared for and better respond to the challenges we face now and those we will face in the future.

Foreword by Milan Krek, Director of the National Institute of Public Health

Public health has a very long tradition in Slovenia. It dates back into the 18th and 19th century when several scientific works addressing public health challenges have been published. Through the establishment of the first community primary healthcare centre in Lukovica in 1927 and the work of the brothers Bojan and Ivo Pirc, Slovenian public health reached 21st century through numerous milestones.

The Resolution on the National Health Care Plan 2016-2025 »Together for a Society of Health« states that it is necessary to strengthen public health in Slovenia and adopt a strategy for the development of public health activities. To this end, between 2017 and 2019, the Republic of Slovenia conducted an extensive self-assessment of the essential public health operations, EPHO, which provides the basis for the strategy. The COVID-19 pandemic has shown that the need to strengthen public health system is now greater than ever.

The health care system contributed a significant share to the fact that life expectancy in 2019 was extended to 81.6 years, which puts Slovenia at the level of Germany and Denmark. In general, Slovenia has a strong public health system, which is well integrated into the national public healthcare infrastructure. The most important developmental improvements in public health were the introduction of new health education, promotion, prevention and screening programs as well as public health measures at the population level (legislation, intersectoral coordinated programs and measures to protect and promote health by acting on health determinants, national programs to reduce the burden of certain diseases and conditions - cancer, diabetes, obesity, HIV / AIDS, rare diseases, mental health). With the latter, we were able to significantly reduce the burden of premature mortality, mainly in the area of cardiovascular disease and suicide.

In line with the European guidelines, we have successfully introduced three cancer screening programs (ZORA, DORA, Svit Program). We also upgraded public health approaches at primary health care with targeted measures to manage four lifestyle risk factors (smoking, excessive alcohol consumption, insufficient physical activity and unhealthy diet) - first through the development of health education centres, and in the next decade through strengthening the family medicine team with a registered nurse who performs screening for noncommunicable diseases and performs regular checks of well-managed chronic patients.

I am honoured to be able to serve as director of the National Institute of Public Health in these turbulent times, in the midst of the first serious pandemic after the Spanish flu. I am especially proud of how successfully Slovenia has prepared the COVID-19 vaccination campaign and that to date over 1,000,000 people have been fully vaccinated. The COVID-19 pandemic in Slovenia is well managed by following and upgrading the recommendations of international health organizations.

The present publication describes the building blocks of successful and intensive development of public health in the years after Republic of Slovenia gained its independence, and I hope this will continue also in the future.

01
HEALTH IN SLOVENIA

Core health indicators in Slovenia in comparison with EU-27

Metka Zaletel, Tatjana Kofol Bric

Comparing Slovenia with European Union Member States, Slovenia ranks around the average of EU-27 in most of the health indicators. Slovenia is one of the most successful countries for several indicators, e.g., infant mortality, and on the contrary, there are few health indicators where Slovenia still remains as one of the countries with worst outcomes (e.g., suicide mortality) in spite of significant improvements in the last decade. Life expectancy has increased faster than the EU-27 average for male and female during the last decade; share of people that assess their health as good or very good, is still lower than the EU-27 average, despite an increase in recent years.

The health status of a population is the result of a complex interaction of many factors. Due to the changes of general well - being, better control of risk factors, research and development in medicine, and better access to healthcare, health of population is improving in all EU-27 countries. The pace of improving health and reducing health inequalities in most countries depends on investment in the health and social system, changes of access to health services, and health prevention and promotion in the country. Comparing to EU-27 countries, Slovenia ranks close to the average in most indicators, is very successful in some health indicators (e.g., infant mortality), and still remains at the tail end of the EU-27 in some indicators (e.g., suicide mortality rate). The entire spectrum of health and health care is best illustrated by few indicators presented later.

Life expectancy is one of the core indicators that embrace health status of the population and functioning of the health care system. It increased by 2.1 years (to 81.5 years) in the period 2010–2019, increasing more in male (by 2.6 years) than female (by 1.7 years). Based on preliminary estimates for 2020, Eurostat predicts a decrease in life expectancy in Slovenia by approximately one year as a result of the pandemic. In the same period (until 2019), life expectancy in the European Union increased by 1.4 years, more in male (1.7 years) than female. Preliminary estimates for pandemic consequences are not available for EU.

An indicator that is often used to generalize the health status of the population, which is influenced by many different factors, is self-assessed health. Self-assessed health is a qualitative indicator of personal perception of health that is widely used in medical, psychological, and clinical research. Personal perception of health is supposed to reflect the biological, socio-economic and psychosocial dimensions of an individual's health, which is determined by the response to one question. Slovenia traditionally ranks just below the average of EU-27 in the share of people who assess their health as good or very good with slight increase during the last decade.

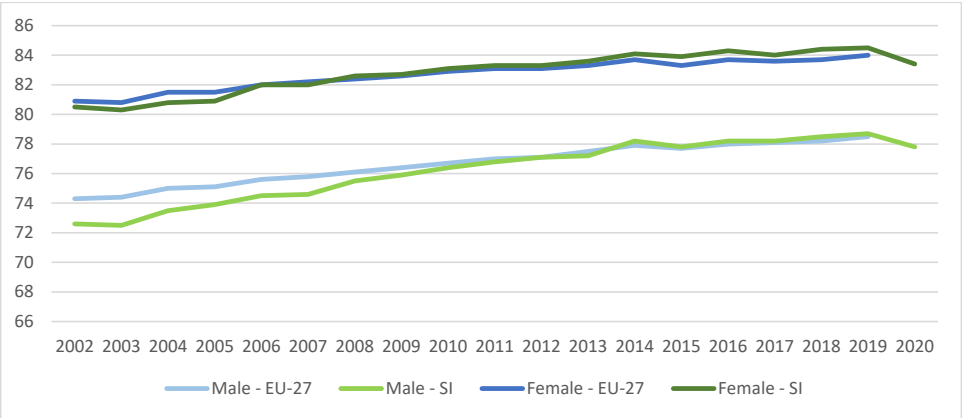

Figure 1: Life expectancy by gender, Slovenia and EU-27, 2002–2020. Source: Eurostat database, downloaded on 3 June 2021 Note: estimate for Slovenia for 2020 is based on excess mortality in 2020, estimate for EU-27 in 2020 is not available.

The main causes of mortality describe the health status of the population quite well when comparing Slovenia with other countries. Age-standardized mortality rates in Slovenia are near to the EU-27 average, the ranks of the main causes of mortality (circulatory, cancer and respiratory diseases) do not differ from countries with similar features. Slovenia has one of the highest mortality rates due to external causes of death, which includes accidents (transport and other), suicides and other similar causes. Large proportion of external causes of death are attributed to suicides, where Slovenia remains one of the countries with the highest burden.

More information on health in Slovenia is available in online sources:

OECD/European Union (2020), Health at a Glance: Europe 2020: State of Health in the EU Cycle, OECD Publishing, Paris, https://doi.org/10.1787/82129230-en.

OECD/European Observatory on Health Systems and Policies (2019), Slovenija: Zdravstveni profil države 2019, State of Health in the EU, OECD Publishing, Paris/ European Observatory on Health Systems and Policies, Brussels.

Eurostat Database: https://ec.europa.eu/eurostat/data/database

Zdravstveni statistični letopis Slovenije 2019: https://www.nijz.si/sl/publikacije/zdravstveni-statisticni-letopis-2019.

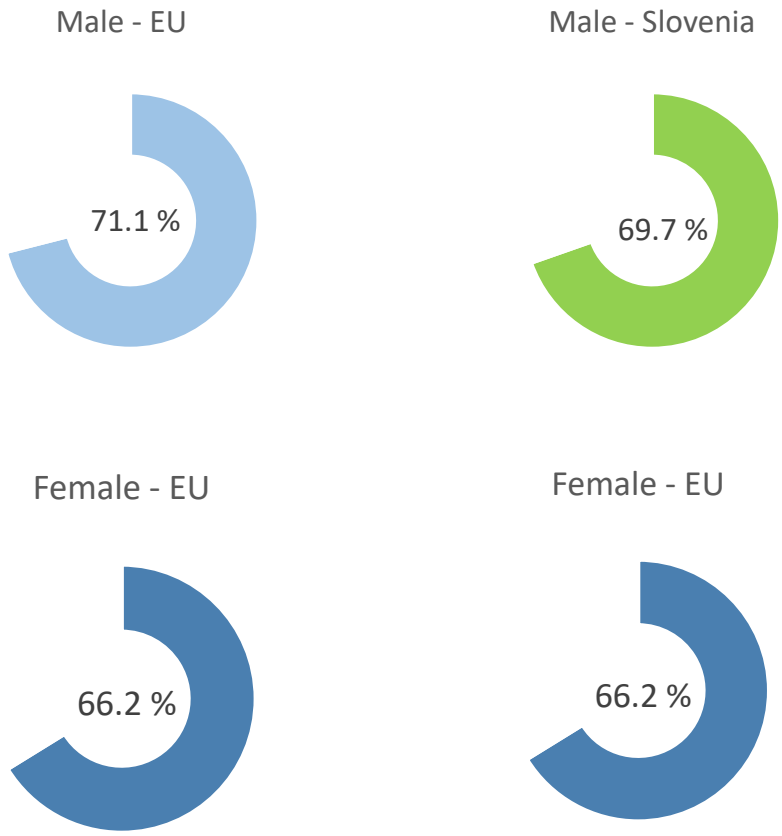

Figure 2: Proportion of persons who assess their health as good or very good, by gender, Slovenia and EU-27, 2019. Source: Eurostat database, downloaded on 3 June 2021

Health in the Municipality - health card for each Slovenian municipality

Ada Hočevar Grom, Victoria Zakrajšek

Every year the National Institute of Public Health (NIJZ) presents a set of indicators and key information on the health of the inhabitants of each Slovenian municipality. The purpose of the project is to strengthen health and prevent disease in the local environments where people live and work, and to make health information more accessible. All data and graphic displays are available at http://obcine.nijz.si.

The health of the population in the local community is the foundation of a healthy and prosperous society. There are 12 statistical regions in Slovenia, which include 212 municipalities that differ significantly in terms of health indicators. The project "Health in the Municipality" was created in 2015 in order to reduce inequalities in the health of the Slovenian population.

"Health in the Municipality" is an online tool containing a set of 36 health indicators for each municipality, which are comparable among the different municipalities, as well as with the regions and the Slovenian average statistics and which also shows the time trends. A so-called "health card" is available with a summary of the current situation, along with a short four-page booklet with related content, interactive maps and a table with all the data are created for each municipality. Data from NIJZ databases and external institutions are used (such as from the Faculty of Sports at the University of Ljubljana, Cancer Registry at the Oncology Institute, Public Road Safety Agency, Social Protection Institute, Ministry of Finance and Statistical Office of Slovenia).

The contents of the website are intended primarily for local decision-makers, mayors, employees of health centres and educational institutions, representatives of various associations and non-governmental organizations, who can influence community decisions and participate in creating a healthy environment.

All the data are available at http://obcine.nijz.si, where they are updated once a year and supplemented with new content. We can thus present the most important public health challenges for different population groups. The main aim is to encourage action at local level. The regional units of the NIJZ provide professional support to local decision-makers, play an important role in data interpreting and are involved in formulating effective strategies at the local level.

The usefulness and convenience of this online tool has already been recognized in many municipalities, which is confirmed by regular evaluations. The annual data releases receive great attention from the media, mayors and other important actors at the local and national levels.

In 2020, the NIJZ together with the leading Slovenian project for the monitoring of the local level of development, "Zlati kamen", for the second time awarded the honorary title of "Municipality of Health" to a municipality that recognized health as an important value and stood out in terms of activities to improve the health of its inhabitants.

Upgrading of the programme Health in the Municipality at Gorenjska

Alenka Hafner

The Health in the Municipality programme, which is taking place at the national level, was upgraded by the Kranj Regional Office of the National Institute of Public Health in 2018 with the publication Health in the Municipality of Jesenice, which contains a detailed analysis of health status, lifestyle factors and healthcare, as well as proposals for measures to improve, protect and strengthen health. Based on the proposals, decision-makers committed to take health into account as a key criterion when making decisions in local policies. In 2020, the monograph Health in the Municipality with Trends and Challenges was prepared for each municipality in the region of Gorenjska.

In 2016, the National Institute of Public Health (NIPH) issued the publication Health in the Municipality for the first time for all 212 Slovenian municipalities. From the very beginning, the Kranj Regional Office of the NIPH has been actively involved in improving national publications, and in 2018 it prepared Health in the Municipality of Jesenice, which represents an upgrade of the Health in the Municipality programme for the local environment. Numerous health indicators suggested that the health of the citizens of this municipality, which has a population of just under 21,000 (or 10% of the population of Gorenjska region), and a lower level of average educational attainment, is on average worse than in its region overall, and it also has the highest socio-economic deficit. In view of this finding, the Kranj Regional Office decided to cooperate with the municipal leaders in making an in-depth multi-year analysis of health status, lifestyle factors and healthcare, preparing proposals for measures to protect and strengthen health and presenting them to decision-makers at the municipal level. In particular, they highlighted the importance of reducing health inequalities and adopting a community-based approach to health. Based on this document, the decision-makers committed to taking health into account as a key criterion when making decisions in local policies. Various institutions will be involved in the implementation, from healthcare, education, social services and economic institutions to local communities, civil society organizations and associations, while empowered members of the community will also take part in the decision-making processes. It is no less important for them to be aware that the better health of the population will contribute to the economic and social development of the municipality, and especially to a better quality of life for residents. The document now represents the basis for the preparation of similar publications for other Slovenian municipalities.

In 2020, a monograph Health in the Municipality with Trends and Challenges was prepared for each of the 18 municipalities in the region of Gorenjska. All publications are published on the regional website, and thus accessible to the professional and lay audiences in the region and the wider environment.

SI-PANDA – survey on the impact of the COVID-19 pandemic on people's lives

Ada Hočevar Grom, Andreja Belščak Čolaković, Maruša Rehberger, Darja Lavtar

Since December 2020, the National Institute of Public Health (NIJZ) has been conducting a behavioural insight survey on the impact of the COVID-19 pandemic on people's lives (SI-PANDA). The aim of the research is to understand human behaviour in relation to COVID-19 and to assess "pandemic fatigue" during COVID-19 pandemic in Slovenia. The results of the study showed that the population of Slovenia exhibited signs of such fatigue, and that the pandemic had a most negative impact on younger groups of the population due to its syndemic potential. The results of the study are available at: https://www.nijz.si/sl/izsledki-panelne-spletne-raziskave-si-panda.

The aim of the research is to understand the behaviour of people in relation to the COVID-19 pandemic and to assess pandemic fatigue[1]. Understanding people's behaviour enables the identification of target groups who are at risk and helps to find solutions that encourage better compliance with the recommendations for protective behaviour.

The SI-PANDA study has been conducted since 4 December 2020 in the form of a panel online survey with repetitions once every two weeks, and once a month since June 2021. Each wave of the online survey involves a sample of about 1,000 adults aged 18 to 74 years (inclusive). In the survey, we use the World Health Organization (WHO) questionnaire, which was adjusted to the situation in our country, and the WHO methodology[2].

The survey results show that signs of pandemic fatigue are already appearing in general population of Slovenia. The COVID-19 pandemic has worsened the population lifestyle, as well as contact with personal physicians and people's mental health. The negative impact of the pandemic is especially noticeable among the younger population, which indicates that while the disease itself had more of an impact on the elderly, the consequences of pandemic control measures affected mainly younger groups, whose financial situation was also deteriorated.

In Slovenia, we will continue to face the long-term consequences of the COVID-19 pandemic. This is not only because of the large number of people who have been ill or died from the disease, but also because of its syndemic impact. It is therefore crucial that steps are taken in time in the areas of healthcare and social protection, as well as in other areas, to prevent an increase in health inequalities among future generations (Bambra et al., 2020).

Bambra C, Riordan R, Ford J, et al. The COVID-19 pandemic and health inequalities, J Epidemiol Community Health. 2020; 74: 964–86.

1_Fatigue is a natural and expected response to a long-lasting public health crisis that has a significant impact on the individual's everyday life. It arises gradually and is influenced by an individual's feelings, experiences and views. Over time, the compensatory mechanisms people use to combat a crisis situation begin to exhaust themselves. The resulting demotivation is also reflected in reduced awareness of the risks associated with COVID-19, unwillingness to receive information and failure to engage in self-protective behaviours. Pandemic fatigue is a serious threat to the success of measures to prevent the transmission of SARS-CoV-2 infection among the population.

2_Survey tool and guidance: behavioural insights on COVID-19. Available at the website: https://apps.who.int/iris/bitstream/handle/10665/333549/WHO-EURO-2020-696-40431-54222-eng.pdf?sequence=1&isAllowed=y.

National population health surveys in Slovenia

Tina Zupanič, Darja Lavtar

National surveys in the field of health and healthcare are an important source of data on the health status of the population, the use of various healthcare services and health-related behaviours. In the last 10 years, the National Institute of Public Health (NIJZ) has gained valuable experience by using mixed survey modes and introducing web surveying.

The NIJZ conducts national surveys in the field of health and healthcare among the adult population of Slovenia and school-aged children and adolescents, which are an important source of data on the health status of the population, the use of various healthcare services and health-related behaviours. National cross-sectional surveys on a sample of target population, unlike administrative databases, give us a more general and broader insight into the health of the population.

Representative data for Slovenia and international comparability were provided by the following surveys: European Health Interview Survey (EHIS; implemented in 2007, 2014 and 2019), Health Behaviour in School-Aged Children (HBSC; implemented in 2002, 2006, 2010, 2014, 2018, 2020) and National Survey on the Use of Tobacco, Alcohol and Other Drugs (ATADD; implemented in 2012 and 2018).

The research CINDI Health Monitor (CINDI; implemented in 2001, 2004, 2008, 2012, 2016, 2020) is not internationally comparable, but it represents a survey with the longest tradition in the field of public health survey research in Slovenia, and therefore provides important temporal insight into changes in health in the last 20 years.

Research was also carried out in narrower content areas, such as the Slovenian National Food Consumption Survey on Children (infants and toddlers), adolescents, adults and elderly (2007, 2017), the National Survey of Sexual Attitudes and Lifestyles (2001, 2016), School Scheme (yearly implementation from 2009 onwards), the research Determining the Urine Levels of Sodium and Potassium in the Adult Population of Slovenia (2012), the Survey on the Use of Illicit Drugs, Tobacco and Alcohol among Prison Population (2015), the National Oral Health Survey of the Population of Slovenia (2019), the National Health Literacy Survey (2020) and other smaller studies.

In 2020 and 2021, the NIJZ conducted several surveys on the impact of the COVID-19 pandemic (SI-PANDA, the first longitudinal HBSC survey).

In the last 10 years, the NIJZ has gained valuable experience by using mixed survey modes among the adult population (such as combining web and face-to-face surveys in EHIS and ATADD surveys or combining web and mail surveys in CINDI and SI-PANDA surveys) and introducing web surveying among school children and adolescents (such as HBSC, School Scheme). The use of web surveys, whether alone or in a combination, reduces the cost of conducting the survey, and these methods also allow for reaching a more mobile and younger population, which is not possible with traditional modes of surveying (face-to-face, by mail, by telephone). This ensures adequate representation of individual subpopulations in the collected data, achieves the desired response rate and increases the reliability of population estimates.

In the last 5 years, the NIJZ has given a lot of attention to the qualitative aspect of preparing survey questions and answers, as questionnaires are tested before data-collection is conducted, which includes cognitive testing of new questionnaires (or parts thereof) and pilot field testing.

By tracking progress in conducting survey research, the NIJZ provides quality data for indicators used for national and international comparisons.

Inequalities in health

Mojca Gabrijelčič Blenkuš

Inequalities in health are a similarly challenging public health problem in Slovenia as elsewhere in the world, despite one of the smallest Gini indexes in the world. Regular monitoring is key to addressing and reducing health inequalities. In the last ten years, Slovenia has switched from reporting on inequalities based on the results of selected indicators to reporting on the impact of social determinants and sectoral measures on the occurrence of inequality, in accordance with the 2011 Rio Political Declaration on Social Determinants of Health[1]. The WHO European HESRi[2] tool was tested and a lot of experience from the EU space, from JAHEE[3] and the EuroHealthNet partnership was used in performing those tasks.

In 2011, NIJZ published the first modern review publication on health inequalities (Buzeti et al., 2011) and defined "socio-economic inequalities in health" as "those differences in health conditions between social groups with different socio-economic status that can be prevented and are unfair. In 2018, a second publication was dedicated to health inequalities, showing inequalities during the economic crisis (Bajt et al., 2019). It showed that in Slovenia, compared to other EU countries, we managed to maintain relatively good health of all population groups even during the economic crisis, without increasing the gap, despite relatively low health expenditures. On the other hand, population as a whole made less progress in health than other comparable countries of EU.

In the third publication Inequalities in Health - Future Challenges in Intersectoral Cooperation (Gabrijelčič Blenkuš et al., 2021), published in 2021, we showed that cross-sectoral cooperation can run better if competent central national sectoral institutions work together to prepare arguments for individual policies or measures to support multisectoral work. Report in 2021 was prepared in close cooperation of experts from the NIJZ, the Institute for Economic Research (IER) and the Institute of the Republic of Slovenia for Social Welfare (IRSSV) with the cooperation of the Office of the Republic of Slovenia for Macroeconomic Analysis and Development (IMAD). In the process of preparing the publication, a Steering Committee from representatives of relevant sectors was established, which monitored the preparation and provided guidelines. With the preparation of the third publication, we tested the operation of the Platform of national institutions (Figure), which we want to pilot in the next five-year period and check the possibilities of institutionalization in the future.

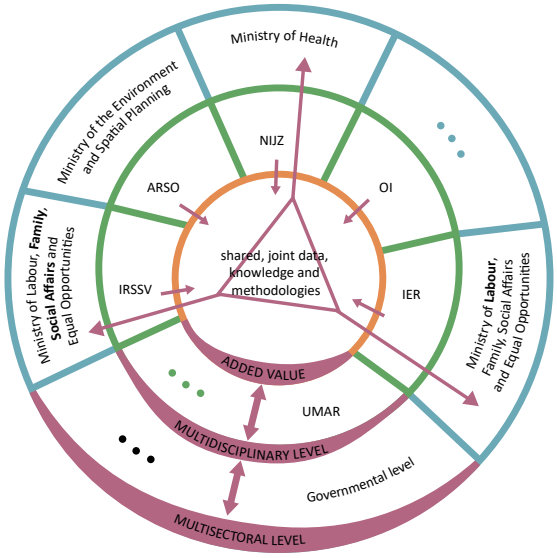

Figure 1: Collaboration of national institutions

Buzeti T, Djomba JK, Gabrijelčič Blenkuš M, et al. Health Inequalities in Slovenia. National Institute of Public Health; 2011. Available from: https://www.nijz.si/sites/www.nijz.si/files/publikacije-datoteke/health_inequalities_in_slovenia.pdf.

Bajt M, Lesnik T, Farkaš-Lainščak J, et al. Examining Health Inequalities in Slovenia during the Financial Crisis, Key Takeaway Messages. National Institute of Public Health; 2019. Available from: https://www.nijz.si/sites/www.nijz.si/files/publikacije-datoteke/povzetki_examining_health_krajsa_angleska_2019_elektronska_izdaja_2.pdf.

Gabrijelčič Blenkuš, M., Kofol-Bric, T., Zaletel, M., Hočevar-Grom, A., & Lesnik, T. (Eds.). Inequalities in Health - Future Challenges in Intersectoral Cooperation. Nacionalni inštitut za javno zdravje, 2021. Available from:: https://www.nijz.si/sites/www.nijz.si/files/publikacije-datoteke/neen_strokovna_monografija_eng_e-verzija_5_7_21_obl_1.pdf

1_https://www.who.int/sdhconference/declaration/Rio_political_declaration.pdf

2_https://www.euro.who.int/en/health-topics/health-determinants/social-determinants/health-equity-status-report-initiative

3_Joint Action on Health Equity in Europe https://jahee.iss.it/

Health-related behaviours among adolescents

Helena Jeriček Klanšček, Vesna Pucelj, Tina Zupanič

Since 2002, the National Institute of Public Health (NIJZ) has been systematically measuring and analysing the situation, trends and comparisons in the context of the International HBSC Survey of 11-, 13- and 15-year-olds. Based on these findings, we are planning programmes and measures for protecting and strengthening the health of children and adolescents. In 2018, we also included 17-year-olds for the first time, which allowed us to gain a more comprehensive insight into behaviour during adolescence. In 2019, we also conducted a survey among adolescents who do not attend school and are not employed.

Recent decades have seen many significant developments in the field of research into the health of children and adolescents. Slovenia participated in the regular monitoring of international indicators of health, social context, current challenges and health-related behaviours by taking part in the international survey Health Behaviour in School-Aged Children (HBSC[1]). HBSC is a survey conducted every four years under the auspices of the World Health Organization among 11-, 13- and 15-year-olds attending school in more than 40 countries, which provides an assessment of the situation in the country, comparisons and monitoring of trends over the years and international comparisons. Slovenia joined the survey in 2002 and conducted surveys in the years 2002, 2006, 2010, 2014, 2018. Our special achievements include[2] the annual reports and the first policy brief for political decision-makers in 2012, which provided a brief but comprehensive overview of the health status of children and adolescents, as well as proposals for measures. The findings and proposals for measures were presented to representatives of three ministries – the Ministry of Health, the Ministry of Education, Science and Sport and the Ministry of Labour, Family and Social Affairs. This publication, along with other publications presenting the situation, trends and inequalities, was an important starting point for the preparation of various national documents and also for planning and evaluating various measures and programmes in Slovenia related to alcohol, tobacco, nutrition, mental health, injuries and other areas. 17-year-olds were included in this survey for the first time in 2018, which gave us an insight into health-related behaviours in this age group, about which we normally have less data, as this group is mostly not included in research on adolescents or adults. This allowed us to fill an existing gap in data. In 2019, for the first time, we conducted a customized survey among dropouts and young adults attending the programmes Project Learning for Young Adults (PUM-O). The term dropouts denotes adolescents who do not attend school and are not employed. This is a particularly vulnerable group among adolescents and young adults, about whom we have very little data on health and health-related behaviours. The data are also difficult to obtain, so they are even more valuable to provide insight into the situation and plan further activities to help this population.

In 2020, just before the second wave of the COVID-19 epidemic in Slovenia, we also conducted the first longitudinal HBSC survey to determine what impact the first wave of the epidemic had on Slovenian adolescents.

1_For more information about the HBSC survey, please visit the website: http://www.hbsc.org/.

2_The above-mentioned publications are available on: https://www.nijz.si/sl/z-zdravjem-povezana-vedenja-v-solskem-obdobju.

Workers' health surveillance

Ticijana Prijon

The health of workers is a major and growing public health problem, especially in terms of the negative effects of work on the health of employees and the ageing of the working population. For years the health of workers has been excluded from shaping the vision and strategy of public health. Therefore, the NIJZ has been forced to establish a new field of expertise aimed at studying the health of workers as well as workplaces.

The size of the problem is reflected by the fact that in 2020 more than 12,300,000 working days were lost due to sick leave, and expenditures for health insurance benefits amounted to more than €440 million, which represents about 13% of all expenditures of the Health Insurance Institute of Slovenia (ZZZS). In addition, we note that in Slovenia there are currently no developed systems or established mechanisms to assist in the reintegration of workers after long-term sick leave, nor any effective early vocational rehabilitation programmes.

The basic field of work within the framework of workers' health consists of an analysis of causes, dissemination of data and preparation of publications on health-related absenteeism, promotion of health in the workplace and participation in interdisciplinary interdepartmental working groups to ensure the safety and health of employees in the Republic of Slovenia.

Through an analysis of long-standing trends in health-related absenteeism (as part of the PKMO project), the incidence of work-related musculoskeletal disorders (MSDs) and psychosocial risks (PSRs) was identified in relation to the burden and characteristics of individuals and workplaces in various economic activities and health regions. The analysis represents a direct connection between the actual prevalence of the most common forms of MSDs and PSRs among employees in Slovenia that are related to work, on whose basis employers, in cooperation with occupational safety and health experts, can plan preventive measures and other activities for averting and managing issues and risks in this area in a direct and targeted way (Prijon, 2020).

Within the framework of set tasks, the professional contents of the »National Platform for the Promotion of Occupational Health« (PZD) have also been prepared. The basic aim of PZD (https://pzd.razvoj.dev/) is to raise awareness and inform employers, employees, experts and other stakeholders about the benefits and methods in the promotion of health in the workplace. With PZD we also want to improve a healthy working environment as well as the physical and mental health of employees, reduce health-related absenteeism and work disability and thus the cost of benefits, reduce the number of occupational injuries as well as occupational and work-related diseases, reduce presenteeism in Slovenian companies and consequently increase employee satisfaction and productivity.

Prijon T. Zdravstveni absentizem zaradi z delom povezanih kostno-mišičnih obolenj in duševnih stresnih motenj v Sloveniji. Primerjalna analiza začasne nezmožnosti za delo v letih 2015 in 2019. National institute of Public Health, 2020. Available from: https://www.nijz.si/sites/www.nijz.si/files/uploaded/pkmo_analiza_bs_zaradi_z_delom_povezanih_kmo_in_dusevnih-stresnih_motenj.pdf.

Prijon T. Najpogostejša z delom povezana kostno-mišična obolenja po anatomskih regijah. National Institute of Public Health, 2020. Available from: https://www.nijz.si/sites/www.nijz.si/files/uploaded/pkmo_najpogostejsa-kmo-po-anatomskih-regijah.pdf.

Prijon T. Duševne in vedenjske motnje v luči začasne nezmožnosti za delo. Primerjalna analiza zdravstvenega absentizma v letih 2015 in 2019. National Institute of public Health, 2020. Available from: https://www.nijz.si/sl/publikacije/dusevne-in-vedenjske-motnje-v-luci-zacasne-nezmoznosti-za-delo-primerjalna-analiza.

02
HEALTH POLICIES, STRATEGIES, NATIONAL PROGRAMMES AND INTERSECTORAL COOPERATION FOR HEALTH

DPOR | National Cancer Control Programme Slovenia

National Cancer Control Programme

Sonja Tomšič, Branko Zakotnik

In 2010 and 2017 Slovenia adopted the National Cancer Control Programme (NCCP), which brings together comprehensive measures for controlling cancer in Slovenia. In that period the growth trend of age-standardised incidence of cancer eased off, even declining among men, the survival rates for cancer patients have been improving, and significant shifts have been made in the area of improving quality for cancer patients through integrated rehabilitation and palliative care.

During its first Presidency of the Council of the European Union in 2008, Slovenia set cancer as a priority. In this way it supported international and national efforts to comprehensively address this important public health issue of modern times. In 2010 the first *National Cancer Control Programme 2010–2015* was adopted, setting out three strategic goals[1]:

- Slowing down the increase in incidence;
- Increase survival rates;
- Improve the quality of life for cancer patients.

NCCP 2017–2021 sets out strategic and specific goals to upgrade the original NCCP 2010–2015, which was prepared on the recommendations of the European Commission written in the EPAAC[2] project.

In the ten years of common efforts, we can highlight the following achievements and a few challenges.

The number of new cases of cancer (incidence) is still growing, but if we exclude the effect of population ageing, we can see that the growth is less steep, with the trend among men after 2010 even reversing and decreasing annually by 0.3%. A major contributor to this is undoubtedly the introduction and exemplary functioning of the national screening programmes (the ZORA Programme for cervical cancer and the Svit Programme for colorectal cancer), while primary preventive measures have also contributed significantly. There is, however, a worrying trend of growth in lung cancer among women.

The survival of cancer patients is a composite indicator that reflects both the characteristics of patients and the organisation, accessibility, quality and effectiveness of the healthcare system. In a 10-year period the overall survival rate of cancer patients improved by 3 percentage points (5-year net survival for the period 2011–2016 was 58%), principally owing to the detection of cancer in earlier stages, which was helped significantly by all three cancer screening programmes, which in addition to the two mentioned earlier include breast cancer screening in the DORA Programme. Appropriate and timely diagnosis and treatment also contribute significantly to the survival rate. In Slovenia in general, access to modern therapeutic options is good. For the most common cancers, we will soon be able to continuously monitor the quality of care on the national level. As in 2017 we started introducing so called national clinical registries, which will contain more detailed data on diagnosis and treatment.

In order to improve the quality of life of cancer patients we started to upgrade the organisation of integrated rehabilitation, which links together all levels of healthcare and thereby enables high-quality services as close as possible to home. In the area of palliative care, we are enhancing the knowledge of all health workers, with specialised palliative departments being set up at hospitals along with mobile teams.

The third *National Cancer Control Programme 2022–2026* is currently in the process of being adopted, and it contains ambitious objectives for the future.

1_National Cancer Control Programme 2017–2021. Available at: www.dpor.si

2_European Partnership for Action against Cancer. Available at: http://www.epaac.eu/

odkrijmo sladkorno

Managing diabetes: from strategy 2010–2020 to strategy 2020–2030

Jelka Zaletel, Jožica Poličnik, Kerstin Vesna Petrič

In order to manage diabetes until 2030 it will be necessary to strengthen health literacy; increase empowerment for successful self-management of diabetes and good quality of life; ensure effective clinical guidelines, clinical pathways, protocols of cooperation, supply plans, discharge plans, supply coordinators and case coordinators; offer a community-based approach for health on a municipal level, a new structure or process for harmonisation and connection on a territorial or regional level, and harmonised and connected intersectoral measures on a state level, territorial/regional levels and in local communities.

The National Diabetes Management Programme 2010–2020[1] was the first strategic document dealing with the management of diabetes - everything from reducing the incidence of type 2 diabetes and its early detection, to reducing the number of complications and mortality due to diabetes. The related activities have connected partners of different subject fields and occupational groups, the NIJZ, Ministry of Health and ZZZS, and representatives of those suffering from diabetes. In this period access to education has increased, together with the implementation of uniform and regularly renewed clinical guidelines with the introduction of registered nurses as coordinators of care in general practices. In this period, access to modern medications and medical devices has increased. We have seen improved availability of the key data and information necessary for monitoring the management of diabetes. Despite changes in lifestyle, we can observe positive shifts concerning a healthy diet and physical activities.

Regardless of these successes, there are still gaps which are systematic in nature. There are considerable differences in health between different parts of Slovenia, a high prevalence of diabetes and a distinct increase in its incidence in certain areas and clear differences between areas. This draws attention to the greater health needs of certain populations, the need for public health measures to improve lifestyle factors and factors connected with the health care system in these environments, and the need for measures outside health care. Health care, which often demands the inclusion of many experts from different fields and specialities, and can therefore be fragmented, is of a high quality only if it is harmonised and connected, bearing in mind that the circumstances in different parts of Slovenia differ widely. Except for differences in access to suitable care for people with diabetes on a primary level, there are also huge differences in the diabetological teams, which causes significant differences in access to care on the level of specialist diabetological activities. In 2020 COVID-19 undermined the health care of people with chronic and acute conditions, and interrupted the implementation of programmes to improve health and preventive check-ups for early detection of chronic illnesses, and in a social sense it worsened the determinants of health for certain sections of the population. As people with diabetes are among those most at danger, a fundamental development document is urgently needed which in the case of diabetes as a model illness would support and establish strategic action.

The coordinative group, which harmonised and monitored the activities of the National Diabetes Management Programme from 2010 to 2020, has on the basis of diabetes management trends, a broad discussion and external evaluation, prepared starting points for strategic guidelines until 2030, on the basis of which the Ministry of Health formed a National Programme for Managing Diabetes 2020–2030, which the Government of the Republic of Slovenia adopted on 24 June 2021.

Approaches and tools for realising the common idea of the partners include strengthening health literacy and support for the process of empowerment for successful self-management of diabetes and good quality of life; offering clinical guidelines, clinical pathways, protocols of cooperation, supply plans, discharge plans, supply coordinators and case coordinators; using a community-based approach for health on a municipal level, a new structure or process for harmonisation and connection on a territorial or regional level and harmonised and connected intersectoral measures on a state level, territorial/regional levels and in local communities.

1_https://www.obvladajmosladkorno.si/.

National Programme on Nutrition and Physical Activity for Health 2015–2025

Katja Povhe Jemec

In 2015 the Slovenian National Assembly adopted the *Resolution on the National Programme on Nutrition and Physical Activity for Health 2015–2025 (National Programme 2015–2025*) (Ministry of Health, 2015). The purpose of the National Programme 2015–2025 is to improve the dietary and physical movement habits of the population from the early period of life up until late old age. Through it we are seeking to offer equal opportunities for maintaining health for all, including socially and economically more vulnerable groups of the population, to stop and reverse the trend of increasing body mass among people and to aid in reducing the occurrence of chronic diseases. In this way we will also make an important contribution to the quality of life and prosperity of society.

Through the *National Programme 2015–2025* we are fulfilling the following strategic goals:

- reducing the proportion of the population with excessive body mass and obesity,
- reducing the proportion of the population that is physically inactive and has an inappropriate diet,
- increasing the number of children who are breast-fed and reducing the proportion of malnourished and functionally less capable elderly people and patients,
- increase the availability and demand for foods with more favourable nutritional composition.

Action plans are focused on certain priority areas that require the close and effective cooperation of several departments:

1. ensuring healthy diets in line with guidelines and recommendations,
2. improving the range of choices on offer that are beneficial for health in cooperation with stakeholders in the food production business and trade and in hospitality and tourism,
3. ensuring the accessibility of healthy dietary choices for socially and economically at-risk groups,
4. ensuring safe food that is beneficial to health, with emphasis on sustainable local supply and self-sufficiency,
5. labelling, presentation and marketing of food,
6. physical activity for health,
7. an environment that encourages regular physical activity,
8. the role of the healthcare system,
9. education and training and research,
10. information and awareness-raising.

Due to the complexity and numerous challenges in the area of healthy nutrition and regular physical activity, we are pursuing cross-sectoral links, and seeking synergies with agricultural policy guidelines, with the guidelines of the *National Sports Programme, Strategy of Slovenian Tourism for a Green, Active and Healthy Slovenia*, with integrated transport strategies (promoting and facilitating the conditions for healthy, active mobility with a reduction in the carbon footprint) and with the social policy guidelines for social activation and reducing the risk of poverty. Through cooperation in the area of infrastructural and environmental policy we are creating an environment that is more favourable for physical activity. We are encouraging local communities to plan green areas for the promotion of physical activity and to ensure the conditions for healthy, active mobility. We wish to reduce the time spent sitting in the workplace, in kindergarten, at school and home.

Changing dietary and physical movement habits is a lengthy process, where only through interdepartmental cooperation can we create the conditions where individuals will want and be able to exert an influence on over-eating, the incidence of cardiovascular diseases, cancer and other diseases related to diet and lack of physical exercise, which have a major impact on the quality of life for all of us.

1_Ministry of Health of the Republic of Slovenia National Programme on Nutrition and Physical Activity for Health 2015–2025. Ljubljana, Ministry of Health of the Republic of Slovenia, 2015. https://www.dobertekslovenija.si/nacionalni-program-2015-2025/.

Evidence-informed policy brief for prescribing antibiotics to residents in long-term care facilities

Polonca Truden Dobrin, Maja Šubelj, Bojana Beović

Physicians in long-term care facilities (LTCFs) often prescribe broad-spectrum antibiotics without adequate prior microbiological diagnostics to treat health complications due to infections. Inadequate antibiotic prescribing poses an additional health risk for vulnerable elderly people, and further contributes to the increased incidence of antimicrobial resistance (AMR).

With the help of technical and professional support from the Evidence-Informed Policy Network (EVIPNet) of the World Health Organisation (WHO) Regional Office for Europe, the WHO Office in Slovenia, the Ministry of Health and the National Institute for Public Health (NIJZ), in cooperation with key field experts, we prepared an Evidence-Informed Policy Brief (EBP) (EVIPNet Europe, 2018). After reviewing the literature, we selected evidence-based options to optimize antibiotic prescribing in Slovenian LTCFs.

Residents of LTCFs are often colonized by multidrug-resistant bacteria against which broad-spectrum antibiotics are not effective. LTCFs are places where the spread of resistant microbes is easy, as residents live in a relatively closed environment with limited mobility, have repeated contact with other residents, staff and visitors, and are often in contact with the hospital environment.

Regular monitoring and control of antibiotic prescribing and AMR with feedback to prescribers are key to improving antibiotic prescribing. In addition, the development and implementation of appropriate guidelines and clinical pathways for diagnosis and treatment, including the consideration of diagnostic criteria for common infections, is important to improve antibiotic prescribing. There is also a need to establish continuing education programs for medical staff and to provide health information to residents/patients and their relatives/carers/visitors. Regular training of physicians on the appropriate prescribing of antibiotics and on diagnosing specific conditions and distinguishing viral from bacterial infections is known to improve the use of antibiotics. Because physicians are often confronted with patients who

are unaware of AMR, greater awareness with regard to such issues is also needed among patients and their relatives/carers.

The proposals from the EBP were taken into account in the preparation of the National Strategy »One Health« for the control of AMR and the Action Plan for the period 2019-2021 (Ministry of Health, 2019). They were also taken into account when planning the activities of clinical pharmacists at the primary healthcare level.

EVIPNet Europe, Evidence brief for policy. Antibiotic prescribing in long-term care facilities for the elderly. Copenhagen: WHO Regional Office for Europe; 2018. Available from: https://www.euro.who.int/en/health-topics/Life-stages/healthy-ageing/publications/2018/antibiotic-prescribing-in-long-term-care-facilities-for-the-elderly

Ministry of Health. Državna strategija »Eno zdravje« za obvladovanje odpornosti mikrobov. [National Strategy »One Health« for Microbial Resistance Management 2019–2024.] Ljubljana: Ministry of Health; 2019, Available from: https://www.gov.si/novice/nov-vlada-sprejela-drzavno-strategijo-eno-zdravje-za-obvladovanje-odpornosti-mikrobov-2019-2024-z-akcijskim-nacrtom-za-obdobje-2019-2021/.

Comprehensive tobacco control programme in Slovenia

Helena Koprivnikar

A comprehensive programme of tobacco control is conducted in Slovenia Following the adoption of a new law in 2017, the percentage of smokers fell in the adult population, and the decline among adolescents continued. There are still a lot of challenges, and these are defined and addressed in the *Strategy to Reduce the Consequences of Tobacco Use 2021–2030* (in the confirmation process), which has the long-term goal of a tobacco-free Slovenia in 2040.

Slovenia has a 25-year legislative tradition in the area of controlling tobacco. *The Restriction on the Use of Tobacco and Related Products Act*[1], adopted in March 2017, includes the latest effective measures of controlling tobacco, including uniform packaging. Following adoption of the act, among European countries Slovenia advanced from 28th place to 8th place on the scale of measures to control tobacco (Joossens et al., 2020), after nearly two decades the percentage of smokers fell among the adult population in total and among both genders (in 2021 every fifth inhabitant aged 18 to 74 smokes tobacco), while the spread of smoking continued to decline amongst adolescents (Koprivnikar et al., 2021).

The reduction in the spread of smoking was brought about not just by legislation but also by programmes and activities to prevent smoking, the reduction in exposure to tobacco smoke and encouraging people to quit smoking, which are conducted as part of preventive healthcare in the context of preventive check-ups, preventive activities and programmes to promote health in health promotion and health education centres, visits by staff from these centres to kindergartens, primary and secondary schools, and programmes such as the *Slovenian Network of Healthy Schools and Health in Kindergarten*. There are various forms of assistance available in Slovenia to help people give up smoking. In the aforementioned centres experts offer free support for giving up smoking in the form of group workshops or individual counselling. Every day from 7 to 10 am and 5 to 8 pm there is a free telephone counselling service at 080 2777, which offers information on giving up smoking and the possibility of guidance over the phone in the process of giving up. Nicotine replacement therapy, available in pharmacies, and prescription medicines prescribed by a doctor, are covered by the individual. Programmes and activities to prevent smoking and to help people quit smoking are also provided by non-governmental organisations.

Continued work in the area of controlling tobacco and dealing with existing challenges are addressed in the *Strategy to Reduce the Consequences of Tobacco Use 2021–2030* (in the confirmation process), which has the long-term goal of a tobacco-free Slovenia in 2040.

Joossens L, et al. The Tobacco Control Scale 2019 in Europe. Brussels: Association of European Cancer Leagues, Catalan Institute of Oncology; 2020.

Koprivnikar H, Korošec A, Rehberger M, Lavtar D, Zupanič T, Rudolf A. Pregled najnovejših podatkov o uporabi tobačnih in povezanih izdelkov v Sloveniji. Ljubljana: National Institute of Public Health, 2021.

1_Restriction on the Use of Tobacco and Related Products Act (ZOUTPI). Official Gazette of the Republic of Slovenia, Nos. 9/17 and 29/17.

Approaches to reduce the negative effects of alcohol consumption

Maja Roškar, Sandra Radoš Krnel, Vesna Kerstin Petrič, Nataša Blažko, Marjetka Hovnik Keršmanc

Alcohol is one of the key public health problems in Slovenia, so major attention is focused on the development of preventive programmes and measures to prevent and reduce the harm of alcohol, and also to monitor the consequences of alcohol use, as key elements of a successful alcohol policy.

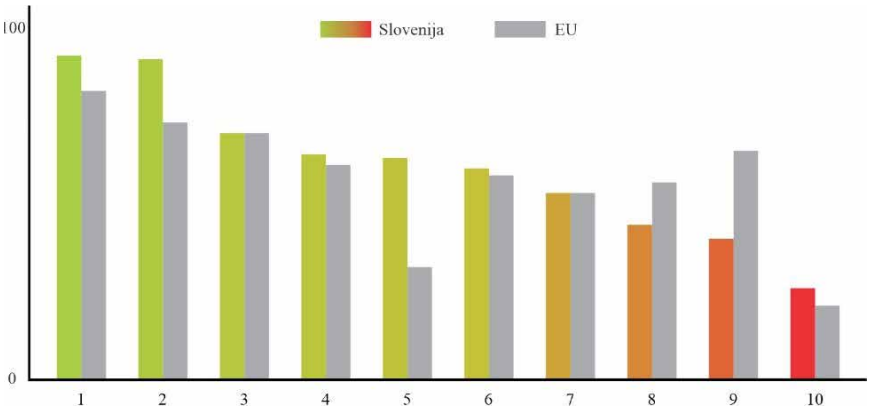

Figure 1. Comparison between Slovenia and the average for 30 European countries (28 EU members plus Switzerland and Norway) using a scale of 0 to 100, which tells us the extent to which countries have adopted certain alcohol policy measures, merged into ten action areas for a comprehensive alcohol policy (WHO, 2018).

In terms of international comparisons, in the last few years, Slovenia has had greatest success in the following areas: drink-driving countermeasures, leadership and awareness, the monitoring of alcohol--related issues, restricting the availability of alcohol, reducing the negative consequences of drinking and alcohol intoxication, and treating hazardous and harmful alcohol drinking and addiction in healthcare settings. The country has had less success in the areas of restricting the marketing communication of alcoholic beverages, reducing the impact of the informal production of alcohol and of the illicit provision and sale of alcohol, and reducing the affordability of alcohol, although other countries are also performing poorly in these areas (Figure 1, Table 1).

Figure 1. Comparison between Slovenia and the average for 30 European countries (28 EU members plus Switzerland and Norway) using a scale of 0 to 100, which tells us the extent to which countries have adopted certain alcohol policy measures, merged into ten action areas for a comprehensive alcohol policy (WHO, 2018).

Ten action areas: (1) Drink-driving policies and countermeasures, (2) Leadership, awareness and commitment, (3) Monitoring and surveillance of alcohol-related issues, (4) Limiting the availability of alcohol, (5) Reducing the negative consequences of drinking and alcohol intoxication, (6) Health services response; dealing with hazardous and harmful alcohol consumption and addiction in healthcare settings, (7) Community and workplace action, (8) Restricting the advertising and marketing communication of alcoholic beverages, (9) Reducing the health impact of the illicit provision and sale of alcohol and informally produced alcohol, (10) Affordability of alcohol, pricing policies.

Driving under the influence of alcohol

Traffic legislation in Slovenia includes not only restrictive measures to combat drink-driving but includes also specific preventive measures. Non-obligatory medical examination with counselling (brief intervention) was introduced. It is aimed at drivers of motor vehicles, who drove under the influence of alcohol (0.50 to 0.80 grams of alcohol per kilogram of blood) and special groups of drivers (e.g. novice drivers, professional drivers; up to 0.50 grams of alcohol per kilogram of blood). Medical examination with counselling is done by selected general practitioner, who screens for hazardous and harmful alcohol drinking and motivates for behavioural change. Based on the examination 4 penalty points can be deleted, but only once every two years.

Preventing driving under the influence of alcohol	
The gradual reduction of the permitted quantity of alcohol in the blood of drivers to 0.0 g/l	PARTLY – The highest permitted blood alcohol level is 0.50 grams of alcohol per kilogramme of blood (ZPrCP). National Programme on Road Traffic Safety 2013-2022 includes not only random breath testing but also educational and awareness raising activities and campaigns to prevent drink-driving.
Introduction of 0.0 g/l permitted blood alcohol for young drivers, public-transport drivers and drivers of heavy goods vehicles	YES (ZPrCP)
Random testing of alcohol content in exhaled breath	YES – Drivers can have a maximum of 0.24 milligrams inclusive of alcohol in a litre of exhaled breath, on the condition that even with lower concentrations of alcohol they show no signs of behavioural disturbance that could result in irresponsible behaviour on the road. Professional drivers, public transport drivers, driving instructors, learner drivers, drivers with children and certain other drivers are not permitted to have any alcohol in their organism (ZPrCP).
Gradual qualification for a driving licence	YES – Upon having a driving licence revoked for driving under the influence of alcohol, drivers are required to attend rehabilitation programmes before taking the driving test again (ZVoz).
Limiting the availability of alcohol	
State control over the retail sale of alcohol (state monopoly on the sale of alcohol, introducing licences to sell alcohol)	PARTLY – In order to sell or offer alcoholic beverages at public events, the organiser must obtain a permit issued by the administrative unit (ZOPA). Despite the opposition of public health experts and alcohol policy makers, an amendment to the ZOPA law was adopted in 2017, according to which the sale of alcoholic beverages containing less than 15 volumes of alcohol (permitted beverages are beer, wine, etc.) is again allowed at public sports events.
Specific minimum age for the sale and purchase of alcoholic beverages	YES – The sale and offer of alcoholic beverages to persons under 18 years is prohibited (ZOPA).
Restriction of sales by hour and day Ban on working under the influence of alcohol	YES – The sale of alcoholic beverages between 9 pm and 7 am on the following day is prohibited in shops; the sale of spirits in restaurants and hospitality establishments from the start of the daily opening hours up to 10 am is prohibited (ZOPA). The television sale of alcoholic beverages is prohibited (ZAvMS). YES (ZVZD)
Reducing the affordability of alcohol	
Taxation – raising the minimum tax rates, in line with inflation, for all alcoholic beverages, with rates at least proportionate to the alcohol content. Setting the minimum price of alcohol. Prohibiting special offer and promotional prices.	PARTLY – Excise duty has been introduced for beer, intermediate alcoholic beverages and ethyl alcohol. Excise duty has not been introduced for wine and fermented drinks, i.e. it is set at EUR 0 (ZTro-1). Excise duty is not tied to inflation.
Managing persons with hazardous and harmful drinking and treatment of mental and behavioural disorders due to alcohol consumption	
Brief interventions for persons with hazardous and harmful drinking, in primary healthcare and other environments	PARTLY – A measure is being implemented under the *Drivers Act* and as part of the National Programme of Primary Prevention for Cardiovascular Diseases. Not all general/family medicine physicians detect hazardous and harmful alcohol consumption, but clinical guidelines exist for early detection and brief measures. Activities are enhanced through the project SOPA – *Together for a Responsible Attitude Towards Alcohol Consumption.*
Treating mental and behavioural disorders and other diseases due to alcohol consumption	YES – Treatment costs of treatment are covered by health insurance.

Table 1: Selected effective measures of alcohol policy (left column) which have been adopted partly or entirely in Slovenia (right column).

Key: ZOPA – Restrictions on the Use of Alcohol Act, ZVoz – Drivers Act, ZTro-1 – Excise Duty Act, ZPrCP – Road Traffic Rules Act, ZZUZIS-A – the Act Amending the Health Compliance of Foodstuffs and of Products and Materials Coming into Contact with Foodstuffs Act, ZAvMS – Act on Audiovisual Media Services, ZVZD – Health and Safety at work Act. Table taken from the publication Alkoholna politika v Sloveniji (Alcohol Policy in Slovenia, Roškar et al., 2019).

Reducing harm in a drinking environment	
Increasing the responsibility of those serving alcohol	PARTLY – A fine is imposed on a legal entity, the responsible person of the legal entity, sole trader, responsible person of a sole trader performing independent activity and the responsible person of an individual that performs an independent activity, if they serve a person showing signs of intoxication, and on anyone that enables a person under the age of 18 years to drink alcoholic beverages in a public place (ZOPA).
Training of serving personnel and management for responsible serving and ensuring safe environments	PARTLY – Specific programmes have been developed, but legal provisions are not fully in place.
Restricting the marketing communication of alcoholic beverages	
Complete ban on advertising alcoholic beverages	PARTLY – The advertising of alcoholic beverages containing more than 15% alcohol by volume is prohibited. Alcoholic beverages with less than 15% alcohol by volume may not be advertised on the radio or television between 7 am and 9.30 pm, and in cinemas before 10 pm (ZZUZIS-A). Advertising may not appear on panels, boards, posters or illuminated signs that are less than 300 metres from nursery schools and schools (ZZUZIS-A). The advertising message must contain a message about the harmfulness of drinking alcohol.

The legislation also includes three types of rehabilitation programmes, mandatory to persons who have been issued a revocation of a driving license and who have been sentenced for driving under the influence of alcohol. In case of postponement of a revocation of the driving license the person must attend one of the rehabilitation programmes, but firstly he must undergo medical examination. The court directs the person to one of the three rehabilitation programmes: shorter educational workshops, longer psychosocial workshops, and treatment of alcohol addiction. The above legislation was effective in improvement of road traffic safety.

Alcohol and pregnancy

More intensive NIJZ work in the area of alcohol and pregnancy began with the project Alcohol and Pregnancy, which ran in 2013–2014 mainly in the Gorenjska region and was headed by the then Health Protection Institute (today a unit of the NIJZ) of the Kranj NIJZ. In the project we linked up a gynaecologist and obstetrician, paediatrician, professional worker at a school for future parents from the local health centre and public health experts from the NIJZ, with the aim of protecting unborn children from the effects of alcohol. On 9 September 2014 for the first time Slovenia marked the international FASD Day, which bore the key message: "In pregnancy there is no safe alcoholic drink no safe quantity of alcohol and no safe time to drink alcohol. Abstinence is the best decision for a woman who is pregnant, could become pregnant or is nursing a child." Since that time, we have marked this day each year, and we have prepared and disseminated health education materials to inform and raise awareness of future parents and the general public. With the aim of sensitising various expert circles (healthcare, social services, hospitality) to this issue, we organise lectures and workshops and publish professional articles. Our wish is for us as a society to be aware that the attitude of future parents to alcohol and pregnancy is a reflection of the broader social attitude to drinking alcohol, and that preventing pregnancies exposed to alcohol is a common responsibility of society.

MOSA – Mobilising the Community for Responsibility Towards Alcohol

MOSA (Mobilising the Community for Responsibility Towards Alcohol (www.infomosa.si)) , an entity founded in 2008, has made an important contribution to identifying alcohol-related issues and reviewing approaches to the reduction of the alcohol-related burden in Slovenia. With the aim of transferring knowledge, increasing effectiveness and bringing different alcohol policy actors together, MOSA provides information on alcohol-related issues in Slovenia in a transparent way that is accessible to all. MOSA provides the general public and the profession with access to a variety of databases (databases on preventive programmes, research studies, entities and organisations, sources of help, publications) and to information on current events relating to issues surrounding alcohol and on approaches to the issue in Slovenia and around the world (Kamin in Roškar, 2021).

Development and evaluation of preventive programmes and interventions to prevent and reduce the harm of alcohol.

In Slovenia a range of different preventive and promotional programmes, as well as interventions, are carried out to address the alcohol problem (MOSA database includes 70 preventive programmes), but for the most part they are aimed at children and adolescents and their parents, while there is less focus

here on young adults and older people – for the most part there is just information and awareness-raising about the alcohol issue, and there is less focus on pursuing the goal of changing behaviours, and few such programmes for which there is evidence of their effectiveness.

For this reason, based on various existing European documents and portals of good practice, we drew up the Criteria for Evaluating Public Health Interventions with the aim of identifying and selecting examples of good practice (Radoš Krnel et al., 2020). Their purpose is to draw up clear guidelines for identifying and selecting good practice in the field of public health, which will serve as guidelines for the creation, planning, design, and implementation of various interventions.

Cooperation with non-governmental organizations (NGOs)

Ministry of health is co-financing different programmes and activities of NGOs in the field of harmful and hazardous alcohol use. Programmes are aimed at different vulnerable population groups, especially youth – with the involvement of organized youth. Programmes include awareness raising activities, promotion of healthy choices, drink-driving prevention, interventions aimed at harmful drinkers and their families, advocacy, implementation surveillance of different measures (e.g., mystery shopping). From 2017 on, the Ministry of Health has substantially increased financial resources in this field.

Restricting the digital marketing of alcohol

The growing use of digital media has created new opportunities for market communication about various products, including alcohol. The marketing communication of alcohol encourages adolescents to try out alcoholic beverages in earlier years and in larger quantities (Anderson et al., 2009; Kenny in Hastings, 2011). For this reason, the NIJZ is actively involved in European development projects that pursue the development of effective legislation in this area, since modern forms of digital marketing of alcohol are almost entirely exempted from existing legislation, which in Slovenia, as in the majority of other countries, was developed before the appearance of new channels of marketing.

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Inclusive public health – the disabled and the elderly

Marko Štanta, Marko Vudrag

Integration of vulnerable people into society must be one of the most important goals of health policies and programmes if we want to improve and maintain public health. In doing so, it is essential to adapt society to the limitations of the individual. We have relatively small but numerous and heterogeneous vulnerable groups among the population, so that together their total share of the population is significant, and every third individual is on the margins of society for various reasons and risks social exclusion.

Experience to date shows that the benefits of inclusion are many, not only for people with disabilities but for all citizens. Active inclusion programmes help reduce social exclusion and promote a healthier lifestyle for all citizens. A more accessible and thus friendlier social environment reduces health inequalities and improves the public health of society as a whole.

In the Nova Gorica Regional Office of the NIJZ, we participate in the project *A municipality tailored to the needs of the disabled*, which was started by the Association of Working Disabled People of Slovenia. The project uses the *disability policies in local communities under Agenda 22*[1], which allows for regulating the situation of all members of vulnerable groups (the disabled, the elderly, the unemployed, the homeless, those living below the poverty line, the chronically ill, etc.). This is intended for the development of disability policy plans and is based on the *Standard Rules for the Equalization of Opportunities for Persons with Disabilities* (UN General Assembly, 1993), adopted by the United Nations in 1993. Municipalities that have received the title A municipality tailored to the needs of the disabled have a Council for the Disabled, which acts as an advisory body to the mayor. In the Goriška region, representatives of the Nova Gorica Regional Office of the NIJZ also participate in councils for the disabled. The participation of an NIJZ representative in such social bodies brings the possibility of direct participation of the NIJZ in the development of municipal policies through advising mayors and municipal councils. In this way, it is possible to implement the '*community approach to health' and 'health in all policies*' more effectively and bring the topic of health closer to all citizens.

In the municipalities that have expressed interest, coordination of social and health services is carried out through the Council for the Disabled. In order to respond more quickly to the needs in this context, information was collected in 2018 on social and health services and their providers in the local environment. It was received by all service providers, municipal administrations and citizens. As part of the coordination and with the cooperation of municipalities, public institutions and NGOs, workshops on health, informal long-term care, exercise and free emergency transport for the disabled and elderly are being carried out in a coordinated manner. Special attention is given to people on the social margins, so periodic visits are carried out to examine their situation and provide them with appropriate support and assistance.

UN General Assembly. Standard Rules on the Equalization of Opportunities for Persons with Disabilities. Resolution adopted by the General Assembly, 1993, A/RES/48/96. Available from: https://www.refworld.org/docid/3b00f2e80.html (Accessed 7 June 2021).

1_Zveza delovnih invalidov Slovenije. Invalidska politika v lokalnih skupnostih – Agenda 22. https://www.zdis.si/node/441.

Public health approaches in cross-sectorial policies: achievements in active and healthy ageing

Andreja Mezinec, Monika Robnik Levart in Mojca Gabrijelčič Blenkuš

Ageing is a process that begins at birth and affects all aspects of our lives. Active and healthy Ageing (AHA) is very important for the entire cycle of life. In Slovenia the dynamics of population ageing are moving very quickly, and should be taken into account in the preparation of the country's strategic plans. There is a need for joint integration, cooperation and involvement of different stakeholders, both cross-sectorial and multi-disciplinary.

The main purpose of the AHA is to develop multidisciplinary competencies and inter-sectoral approaches to integrating health into different sectoral actions and policies and to monitoring development policies relevant to public health at both the European level and within the World Health Organization (WHO). Through its activities, the National Institute of Public Health (NIJZ) aims to strengthen research, networking and awareness of the importance of such issues inside the NIJZ (integration with already well-established areas of work) and beyond, with a focus on understanding the areas of ageing, demographic and environmental changes, the lifelong approach, intergenerational integration and other topics related to AHA. Therefore, ageing is a cross-sectional or integrating theme across many of the work areas of the NIJZ. Activities in the field of AHA are also supported by the United Nations and the WHO, notably in the context of the Decade on Ageing 2021-2030, as well as the European Commission through its Green Paper on Ageing – Promoting solidarity and responsibility between generations.

The mission of the NIJZ is to contribute to the better health and greater well-being of the population of Slovenia. Despite great efforts, NIJZ cannot perform its task solely with the support of the health care sector, there is a need for broader integration and cooperation between different sectors and stakeholders. With the AHA.SI project in 2014-2016 (preparation of the basis for inclusion in the Strategy for Long-Lived Society), where the NIJZ was the leading partner, it took an important step in bringing together experts working on the challenges related to an ageing society. With the successor project ASTAHG, the NIJZ further expanded the activities and strengthened the cooperation of the different political decision-makers at the regional level of operation.

All nine Regional Offices of the NIJZ were involved in the implementation of the AHA methodology at their level of operation. They established networks with stakeholders working on ageing at regional and also local levels. In 2021, the fifth joint report on the »Compendium of NIJZ activities for 2020 in the field of aging« (Robnik Levart et al., 2021) was prepared, which this time has a national dimension and a view of the COVID-19 situation, in addition to a regional perspective. Currently, by linking and maintaining the network, the NIJZ strives to support the preparation and implementation of the action plan to improve public health content and thus enable Slovenia's long-term strategy for healthy ageing.

In 2020, the NIJZ was recognized by the WHO as an important stakeholder in the field of healthy ageing and in the Advisory Committee of Older Persons (lead by SURS)[1].

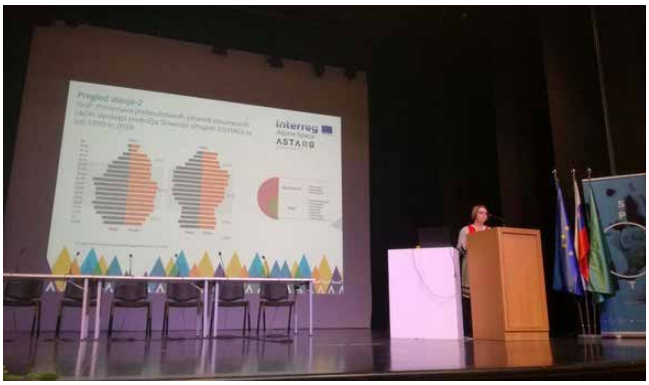

Figure: Work of the regions, OE Nova Gorica, Challenges of ageing in the Nova Gorica region, participation in the SILVER SMEs project, presentation of the ASTAHG project at the conference in Tolmin.

http://www.staranje.si

http://www.staranje.si/aktualno/aktivno-zdravo-staranje-v-odmaknjenih--podrocjih-projekt-astahg#read-more

Robnik Levart M, Mezinec A, Gabrijelčič Blenkuš [uredniki]. Zbornik NIJZ aktivnosti za leto 2020 na področju staranja. Ljubljana: Nacionalni inštitut za javno zdravje, 2021 (v pripravi).

1_https://www.stat.si/statweb/NationalStatistics/AdvCommittees-Description/99.

CENTER ZA ZDRAVJE IN RAZVOJ
CENTRE FOR HEALTH AND DEVELOPMENT
MURSKA SOBOTA

Actions on health inequalities of the Centre for Health and Development Murska Sobota

Peter Beznec

The Centre for Health and Development Murska Sobota implements programmes on reducing health inequalities by including health in regional development plans at different tiers of government and in cooperation with different sectors. In partnership with University of Maribor and the World Health Organisation, we conduct research on economic effects of the health care system on the economy and employment at national and regional levels. Additionally, we research impacts of social entrepreneurship on health of vulnerable population groups, and on the economic and social development at the regional level.

The Centre for Health and Development Murska Sobota (CHD) was established by the National Institute of Public Health (NIJZ) to implement the activities of the Programme Mura (Buzeti and Maučec Zakotnik, 2008), focused on reducing health inequalities in Pomurje region by including health in regional development plans and intersectoral collaboration. The World Health Organisation (WHO) recognised the innovative programme as an example of a good practice. In 2008 the CHD became a WHO Collaborating Centre with an agenda to implement capacity building in the field of intersectoral investment in health and is currently the only WHO Collaborating Centre in Slovenia. As the programme Mura ended, we continued our efforts in the field of health inequalities and in 2011 published the first publication focusing on health inequalities and causes of inequalities in Slovenia (Buzeti, 2011).

CHD is the coordinator of the WHO Regions for Health Network for Pomurje region. In cooperation with NIJZ and Ministry of Health we organise international public health summer schools which are attended by members from the Regions for Health Network, Healthy Cities Network, and other professionals from different sectors.

In the programme "Building capacities for intersectoral cooperation in the field of health determinants and investments in health for reduction of health inequalities" co-financed by the Ministry of Health and in partnership with the WHO European Office for Investment for Health and Development (Venice office) we established an international initiative of professionals and scientists. Together we worked to develop tools and methods to improve our understanding of the social and economic benefits of a health care system for the wider environment in which the system is functioning, and how to maximise its positive impacts on sustainable development on a regional as well as on a national scale. A study on economic footprint of the health care system in Slovenia (Bekő, 2019) by University of Maribor Faculty of Economics and Business, CHD and WHO Venice office was one of the results of the programme.

Throughout our activities we strive to act locally, to implement developmental projects, with positive impact on health and quality of life of residents of Pomurje region, and health promotion projects, such as Programme on empowerment and raising awareness of heart failure[1] (in partnership with Murska Sobota General Hospital) and Empowerment and raising awareness for the health of Roma population (in partnership with the Association for development of Roma tourism, sport and culture in Republic of Slovenia "Nova pot- Nevo drom").

Buzeti T, in Maučec Zakotnik J. Vlaganje v zdravje in razvoj v Sloveniji: program Mura. Murska Sobota: Centre for Health and Development Murska Sobota, 2008.

Buzeti T, Djomba JK, Gabrijelčič Blenkuš M, et al. Health Inequalities in Slovenia. National Institute of Public Health; 2011. Available from: https://www.nijz.si/sites/www.nijz.si/files/publikacije-datoteke/health_inequalities_in_slovenia.pdf

Bekő, J, Jagrič T, Fister D, Brown C, Beznec P, Kluge H, in BoyceT. The economic effects of health care systems on national economies: an input-output analysis of Slovenia. Applied Economics, 2019; 51: 37, 4116-4126.

1_https://www.czr.si/index.php/projekti_reader-en/programme-for-awareness-and-empowerment-on-heart-failure.html

A community approach to strengthening mental health

Nuša Konec Juričič, Domen Kralj, Marjeta Peperko

The key orientations of the Celje regional office of the National Institute of Public Health (NIJZ) are knowing the health status and needs of the population and responding to them. In response to the high rate of suicide in the Celje region, the Suicide Prevention Group has been implementing the *Mental Health Strengthening and Suicide Prevention* programme over the last two decades (Konec Juričič, 2013). In 2017, we restarted the operation of the *Celje Local Action Group for the Prevention of Addiction* due to the problem of abuse of psychoactive substances and new technologies.

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The high rate of suicide and abuse of psychoactive substances and new technologies are public health problems that need to be managed through integrated and coordinated approaches by stakeholders from different sectors and professions, as well as users themselves. At the Celje regional office of the National Institute of Public Health (NIJZ), we started coordinating stakeholders within the framework of the Local Interdisciplinary Action Group (LAS) Celje for the Prevention of Addiction in the 1990s. After the successful implementation of many training programmes and the then innovative needle exchange for illicit drug users, and upon transferring this task to another provider, we suspended the group's work in 2013. Since 2017, when we revitalized the group's work due to the growing abuse of new psychoactive substances and non-chemical addictions, we have been holding regular annual meetings for experts in the health, education, social and non-governmental sectors, designed to strengthen their knowledge and competencies.

We have also successfully transferred the experience gained from this coordination to the field of preventing suicide and strengthening mental health. As part of the interdisciplinary Regional Group for the Prevention of Suicide, we have been carrying out targeted training programmes since 2001, which have been attended by more than 12,000 experts and laypeople. Through regular and proactive communication with the media, we take care of raising awareness and improving understanding of the topics of mental health and suicidality, and consequently contribute to dispelling myths and reducing stigma in these areas. Between 2007 and 2016, we ensured the operation of a self-help group at our office in Celje to support people with depression and their relatives. As there was a large gap in our region in terms of easily and quickly accessible psychological assistance for people in distress, we opened the centre for psychological first aid "Tu smo zate" (We Are There for You) in 2010 at the Celje regional office of the NIJZ with the consent of key regional stakeholders. The counselling centre, which we connected to the Posvet counselling network in 2015 as part of the MOČ project, has been continuously operating in Celje for eleven years. It is visited annually by between 250 and 300 clients, who, with the support of counsellors, overcome difficulties that could otherwise turn into more serious social or health problems. In addition, the Celje regional office has been organizing weekly meetings of Alcoholics Anonymous for sufferers and their relatives for 20 years, as well as weekly meetings of a support group for women with relationship dependency. The groups provide members with support and motivation to change their behaviour and consequently improve all aspects of their health.

We estimate that in the Celje region we have forged an effective network of stakeholders in the field of mental healthcare in the broadest sense. The network is gradually including three centres for the mental health of adults and two centres for the mental health of children and adolescents operating in the Celje region. The connected network of stakeholders enables us to ensure the flow of key information, to respond effectively to the problems of individuals and groups, to organize professional discussions, and to supplement our content and programmes. It also provides support and motivation to all those who participate in it, with a common goal of the greater well-being of our residents.

Konec Juričič N, Lekić K. Tu Smo Zate : Krepitev Duševnega Zdravja in Preprečevanje Samomorilnosti Na Celjskem - Skupnostni Model Zavoda Za Zdravstveno Varstvo Celje. Zavod za zdravstveno varstvo; 2013. Available from: https://www.nijz.si/sites/www.nijz.si/files/uploded/tu_smo_zate_publikacija_25_10_2013_4.pdf

03
HEALTH INFORMATION SYSTEM - DIGITAL INNOVATIONS IN HEALTHCARE

Slovenian Cancer Registry

Vesna Zadnik, Sonja Tomšič

The Slovenian Cancer Registry, having operated continually for over 70 years, is recognised as one of the oldest and best population-based cancer registries in the world. With high-quality data on the burden of cancer in the country, it is a point of reference for experts in drafting national cancer control plans. These contribute to the prevention and early detection of cancer as well as improving treatment, survival and quality of life for all cancer patients.

The Slovenian Cancer Registry (www.onko-i.si/eng/crs) is one of the oldest and highest quality population-based health registries in Europe and the world. Established in 1950 at the Institute of Oncology Ljubljana, over seven decades of continuous operations it has maintained its core mission of a national population-based registry for the collection, processing and presentation of high-quality data on the burden of cancer in the country. Cancer reporting is mandatory and legally required in Slovenia.

The Cancer Registry is part of a national public health activity that monitors the health of the population and guides strategic developments in oncology. It provides and regularly publishes indicators on the number of new cases (incidence), the number of all patients (prevalence) and the survival of cancer patients. The data support the National Cancer Control Plan in planning and evaluating primary and secondary prevention, diagnosis, treatment, and rehabilitation of cancer patients, as well as in planning the capacity and resources needed for cancer control in Slovenia. In addition to this, the quality of patient care can also be monitored through the detailed data on diagnosis and treatment recorded in the Registry's clinical registries. Indicators and results of analyses are published in regular annual reports, articles, publications, through cooperation with the media and on our own web portal Slora.

Experts employed at the *Cancer Registry* conduct in-depth epidemiological research on cancer incidence, time trends, spatial distribution, cancer patient survival and the effectiveness of cancer screening programmes. At the same time, by providing data and statistical services the *Cancer Registry* is a reference point for many national and foreign researchers performing clinical and epidemiological research. *Cancer Registry* experts are also frequently contacted by individuals or groups, usually associations and civil initiatives, seeking answers to specific questions on cancer in their local area. *The Cancer Registry* recognises that civil society is a key partner for successful action against cancer and takes all such requests very seriously, carefully analysing the issues presented and interpreting the results responsibly.

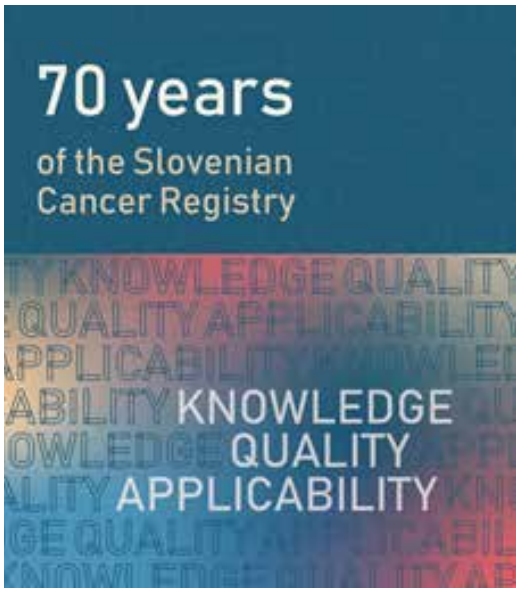

Figure: In 2020, the Slovenian Cancer Registry celebrated its 70th anniversary of continuous operation. Historical facts and anecdotes are presented at www.onko-i.si/eng/crs/70-years-of-the-cancer-registry and in a brochure published especially for the occasion.

Health databases and other health and healthcare data sources

Metka Zaletel, Tina Zupanič

The National Institute of Public Health (NIJZ) monitors the majority of the public health and healthcare data and, together with other stakeholders, forms a health information system to support decision-making in Slovenia. Health and healthcare data are based on four closely related pillars.

Health and healthcare data to support decision-making in Slovenia are based on four pillars that are closely interconnected:

I. Regular annual databases managed on the basis of the Health Care Databases Act

II. Data from national surveys that provide insight into risky behaviors, self-assessment of health and well-being, etc.

III. Data from other administrative and statistical sources that »enrich« basic data sources with additional information on socio-demographic structure or use of services

IV. Statistics of the eHealth system, which provides a lot of interesting data on the use of the healthcare system

The health information system to support decision making in Slovenia is managed by the NIJZ and other stakeholders. The NIJZ monitors the majority of public health and healthcare data and manages relevant databases on patients and services, such as data on causes of death, deliveries and child births, hospitalizations, waiting times, infectious diseases, injuries and poisonings, absences from work, vaccinations, and health care professionals. In December 2019, a broader review of the Slovenian health information system was performed by the World Health Organization, which confirmed the high quality of the system and data and the achievement of the desired standards. The NIJZ also has the role of an authorized provider of national statistics and represents a national contact point for reporting to international organizations in the field of health statistics. In addition to the NIJZ in Slovenia, the data are managed by several other key stakeholders, including the Oncology Institute, the Golnik University Clinic, the Valdoltra Orthopedic Hospital and the Pediatric Clinic of the University Medical Center Ljubljana. The NIJZ, together with other stakeholders, has been working for a long time to fully digitize all areas of health care monitoring, for example the latest successful and ongoing renovations of databases such as electronic certificate of justified absence from work (eBol), electronic registration of death (eDeath) and monitoring the outpatient services (eSZBO), which will enable faster monitoring of data, reduce administrative burden and provide even better support to the processes of formulating health policies and concrete measures within the Slovenian health system.

National research data are becoming increasingly important in the health information system. The NIJZ conducts general research on large representative samples of the population of Slovenia, such as the National Survey on Health and Health Care, and field research, such as research on illicit drug use, mental health, etc. In the last five years, the NIJZ has upgraded the survey methodology with an emphasis on combined survey methods, which enables quality research and at least partial relief of the population.

Data from other administrative and statistical sources and eHealth bring added value to the first two pillars, as they enrich the data and enable analyzes that are more thematically- and problem-oriented. Combining the listed data with an appropriate legal basis enables a broad view of the health of the population and the use of the health system.

SLORA: web portal providing access to cancer data

Vesna Zadnik, Nika Bric

In 2010, the interactive web portal Slora (from the Slovenian words for Slovenia and cancer) was set up at www.slora.si, enabling easy and quick access to up-to-date data on the cancer burden in Slovenia. Links to foreign databases also enable simple international comparisons of the cancer burden. The onKOvid subpage provides up-to-date information on the impact of the Covid-19 epidemic on the cancer burden and the management of cancer patients in Slovenia.

Thanks to the Slovenian Cancer Registry, which has been operating within the Institute of Oncology Ljubljana for over 70 years, Slovenia has a very long tradition when it comes to monitoring the population burden of cancer. In 2010, an innovation was introduced in the Slovenian healthcare system for providing information to experts and the lay public: an interactive web portal that provides easy and quick access to data on cancer in Slovenia at both the national and administrative unit levels, and it also enables comparisons of cancer burden indicators with other countries. The web portal is called SLORA, after the initial letters of two words in Slovenian denoting its subject – Slovenia and cancer. It can be accessed at www.slora.si. The content is also fully available in English, and a built-in communication bridge enables direct contact between users and experts. Additional content provides the user with information on proven risk factors for cancer and possible ways to prevent and detect malignant disease early on. The Glossary is a collection of concepts and methods to help the user properly understand the indicators presented and the epidemiology of cancer more broadly. During the Covid-19 epidemic, the Slora web portal has provided up-to-date information on the impact of the epidemic on the cancer burden and the management of cancer patients in Slovenia on its onKOvid subpage.

A key feature of the Slora web portal is an innovative application for direct access to data from the Cancer Registry database, which allows users to retrieve aggregated data according to parameters of their choice. The data is compiled via search windows – for each epidemiological indicator (incidence, mortality, prevalence, survival) an independent search window is available. The query results are shown in graphical and tabular form and can be further processed and stored by the user.

The verified content of the Slora website, strict quality criteria and extensive media promotion of the site put a spotlight on the disease we call cancer and make it more understandable to the general public. The Slora web portal serves to simplify the evaluation of the impact and performance of the National Cancer Control Plan and has significantly reduced the amount of misinformation in the public domain regarding the cancer burden in Slovenia (outdated, incorrect data or misinterpretations). Secondary, though not insignificant outcomes of the web portal are tied to the technological and organisational functioning of the Cancer Registry: data processing and routine analysis are simplified and faster, and the likelihood of errors is reduced.

Figure: The interactive web portal Slora is available to users at www.slora.si.

Health Statistical Yearbook of Slovenia

Mojca Simončič, Damjana Vardič, Marjana Hladnik

The Health Statistical Yearbook of Slovenia offers an organized and understandable overview of contents related to various aspects of population health. All this health-related information is very helpful in highlighting important public health issues, daily work on the assessment of the health status of the population, and in deciding on and adopting appropriate policies. The publication focuses on clear graphic displays, data visualizations and infographics in combination with short summaries of major contents regarding important public healthcare topics.

The first publication Statistical Report on the *Work of the Healthcare Service in the SR of Slovenia* was launched in 1966 with presentations of 1965 data, and presents the basis of today's Health Statistical Yearbook of Slovenia (Zavod SRS za zdravstveno varstvo v Ljubljani Republiški zdravstveni center, 1966). The volume of the publication was shorter, as many publications at that time were still manually typed on one side of paper, and all the data were presented in tabular form, mostly only with absolute numbers. Due to fast changes of the environment and the growing need for quality data and information, the publication was gradually changed, supplemented and revised. The last major transformation was carried out in 2013.

The publication has been given a new structure for all chapters. The introduction at the beginning of each chapter serves primarily to present the main highlights of the content. The main part of the publication highlights the national situation over a longer period of time, with highlights on the last year. The regional part of the publication compares regions with the national average. The last part of each chapter shows the situation internationally, with Slovenia and EU comparisons.

The main guideline of the publication is a clear and simple visualization of the main contents of public health topics. Contents are divided into nine chapters, presented with distinctive and recognizable pictograms, which give a quick and clear insight of the content. The introductory part is followed by graphic and tabular presentations, supplemented with short summaries of important public healthcare topics and several simple and clear infographics (with the visualization or visual presentation of data) (Veszelszki, 2014; Emerson, 2008).

Good quality healthcare data and information are very important for future planning and decision-making regarding the main healthcare issues of the population. The publication *Health Statistical Yearbook of Slovenia* was created, and is annually updated, with the help of the inter-organizational[1] cooperation of experts who use their experience and knowledge to prepare quality content as a basis for future decision-making measures.

Figure: The poster Health in Slovenia, 2019

Emerson J. Visualizing Information for Advocacy: An Introduction to Information Design. New York: OSI, 2008.

Veszelszki Á. Information visualization: Infographics from a linguistic point of view. In: Benedek, András – Nyíri, Kristóf (eds.): The Power of the Image Series Visual Learning, 2014; 4.

Zavod SRS za zdravstveno varstvo v Ljubljani Republiški zdravstveni center - zdravstvena statistika: Statistično poročilo o delu zdravstvene službe v SR Sloveniji za leto 1965. Ljubljana, december 1966.

1_Ljubljana Institute of Oncology, Environmental Agency of the Republic of Slovenia, Statistical Office of the Republic of Slovenia, Radiation Protection Administration of the Republic of Slovenia, Ministry of the Interior, Police, Ministry of Health, Health Insurance Institute of Slovenia, University Clinic of Respiratory and Allergic Diseases Golnik (Klinika Golnik), National Laboratory of Health, Environment and Food, Blood Transfusion Centre of Slovenia and others.

The role and value of eHealth solutions during the COVID-19 pandemic in Slovenia

Dalibor Stanimirović, Vedrana Matetić

The public healthcare system in Slovenia has been struggling with numerous challenges in recent years, due to various systemic and socio-economic circumstances and unfavourable public health trends (WHO, 2016). The system has been facing management issues and a shortage of resources on one hand, and often outdated and inappropriate legislation on the other. To confront these challenges and ensure the sustainability of the public healthcare system, profound and wide-ranging changes to the current healthcare arrangements are needed.

In view of that, the digitalisation has been deemed essential for innovation and setting up a more efficient and successful healthcare system. The term "digitalisation" is in this text defined as a comprehensive introduction of information and communications technology (ICT) solutions into the healthcare system operational and business processes. In international strategic documents, ICT represents one of the essential instruments for achieving the improved medical treatment of patients and ensuring timely monitoring of all operating parameters in the healthcare system (European Commission, 2018). The most recent Slovenian strategy document, i.e. "Resolution of the national healthcare plan 2016–2025", lists several specific goals in the area of ICT in healthcare. In compliance with the EU documents emphasising the efficiency, accessibility, and flexibility of healthcare systems, it primarily highlights the implementation of unified and efficient ICT solutions as an overarching strategic objective. Such ICT solutions would provide relevant data for the medical treatment of patients and support evidence-based decision-making (Official Gazette of the Republic of Slovenia, 2016).

Dependable medical, financial, and administrative data would enhance the planning and management of both individual healthcare providers and the healthcare system in general (Stanimirovic, 2015). The research reveals that successful healthcare digitalisation projects have enormous strategic importance for further advancing the healthcare system and the far-reaching impact on economic growth and social development (Wolff, 2020).

Digitalisation in process and the COVID-19 outbreak

The Slovenian healthcare digitalisation project (eHealth), following the national, European, and World Health Organization guidelines on ICT in healthcare, is one of the key long-term goals of the public sector in Slovenia (Ministry of Health, 2005). The Slovenian eHealth in its current form covers digital solutions such as electronic prescription (ePrescription), electronic appointment (eAppointment), Central Registry of Patient Data (CRPD, containing specialist reports, microbiology reports, discharge letters, ambulatory exam reports, vaccinations, and other patient records), and Patient Portal, to name just a few of the most important. Then, of course, there is a whole range of back-end infrastructure and network platforms that actually enable the use of eHealth solutions, but they are not generally user-oriented and therefore they are not specifically outlined in this text. Considering the events since the publication of the first strategic document involving healthcare digitalisation in 2005, the implementation of eHealth solutions from 2016 onwards represents an important milestone in the history of the Slovenian healthcare system. This is supported by statistical data and different evaluations carried out by national and international institutions. The percentage of ePrescriptions among all drug prescriptions in the year 2019 was above 92% (calculated as a monthly average). In absolute figures, this represents more than 1,150,000 ePrescriptions per month. Similarly, the share of eAppointment referrals averaged more than 95% per month in the last year (more than 300,000 referrals per month). The number of health-related documents sent by healthcare providers into the CRPD is rising steadily. The Patient Portal had more than 768,000 visits in 2019, compared to 548,000 visits in 2018. Table 1 shows the cumulative growth in the use of eHealth solutions in Slovenia on an annual basis since their introduction into the healthcare system in 2016 until the end of 2019. The cumulative figures for this year are understandably not yet available. Over the years, it is possible to see a constant growth in the use of eHealth solutions, and according to interim data in 2020, these figures are likely to increase in absolute or relative terms this year, despite the distressing and unpredictable public health situation due to the COVID-19 epidemic.

		2016	2017	2018	2019
eAppointment	Number of eReferrals	241,379	2,509,518	3,564,993	3,946,878
	% of all Referrals	42.96	84.71	95.11	93.92
ePrescription	Number of ePrescriptions	12,326,845	13,095,808	13,867,192	13,895,517
	% of all Prescriptions	87.23	88.73	92.33	93.47
CRPD	Number of documents	3,180,704	6,436,900	9,411,132	15,201,309
Patient Portal	Number of visits	669	262,012	548,512	768,255

Table 1: Annual growth in the use of eHealth solutions in Slovenia, 2016–2019

An evaluation by the Ministry of Public Administration for the 2016–2018 period shows that the usage of eHealth solutions (ePrescription and eAppointment) resulted in significant savings in the healthcare system; the Ministry of Public Administration's estimate of the accumulated savings is approximately EUR 40 million (Ministry of Public Administration, 2019). In addition to financial savings, the evaluation highlights other systemic benefits of ePrescription and eAppointment, such as streamlined and more effective treatment processes, simplification of procedures for patients, greater standardization, quality and safety of collected health data, consultations between general practitioners and specialists, lower administrative costs, availability of data for analysis and research, etc. The annual dynamics of savings from the evaluation of the Ministry of Public Administration is illustrated in Figure 1.

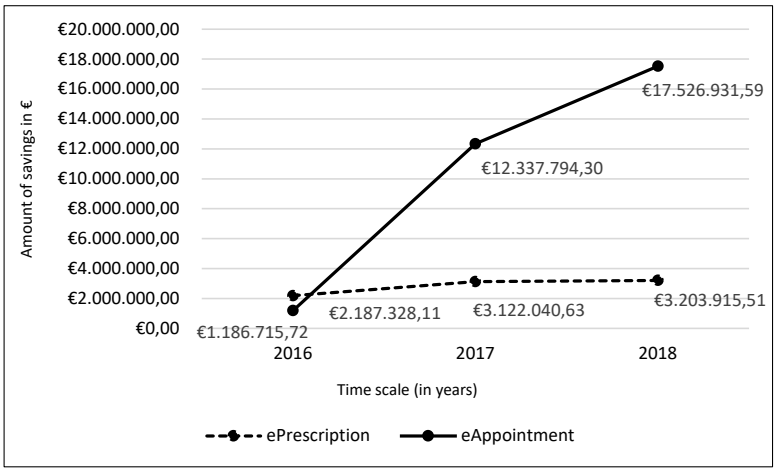

Figure 1: Estimated savings from ePrescription and eAppointment, 2016–2018

The Digital Economy and Society Index (DESI) of the European Commission is a compound index, which encapsulates pertinent indicators on digital performance and monitors the developments in digital competitiveness of EU Member States. DESI Report 2019 indicates a big breakthrough in the development and usage of eHealth services in Slovenia, ranking Slovenia in 6th place in the EU (European Commission, 2019) (Figure 2). Slovenia's position (marked in black) is well above the EU28 average (marked in white), and it also ranks better than many countries with comparable GDP (or even higher) and a comparable population.

Digital solutions for monitoring quality and safety in hospitals are also relatively well developed. In 2002, the Ministry of Health set up a system for monitoring warning events and reporting by healthcare providers. In accordance with the requirements, hospitals have introduced internal digital solutions in the form of online self-assessment questionnaires, which enable monitoring of quality and safety indicators, as well as appropriate actions in the event of identified deviations. The development of a national web portal is also underway, which will enable patients to report perceived deviations in the quality or safety of their own medical treatment. Due to the COVID-19 pandemic, the project was unfortunately suspended in April 2020.

Specialized online expert systems, which enable advanced decision-making support and predictive analytics with the help of artificial intelligence, are used in individual areas. However, this approach is not widespread in Slovenia and is not routinely used by healthcare providers. Expert systems, which are usually used in combination with decision-support algorithms and smart devices, are mostly used in monitoring

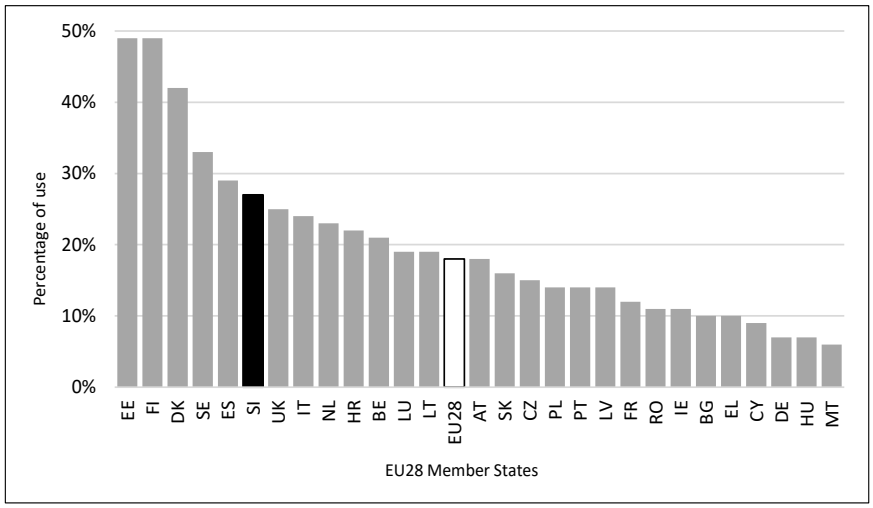

Figure 2: Use of eHealth services in EU Member States (DESI Report 2019).

and interpretation of simultaneous analyses of a large amount of data in specific areas, where this is substantively and technologically feasible (COVID-19 patients, chronic patients, monitoring of cancer patients, clinical chemistry, etc.). Nevertheless, it should be emphasized that this branch of digital solutions is only in its infancy in Slovenia and that the main initiatives for the development of such approaches have come from national and international research projects in recent years.

As we can see, a multilateral analysis of the maturity, usage, and efficiency of eHealth puts Slovenia high on the list of the most successful countries in the area of eHealth. But after the first COVID-19 case was discovered in Slovenia at the beginning of March 2020 and the epidemic was declared several days later, the questions of the benefits of eHealth during this situation began to appear. Although several analyses and assessments of eHealth were performed in the past, there has been no observation or evaluation of the potential benefits of eHealth solutions in the context of the epidemic. Remarkably, many aspects of the development and use of digital solutions in healthcare have been studied so far, including those of a peripheral nature, which often manifest barely sufficient importance for a legitimate research interest. Nevertheless, it is possible to detect the lack of research interest in such a vital area as the potential benefits of digital solutions in situations like the COVID-19 pandemic. In accordance with these starting points, we provide below an outline of the course of the COVID-19 epidemic in Slovenia and an overview of socio-economic consequences and response measures at the national and EU level. And, most importantly from the point of view of our manuscript, we present an analysis regarding the role and value of eHealth solutions for healthcare professionals and patients during the COVID-19 pandemic in Slovenia.

The first COVID-19 infection case in Slovenia was discovered on 4 March 2020. The epidemic was officially declared on 12 March. The government quickly introduced a series of restrictive measures to fight the COVID-19 outbreak. Due to the relatively positive developments, the measures were gradually phased out at the beginning of April. The government declared the COVID-19 epidemic officially over on 31 May. The total number of cases was 3,312 on 9 September. The number of deaths due to COVID-19 was estimated at 135. Although the epidemic was declared over, the virus is still present, and the epidemiologists are discussing the possibility of a second (or third) wave of COVID-19 by the end of the year. Protective measures such as social distancing and mask wearing are still required. The epidemic and the accompanying measures had severe consequences on the Slovenian economy and healthcare and other social subsystems. To lessen the impact, the government adopted several regulatory measures, the total value of which exceeds EUR 6 billion (Official Gazette of the Republic of Slovenia, 2020). Still, it is already obvious that the epidemic will have profound and lasting consequences.

Generally speaking, we could say that the socioeconomic situation in the EU is even worse. The European Commission is proposing to harness the full potential of the EU budget for the mobilisation of investments and financing of key areas for the recovery of the EU Member States. The Commission is planning on activating an emergency European Recovery Instrument amounting to EUR 750 billion, together with the three important safety nets for workers, businesses, and sovereigns amounting to a package worth EUR 540 billion, thus reaching EUR 1,290 billion of targeted support measures for the recovery of EU Member States (European Commission, 2020). These funds will be channelled through the EU budget to Member States for key areas such as reinforcing healthcare and social systems, and supporting the green and digital economy, with the final goal of ensuring the sustainable development and stabler socioeconomic foundations of EU Member States. If the crisis continues for longer or if there is a second wave of the pandemic, there will be additional funds for appropriate measures, as emphasised by the representatives of the European Commission.

Considering the digitalisation aspect, one should ask what the role and value of eHealth solutions for healthcare professionals and patients were during the COVID-19 pandemic. The daily operation of the healthcare system came to a halt during the epidemic, the exception being emergency procedures and the treatment of oncological patients. The work of healthcare professionals was extremely difficult due to the new treatment protocols and the risk of infection. On the other hand, patients kept in-person visits to healthcare institutions to a minimum, due to a fear of infection, but also because of the changed treatment practice and various limitations imposed by healthcare institutions. eHealth and its various solutions (ePrescription, eAppointment, Patient Portal, CRPD) suddenly became the only way to provide quick, efficient, and safe healthcare services and to ensure appropriate communication, both internally between healthcare professionals and externally between healthcare professionals and patients. After the initial shock of the epidemic, the interest of healthcare professionals and patients in using eHealth solutions soared overnight and the reported learning curve flattened surprisingly. Healthcare professionals started using eHealth solutions more intensively, due to the extraordinary circumstances and other inherent factors, but also due to pressure from patients. On the other hand, patients have shown the greatest interest in monitoring their health and well-being through health-related documents accessible via the Patient Portal and CRPD.

Statistical data supports the qualitative findings mentioned above. The CRPD and the Patient Portal in particular experienced a significant increase in usage during the lockdown period and immediately thereafter (Figure 3). However, other eHealth solutions, despite the very limited operation of the healthcare system in most areas and restricted patient admission, have maintained a relatively stable level of use, which also confirms their critical importance for the medical treatment of patients and the overall functioning of the entire healthcare system.

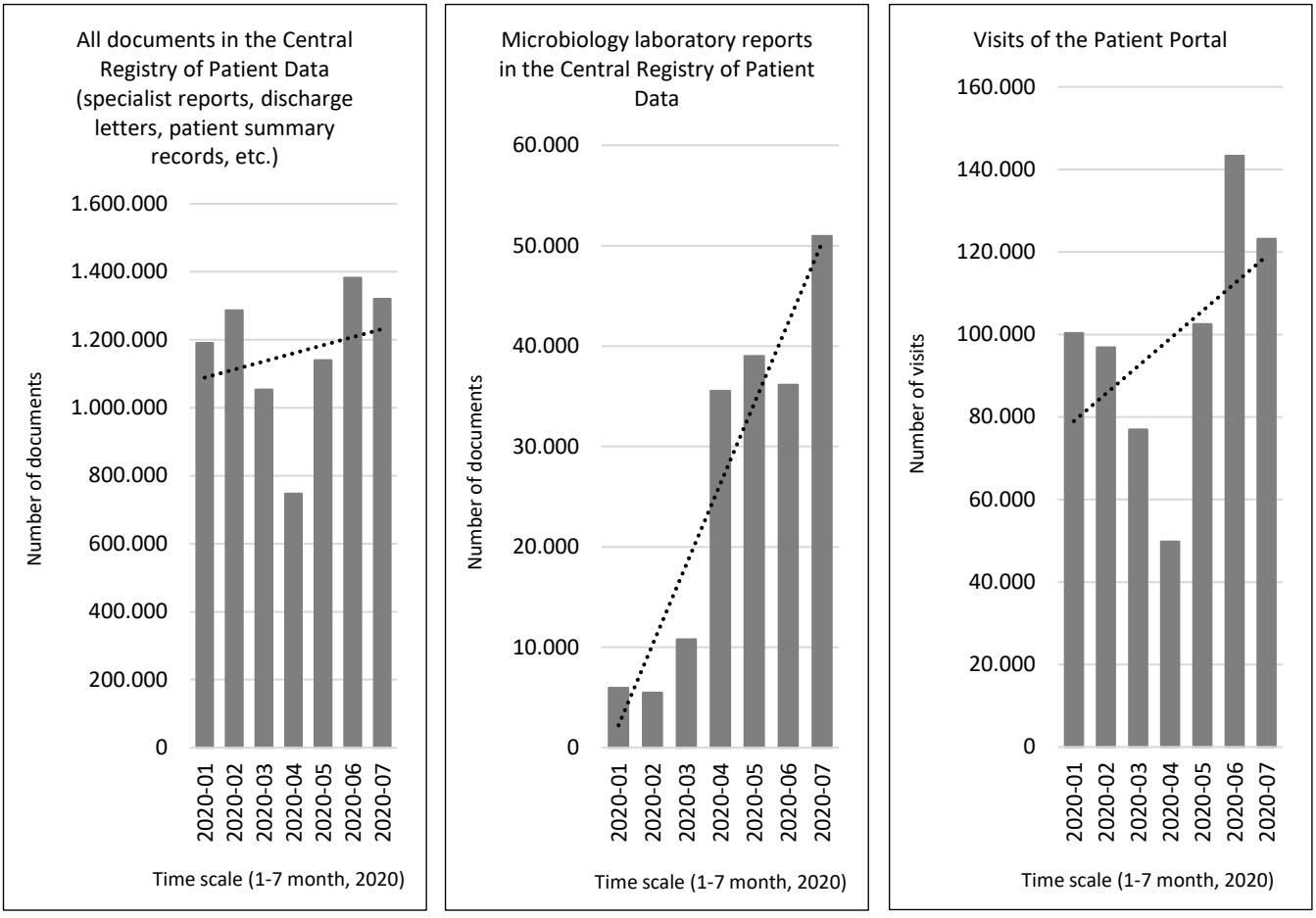

Figure 3: Growth in the use of individual eHealth solutions in Slovenia during the COVID-19 epidemic and immediately thereafter.

Experience from the first wave of the COVID-19 epidemic has shown that eHealth solutions have a very important role in such situations. Usage statistics have clearly shown that both healthcare professionals and patients recognise the many benefits of eHealth in unexpected and crisis circumstances that affect the healthcare system. Furthermore, the advantages of eHealth solutions for healthcare professionals and patients have proved to have an even greater impact in such conditions than in "normal" circumstances.

Conclusions

It seems that the COVID-19 epidemic has done more to raise awareness and usage of eHealth solutions in a very short period of time than any other initiative before, be it of a political, legislative, administrative, or financial character. Given this alarming fact, it should be thoroughly examined and discussed what we did wrong, or what we did not do right, in having failed to intensify the use of eHealth solutions and convince users of the manifold benefits offered by digital solutions in the pre-pandemic era. The reasons for this undoubtedly go back to the lack of political will, insufficient stakeholder commitment, the absence of clearly defined sectoral policies and compelling goals for users with different motivating rationales, and a lack of training and education of users (healthcare professionals and patients). In addition to the outlined factors, the wide-ranging advocacy of eHealth and digitalisation, which is one of the fundamental principles in promoting national public health initiatives, has certainly failed.

If so, perhaps this epidemic (pandemic) may well mark a turning point in the perception of digitalisation as not only one of the crucial drivers for the development and promotion of public health, but also as an indispensable enabler in efforts to exploit existing healthcare system capacities and potentials, and empower patients in national and international public health crises, such as the present and probably all subsequent pandemics.

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Contribution of the Slovenian Medical Informatics Association to the computerisation and digitalisation of health in Slovenia

Ivan Eržen, Mojca Paulin, Živa Rant

The *Slovenian Medical Informatics Association* (SDMI) is a professional association working in the field of healthcare information technology. It is a distinctly interdisciplinary and intersectoral association that links together health workers, IT experts and other stakeholders who depend on good information within the healthcare system. In more than 30 years of operation the members of the association have left a significant mark on the development of healthcare informatics in Slovenia.

The association was founded back in October 1988. It connects internationally with related organisations. Since 1992 the association has been a full member of the EFMI (European Federation for Medical Informatics), and since 1993 a member of the IMIA (International Medical Informatics Association). It is also a member of HL7 (Health level 7 International) and ISTEH (International Society for Telemedicine and Health).

The association organises professional events in the field of medical informatics, collaborates with organisations and institutions involved in the science and research of medical informatics, promotes the research activities of its members, cooperates with competent organisations in the field of medical informatics, informs members and professional circles of issues and advances in the association's operations and publishes the professional journal Informatica Medica Slovenica (IMS). Every two years since 1990 it has alternately organised a conference and professional meeting. A major emphasis at the meetings is the exchange of professional knowledge, opinions, views and linking of all partners in the healthcare system in the effort to integrate information technology into the system.

The activities of the association's members are also evident in their active participation at European and world conferences and collaboration in international projects and international working groups co-financed by the European Commission.

The association played an exceptionally important part in establishing the foundations of computerising healthcare in Slovenia, by drafting the strategic development document in this field in the first few years of the new millennium. Moreover, its members have successfully cooperated in various working bodies of the Ministry of Health, such as the Council for Informatics in Health (SIZ) and the Committee for Health Informatics Standards (OZIS), in drawing up the expert basis for telehealth and in individual expert groups in establishing *e-Zdravje* (e-Health) in Slovenia.

Several sections operate within the association: the journal *Informatica Medica Slovenica*, which has been issued since 1994 in print and electronic form, the Healthcare Section (SIZN), Telehealth, SDMI academy and HL7. The association also has its own website (http://www.sdmi.si/), which posts current events, reports, news, materials, articles, pictures, invitations to various events and information on these events in the field of medical informatics at home and abroad, while at the same time it serves as a space for disseminating expert materials and information to expert circles and the general public.

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04
SCIENTIFIC RESEARCH AND PUBLISHING ACTIVITIES IN PUBLIC HEALT

Univerza v Ljubljani
Medicinska fakulteta

Scientific achievements of the Department of Public Health of the Faculty of Medicine of the University of Ljubljana

Lijana Zaletel Kragelj

The research group of the Department of Public Health of the Faculty of Medicine of the University of Ljubljana is a group with great methodological potential. It carries out research in numerous fields of public health, both on the effects of physical factors (e.g. pollution of ambient air) and also the social environment (e.g. sense of coherence) on the health of the population. Research in the field of oral public health is also increasing.

The Department of Public Health at the Faculty of Medicine of the University of Ljubljana (DPH – UL FM) is a very small department, but nevertheless possesses large research potential in the fields of public health (PH) and occupational, transport and sports health (OTSH) in Slovenia. Its ranks include methodologically powerful researchers who are capable of doing research in different fields. The main aspects of health that are often the emphasis of such efforts are quality of life and self-assessed health. Important areas of research in the last five years have included the following:

1. Research in the field of environmental health to examine the effects of various factors on the health of the population. Within this field, the DPH – UL FM researchers direct their attention towards studying the influence of different environmental factors on the health of the population. Key among these are ambient air pollution, indoor air pollution and food contaminants. Special mention must be made of research into sick building syndrome (Dovjak, 2019). The observed aspects of health that are the focus of special attentions also include respiratory diseases and reproductive organ diseases/problems with the functioning of the reproductive system. In terms of methodology, special mention should be made of knowledge in the field of geographic analysis methods.

2. As part of their research into the effects of social factors on the health of the population, DPH – UL FM researchers work above all in examining the effects of the sense of coherence on the quality of life and the self-assessment of health (Štern et al., 2021). In recent years, research has been directed at patients suffering from multiple sclerosis and migraine, while a study is being prepared on the effect the sense of coherence has on the effectiveness of treatment outcomes in selected groups of cancer patients. Also important is research into the effects of previous bad experiences on different aspects of health. Special mention should be made of the methodological approach for identifying the profiles of population groups for the effective functioning of PH measures (Brajović, 2018). Another focus is the effect of social networks on the health of the population, especially the elderly. The research group also tries to introduce into its research new methodological approaches in the field of PH in Slovenia – besides geographical analyses it is, for example, increasing the use of analysis of social networks.

3. The integral effect of the environment on health is also included in research in the field of OTSH.

4. In the past five years, significant advances have been made in research in the field of oral PH. Special mention should be made here of research into the effects of fluorides on oral health and the influence of oral health on the perception of general health.

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Anthropology hand in hand with public health

Maruška Vidovič

The researching of "natural experiments" in the world has already led to significant anthropological and biomedical discoveries. Research of isolated populations in the world has shone light on numerous unknown health conditions which are often also associated with particular ecological and cultural features.

The first anthropological and public health project, a very ambitious, multi-year project that has been to date the most wide-reaching, was Population Structures of Slovenia, and this was the foundation for our research. Based on the results obtained, from year to year we supplemented and built on continued holistic anthropological and biomedical research. We initiated the project together with the Institute of Anthropology in Zagreb. In Slovenia, too, we therefore researched "isolated populations", which offer certain advantages for anthropological and medical research.

The valley of Selška dolina, a closed mountain valley, and the population living in it, were selected for our anthropological population research due to its specific geographical position, historical events (colonisation), local socio-cultural reasons and special ecological conditions. The research on a research model that represents a "natural research laboratory" enabled us to arrive at some important conclusions regarding the population living in the valley among the Škofja Loka hills.

Research of population structures presents a complete spectrum of biological, sociological and demographic factors that influence the genetic structure of a population. Population structure is a reflection of various processes that arise through the common dynamic formation of different population characteristics over time (through generations) and in space (in an ecological niche).

We carried out research of population structures on several levels. We used group parameters: the biological properties of the human organism: morphological, physiological, dermatoglyphic (palm and fingerprints) and dental characteristics, as well as certain socio-cultural characteristics: migrational, isonymic, linguistic and demographic. Through these parameters we traced microevolutionary processes which in reproductively closed populations that have been affected by genetic drift occur in just a few generations. This leads to the fixation of individual alleles, and the microevolutionary changes enable the population to modify certain characteristics. The research was dominated by two aspects of population structure and their mutual relationship: an assessment of the isolation of individual villages (subpopulations) and the level of kinship between them and within them (inbreeding), which is relatively high, especially in the sub-Alpine area. Our research has frequently pointed out guidelines for public health action.

For a number of years, we have been very active and successfully involved in international research collaboration. In Selška dolina we were joined by anthropologists from renowned foreign universities. Together we conducted research associated with way of life and health. We collaborated with Oxford University and the president of ICAF at IUAES in connection with dietary analysis. We carried out research on menopause and menopausal symptoms with medical anthropologists from Amherst University, Massachusetts, USA. We conducted research with anthropologists from the University of Western Australia in Perth on hormonal stress (the levels of cortisol and testosterone) in relation to way of life. On the subject of ageing and fragility of the inhabitants of Selška dolina we carried out a bilateral Slovenian Research Agency (ARRS) project with Ohio State University, Columbus, USA, and an analysis of the genetic diversity of the Selška dolina population in a bilateral ARRS project with the Institute of Genetic Engineering and Biotechnology of the University of Sarajevo. The NIJZ with the assistance of the ARRS published an editorial original book by Maruška Vidovič, Anthropology and Public Health.

Public health research in oncology

Vesna Zadnik, Tina Žagar

Researchers in the field of oncological epidemiology and public health working within the Epidemiology and Cancer Registry unit of the Institute of Oncology Ljubljana address challenges in the field of cancer control in a number of national and international research projects, the results of which enable the adoption and implementation of evidence-based programmes at the levels of primary, secondary and tertiary cancer prevention.

Researchers in the field of oncological epidemiology and public health working within the Epidemiology and Cancer Registry unit of the Institute of Oncology Ljubljana address challenges in the field of cancer control in a number of national and international research projects, the results of which enable experts and decision-makers to adopt and implement evidence-based programmes at the levels of primary, secondary and tertiary cancer prevention. The core task of oncological epidemiology is cancer burden estimation, which is determined using data from the internationally renowned Slovenian Cancer Registry. In recent years, a special focus has been placed on research on socio-economic inequalities, which can be observed both in Slovenia and globally.

The specific objectives of public health research in oncology are:

- Analyse the burden of cancer in Slovenia based on data from the national Cancer Registry and place the indicators in an international context.
- Identify the most important risk factors for cancer and propose evidence-based primary prevention measures.
- Monitor the impact of existing national cancer screening programmes and provide for the introduction of new ones.
- Develop quality of care indicators (for diagnosis, treatment, rehabilitation, and palliative care) for each type of cancer, using clinical registries, and ensure their monitoring, analysis, and appropriate interpretation.
- Identify and analyse factors that are important for improving the quality of life of cancer patients, for reducing the burden of late effects of the disease and treatment, and for improving survival of cancer patients.
- Examine the socio-economic inequalities in cancer risk factors, cancer burden and cancer treatment in Slovenia, and propose possible measures to reduce these inequalities.
- Develop and introduce new methods and technologies for collecting, processing, analysing and interpreting health data with relevance for the Slovenian public health landscape.

The main purpose of public health research in oncology is to provide integrated research and evidence-based cancer control in Slovenia, and to place the progress Slovenia is making in an international context. Research results and findings are published in monographs and articles in top-ranked scientific journals.

Figure: Embedding of oncological epidemiology and public health oncology research into evidence-based integrated cancer control in Slovenia.

Heart failure: from epidemiological burden to effective (self-)care of patients

Jerneja Farkaš Lainščak

The results of systematic research work represent an important scientific advancement in the international arena, as they provide the first comprehensive data on heart failure from this part of Europe. They are also important in the socio-economic sense as they enable the planning of public health measures to manage the burden of heart failure, which will increase further based on the demographic projections of the ageing Slovenian population.

Heart failure is the only cardiological condition whose frequency is increasing. Few national studies have been conducted on the rates of hospitalizations due to heart failure, and there is no data at all for Central and Eastern Europe. We analysed the Slovenian national hospitalization database for the period 2004–2012 and found that during this time there were approximately 6,000 hospitalizations per year (median age 78 years, 55% women). We observed an increase in the crude rate of hospitalizations due to heart failure (from 249 to 298/100,000 residents) and a decrease in age-standardized rates (from 249 to 232/100,000 residents). Up to 20% of patients died during the first year after hospitalization, and up to 40% of patients were re-hospitalized during the first year after their discharge from hospital.

We conducted a cross-sectional epidemiological study titled Screening Of adult urBan pOpulation To diAgnose Heart Failure (SOBOTA–HF) among the residents of Murska Sobota. The research was conducted in two phases: in the first phase we performed screening examinations, to which we invited all individuals from a representative sample of the population of Murska Sobota, aged 55 and over (N = 2861), and in the second phase we performed diagnostic examinations in individuals who have a risk of developing heart failure based on natriuretic peptide (NT-proBNP) levels equal to or greater than 125 pg/ml, and determined the prevalence of heart failure. The screening examination was performed in N = 1851 subjects (response rate 64.7%). The subjects whose NT-proBNP level was equal to or greater than 125 pg/ml (N = 1002) were invited to the General Hospital Murska Sobota for a detailed diagnostic examination. Heart failure was found in 221 subjects; the prevalence of this condition in the research sample was 11.9%. Conservative extrapolation to the general population showed a heart failure prevalence of 4.7%.

As the healthcare system fails to keep up with the burden of the disease, care in heart failure is increasingly being transferred to the home environment, to the patients themselves and their informal caregivers. Bearing in mind the importance of the active role of patients in the treatment process, we systematically conduct research on the knowledge and skills of patients with heart failure related to the disease, its (self-)care and its impact on various aspects of life. Quantitative and qualitative research approaches allowed us to gain insight into the health-related quality of life of patients and the main barriers and incentives for implementing self-care behaviours. We used the findings as a basis for the development of health education programmes and materials on heart failure, which are better tailored to the needs of patients and support them to a greater extent in everyday living with the disease (nepopustljivo-srce.si).

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Slovenian Journal of Public Health

Saša Zupanič

The Slovenian Journal of Public Health has been published quarterly by the National Institute of Public Health (NIJZ) since 1962. It has been published as a scientific journal with English abstracts since 2003, and since 2014 in the English language only.

The journal's mission is to promote new achievements in the broad field of public health in Slovenia and Central and Southeast Europe. The Slovenian Journal of Public Health publishes internationally oriented articles and encourages an interdisciplinary approach to public health. The journal is intended as a source for the exchange of new public health concepts and solutions among researches in Central and Southeast Europe.

The scope of the Slovenian Journal of Public Health covers all specific issues in public health, and thus includes primary care, the prevention of communicable and noncommunicable diseases, health promotion, environmental and occupational health, organization and management in public health, and the social and economic aspects of public health in Central and Southeast Europe.

The journal publishes mainly original research and scientific papers, and sometimes also study protocols, systematic reviews and invited editorials.

The articles are submitted to a peer review process carried out by at least three international reviewers from different areas of public health. The process is double-blinded, fast, fair and constructive.

Slovenian Journal of Public Health has had an IF since 2011: IF (2011) = 0.452, IF (2012) = 0.163, IF (2013) = 0.732, IF (2014) = 0.417, IF (2015) = 0.203, IF (2016) = 0.429, IF (2017) = 0.620, IF (2018) = 1.074, IF (2019) = 1.097.

In 2019, we achieved the highest total cites, IF, 5-year IF and IF without journal self-cites in our history. Our rank in the SSCI Public, Environmental & Occupational Health category is among the highest to date, which also applies to our ranking among Slovenian scientific journals.

Our policy is aimed at achieving the highest possible IF. We try to select 30 to 35 internationally oriented citable articles out of 200 manuscripts every year. Selecting 18% means three articles out of 16 manuscripts per month. As we receive a lot of good quality manuscripts it is a very demanding task for our reviewers and editors.

For 2020 we expect an IF higher than 1.1.

The Slovenian Journal of Public Health is indexed in many databases: SSCI, JCR, Web of Science (WoS), PubMed, PubMed Central, Scopus, DOAJ, PsycINFO, CAB Abstracts, Global Health, ProQuest, The Summon, Cabell's Directory, Celdes, CNKI Scholar, CNPIEC, EBSCO Discovery Service, Google Scholar, J-Gate, Naviga, Primo Central (ExLibris), SCImago (SJR), TDOne (TDNet), WorldCat.

https://www.nijz.si/sl/nijz/revija-zdravstveno-varstvo

Journal Javno zdravje

Matej Vinko, Tadeja Horvat, Erna Pečan

Javno zdravje is a new Slovenian peer-reviewed journal covering a wide area of public health. It strives for enhancing and networking of science and expertise in the field of public health. In the last 4 years the journal has published over 40 scientific and professional articles that have helped to broaden the public health discussion in Slovenia.

Public Health, the science and the art of preventing disease, prolonging life, and promoting health through organized community efforts, is intrinsically intertwined with the physical and social environment (Winslow, 1920). In step with constant changes in the world around us, public health evolves with new approaches, theories, and subsequently with new terminology. For the development of the Slovenian public health workforce, it is of great importance to facilitate the exchange of ideas, experiences and contemplations in Slovenian language, thus maximising the accessibility of such discussions to the widest circle of professionals. We have a long history of scientific publishing in the field of public health in Slovenia, but since recently there has been no peer-reviewed journal covering the broad discipline of public health that would publish its articles in Slovenian language. To fill that gap the National Institute of Public Health introduced a new journal titled Javno zdravje (Slovenian for public health) (Eržen, 2017). The first issue of the journal that was published in October 2017 contained, among professional and scientific articles, a special section titled Perspectives. In the special section prepared by a guest editor, short commentary pieces of professionals are presented to highlight a selected public health issue from relevant viewpoints of public health and related professions. Among topics addressed in Perspectives in past issues of the journal were frailty, alcohol use disorder, public health workforce development, and accessibility of mental health services in Slovenia. The journal publishes another special section titled Methodological conversations where two researchers take the roles of early career researcher and a methodologist and discuss various challenges researchers face at the start of their career. Topics covered in Methodological conversations range from bias in epidemiology to validity and reliability of measures used in survey questionnaires. Along the presented special sections journal also published professional and scientific articles, which present the majority of published articles, as well as book reviews, conference proceedings and other types of articles, all of them dedicated to the field of public health.

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05
EDUCATION IN PUBLIC HEALTH

Public Health School

Ivan Eržen

The rapid development of public health, which has been especially fast in the last two decades - both in terms of content and scope of work - has led to a steady increase in the need to provide successful approaches to ensuring better health of the population. In order to respond to these needs, both in research and education, the Public Health School was established in Slovenia in 2020 and operates within the framework of the National Institute of Public Health (NIJZ).

The need for a public health school has been present in Slovenia practically since independence. As early as 2004, a group of public health teachers led by Marjan Premik prepared a comprehensive document that provided the professional basis for the establishment of a Public Health School in Slovenia (Premik, 2004). Unfortunately, the project was not realized at the time. In the years since, the situation and related needs have changed. In Slovenia, public health education is provided at all five Slovenian universities. Public health content is thus included in the accredited curricula of at least 15 faculties and colleges of higher education.

Most of the programmes are taught by professors who are also employed at the NIJZ, and the possibility of further development of the education within the School of Public Health, which operates under the auspices of the NIJZ, became apparent. The NIJZ is strongly involved in staff and skills development. NIJZ experts are involved in the teaching of accredited and non-accredited forms of public health education. Training is provided at different levels and in different areas of public health expertise, carried out either by the experts themselves or in collaboration with experts who are otherwise employed elsewhere. There is a dense network of colleagues, who continuously raise their knowledge and abilities while working together on individual projects, both foreign and domestic. The international dimension also makes it possible to involve international experts. In addition, the NIJZ has a good insight into the training needs of the public health workforce.

Another important area of work of the Public Health School is research, which is rather dispersed, as experience shows the great advantage of networking with other research organizations. The NIJZ is already linking up with research organizations and project teams in its partners, which are also able to tackle very challenging research questions in public health. The Public Health School will continue to support and develop such models.

The Public Health School therefore provides a roof and support for various research projects and education and training programmes in the field of public health. Accredited programmes leading to a specific level of education will continue to be delivered by universities and other higher education organisations, with cooperation of the Public Health School in terms of content and modern teaching methods. Within the Public Health School, particular emphasis will be placed on coordinating and supporting the implementation of the many educational activities already carried out by the NIJZ in the field of public health.

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Education and training at the Department of Public Health of the University of Ljubljana, Faculty Of Medicine

Lijana Zaletel Kragelj

The Department of Public Health at the Faculty of Medicine of the University of Ljubljana is the leading educational institution for public health in the country. Together with external teaching staff it provides both undergraduate (Medicine and Dental Medicine integrated master's programmes) and post-graduate courses (Doctoral and specialist study programmes). It covers areas of public health and occupational, transport and sports health.

The Department of Public Health at the Faculty of Medicine of the University of Ljubljana (DPH – UL FM) is a very small department, but is nevertheless the leading educational force in the field of public health (PH) and occupational, transport and sports health (OTSH) in Slovenia, and its influence also reaches beyond Slovenia's borders. Together with external teaching staff the DPH – UL FM provides both undergraduate and post-graduate courses. The DPH – UL FM can take pride that its teaching staff includes the first full professor in the field of OTSH and the first full professor for PH in Slovenia. The DPH – UL FM team currently includes four full professors. The most important areas of the courses are:

1. Basic education is part of the integrated master's programmes Medicine (IMPM) and Dental Medicine (IMPDM). We find that awareness of the importance of public health for the effective operation of the health care system, within which future doctors and dentists will operate, is falling at the UL FM. As a result, the amount of PH content in the IMPM and IMPDM is also decreasing, regardless of the all the efforts invested by the DPH – UL FM and the broader professional public.

2. On the other hand the DPH – UL FM is very successful in the UL doctoral study programmes Biomedicine (with the independent scientific course Public Health) and Environmental Protection. Competence-oriented education and training is very well received by students, as shown in the large amount of interest in enrolment.

3. The DPH – UL FM is also very successful in the field of specialist studies in public health for doctors and dentists in Slovenia, within which it is the only accredited institution to carry out one quarter of the programme. This is part of the Two-semester Post-graduate Study of PH (TPSPH), which is a fundamental organised part of the programme of this specialised study course. The competence-oriented TPSPH is constantly being upgraded, and its latest version in 2021 has adapted it for distance learning with the use of the UL FM e-classroom, which operates on the Moodle platform. The first two full professors in the field of PH in Slovenia have also prepared a draft renewal of the PH specialisation programme in Slovenia which complies with European guidelines and would be entirely competence-oriented.

4. The international influence of the DPHZ – UL FM is the fruit of a 10-year project of cooperation in the field of public health in South-Eastern Europe. DPH – UL FM participated in this project as one of the leading partners in the preparation of extensive teaching materials, the first and second editions of which have already been published (Burazeri and Zaletel-Kragelj, 2013a; Burazeri and Zaletel-Kragelj, 2013b).

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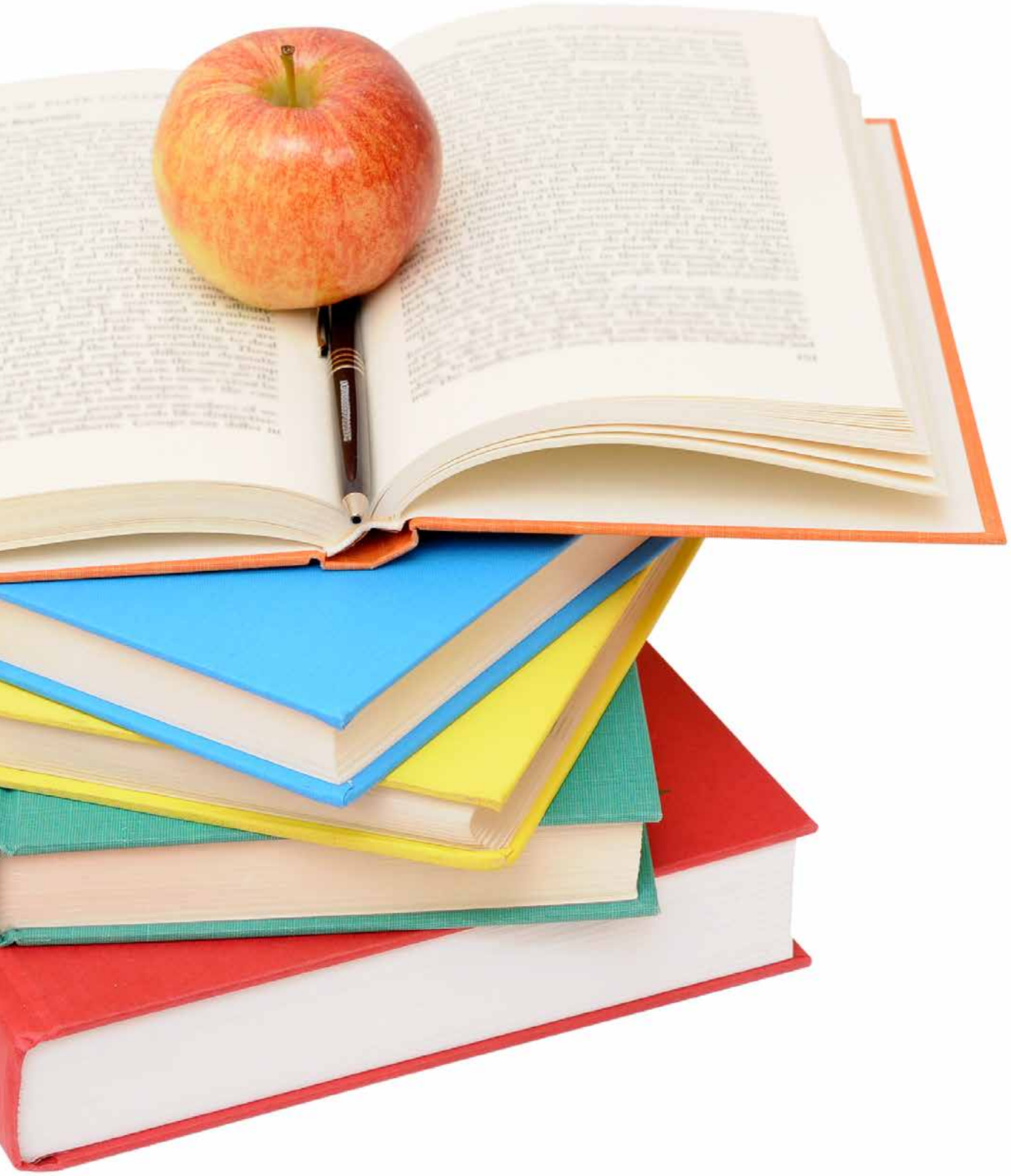

06
PUBLIC HEALTH ACTIVITIES

6.1 HEALTH PROTECTION AND PROMOTION

Website ZDAJ.net and the guide We are expecting a baby: modern, professional and accessible

Barbara Mihevc Ponikvar, Zalka Drglin

The new National Institute of Public Health website ZDAJ.net (www.zdaj.net) and the printed *Guide to Pregnancy, Childbirth and Early Parenthood* We are expecting a baby are important tools for health promotion and informing future parents.

The guide on pregnancy, childbirth and early parenthood We are expecting a baby is intended for pregnant women and future fathers. Many renowned medical and other experts contributed to its creation. It collects key professionally verified information and guidance for pregnancy and early parenthood. They inform future parents about the care for their own and the child's health, about the course of pregnancy, childbirth and the postpartum period, as well as about the care of the baby, cooperation with him and about family relations. The guide offers answers to many questions and directions, where to get additional information, support or help. It is available to any expectant mother who receives it during a preventive check-up in early pregnancy. It encourages self-care, cooperation between partners and parents, and the creation of a loving and safe family environment. It raises awareness of the importance of early childhood, which is crucial for a child's development and forms the foundation of a healthy adult. The guide accompanies future parents into a new period of life with an attractive design, with understandable and transparent content enriched with gentle verses. For more detailed and additional content, direct parents to the website ZDAJ.net.

The World Wide Web has become an easy, accessible, and popular tool for finding information, including health-related information. Expectant parents and parents of children are among the most active users of the Internet, which is why we have dedicated a large part of the website of the prevention program ZDAJ - ZDAJ.net specifically to them. It gathers a wealth of information on healthy living, health and healthcare during pregnancy, childhood and adolescence. Access to the web and a wealth of information puts users in a more active role in acquiring health knowledge, while at the same time challenging them to choose quality information in the massive websites that are available. Healthcare professionals who meet the target population thus play an important role in directing and raising the awareness of users to websites where professionally supported and verified content and popular topics are available. The ZDAJ.net website and the Expecting a Baby guide are very warmly received by users and experts, according to their first experiences; they are an excellent complement to the preventive medical check-ups during pregnancy and health education programs. They also played an exceptional role during the COVID-19 pandemic, when health education programs for future parents took place in a truncated form, or for some time were not even accessible.

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Health education for future parents and mothers: starting at the beginning, supporting healthy growth and development

Zalka Drglin

In Slovenia, the implementation of preventive healthcare and health education for various target groups is stipulated by the law. Hereby, we present the health education for pregnant women, future parents and mothers, which is carried out in health centres.

Maternity schools (or Childbirh classes) have a long tradition in Slovenia and in the beginning were attended only by pregnant women. A modern programme called *Pregnancy, Childbirth and Parenthood programme*[1] is currently available, aimed at pregnant women and expectant fathers. Experts from various fields help future parents develop new skills for caring for their own and the baby's health during pregnancy and after birth, as well as inform them about the course of pregnancy, delivery and postpartum period, how to care for and cooperate with the baby, and family relationships. The most important topics covered are the physiological processes of pregnancy, childbirth, the postpartum period, lactation and breastfeeding, as well as practical tips for improving health. The programme includes information on the importance of a healthy lifestyle for the pregnant woman, foetus, mother, father and baby (nutrition, physical activities, rest…), which contributes to a quality life and the good health of everyone in the family, with a special emphasis placed on deviations and warning signs at which it is necessary to seek medical attention. Expectant parents also acquire new skills related to cooperating with the baby from birth, and information about the baby's needs and development. They learn about the different aspects of ensuring safety and receive information about healthcare services in the perinatal period, their rights and options, and how to find help and support for different life situations. The first of seven two-hour sessions is scheduled during early pregnancy, and the remaining six in the third trimester of pregnancy. The first session, where future parents learn about various aspects of a healthy lifestyle in pregnancy, including the importance of physical activity and good physical fitness, is accompanied by a lesson with a physiotherapist where they receive practical instructions and exercises. Selected information within the programme is presented in the form of electronic and printed materials. The programme is regularly carried out in community health centres across Slovenia, with an emphasis on the active participation of future parents and their empowerment on the way towards a family life. Attendance is high: in 2019, 17,238 pregnant women and future fathers participated in the Pregnancy, Childbirth and Parenthood programme , who also expressed great satisfaction with the programme in their responses[2].

For pregnant women who do not have any health problems, the Pregnancy Exercise Programme, carried out by specially trained physiotherapists or kinesiologists, is also available in centres for health promotion in the community primary healthcare centres. The programme consists of two exercise sessions of 60 minutes per week, provides scheduled sets of exercises suitable for pregnant women, and lasts a total of sixteen weeks.

In addition, we are now introducing a Breastfeeding Counselling Programme, which includes telephone and personal counselling and is intended for mothers who are experiencing problems with lactation and breastfeeding. Timely professional and accessible counselling and support are provided by healthcare professionals who have passed the International Board Certified Lactation Consultants (IBCLC) exam.

1_https://www.nijz.si/sl/vzgoja-za-zdravje-za-bodoce-starse.

2_https://www.nijz.si/sites/www.nijz.si/files/uploaded/publikacije/letopisi/2019/4.3_vzgoja_za_zdravje_2019.pdf.

Health education: for joyful and healthy children and adolescents

Vesna Pucelj

The public healthcare system in Slovenia offers various services for providing preventive healthcare, part of which is also health education. National Health education programmes for children and adolescents have a long tradition in Slovenia. They are implemented at the primary level of healthcare in cooperation with educational and other institutions. Within the school system, health promotion and health education for children and adolescents are updated and supplemented through the regular school curriculum and as additional programmes or activities.

The Health Education for All Children and Adolescents (VZOM)[1] programme has been implemented for many years, approximately since 1995, as part of regular systematic preventive health examinations of children and adolescents in the school/kindergarten setting and in the local community. Currently, health education for children and adolescents is part of the Preventive Healthcare Programme for Children and Adolescents – the ZDAJ Programme – Health Today for Tomorrow. In the VZOM programme, providers cover all key target groups, that is preschool children and their parents, schoolchildren and pedagogical and other staff in kindergartens and schools. Meetings or counselling take place during the periodical health examinations as individual health education and/or group works, and in educational institutions mostly as group works within regular classes, science days, activity days, etc. The key providers of the VZOM programme are specially trained nurses, as well as psychologists, kinesiologists, dieticians and other professionals. Health education is more than just sharing information; it is an active learning process that considers personal experiences and socioeconomic factors. It aims to provide information and encourages individuals and groups to take care of their health. The contents are spirally upgraded according to the age of the children or adolescents. Health education thus includes all important health education topics, such as healthy nutrition, physical activity, prevention of addiction and other risk behaviours, education for healthy sexuality, prevention of cancer, prevention of infectious diseases, growing up, positive self-image, interpersonal relationships, etc.

The providers of the VZOM programme from community health centres cooperate with most kindergartens, primary and secondary schools in Slovenia. In the school year of 2018/19, for example, they provided their activities to almost 95% of all primary school classes[2].

Health education providers also work with young people who do not finish their regular schooling and are unemployed (also known as drop-outs or NEET youth – neither in employment, education or training) for various reasons, but are attended Project Learning for Young Adults programme (PUM-O). The providers have carried out a series of workshops with them and their mentors, most often in the field of mental health, physical activities, nutrition, and addiction. In 2019, the education providers established cooperation with all PUM-O organizations.

1_https://www.nijz.si/sl/vzgoja-za-zdravje-za-otroke-in-mladostnike.

2_https://www.nijz.si/sites/www.nijz.si/files/uploaded/publikacije/letopisi/2019/4.3_vzgoja_za_zdravje_2019.pdf.

Health in kindergarten – a health promotion programme for the youngest

Nives Letnar Žbogar

The *Health in Kindergarten* programme promotes health for children from 1 to 5 years of age, in the kindergarten setting and beyond. An important part is training for professionals in kindergartens and providing up-to--date information on the protection and strengthening of health. The programme develops and strengthens the capacity of kindergartens to create health-promoting environments, provide conditions and strengthen the ability of individuals to maintain and improve their health throughout life. Various activities are planned at the national level and carried out with national-regional coordination.

The programme assigns health as an important value, promotes it and directs the implementation of activities to maintain and strengthen well-being and health in kindergartens. At the beginning of the 2019/20 school year, 87,708 children were enrolled in kindergartens, i.e. 82.7% of all children aged 1–5, of which 94.1% were children aged 4 and 5 and 67.5% were children aged 1 and 2. Children spend 6 to 9 hours a day in kindergarten, so the kindergarten as a physical and social environment affects the development, well-being and acceptance of a child, but also represents an environment for obtaining information and learning skills, as well as an opportunity to inform parents and maintain contact with them. In addition to pedagogical knowledge, the health-related knowledge and competencies of kindergarten employees (i.e. health literacy) are very important in this context.

An important part of the programme is training for professionals in the kindergarten (2x per year) and the provision of up-to-date information with which we want to support employees in their efforts to maintain and improve their own health and that of the children they work with. The training is well attended and highly rated. We started with 50 participants in 2006, around 500 in recent years, and in 2020 there were 1,250 participants (due to the epidemic, the training was conducted through videos).

The basic messages are the ever-present themes of a healthy lifestyle (physical activity, nutrition, mental health, infectious diseases, hygiene and hygiene conditions, oral health, safety, etc). Every year we focus on a certain topic – the common thread with which we bring particular attention to the featured content (intergenerational cooperation, I feel good, time for a tasty treat, and so on). We also strengthen understanding of the content and targeted messages through regional meetings with coordinators from kindergartens, materials and visits to kindergartens.

The activities are planned at the national level and carried out with national-regional coordination (via the nine regional offices of the NIJZ). A unified approach allows for equal opportunities throughout the country. Through regional coordination, we also encourage and strengthen the community approach to health (cooperation of kindergartens with the health service, founders and other stakeholders in their community).

Kindergartens join the programme on a voluntary basis. All training materials are made available to all kindergartens on the website https://www.nijz.si/sl/zdravje-v-vrtcu, and reporting on the activities they have implemented also earns the kindergartens promotion points. In the 2019/20 school year, reports were submitted by 37.6% of kindergartens, and the activities were carried out for 24,100 children (27.5%). We issued 2,113 different certificates.

The support by the NIJZ significantly helped the employees of the kindergartens to achieve the acceptance and support of a healthy lifestyle by the parents (e.g., drinking unsweetened tea, celebrations without unhealthy food, spending time outdoors every day, vegetable tastings).

Sex education programme for children and adolescents

Alenka Hafner

Nearly all children and adolescents in Slovenia, from kindergarten to the end of secondary education, have in recent times received formal sex education in a uniform manner. In the field of healthcare, sex education is mainly performed by specially trained graduate nurses, health education providers, and partly also by graduate nurses from paediatric/school outpatient clinics. The development of content, preparation of materials and training of providers in the field of healthcare take place under the supervision of the Kranj Regional Office of the National Institute of Public Health.

The Slovenian educational programme for the health of children and adolescents has undergone significant changes in recent years. Health education has been stipulated in the Rules for the *Implementation of Preventive Healthcare at the Primary Level* since 1998 as a right of all children and adolescents; however, its implementation was not unified until 2015. At that time, the conditions for the implementation of the programme were provided by realizing the objective of providing content to all children and adolescents, initially in the population of primary school children: key contents were defined, materials for providers were prepared (the manual *Improving the health of children and adolescents*), a national network of providers was established, and continuous, stable funding was ensured. In the following years, the programme expanded to the children of kindergarten and secondary school students.

Sex education (education for healthy sexuality) is part of the health education programme. Since 1999, the Kranj Regional Office of the NIPH has been taking care of unifying implementation, developing content and preparing materials, as well as educating providers in the field of healthcare. All materials are created and updated in cooperation with regional and national experts (clinical psychologists, graduate nurses, specialists in gynaecology and obstetrics, public health specialists, psychiatrists, sexologists, and pedagogues) in the field of sexual and reproductive health or health of children and adolescents. While developing approaches, we have tested peer education in the past, but the current formal method of education provided by full-time health education providers makes it much easier to achieve the goal of providing uniform and professional content to all children and adolescents, from kindergarten to the end of secondary education. Sex education is spirally upgraded from the earliest years to the end of the secondary school period and is supposed to be carried out in the form of three pillars, the first and second of which take place under the responsibility of the healthcare system. The first pillar takes place in combination with systemic health examinations in the 6th grade of primary school (under the title *Growing Up*) and in the 1st year of secondary school (under the title Love and sexuality) and is performed by a graduate nurse from a paediatric/school clinic in the form of a 45-minute workshop. As part of the second pillar, the education provider conducts a 90-minute workshop on the school premises for the 9th graders of primary schools (*Education for Healthy Sexuality*), and in the secondary school period, topics from the field of sexuality are presented according to the identified needs of a particular school. The third pillar should be implemented by professional staff of kindergartens and schools. The regular curriculum already includes some topics in this field and materials (Health through Art) have been prepared for the uniform implementation of additional topics.

Challenges of eating disorders

Alenka Hafner

Due to their serious consequences, eating disorders represent an important public health problem that requires action, as well as the raising awareness of society as a whole. The school environment has an important role in preventing these disorders, and together with healthcare can make a key contribution to early detection and treatment by raising awareness and reducing the stigma of such conditions. The Kranj Regional Office of the National Institute of Public Health conducts research on the prevalence of these disorders, prepares materials and carries out education of key stakeholders and the general public.

Eating disorders are an important public health problem, especially during adolescence. Adolescents who experience these disorders often deny them as well as refuse appropriate professional help. At the same time, both parents and teachers who notice the presence of these disorders are often in distress, do not know how and when to act, and similar problems are often experienced by primary healthcare professionals. Due to the serious consequences, this problem requires action by various sectors as well as raising the awareness of society as a whole. The school environment has an important role in the prevention of these disorders, and healthcare and education together can, with increased awareness and reduced stigma of mental disorders, including eating disorders, make a key contribution to early detection and consequent early interventions. The education of parents and adolescents as well as the education of health professionals who do not work in the field of mental health are important.

The Kranj Regional Office of the NIPH has been conducting research on the prevalence of these disorders and their risk factors in Slovenia since 1999, in addition to preparing materials for the professional and lay public and conducting training for medical and pedagogical workers. In 2011, the Unit published a booklet *Understanding Eating Disorders*, which contains a synthesis of everything related to the origin and development of these disorders, possibilities of help, state-of-the-art views on family structure and its role in today's society, as well as what it means to be an adolescent today and how to develop from an adolescent into a mature and responsible adult. In 2016, they prepared guidelines in the field of eating disorders for publication in the manual Health through Art, intended for pedagogical workers. In 2018, the third updated leaflet Understanding Eating Disorders was published, which is an important aid in identifying these disorders and can also be a tool for starting a conversation with a person who has such a disorder. In 2018, they also participated in the monograph *Mental Health of Children and Adolescents in Slovenia* by contributing the chapter *Eating Disorders*. We also regularly cooperate in this field on the online counselling portal *To sem jaz.net*, where the questions from children and adolescents related to eating disorders are classified among the most difficult. In addition, we regularly conduct training for various professional audiences (pedagogues, health professionals…) and cooperate with the media.

Figure 1: Materials by the regional office of the NIJZ on the issue of eating disorders.

Prevention in the area of oral health

Martin Ranfl, Christos Oikonomidis

Oral health is an inseparable part of general health. As such it demands special attention in the context of public health. To this end, the National Institute of Public Health (NIJZ) has a Working Group for prevention in the area of oral health, which addresses this area comprehensively, looking at its broader significance for society.

Oral health is an inseparable component of general health and has an important influence on the individual's quality of life. Diseases in the oral cavity are among the most widespread chronic non-infectious diseases, and their extreme consequence – loss of teeth – can seriously limit the individual and their health in general. Around the world, oral health is closely interwoven with public health; the measure of using fluoride to prevent caries even ranks among the 10 greatest achievements of public health in the past century. Oral or dental public health is a special branch of public health, which in certain countries merits its own field of studies, and departments in public health institutions deal specifically with it. The public health profession in Slovenia did in fact recognise the importance of oral health in the past, but unfortunately the field has not received much attention. The year 2014 was a turning point in Slovenia for oral public health, since it marked the establishment of a special group for this branch of public health within the NIJZ.

Since 2014 we have regularly monitored the level of human resources coverage in the field of oral health. In the first year the report comprised just data on dentists, but later the monitoring added other professionals that make up a dental team. In 2014 we began marking World Oral Health Day, a campaign organised each year by the World Dental Federation (Fédération Dentaire Internationale, FDI). We merged together activities into one common banner, *Pamet v roké – za usta in zobé* (*Intelligence in your hands – for mouth and teeth*) (Oikonomidis and Ranfl, 2021), and each year we adapt the slogan of the campaign. Through these activities we are trying to empower people and to underline the importance of oral health for general health, along with the effect of our own care and responsibility for it.

Empowering the people of Slovenia and caring for oneself are more successful if the knowledge and skills can be acquired in childhood. Dental education is provided in an organised form throughout the country in kindergartens and primary schools. It is important here for the recommendations to be clear and standardised. To this end, in 2015 we drew up an expert publication entitled Vzgoja za ustno zdravje (*Education for Oral Health*) (Ranfl et al., 2015), which was adopted by the University of Ljubljana Senate as a university textbook, and which provides key expert recommendations and guidelines for the care of one's own oral health in terms of diet and oral hygiene.

In 2019, in cooperation with the Department of Public Health at the Faculty of Medicine of the University of Ljubljana and with the Stomatology Clinic of the University Medical Center Ljubljana, we joined forces in implementing a project of monitoring oral health in Slovenia (Artnik, 2020). The project included research among adults, children and adolescents about the habits related to oral health. The analyses conducted and published represent a basis for evidence-based action, decision-making and monitoring of the effectiveness of measures.

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Programme for the prevention of child injuries and the promotion of safety

Mateja Rok Simon

The Slovenian Programme for Child Injury Prevention and Safety Promotion includes a combination of counselling for parents, home visits and assistance in the use/installation of safety equipment. Programmes of this type are important for reducing socio-economic inequalities in ensuring the safety of children, as they are most effective in families where parents have a low level of education, among recipients of social assistance, and in single-parent families.

A survey of Slovenian parents' behaviour in ensuring the safety of their young children revealed that an alarmingly low proportion of parents implement measures to prevent injuries, showing large differences among families depending on the education and socio-economic status of parents (Rok Simon, 2017). The most effective way to reduce inequalities in ensuring the safety of children is the use of safety promotion programmes, which include a combination of counselling for parents, home visits and the provision/installation of safety equipment (Ingram et al., 2012). To this end, the National Institute of Public Health has developed a comprehensive counselling programme for parents, which is integrated into the existing child healthcare system. The programme starts as early as in the gynaecological clinic, where pregnant women get information about the choice of equipment for newborns in the booklet *Choose Safe Equipment for Your Baby* and duringthe course *Preparation For Childbirth And Parenthood*. Subsequently, counselling for parents is provided in paediatric clinics at each preventive medical examination of the child. This has proven to be an effective way to improve parental awareness and implement measures to prevent injuries in children. In addition, paediatric clinics ensure the credibility and relevance of individual messages, and parents also have the most trust in healthcare professionals (Zonfrillo, 2018). The problem with preventive paediatric counselling is time constraint due to the multitude of information on various health topics that needs to be provided to parents. Therefore, in the field of safety promotion, a combination of personal counselling and the use of health education materials, namely '*Taking care of children's safety*', is used, offering facts about the risks of injuries to children and simple instructions for implementing safety measures. As an upgrade to paediatric counselling, counselling is also provided to families in the first year of a child's life during home visits by a community nurse. The community nurse, together with the parents, verifies the safety of the home with the help of the *Home Safety Check Lists*, advises the parents on the appropriate safety measures specific to the child's age, and assists them in the use/installation of safety devices. Counselling and assistance are individually tailored and intended primarily for families with parents who are less aware and who, for various reasons, do not implement safety measures and do not use safety equipment. The programme is supported by the website *ZDAJ.net* that publishes, in addition to other content, the most important information and materials on the prevention of child injuries for parents and the professional public.

Figure 1: Examples of leaflets

Rok Simon M. Vpliv izobrazbe staršev in izbranih socialno ekonomskih dejavnikov na izvajanje ukrepov za preprečevanje poškodb majhnih otrok. Doktorska disertacija. Ljubljana: Univerza v Ljubljani, Medicinska fakulteta, 2017.

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Provision of psychological support during the COVID-19 epidemic

Matej Vinko, Helena Jeriček Klanšček, Nuša Konec Juričič, Saška Roškar

Epidemics that last for months and permeate all aspects of our lives have a significant impact on population mental health. To prevent mental health issues and distress due to the epidemic and its consequences a Psychological Support Task Force was established in Slovenia. The task force with over 30 members, including both non-governmental and governmental organisations, provided timely psychological support and coordinated efforts on a national scale.

The mental health impact of the COVID-19 epidemic was evident from its start. In response numerous institutions and individual professionals introduced activities and services to address the needs for psychological support arising due to the epidemic. During the first wave of the epidemic in March 2020 the National Institute of Public Health (NIJZ) acted as a coordinator and facilitator of a number of mental health related activities (Vinko et al., 2020). Following the first wave of the COVID-19 epidemic, Slovenia adopted a renewed National Protection and Rescue Plan in the Event of an Epidemic (NPRP), setting the framework for the Psychological Support Task Force (PSTF) (Ministry of Defence, 2020). The latter was the acknowledgment and formalization of good practice of networking and collaboration of NIJZ and a number of NGOs in the field of public mental health during the first wave of the epidemic. PSTF, comprising over 30 members representing users, service providers, researchers and decision makers, was convened in October 2020 at the start of the second wave of the epidemic in Slovenia by NIJZ and Ministry of Health. Mental health needs assessment was the cornerstone of PSTF activities – on bi-weekly basis data on mental health needs was collected from NGOs working with at-risk populations using a survey instrument. A national survey on psychosocial needs was conducted focusing on different population groups that were exposed to increased levels of risk factors (health care workers, parents of school-aged children, social care workers etc.). In order to provide accessible psychological support a free of charge 24/7 helpline was established. Psychological support was also made available in individual and group format to employees in NGOs and social care institutions. PSTF produced a large collection of psychoeducational materials addressing acute needs related to epidemic (from guidelines on psychological first aid to grief and bereavement advice during COVID-19). Collaboration was also established with the national public broadcasting organisation with whom the PSTF co-created mental health related content that was aired on television and radio programmes.

Ministry of Defence, Administration of the Republic of Slovenia for Civil Protection and Disaster Relief. National Protection and Rescue Plan in the Event of an Epidemic, version 2.0. 2020

Vinko M, Roškar S, Novak Šubara T, Tančič Grum A. Local mental health support in Slovenia during COVID-19: setting up primary health care helplines. EuroHealthNet Magazine, 2020 (15).

Improving accessibility of help in time of mental distress and suicide prevention

Helena Jeriček Klanšček, Saška Roškar, Nuša Konec Juričič, Matej Vinko

In the field of mental health, the focus and effort in the last decades was directed towards improvement of accessibility of help, destigmatisation and raising awareness about mental health topics; also, effort was invested in prevention of suicide mortality which decreased for over 30 %.

The field of public mental health has gained national wide recognition in the last decades. It comprises of systematic measurement of mental health indicators, data analysis and development and evaluation of programmes in the field of mental health. In 2008 the Mental Health Act was launched which enabled legal regulation of the mental health field. In addition, in 2018 the Resolution On The National Mental Health Programme 2018 - 2028 was accepted which emphasizes priority topics in the field of mental health and pinpoints principal institutions and sectors responsible for activities as planned in the Action Plan 2018 – 2020 and 2021 – 2023.

Among major achievements in the past period it is worthwhile mentioning the prevention – promotion programme To sem jaz (eng. This is me) and the web counselling service for youth of the same name, the establishment of free of charge psychoeducational workshops for management of depression, anxiety and stress (for patients and their relatives) within health promotion centres Promotion which are part of the primary community primary healthcare centres throughout Slovenia, the formation of the network of psychological counselling services which offer free help to individuals in times of emotional distress, the implementation of evidence based public health approaches in the field of suicide prevention (e.g. responsible reporting on suicide in the media, education of different gatekeepers), the pilot setting up of Community mental health centres for adults and Community mental health centres for children and adolescents in selected Health Care Centres in Slovenia and last but not least, setting up free of charge psychological help during the COVID – 19 pandemic.

Next to the presented programmes, the last decades also gave rise to comprehensive research on mental health in Slovenia, which resulted in several publications on mental health in adults, children and adolescents. The obtained results and insights served as background and corner stone for planning and preparing strategic documents and actions in the field of mental health.

Strengthened efforts to promote mental health and at the same time prevent mental illnesses have led to better accessibility of services and narrowing the inequalities gap, to less stigma and greater awareness about mental health among general public and last but not least to a 30% decrease in suicide mortality in Slovenia.

A community approach to reducing health inequalities

Tatjana Krajnc Nikolić, Teodora Petraš, Martin Ranfl

According to some socio- economic and health indicators, the Pomurje region is below the Slovenian average experiencing health inequalities. In the activities of promoting health and reducing health inequalities, we focus on close collaboration with the local community. We pay special attention to vulnerable groups. Pomurje borders three countries, which affects the culture and lifestyle of its inhabitants. Therefore, the Murska Sobota Regional Office worked closely with stakeholders from Hungary and Croatia, and since 2014 also with partners from Austria.

The experts of the Murska Sobota Regional Office focus on reducing health inequalities through health promotion. In cooperation with the local environment, we carry out public health activities and connect local stakeholders, implementing of the World Health Organization's approaches, the so-called »whole of society approach« and »health in all policies« in practice.

At the Murska Sobota Regional Office, we have already developed a strategic »bottom-up« approach addressing health inequalities through health promotion, which we first successfully implemented in the Pomurje region, and then transferred to all Slovenian regions. Our goal was to equip people with knowledge and skills for greater control over their health and strengthen the role of an individual in a local community through a planned long-term and interconnected approach. The EU DG Sante also assessed the approach as successful and co-financed the ACTION-FOR-HEALTH project, aimed at transferring this approach to other European countries (Krajnc Nikolić T, 2013). Important results of the project were, among others, the transfer of knowledge and experience of our regional office in addressing health inequalities and preparing strategic documents for other environments.

In order to reduce health inequalities in the Roma ethnic community, we deliberately and systematically connect with all relevant stakeholders in the implementation of activities to improve the health of the Roma people. In the publication »Public health approaches for the Roma ethnic community in Slovenia« (Krajnc Nikolić, 2018) we explain the causes of the health status of the Roma people based on the available evidence, present current health indicators and selected examples of activities aimed at improving the health of the Roma, which have been implemented since 2016. We have prepared a Programme for Strengthening Public Health in the Roma Community, the first such comprehensive approach aimed at improving the health of the Roma people.

We are aware of the importance of the implementing public health activities within the local community, and we focus our activities to fulfil local population needs with their active cooperation. In carrying out the activities, we take into account the specific needs of an individual vulnerable groups, available resources and the impact of the social and cultural environment. By being present in the local community, connecting and creating a network of stakeholders, we reach a wider part of the population and make it easier to encourage them to a healthier lifestyle (for example, in the promotion of physical activity: Zgeni.se: zimska gibanica, non-smoking: Burning message).

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Krajnc Nikolić T et al. Public health approaches for the Roma ethnic community in Slovenia. Ljubljana: National Institute of Public health, 2018.

Health promotion in schools: The Slovenian Network of Health Promoting Schools (1993–2021)

Mojca Bevc

The Slovenian Network of Health Promoting Schools[1] (SMZŠ) has been operating with the support of the Ministry of Health and the Ministry of Education, Science and Sport since 1993 and was one of the first members of the European Network of Health Promoting Schools (Schools for Health in Europe Network Foundation, SHE)[2]. From the first 12 pilot schools in 1993, the SMZŠ expanded to 400 institutions in 2021, including 71% of all primary schools, 34% of all secondary schools, 28% of all student dormitories and three institutions for children with special needs.

The National Institute of Public Health (NIJZ) and its regional offices lead the national and regional coordination, prepare an annual programme with selected current public health topics, which is presented at regular regional educational meetings, and provide schools with ongoing professional support. In their work, they follow national and international guidelines and principles in the field of health promotion for children and adolescents.

Each school has a team of staff (representatives of management, teachers, students, parents, local communities, health services) who systematically plan tasks, take a holistic approach to health in different ways – health content is provided through the curriculum, with various projects/activities focused on a healthy lifestyle – and also involve parents, the local community, the health service and other interested health institutions.

According to the SMZŠ programme and reports, various activities in schools are aimed primarily at raising the awareness of students, teachers and parents about healthy eating, promoting physical activity at school and in leisure time, strengthening mental health and other topics that promote the healthy lifestyles of children and adults (addiction prevention, environmental content, education in the digital world, schooling during the pandemic, safety, etc.).[3,4]

The SMZŠ programme has been operating for 28 years, which would not have been possible without the support of ministries, national and regional coordination and a huge number of aware and interested principals, team leaders, as well as pedagogical, medical and other associates. Regular regional educational meetings, in particular, are an opportunity for new knowledge, professional orientations, networking and examples of good practices in the field of health promotion to spread to other environments.

1_Slovenska mreža zdravih šol: https://www.nijz.si/sl/slovenska-mreza-zdravih-sol.

2_Schools for Health Europe: https://www.schoolsforhealth.org/.

3_Poročilo o delu SMZŠ v šolskem letu 2019/2020: https://www.nijz.si/sites/www.nijz.si/files/uploaded/porocilo_zs_2019_2020_koncna_27_1_21.pdf.

4_Infografika 2019/2020: https://www.nijz.si/sites/www.nijz.si/files/uploaded/infografika_27_1_21_koncna.pdf.

Slovenian Healthy Cities Network

Zlatko Zimet

The core principles of healthy cities build on the Health for All principles, which are mainly concerned with values to achieve better healthcare and a better quality of life, as well as the development of the basic health-care system. The Healthy Cities Project began in 1986 under the umbrella of the World Health Organization (WHO). Slovenia joined the project in 1989 and today 40 municipalities are involved in the project. It is one of the most successful programmes to improve health in local communities.

Healthy cities was launched as a project in 1986 under the auspices of the WHO Regional Office for Europe and the first Slovenian cities joined in its early stage in 1989. The concept of healthy cities is supported by the WHO strategy and is fully aligned with the European policy framework *Health for All*, the 2030 *Agenda for Sustainable Development, the Copenhagen Consensus of Mayors and the Belfast Charter*.

The Healthy Cities approach is based on equity, participatory governance and solidarity, cross-sectoral cooperation and actions/efforts to improve the health determinants. The national network works in a cohesive and unifying way, providing encouragement, support and advice at the local and national levels (Krampač, 1996).

The Programme, coordinated by the National Institute of Public Health (NIJZ), operates in phases, and in 2019 moved to phase VII, which will last until 2025. Forty municipalities are currently included in the national network, and we strive to increase their number from year to year in order to attain the objectives pursued through the principle of continuous expansion.

In the current phase, the common goal is to radically improve »the health and well-being of the population, reduce inequalities, and strengthen public health". In order to achieve this, in 2019 we connected with sub-networks and established the Slovenian Healthy Cities Network (SHCN) Steering Committee to be better connected with key ministries, governmental and non-governmental organizations. We organize annual regional, national and international meetings. We actively participate in a public health summer school, and we have redesigned/remodelled the website and published the *SNHC Gazette*, all with the aim of adressing health promotion and facilitating knowledge transfer to the local population/at the local level.

The responsibility of each member municipality is to create a health profile of the city, which consists of an assessment of the situation and serves as a base for the Council's project with a programme of priorities in the fields of healthcare, environment, economy, social protection, security or another field, depending on the problems identified in the local environment (Benko, 2020). The member municipalities evaluate the effectiveness of the programmes through annual evaluations. Due to the well-designed programmes within the SHCN, our vision is to accredit the national network with the WHO while phase VII is still ongoing (Zimet, 2021).

In empowering people to improve the health and satisfaction of citizens, local politics and civil society are crucial. A healthy city is a long process and path, not just an outcome. The National Coordination under the responsibility of the NIJZ through joint efforts will constantly strive to achieve the principles of *Health for All*.

Benko E. Program projekta Koper – Zdravo mesto za obdobje od 2020 do 2024. Koper: University of Primorska Faculty of Health Sciences, 2020.

Krampač I. Projekt Maribor zdravo mesto 1989 – 1996. Maribor: Center zdravo mesto Maribor, 1996.

Zimet Z. Zdravo mesto – Glasnik slovenske mreže zdravih mest. Online edition: No. 1, 2021.

The web portal Šolski lonec

Rok Poličnik

The web portal Šolski lonec ('*School Pot*') is a national website intended to support the implementation of nutrition guidelines in educational institutions. The portal was created as a result of cooperation between public health and education sectors, and is intended for professionals responsible for planning and preparing school meals. It includes content, recipes, ideas and good practices that can help with providing food at school or educating young people about the importance of healthy eating.

Slovenia has a long tradition of organized school nutrition, as the first beginnings of care and social responsibility regarding nutrition and health of children in schools date back to the period after the Second World War, and the system of organized school meals was preserved even after the country gained independence. The first practical instructions for preparing school meals were developed in Slovenia in the 1980s, and modern nutrition guidelines were adopted in 2005 as part of its *National Food and Nutrition Action Plan for 2005-2010*. The system of organized school meals is the responsibility of the school department, and the public health sector also has an important role. In accordance with the *School Nutrition Act*, the health sector is responsible for preparing professional guidelines for healthy eating, while the public health professionals systematically ensure the monitoring of school meals in practice and provide nutrition organizers in educational institutions with advice on nutrition guidelines.

The web portal *Šolski lonec* (www.solskilonec.si) was established in 2014 with the financial support of the Ministry of Health, and it is currently being upgraded due to the updating of dietary guidelines. The development of the portal is in line with the objectives of the National Programme on Nutrition and *Physical Activity for 2015–2025*, which includes among its priorities the importance of providing nutrition in accordance with guidelines and recommendations, promotes cross-sectoral cooperation and access to choices that are beneficial for health, while focusing on caring for the population of children and adolescents and preventing the occurrence of chronic non-communicable diseases.

The portal includes useful professional content on healthy diet, nutritionally balanced school menus, as well as descriptions and links to national projects and good practices in the field of children's nutrition and physical activity. The portal also offers an e-cookbook that provides ideas to spice up school menus. In cooperation with the Jožef Stefan Institute, a menu planning tool has also been developed, which is connected to the national food database. Simultaneously with the development of updated nutrition guidelines in this period, we are also developing a tool for managing school meals planning, which can be customized according to the needs of individual educational institutions, and supports the entire process from receiving food, managing recipes and menus and ordering food in kindergartens, primary and secondary schools.

Promocija aktivnosti za
preprečevanje kostno-mišičnih
obolenj in psihosocialnih tveganj pri delu

The online tool of the PKMO project

Ticijana Prijon

Musculoskeletal disorders (MSDs) and psychosocial risks (PSRs) in the workplace have been for decades the main cause of health-related absenteeism, prolonged absence from work, occupational disability and early retirement. Our analysis shows that incidences of MSDs and PSRs in Slovenia have been increasing each year, as has the average duration of absences from work for health reasons (Prijon, 2020).

Having a significant impact, MSDs and work-related PSRs are a major burden on the health system and also represent a financial and economic burden, thus causing a major socio-economic as well as pervasive social problem.

The National Institute of Public Health (NIJZ) and the Faculty of Health Sciences of the University of Primorska (UP FVZ) have developed an online tool to help workers and employers. The online tool is part of the project »*Promotion of activities to prevent MSDs and PSRs at work*« (abbreviated PKMO) and funded by the Ministry of Labour, Family, Social Affairs and Equal Opportunities of the Republic of Slovenia and the European Social Funds. The PKMO online tool includes a set of measures to prevent new disorders and at the same time manage the existing MSDs and PSRs in the workplace. The tool is based on the incidence analyses of the most common work-related MSDs and PSRs in Slovenia and its content includes only scientifically supported findings and principles. It is available publicly and free of charge at https://pkmo.si/. The tool is set up in the form of a basic e-manual and an in-depth e-textbook, containing detailed descriptions of work-related MSDs and PSRs, ergonomic measures to improve workplaces, kinesiological measures at work and in leisure time, PSRs management activities at work and recommendations to employers. A special feature of the PKMO online tool is the introductory »*Find and Eliminate*« questionnaire. Based on the answers given in the questionnaire, each user receives an individualized report on their risk for MSDs and PSRs in relation to work, according to age, gender, and the type of work they perform. Moreover, basing on the identified risk and possible pre-existing problems, the report includes links to the most relevant chapters of the online tool, dealing with the respondent's self-reported problems. By referring employees to the relevant educational content with measures to prevent MSDs and PSRs at work we want to ensure that each individual receives the most necessary information. The online tool contains several photos and videos with step-by-step implementation of the proposed activities and measures in practice.

The PKMO project team designed the online tool to help raise awareness of the issue of MSDs and PSRs at work, to reduce their incidence and prevent their consequences in the working population, especially among employees over 45 years of age.

Prijon T. Zdravstveni absentizem zaradi z delom povezanih kostno-mišičnih obolenj in duševnih stresnih motenj v Sloveniji. Primerjalna analiza začasne nezmožnosti za delo v letih 2015 in 2019. NIJZ gradivo (2020). Available from: https://www.nijz.si/sites/www.nijz.si/files/uploaded/pkmo_analiza_bs_zaradi_z_delom_povezanih_kmo_in_dusevnih-stresnih_motenj.pdf.

Preventive programmes in Novo Mesto

Doroteja Kuhar

Preventive programmes are organised systemically in Slovenia and aimed at various target groups. In the Novo Mesto Health Region we have for a number of years successfully coordinated these programmes and we are cooperating well with their providers. Over these years we have met regularly with the providers for specific population groups and helped resolve various issues and obstacles.

Since back in 2009, at the then Novo Mesto Health Institute we have established the regional responsible person on the side of the providers for each specific target group, as defined in the *Rules on implementing preventive healthcare on the primary level*. Together with the regional responsible persons we first agreed on the agenda of meetings, including in them expert topics and helping find providers of expert content. We met at least once a year with the providers for a specific population group. At each meeting we especially highlighted the current issues and helped them resolve problems that arose in their work. We included them in regional activities. Thus, for instance the health centre in the region invited us to present the public health aspect and importance of carrying out preventive checks for children and adolescents to the heads of primary schools in their area.

Also cooperating were the municipalities of the founder and representatives of the programme funding provider. One of the important aspects was the active participation of schools in implementing these types of programmes, which contributed to the co-creation of the healthiest school environment. In this we linked up with the area unit of the Novo Mesto Education Institute. We participated in regular advisory boards of family medicine practitioners in individual health areas, where the topics included implementation of the Svit Programme. Throughout this time, we had major support from our then regional responsible physician. As a family medicine practitioner, she was well able to underline the importance of implementing the programme and the major role of the family physician in people's trust in the programme. One of our regular tasks as part of coordinating preventive programmes was regular visits to health centres in the region. Meetings were attended by management representatives, the heads of individual departments and the then regional responsible physician. This gave us an insight into the regionally specific implementation of programmes at the level of the individual health centre.

On a regional level we also linked up with private providers operating in the public network. The basis for good cooperation was ensured by our continuous communication with providers and regular response to the needs of individual environments, where we always advocated the public health importance of preventive care. We presented our good cooperation with providers at meetings with regional responsible physicians and coordinators for adult healthcare, which were organised by the NIJZ central unit. The COVID-19 epidemic temporarily limited our coordination work, and this will pose an even greater challenge for the future.

Maturation of young people through the This is Me programme

Ksenija Lekić, Nuša Konec Juričič, Petra Tratnjek, Domen Kralj, Alenka Tacol, Marjan Cugmas

The This is Me programme, established in 2001 at the Celje Regional Office of the National Institute of Public Health, aims to strengthen young people's mental health and mental resilience. The evidence-based programme has been repeatedly recognized by the international professional public as an example of good practice in the field of organized mental healthcare for adolescents, and has also been described in a publication by the World Health Organization (WHO, 2019). In addition to other national awards, the programme has received the Prizma award for communication excellence.

The youth mental health programme This is Me, the development of which is supported by the Ministry of Health, is based on two main approaches to work:

1. Online consultation

The online counselling centre www.tosemjaz.net provides young people with anonymous, publicly available, free-of-charge and easily accessible professional advice. The answers to questions about the challenges and hardships of growing up are provided by a multidisciplinary and inter-institutional online counselling network, which brings together more than 60 specialists/volunteers (doctors from various disciplines, psychologists, social workers and other experts). The editorial office, which is located in Celje at the National Institute of Public Health, takes care of the online counselling activity, coding of online submitted questions and analytics. The extensive, unique online database currently contains more than 45,000 conversations – questions from young people and answers from experts. *An analysis of more than 18,000 online questions (2012–2020) shows that young people most often submit questions about issues related to their relationships with peers, friends and family, falling in love, physical maturation and sexuality, and self-image. About 75 percent of the questions are asked by girls, and nearly 60 percent of users are between 13 and 17 years old. About a tenth of the questions in the entire database are represented by 'the toughest questions', those related to crisis situations. They are associated with suicidality, eating disorders, self-harm, anxiety and depression, and various forms of violence.*

2. Preventive work in the school environment based on the model of 10 workshops

The comprehensive model of 10 preventive workshops, designed for preventive work with adolescents from 13 to 17 years of age, systematically addresses the development of psychological resilience and social and emotional competencies that support young people during adolescence and act as protection in crisis situations. The approach has been tested and supported by evidence – the results of an in-depth evaluation of the effectiveness of the work model conducted by the Centre for Psychodiagnostic Resources show that the workshops have a positive impact on both the school class and the individual in terms of mental health. The goal is to have a provider carry out all 10 preventive workshops described in the manual *Maturing through the This is Me programme*[1] in the same school class in one or two school years. The workshop providers are teachers (usually class teachers). The National Education Institute of the Republic of Slovenia recommends the use of the manual to all teachers and schools, especially counsellors and class teachers. On average, about 10,000 children and adolescents participate in the programme per school year. The programme is included in the National Mental Health Programme and is intended for gradual systemic introduction into the school environment.

The free-of-charge and publicly available programme literature:

- The manual for preventive work with adolescents Zorenje skozi To sem jaz is available online at: https://www.nijz.si/sl/prirocnik/tosemjaz.
- The professional monograph on online counselling Srečanja na spletu is available online at: https://www.nijz.si/sl/publikacije/srecanja-na-spletu.
- WHO. This is Me: mental health programme for youth, Slovenia. In: Case Studies: The WHO European Health Equity Status Report Initiative. Copenhagen: World Health Organization, Regional Office for Europe, 2019.
- https://www.euro.who.int/__data/assets/pdf_file/0016/411343/HESRi-case-studies-en.pdf.

Sanitary and epidemiological inspection of passenger and cargo vessels in Slovenia

Boris Kopilović, Andreja Rebec, Nevenka Ražman

Since 2005 Slovenia's sole maritime passenger terminal has been in Koper. The recommendations for preventing risks to public health related to vessel transport are set out in the International Health Regulations. In 2006 the European Union implemented the SHIPSAN project, where risks to public health are determined by means of sanitary and epidemiological inspections. The majority of vessels inspected at the Port of Koper are cargo ships, but inspections also cover three passenger ships a year.

Koper is well known for having the sole maritime passenger terminal in Slovenia, which each year records the appearance of new ship operators. Record numbers were reached in 2019: 115,581 passengers[1], although this was followed by a curtailment due to the novel coronavirus pandemic.

Meanwhile sanitary and epidemiological inspections of cargo vessels have continued uninterrupted and no fall in numbers has been noted.

Conditions on ships have a considerable effect on public health, since they may be a source of infections or a means of transferring vectors internationally. Controlling outbreaks on vessels is harder than in facilities on dry land. Studies have shown that the most common infections/outbreaks are: viral gastroenteritis, influenza, hepatitis A, cyclosporiasis, diphtheria, E. coli, measles, meningococcal meningitis, rubella, salmonellosis, scabies, dysentery, sexually transmissible diseases, trichinosis, tuberculosis, chicken pox and cholera. The factors that contribute to such outbreaks can be prevented or reduced through appropriate measures, training of ship crews and advice to passengers (Mouchtouri, 2010).

In accordance with the EU SHIPSAN ACT or EU SHIPSAN manual, inspections are performed by qualified inspectors at the port, and they enter a report in the information system (EU Shipsan Act Joint Action Shipsan, 2016). Regular inspections are carried out in accordance with special criteria every six months. Additional inspections are performed following the unsatisfactory outcome of a regular inspection or following the elimination of deficiencies. Inspections are also carried out in the event of complaints or an outbreak of an infectious disease. Inspections cover all factors of risk to public health: people, air, drinking water, food, recreational water (spas, pools), ballast water, sea water, vectors, animals, plants, baggage, cargo, vehicles, waste (EU Shipsan Act Joint Action Shipsan, 2016).

The *Ship Sanitation Certificate* is a document that confirms the compliance of the vessel with the requirements of international health legislation and serves as a confirmation for entry to the port, valid for six months.

We anticipate the return of passengers to the Port of Koper. This will require the adaptation of the passenger terminal, but prior to that the adoption on the EU level of guidelines as what in fact these terminals should comprise. In the future it will also be necessary to inspect more passenger ships. Health services should be better connected and common criteria valid across the entire EU should be determined. Many European countries have 'special' inspectors who are involved exclusively in inspecting vessels. For the moment Slovenia has no such inspectors, but it would be good to consider whether to set up such a service. In other countries this is known as the Port Health Authority. We believe that this is arranged best in the USA, where these services fall under the Department of Defense (Kopilović et al., 2018).

European Manual for hygiene standards and communicable disease surveillance on passenger ships. Eu shipsan act joint actionshipsan. 2nd edition; April 2016.

Kopilović B. Kleibencetl J. Colarić M., Jug P. Pregled potniških ladij. e-NBOZ, sept. 2018; Pridobljeno na spletni strani: https://www.nijz.si/sl/e-nboz-0#-september-2018, dne 8.6.2021.

Mouchtouri V., Nichols G., Rachiotis G., Kremastinou J., Arvanitoyannis I., Riemer T., Jaremin B., Hadjichristodoulou C. State of the art:public health and passenger ships. Int Marit Health 2010; 61, 2: 49–98.

1_Potniški terminal. Luka Koper. 2021; Pridobljeno 7.6.2021 s spletne strani: https://luka-kp.si/slo/terminali-191/single/potniski-terminal-255.

From research to action in order to promote healthy eating

Matej Gregorič, Vida Fajdiga Turk, Urška Blaznik

Each one of us is "exposed" to food, while our dietary patterns differ and change from day to day as well as from one period of life to another. This a special challenge for researchers. That is why NIJZ has, for already a decade, participated in a network of experts who gather and analyse data on nutrition at the European Food Safety Authority (EFSA), where we co-create the common EU Menu methodology.

On a national level we researchers are active in the programme group Nutrition and Public Health at the Slovenian Research Agency, where we have already prepared numerous initiatives based on scientific evidence to improve the population's diet. We have so far succeeded in carrying out the following activities:

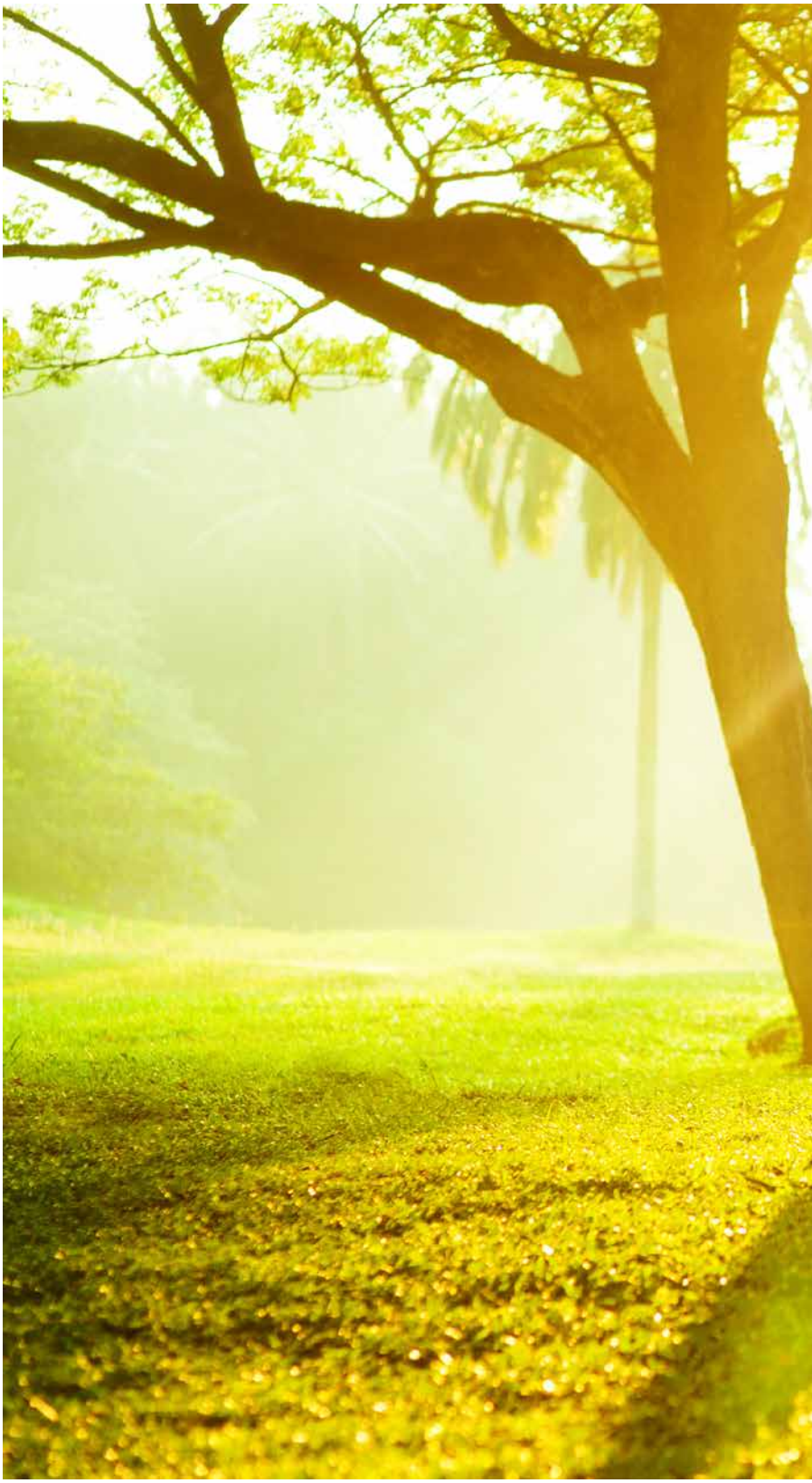
- we have investigated dietary intake from the point of view of nutrients that may cause health problems and identified population groups with more risky diets;
- we have harmonised efforts in the field of limiting the intake of sugar, salt, and unhealthy fats with European initiatives;
- we have provided legal bases for the legislative restriction of trans-fatty acids in our diets;
- we have reviewed the situation regarding vitamin D supplies and on this basis named a group to prepare guidelines for the sufficient supply of vitamin D;
- we have made efforts and directed our work towards increasing the selection of food products that are beneficial for health, in cooperation with the national food industry;
- we have helped increase awareness and the quality and balance of food in public institutions and restaurants with guidelines for healthy nutrition, with cross-sectorally planned programmes, projects, measures and the marking of important events (e.g., monitoring nutrition in schools, expert support for food providers, the School Scheme, Traditional Slovenian Breakfast, World Food Day).

After more than a decade of planned work in compliance with the guidelines of strategic national programmes (Ministry of Health, 2015), various favourable trends are also evident with regard to people making more prudent choices and having healthier diets:

- consumers have become more health-conscious in their choices and also check the origin of foodstuffs;
- dietary habits have improved, especially as regards regularly having breakfast amongst children and young people;
- the trend of falling regular consumption of fresh vegetables has stopped;
- sweet drinks are being consumed less frequently, and this drop is particularly marked among young people;
- the habit of adding more salt to food at the table has been reduced;
- healthy fats are being used more and more often in cooking;
- the trend of increasing overeating and obesity among children and young people has stopped.

Dietary behavioural factors, such as inappropriate ingredients and amounts of certain foods, less appropriate methods of preparing food and the food intake rhythm, are the main reasons for premature morbidity and mortality rates for cardiovascular diseases, diabetes, obesity, and other conditions. Two thirds of Slovenia's adults already have risk factors connected with their diets, such as increased blood sugar levels, high blood pressure, high blood cholesterol levels and increased body weight. As it is possible to successfully change and control most of these factors – by raising awareness among the population, and the creation of the skills and supportive environments needed for healthy choices to be made – it makes sense to continue with the outlined activities. Changing dietary habits is a long process, so citizens have at their disposal suitable support within the health care system to achieve a long-term change in their habits, as well as numerous other supportive public health policies, which go beyond the reach of the health sector.

Ministry of Health of the Republic of Slovenia. National Programme on Nutrition and Physical Activity for Health 2015–2025. Ljubljana, Ministry of Health of the Republic of Slovenia, 2015. Available from: https://www.dobertekslovenija.si/nacionalni-program-2015-2025/.



6.2 REDUCING RISKY BEHAVIOURS AND DRUG DEPENDENCIES

Interventions to control drug dependence

Mateja Jandl, Ada Hočevar Grom, Andreja Drev, Ines Kvaternik, Živa Žerjal, Maša Serec

The National Institute of Public Health (NIJZ), with the assistance of government and non-governmental organisations, gathers and provides access to key epidemiological data in the area of use of illicit drugs. Through activities to reduce harm and by drawing attention to the appearance of new psychoactive substances, it contributes to the protection of public health. The establishment of a network of mobile units to implement harm reduction programmes and provide prevention in 2018 signalled the upgrading of existing programmes and introduction of some of the latest programmes.

The NIJZ systematically gathers data covering drug use among adolescents (Health Behaviour in School-Aged Children (HBSC) and European school survey on alcohol and other drug use among students (ESPAD) surveys) and the adult population (S*urvey on tobacco, alcohol and other drugs*), the spread of infectious diseases, an estimate of problem drug users, treatment of drug use problems and monitoring drug related deaths and mortality due to drug use. Data is also gathered in respect of reducing the supply of illicit drugs, along with data on the use of drugs among persons serving prison sentences. The NIJZ also collaborates with researchers at the Jožef Stefan Institute, which analyses communal wastewater for drugs and their metabolic products.

The NIJZ Koper Regional Office coordinates a network of 20 harm reduction programmes in the area of illicit drugs which are located throughout Slovenia, and which as part of day centres, mobile units, night shelters and safe houses for drug users offer help to drug-dependent clients and homeless persons. Programmes offering sterile needle exchanges come into contact with a hidden population of high-risk drug users and thereby contribute to preventing the spread of infectious diseases and to reducing the visible use of drugs.

The NIJZ coordinates the national and regional networks of the Early Warning System for the appearance of New Psychoactive Substances (NPS). This comprehensive system links together the key institutions and non-governmental organisations that can help in the rapid detection and monitoring of NPS, and in informing various circles that can offer proposals for action and classifying NPS on the list of illicit drugs. All this contributes to reducing the risk to health, while at the same time provides legislative and repressive authorities scope for appropriate action. The Slovenian system is integrated into the European Union Early Warning System, within which information is rapidly exchanged among Member States of the EU and European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and Europol.

The Ministry of Health has pursued the development and upgrading of a network of mobile units for implementing preventive action and harm reduction programmes in the area of illicit drugs as part of the *Operational Programme 2014–2020*. In low-threshold programmes health personnel are embedded in social protection teams, where users of illicit drugs receive comprehensive psychosocial and health treatment. Testing of psychoactive substances is carried out in the mobile laboratory in the night-time setting and regularly every week in the stationary laboratory. The field programmes of substitution treatment for opioid dependence and programmes of health and social rehabilitation foster stable treatment and provide activities for re-socialisation, employment re-integration and prevention of recidivism.

1_HBSC - Health Behaviour in School-Aged Children ali Z zdravjem povezano vedenje v šolskem obdobju

2_ESPAD – European school survey on alcohol and other drug use among students ali Evropska raziskava o alkoholu in preostalih drogah med šolsko mladino

3_EMCDDA - Evropski center za spremljanje drog in zasvojenosti z drogami

Approaches to reducing opioid-related mortality

Mateja Jandl, Ada Hočevar Grom, Ines Kvaternik

With the start of the implementation of the public health intervention "take-home naloxone" in the field of reducing drug-related mortality, Slovenia has joined other countries where this medicine is successfully used to prevent deaths due to opioid overdose. Naloxone is an effective life-saving medicine, and the intervention "take-home naloxone" is one of the most important in reducing the number of deaths due to opioid overdose.

Reducing mortality from opioid overdose is a major public health challenge in Europe, as the number of deaths among drug users has been increasing in the last decade. In 2018, the drug-related mortality rate in Slovenia among users aged 15 to 64 was 41 deaths per million people, which exceeded the number in the EU for that year (23.7 deaths per million). The main approaches to reducing the number of deaths due to opioid overdose used in Slovenia are mainly focused on the following important areas:

Prevention of overdose-related mortality

Experts in the field of dependence treatment in Slovenia recognized the intervention "take-home naloxone" as effective and feasible as early as 2016, when the professional basis for its introduction was prepared. Naloxone is an opioid antagonist used to counteract the effects of opioids in cases of an opioid overdose. The most important part of the intervention is education on overdose and distribution of naloxone to opioid users and other people who may be present during an overdose. The programme trains participants to recognize signs of overdose, to know that it is necessary to call the emergency medical service immediately, to know the basic procedures of resuscitation and application of naloxone, and to know that they must stay with the person who has overdosed until paramedics arrive. In Slovenia, nasal naloxone (in the form of a nasal spray) has been authorized and available since March 2021 in all centres for the prevention and treatment of drug addiction and pharmacies that supply the centres with medicines.

Reducing vulnerability

In Slovenia, we have a well-developed network of non-governmental organizations that implement harm reduction programmes for substance abuse, whose basic goal is to ensure less risky drug use, reduce the possibility of infections and thus ensure the social inclusion of drug users. A network of mobile units implements harm reduction programmes, outpatient substitution treatment programmes, a substance analysis laboratory and a unit for social and medical rehabilitation.

Reducing the risk of overdose

In Slovenia, the network of centres for the prevention and treatment of illicit drug addiction is very easily accessible, and no surcharge is required for substitution treatment, as this type of treatment is covered by health insurance. The network of programmes in Slovenia is well-spread geographically, and treatment programmes also exist in prisons.

Tackling the alcohol consumption problem with the SOPA approach

Tadeja Hočevar

The national developmental project SOPA (*Together for a Responsible Attitude Towards Alcohol Consumption*) is taking place in Slovenia from 2016 to the end of January 2022. It involves activities for the development and piloting of an interdisciplinary approach to limiting excessive alcohol consumption among the adult population of Slovenia, and the preparation of a proposal for the implementation of the approach at the system level. The current results show that the project is exceeding the set goals.

The SOPA project pursues the following objectives in order to limit the problem of alcohol consumption to reduce health inequalities (Hočevar et al., 2022; Hočevar et al., 2018):

I) Building and strengthening capacity. This involves raising awareness and training the professionals, political decision-makers, representatives of NGOs that deal with groups of people with various vulnerabilities, media representatives and members of the community in topics relating to the harm caused by alcohol consumption, and the resources and support methods available for encouraging adults to give up excessive alcohol consumption.

II) Cross-sectoral interdisciplinary cooperation. Cooperation between health workers in medical centres and clinics, social workers at centres for social work and experts at employment offices and in NGOs dealing with groups with special vulnerabilities constitutes a key bridge between the healthcare and social sectors.

III) Piloting of the approach in 18 local areas around Slovenia. The approach is being tested in 18 local areas, with selected health and social workers and representatives of NGOs and employment offices working together to provide activities of the 'short-form measure' of support for people who wish to bring their hazardous and harmful alcohol consumption to an end.

IV) Proposal for establishing the approach at a system-wide level. After the pilot project is evaluated, a proposal will be drawn up to implement the measures as part of the national public health protection programme.

V) Removing the taboo and stigma from alcohol-related problems in Slovenian society. This is carried out through the objectives referred to above, and particularly through the building and strengthening of professional capacities and raising awareness in the media and among the general public.

As part of the project activities, almost 600 experts have been trained to support individuals and groups in ending excessive alcohol consumption, more than 50,000 community members have been addressed, over 4,000 have been involved in the process of stopping their excessive alcohol consumption, and almost 1,000 of these have also successfully done so . This represents a 175% success rate relative to the goal set for the project. In addition, eight regional and 18 local interdisciplinary groups of SOPA actors were established, 15 media representatives trained in writing about alcohol in the media in a way that is appropriate for public health, and several media campaigns were conducted throughout Slovenia, while the 'Alcohol Free Day' was celebrated every year1. Based on the evaluation, and if there is the appropriate political will, the approach can be implemented at the system level.

Figure 1: Map of local areas in which the SOPA pilot project is being implemented

Hočevar, T., Henigsman, K., Štruc, A., Založnik, P. Utemeljitev pristopa SOPA – Skupaj za odgovoren odnos do pitja alkohola Izbrani ukrepi zamejevanja pitja alkohola med odraslimi prebivalci Slovenije. Ljubljana: NIJZ, 2022 (Forthcoming).

Hočevar T, Henigsman K, Štruc A. SOPA – Skupaj za odgovoren odnos do pitja alkohola. Ljubljana: National Institute of Public Health, 2018.

Social protection programme Centre for the Prevention of Addiction

Vanja Žmak

The *Centre for the Prevention of Addiction* began operating in 1996, its work has continued through the years to the present day, and will go on with a vision, compassion and enthusiasm to achieve even better and greater results. The centre operates within the National Institute of Public Health at the Maribor Regional Office.

The content offered has expanded over the years, mainly due to the growing need to address younger generations of users. For the purpose of evaluating the programme, we have also introduced a monitoring group to follow the users who no longer have such frequent contact with us, and to record the number of successful abstainers.

Our work is based on the idea that users remain integrated in the home environment and maintain important social contacts throughout their participation in the programme. In this way, they can feel included, useful and active members of their family and surroundings. We work from the assumption that the level of addiction among programme users is not yet serious enough that they should be excluded from their home environment and included in a therapeutic community or low-threshold programmes.

Most users are secondary school or university students, a certain proportion are also employed, and all have an appropriate support network. We include the foundations of volunteer work and elements of self-help in our work. In this process, we involve the entire National Institute of Public Health (NIJZ) in cooperation with the Slovene Philanthropy, Association for Promotion of Volunteering (https://www.filantropija.org/).

Participation in the programme is voluntary and requires the active participation of users in solving problems. The conditions for participation are:

- abstinence from all illicit drugs, alcohol, chemical substances, alkohola, kemičnih substanc,
- physical and psychological non-violence,
- continuing education or employment,
- undergoing supervised urine tests,
- respect for supervision by all who form a safe social network for the user and provide an incentive to maintain abstinence,
- following instructions and adopting a new lifestyle,
- involvement of the user's most important loved ones in rehabilitation.

Upon completion of the programme, the user is able to adhere to a higher quality lifestyle and achieves autonomy in performing daily activities and obligations.

The Centre for the Prevention of Addiction is thus the only high-threshold programme in this part of Slovenia in which the users can address their drug-related problems in the home environment.

Moreover, we offer the only programme in the Podravska region that is designed for those experimenting with illicit drugs, who are not yet considered to have developed an addiction.

The vision we have for our work is that we may expand the programme to other regions and include the treatment of non-chemical addictions.

Reducing harm in the area of drugs and homelessness

Ines Kvaternik, Živa Žerjal

The Koper Regional Office of the National Institute of Public Health has for a number of years coordinated programmes to reduce harm in the area of drugs and homelessness, providing sterile utensils for safe use of drugs, removing returned infective materials for destruction and gathering epidemiological data on drug use and the needs of high-risk drug users.

The Koper Office coordinates a network of 20 programmes to reduce harm in the area of illicit drugs and homelessness. In this way it contributes significantly to protecting public health, preventing infections with blood-transmitted viruses and reducing conflict between addicted and homeless persons and the local community, as well as spurring the development of new measures in the area of public health.

The harm-reduction programmes are spread throughout Slovenia, and in the context of day centres, classic field work and field work with mobile units, night shelters and safe houses for drug users they offer help to addicts and homeless persons. The programmes include the free service of a needle exchange, which represents a basis for all other approaches to reducing harm that are effective in the area of protecting the health of individuals and the community. Unimpeded access to sterile utensils constitutes a measure of preventive care, and at the same time access to the highest number of intravenous drug users. It facilitates contact with a hidden population of high-risk users and in this way contributes to reducing the health risks for addicted persons and the community, and enables the social inclusion of users.

Numerous studies show that harm-reduction measures actually reduce the incidence of transmission of infectious diseases and at the same time do not contribute to any increase in the number of drug users. These programmes also inform and encourage illicit drug users to put their way of life in order, to use drugs in less risky ways, reduce the sharing of injection utensils and to save and return used infective utensils to the programmes. In this way they provide users with the necessary knowledge about preventing transmission of infectious diseases and encourage them to handle infective waste responsibly and to be included in various addiction assistance programmes – from treatment to social rehabilitation.

6.3 HEALTH AND ENVIRONMENT

6.3.1 Environment and health indicators

6.3.2 Chemical safety

6.3.3 National Human Biomonitoring Programme

6.3.4 Preparation of hygiene recommendations to prevent the spread of SARS-CoV-2 infections

6.3.5 Programme of measures to improve the quality of the environment in the Upper Meža Valley

6.3.6 Preventive programme Safe with the sun

Environment and health indicators

Nataša Kovač, Peter Otorepec

Environmental pollution is an important determinant of wellbeing, as it affects human health and development as well as many socio-economic factors that also determine the quality of life. The effects of the environment on human health are monitored with environmental and health indicators. These indicators are data presented in an agreed manner, which have been developed in accordance with the methodology of the World Health Organization – ENHIS (Environment and Health Information System)[1]. They are intended to be used by decision-makers to support decision-making and by the general public to help them understand environmental and health issues.

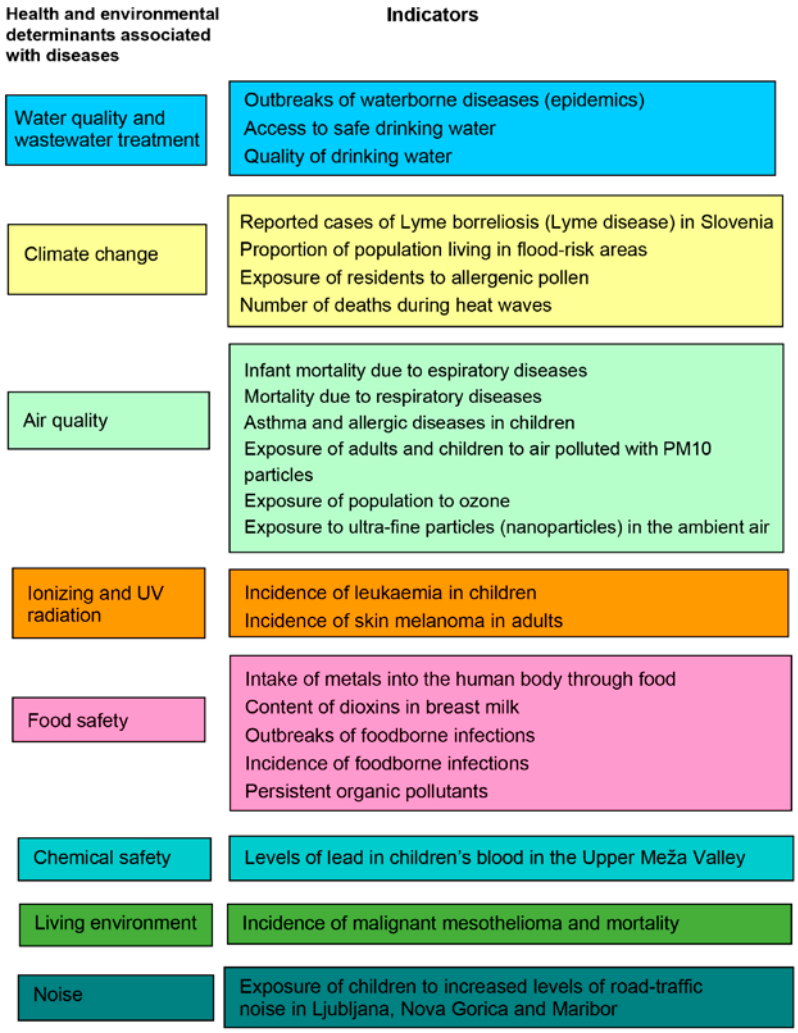


Figure 1: The set of indicators related to the environment and health The Environmental Agency of the Republic of Slovenia, 2021 (http://kazalci.arso.gov.si/sl/indicators-trend?term_node_tid_depth_i18n%5B%5D=7).

The environment/health data set consists of 25 indicators that link the health and environmental determinants of a disease with the effects of the environment on human health (see figure below). A polluted environment can be the cause of gastrointestinal diseases, cardiovascular diseases, respiratory diseases, cancers, hormonal disorders, disorders in nervous system development and sleep disorders. By using these indicators, we want to answer the question of whether the impact of a polluted environment on human health is decreasing. As the relationship between the environment and health is complex, the indicators address various aspects such as quality of water bodies, climate change, air quality, radiation, food safety, chemical safety and noise. Environmental and health indicators are developed by the Slovenian Environment Agency in cooperation with the National Institute of Public Health and the National Laboratory for Health, Environment and Food. As indicators are used to monitor the implementation of the objectives of the EU environmental health policy, they also serve to monitor the *Resolution on the National Environmental Action Programme* for the period 2020–2030 (Official Gazette of the Republic of Slovenia, 2020), to prepare reports on the state of the environment and to comprehensively assess the impact of the environment on human health.

1_ENHIS, Environment and Health Information System, https://www.euro.who.int/en/data-and-evidence/environment-and-health-information-system-enhis/enhis-database.

Resolution on the National Environmental Action Programme 2020–2030. Official Gazette of the Republic of Slovenia, 2020; 31/20. Available from: http://www.pisrs.si/Pis.web/pregledPredpisa?id=ODLO1985

Chemical safety

Lucija Perharič

Chemical safety contributes to health protection and prevention of diseases conditions and poisonings, which may arise as a consequence of exposure to natural and synthetic chemicals. NIJZ is a key stakeholder in chemical safety assurance, in particular by assessing complex risks, introducing the internationally accepted professional approaches to risk assessment and novel methodologies as well as capacity building and risk communication.

Chemical safety is the use of chemicals in such a way, that contributes to assurance of health protection and prevention of diseases, conditions and poisonings, which may arise as a consequence of exposure to natural and synthetic chemicals from various environmental segments, from food and consumer products, during work or in free time. Chemical safety includes all the circumstances, where the exposure may occur: production, transport, use, disposal as well as coincidental or intentional exposure to natural chemicals and chemicals released during chemical accidents. To assure safe use of chemicals it is essential to be fully aware of their physico-chemico-biological properties, the risks associated with the exposure, possess technical knowledge on safe handling and use of chemicals and be able to communicate effectively with all the stakeholders

Chemical safety is a multidisciplinary, transdisciplinary and multisectoral activity. In Slovenia, the health sector is an important driving force in the chemical safety area (Ciraj and Vračko, 2016). The National Institute of Public Health (NIJZ) is a key stakeholder in assessing complex risks, introducing the internationally accepted professional guidance and novel risk assessment (RA) methodologies onto the national level (Bitenc et al., 2017). Besides the above, for the last two decades, the NIJZ has contributed significantly to RA capacity building (Fatur et al., 2021) and risk communication.

Ciraj M, Vračko P (eds) Chemical safety and protection of human health: the Slovenian experience. Copenhagen: WHO Regional Office for Europe, 2016. Available from: https://www.euro.who.int/__data/assets/pdf_file/0005/324293/Chemical-safety-protection-human-health-Slovenian-experience.pdf

Bitenc K, Blaznik U, Bolčič Tavčar M, Fatur T, Gale I, Galičič A, Fuart Gatnik M, Golja V, Ivartnik M, Kirinčič S, Kukec A, Miljavac B, Perharič L, Pollak P. V Pollak P, Perharič L (eds). Navodila za izdelavo ocene tveganja za zdravje ljudi zaradi izpostavljenosti kemijskim in mikrobiološkim dejavnikom iz okolja z izbranimi poglavji in praktičnimi primeri – I.del. Ljubljana: National Institute of Public Health, 2017. Available from: https://www.nijz.si/sites/www.nijz.si/files/publikacije-datoteke/navodila_nijz_za_oceno_tveganja_kem_in_mikrobiol_dejavnikov.pdf.

Fatur T, Bolčič Tavčar M, Lešer V, Kirinčič S, Blaznik U, Golja V, Ivartnik M, Pavlič H, Perharič L. (2021) A risk assessment workshop inspired by a EUROTOX specialized course. Toxicol Lett 2021; 350(suppl. 1): s229-s230. Available from: https://www.eurotox2021.com/wp-content/uploads/EuroTox-2021-Final-abstract-book-by-Elsevier.pdf.

National Human Biomonitoring Programme

Lucija Perharič

Human biomonitoring is a tool for determination and surveillance of physiological changes associated with exposure to chemicals. It serves for assessment of exposure, effects and sensitivity. Human biomonitoring assures scientific basis for public health interventions and policy making. In the national human biomonitoring programme, NIJZ was the initiator and remains a key player aiming at health protection and disease prevention secondary to chemical exposure.

Human Biomonitoring (HBM) is determination and surveillance of changes in human tissues, fluids, cells and biochemical processes resulting from exposure to chemicals. HBM of exposure is determination of concentrations of exogenous chemicals in bodily fluids and tissues and is becoming an ever more important tool in exposure assessment from all routes of exposure and a variety of sources, such as air, water, food, consumer products, house dust. HBM has been asserting itself in assessment of effects secondary to chemical exposure (biomonitoring of effects) and assessment of congenital and acquired capacities of an organism to respond to chemical exposure (biomonitoring of sensitivity). In risk assessment process, the HBM replaces exposure estimation based on surrogate exposure markers, while in risk management HBM serves as a follow-up tool in evaluation of risk reduction measures. HBM assures scientific basis for public health interventions and policy making (WHO, 2015).

In the last 15 years, we have witnessed a worldwide swing of HBM. In 2006, National Institute of Public Health (NIJZ) gave an initiative for establishing a national HBM Programme in Slovenia, which started a year later (Perharič and Vračko, 2012). NIJZ has remained a key player in planning executing and interpreting the HBM results, HBM based risk assessment, proposing risk reduction measures and following-up the efficacy of risk reduction measures (https://www.nijz.si/sl/humani-biomonitoring-hbm-v-sloveniji). NIJZ is also a member of the EU HBM platform (https://www.hbm4eu.eu/). As an example of good practice in health protection and disease prevention, it is worthwhile stressing a systematic regular surveillance of blood lead concentrations in children living in a polluted hot spot of Upper Meža valley, which has been running since 2004 and has contributed significantly to reduction of health risks from exposure to lead (Ivartnik et al., 2019).

Ivartnik M, Pavlič H, Hudopisk N. Levels of lead in children's blood in the Upper Meža Valley. ARSO – Kazalniki okolja. Ljubljana: Slovenian Environment Agency, 2018. Available from: http://kazalci.arso.gov.si/sl/content/vsebnost-svinca-v-krvi-otrok-na-obmocju-zgornje-meziske-doline-2.

Perharič L, Vračko P. Development of national human biomonitoring programme in Slovenia. Int J Hyg Environ Hlth. 2012; 215(2): 180-4.

Woorld Health Organisation. Human Biomonitoring: facts and figures. Copenhagen: WHO Regional Office for Europe, 2015. Available from: https://www.euro.who.int/en/media-centre/events/events/2015/04/ehp-mid-term-review/publications/human-biomonitoring-facts-and-figures.

Preparation of hygiene recommendations to prevent the spread of SARS-CoV-2 infections

Majda Pohar, Nina Pirnat, Irena Veninšek Perpar, Pavel Pollak

The SARS-CoV-2 epidemic required the development of hygiene recommendations to prevent the transmission and spread of SARS-CoV-2 virus in various activities, among various stakeholders. Hygiene recommendations make an important contribution to preventing the transmission and spread of infections in the population and safer implementation of most economic and non-economic activities.

At the outbreak of the SARS-CoV-2 epidemic, hygiene recommendations were key to preventing the transmission and spread of SARS-CoV-2 virus in the population. The recommendations were prepared taking into account the risk of transmission and spread of infection that arises during the performance of certain activities. All the recommendations were based on the results of internationally recognized professional research and good practices that have also been adopted by other countries[1].

The first recommendations were for food stores, cleaning and disinfection of non-medical premises, proper ventilation of enclosed spaces, cleaning of public toilets, selection of suitable disinfectants and proper preparation of effective disinfectant solutions, proper handling of food and associated packaging, cleaning of common areas, ventilation and self-protective behaviour of users in multi-apartment buildings.

Before the return of the first group of Slovenian citizens from abroad, who were ordered to be quarantined, we prepared recommendations for behaviour in the hotel where COVID-19 patients were accommodated.

During the relaxation of measures after the first wave of the epidemic, recommendations for catering establishments followed: first for food delivery, then, in cooperation with the Chamber of Commerce and Industry of Slovenia, recommendations for performing catering and tourism activities. We made recommendations for various shops and service and repair activities (technical shops and shopping centres, stationery stores, bookstores, photocopy shops, clothing stores, footwear stores, sewing and shoemaking services, craft and service providers and chimney sweeping services at home, providers of registration procedures and technical inspections of vehicles, car washes, driving schools and driving tests, language and computer courses…). We prepared instructions for the safe performance of various public services (implementation of administrative and other public-law matters, funeral activities, all types of public transport). We prepared recommendations for body care, safe performance of various recreational sports activities (both outdoors and indoors). In the field of culture, recommendations were made for visiting cultural institutions, performing amateur cultural activities in groups, for cinema, theatre and music facilities, for music schools, for providing and attending religious activities, etc. In cooperation with the Ministry of Education, Science and Sport, we prepared comprehensive hygiene recommendations for kindergartens, schools and universities, as well as student dormitories, recommendations for the implementation of competitive sports and sports competitions. We also participated in the preparation of recommendations for various professional sports activities, healers and psychologists.

Recommendations are constantly updated based on new professional findings. Most of the recommendations for the implementation of activities are published on the NIJZ website: https://www.nijz.si/sl/sproscanje-ukrepov-covid-19.

1_https://www.cdc.gov, https://www.ecdc.europa.eu/en

Programme of measures to improve the quality of the environment in the Upper Meža Valley

Matej Ivartnik

Due to the long tradition of the lead extraction industry, the area of the Upper Meža Valley is heavily contaminated with this toxic metal. The residents are thus exposed to lead as a result. In 2007, measures to reduce lead exposure were implemented. They are primarily aimed at limiting exposure to lead-contaminated dust, which is the most important source of lead intake in the human body. The goal of the programme is to reduce the lead content in the blood of children to below 100 µg/l.

The Upper Meža Valley lies in the north of Slovenia and is known mainly for its lead extraction industry, which is still the leading industry in this area. Due to past emissions, the environment is heavily polluted with lead, the soil being the most polluted. The valley is home to about 7,000 people whose health is potentially compromised. Lead is a toxic metal that has various harmful effects and no useful functions in the human body. Younger children are the most vulnerable group, due to their physiological characteristics and higher intake of lead in the body. From a health point of view, any presence of lead in the body is undesirable, but this is not achievable in populated areas contaminated with lead. The lead exposure of the population in the Upper Meža Valley began to be monitored as early as 70 years ago. Occasional measurements have repeatedly shown high concentrations of lead in the blood of the population. After reaffirming this in 2002, it was time to shift from research to problem solving. A Decree (Official Gazette of the Republic of Slovenia, No. 119/2007) was thus adopted in 2007, which defines the purpose, goals and activities of the environmental remediation programme for the Upper Meža Valley. Various actors carry out activities in accordance with the Decree to reduce children's exposure to lead. The local communities have been implementing various measures to prevent children from coming into contact with contaminated soil and dust, such as resurfacing of gravel surfaces, arranging children's playgrounds, wet cleaning of hard surfaces and planting grass on bare areas. The Slovenian Environment Agency (ARSO) is in charge of monitoring air and soil pollution, while the National Institute of Public Health (NIJZ) is in charge of coordinating the work, information and promotional activities and monitoring the lead content in children's blood. The latter is also the basis for assessing the progress achieved. Before the start of the programme, about half of the children had high blood levels of lead (≥100 µg/l), three years into the programme about 20% of the children, and afterwards the downward trend in lead levels stopped at about 10% of the children. In the period 2019/2020, this proportion decreased again to 4.6% (2019) and 4% (2020), which already corresponds to the set goal (less than 5% of children with blood lead content ≥100 µg/l). The basic goal of the programme is therefore achievable through targeted implementation of measures and self-protective behaviour of the population. Even after the goal is achieved, there will still be room for improvement, but amendments to the programme content will be necessary: limiting the lead extraction industry, the possibility of implementing measures on private land, limiting the implementation of activities that cause dust (construction, agriculture). However, lead will remain in the valley, and residents will have to adhere to self-protection measures to reduce exposure in the future.

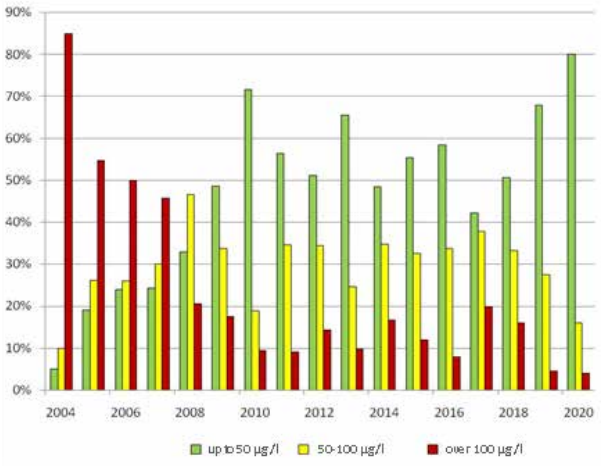


Figure: Comparison of the proportions of three-year-old children from the Upper Meža Valley based on the lead content measured in children's blood.

More information: http://www.sanacija-svinec.si/index.php/aktualno.

Preventive programme Safe with the sun

Simona Uršič, Nataša Šimac

The prevention programme Safe with the Sun was established in 2007 in response to the worrying trend of increasing rates of skin cancer in Slovenia. It is based on the fact that the incidence of skin cancer is associated with exposure to UV radiation and the frequency of sunburn, especially in childhood. With the programme we want to increase awareness among the population of the harmful effects of UV radiation and the importance of self-protection measures. The programme is being implemented in kindergartens and primary schools. So far, 552,466 children have participated in the programme.

The programme was created in cooperation between the National Institute of Public Health (NIJZ), the Association of Slovenian Dermatovenerologists and the Cancer Society of the Celje region. The programme is led and coordinated by the NIJZ. The main activity of the programme is raising awareness of the harmful consequences of the sun's rays and the measures that can be used to effectively reduce these. The target population is kindergarten children, and since 2010 also primary school students. In 2007, we piloted the programme for the first time in a kindergarten in Celje. Since 2008, kindergartens from all regions of Slovenia have been participating in the programme. The guidelines of the programme are followed by kindergartens as a whole and not only by individual registered units of kindergartens, so the number of children acquainted with the contents of the programme is in fact much higher than recorded (385,524). The share of registered schools is also growing; by 2019, 166,942 primary school students had participated in the programme.

The programme was not implemented in 2020 due to the COVID-19 epidemic. Nevertheless, we called on schools and kindergartens to raise awareness of the importance of protection against UV radiation and we published e-materials for this purpose. Moreover, despite the epidemic the programme was implemented anyway, particularly in kindergartens, which shows that in many places they have already included it in their regular activities. In 2021, we adjusted the implementation of the programme to better suit the conditions brought about by the epidemic (online training, etc.). This time, about 60,000 children are participating in the programme. Spending time outdoors is encouraged during the COVID-19 epidemic, so the implementation of protective measures against solar UV radiation is especially important.

The programme is carried out every year in established steps: in the early months of the year, we collect applications, then organize training for programme providers (professionals employed in kindergartens and primary schools), who then teach children in a systematic and age-appropriate way. The knowledge acquired with regard to self-protection is then put into practice by the children in various outdoor activities during the summer months, which is an added value of the programme. This is followed by an annual evaluation of the programme. Training for programme providers includes lectures by experts in various fields (meteorology, dermatology, ophthalmology, non-ionizing radiation, epidemiology of skin cancer, vitamin D) and a presentation of the implementation of the programme. All communication with the programme providers takes place through the online application of the National Institute of Public Health. We have developed a distinct overall graphic image of the programme. Professionals in kindergartens and schools assess that the programme and knowledge acquired by children are both of high quality.

Our goal: implementation of the programme in all kindergartens and primary schools.

Our vision: that the implementation of UV protection measures is adopted by all citizens as a way of life.

Figure: Icons from the graphic image of the programme, which illustrate the basic recommendations for protection against UV radiation.

6.4 PREVENTIVE AND SCREENING PROGRAMMES FOR CHRONIC DISEASE MANAGEMENT

Svit
DRŽAVNI PROGRAM PRESEJANJA IN ZGODNJEGA ODKRIVANJA PREDRAKAVIH SPREMEMB IN RAKA NA DEBELEM ČREVESU IN DANKI

Dora
DRŽAVNI PRESEJALNI PROGRAM ZA RAKA DOJK

Zora
Državni program zgodnjega odkrivanja predrakavih sprememb materničnega vratu

Screening programmes for early detection of cancer – Programme Svit, ZORA, DORA

Dominika Novak Mlakar, Tatjana Kofol Bric, Urša Ivanuš, Katja Jarm

One of the best methods for early detection of precancerous and cancerous changes is organized screening of the healthy population, which allows for targeted detection of cancer or changes that would in the absence of medical intervention eventually turn into cancer. In Slovenia, we carry out population-based organised screening programmes for breast (DORA), cervical (ZORA) and colorectal cancer (the Svit Programme). All three screening programmes are comprehensive and organised according to European guidelines for quality assurance in cancer screening. Screening programmes in Slovenia effectively reduce the incidence of cancer or detect cancer in the early stages, when treatment is less intensive, quality of life is better, and the survival rate is higher.

Colorectal cancer is one of the five most common cancers in Slovenia in both genders combined, whereas before screening started 10 years ago it was the second most common. In terms of colorectal cancer patient survival Slovenia lags behind the EU average, but the gap is narrowing. Since 2009, the Svit organized screening programme[1] has been available at the national level. Residents of Slovenia aged 50 to 74 are invited to participate in the programme. Over the years the response rate of the target population to the programme has been increasing and currently reaches 65%. The programme is based on the laboratory detection of blood in a stool sample. In persons with a positive test result a colonoscopy is performed, and precancerous changes are removed. Persons who have a negative stool test are re-invited to participate in the programme two years later. Since 2011, the Cancer Registry has recorded a decline in colorectal cancer incidence at the national level with a consequent reduction in mortality. 60% of cancer cases detected in the screening programme are in stages I and II, when patients do not need additional oncological treatment. The five-year survival of patients diagnosed with cancer in the Svit Programme is 90%.

Cervical cancer is today no longer one of the most common cancers in Slovenia. Based on the age-standardized incidence rate of 7/100,000 and the mortality rate of 2/100,000, Slovenia has in recent years been ranked among the countries with the lowest burden of this cancer. This was not always the case – when the Cancer Registry was established in the early 1960s, cervical cancer was the second most common cancer in women in Slovenia and the most common in women under the age of 50, while the incidence rate of 27/100,000 was comparable with today's rate in Africa, where cervical cancer is still among the most common cancers in women. The reduction in the burden of cervical cancer in Slovenia is the result of the efficient operation of the ZORA screening programme[2], which achieves more than 70% participation of women aged 20-64 years in the programme and high-quality service at all levels. About 1,700 high-grade cervical precancerous changes are detected every year, which allow treatment to prevent cancer. The story of Slovenia's success in cervical cancer control has also been recognized by the World Health Organization and published on its website. HPV vaccination will make another important contribution to the elimination of cervical cancer in the future.

The Slovenian breast cancer screening programme DORA[3] is an organized programme in which we invite women between the ages of 50 and 69 to have a mammogram every two years. The goal is to reduce breast cancer mortality among the target population by up to 30%. The programme is recognized as an European example of an effectively organized programme for early detection of breast cancer. Given the 74% participation of women and meeting other performance indicators according to European guidelines, the programme predicts a long-term reduction in mortality due to breast cancer in Slovenia. The DORA programme was introduced in 2008, and since 2017 it has been available to all Slovenian women in the target population. We invite about 140,000 women each year and perform about 100,000 screening mammographies. The participation rate between 2008 and 2020 was 74%, and breast cancer was detected in 3,640 women, of which as many as 70% of cases were diagnosed in a localized stage when five-year survival is almost 100%. The DORA programme is distinguished by centralized management, quality control of both equipment and the staff's work, screening registry, specially trained staff, operation according to uniform guidelines, a single uniform computer application and appropriate communication with the target population.

1_ https://www.program-svit.si/
2_https://zora.onko-i.si/program-zora
3_https://dora.onko-i.si/

Integrated prevention of chronic illnesses for adults – the Together for health programme

Sanja Vrbovšek

In recent decades developed countries have been faced with the heavy burden of chronic illnesses, which are a consequence of demographic changes and unhealthy lifestyle habits. At the same time, we are noticing large differences in health between different population groups. The *Together for Health* programme, accessible to all adults in Slovenia, aims to actively monitor the health of the country's population and its improvement by providing directions and specialist support in efforts to encourage people to lead a healthier lifestyle, and thereby enjoy a higher quality of life.

The programme *Together for Health* provides all adults in Slovenia with a comprehensive programme for the integrated prevention of chronic illnesses (CI), which connects public health and family medicine, and encompasses three mutually linked fields of activities in prevention and health improvement:

1. Preventive check-ups in general practices

All adults in Slovenia aged 30 years and above may participate in preventive check-ups with the general practitioner of their choice. This check-up is intended for the early detection of persons with biological, behavioural and psychosocial risk factors to develop CI, the early detection of persons at high risk of developing CI and the detection of persons in the early phases of CI. The preventive check-ups are performed by registered nurses with special expertise who work in the general practitioner's team. There are currently almost 500 registered nurses working according to such a model of preventive check-ups. They are employed in almost all general practices, of which there are over 900 in Slovenia.

2. Health education workshops and individual counselling for the prevention or optimal management of chronic illnesses

The interventive part of the programme Together for health, which consists of health education workshops and individual counselling (Fig. 1), is intended for persons with risk factors for CI, with a high risk of developing CI and with already present CI. At these consultations participants acquire professional information, skills and support for a long-term change to lifestyle with the aim of improving health and strengthening mental health. This part of the programme is based on the process of empowering persons to look after their own health.

These activities are carried out in health improvement centres located in all health centres around Slovenia. These are key organisational structures that ensure health improvement activities in local communities and provide health education on a primary healthcare level. These centres currently employ almost 400 additional professionally trained employees (specially trained nurses, physiotherapists, psychologists, dieticians, kinesiologists).

3. Health improvement activities that are carried out in local communities

Depending on the needs of local communities, experts from the health improvement centres organise events and programmes to improve health and encourage the target populations to join preventive programmes and national screening programmes for early cancer detection. These activities are organised in different environments (e.g. in work organisations, NGOs, local communities), which ensures better access. Efforts to improve the health of the local population also include setting up a network of different stakeholders from the local environment according to the model of a joint approach to health which can support an individual in maintaining a healthy lifestyle and self-sufficiency for CI sufferers. In the Together for Health programme, health improvement centres are responsible for connecting health care with the community in the local environment.

The *Together for Health* programme is financed entirely by the Health Insurance Institute of Slovenia.

Research and development activities and management of the programme are organised by an interdisciplinary group of experts at the National Institute of Public Health in cooperation with experts from the basic health activity and numerous other health workers and colleagues from practice.

More on the *Together for Health* programme: https://www.skupajzazdravje.si/.

Screening and prevention program for children, adolescents and students: Prevention program ZDAJ - Health today for tomorrow

Polonca Truden Dobrin, Kerstin Vesna Petrič, Tanja Mate, Sonja Paulin, Tjaša Pibernik, Jerneja Kožar, Sonja Dravec

The amendment to the Rules for the implementation of preventive health care at the primary level *Pravilnik za izvajanje preventivnega zdravstvenega varstva na primarni ravni* (Official Gazette of the Republic of Slovenia, 2021), brings an update of the preventive program and supplementation with step-by-step treatment for children with risk factors or threats and determines the management of the program. The comprehensive prevention program is now called Program ZDAJ - Health Today for Tomorrow. The name summarizes the lifelong perspective and the importance of the health of children and adolescents for health in adulthood. With the program, we want to ensure equal opportunities and rights in the field of preventive health care and improve the inclusion of target groups in the preventive program.

The implementation of modern prevention programs for children and adolescents affects the health of the population in later life, so the update of the Rules is an important contribution to public health. The program defines preventive health care for newborns in the maternity hospital and then for all age groups: infants, preschool children, pupils, high school students and students at the primary level of health care. Special attention is paid to children with developmental disabilities and registered athletes. The provisions of the Rules bring innovations in the field of preventive examinations, health education and escalated treatment. Special attention is given to reaching deprivated and vulnerable groups of children and adolescents (e.g., young people who for various reasons left the school environment or abandoned schooling immigrant children…), as well as those studying abroad on the basis of compulsory health insurance rights and to some others.

The Program ZDAJ takes a lifelong perspective approach - current activities in children and adolescents to reduce current health risks and threats as well as those manifested by related diseases later in life and enable each child to maximize their potential. It increases the responsiveness to the current health needs of children and adolescents and enables flexibility in developing new approaches and treatments. Program providers work in a coordinated team that approaches systematically to individuals and groups, providing a modern approach and supportive environment in the school and local community.

An important novelty is the establishment of program management with professional bodies at the state level, comparable to other national prevention and screening programs. Thus, cooperation between key stakeholders and networking of program providers is being re-established.

The website www.zdaj.net was established for the purpose of promoting the Program ZDAJ and to inform the target population and the professional public about preventive health programs for children and adolescents and other health education contents. The relevance of this website has increased due to the COVID-19 epidemic, as it offered the opportunity to quickly raise awareness of the target population about the importance of health promotion during this time as well.

Given the current epidemiological circumstances, the implementation of updated prevention programs will be an important part of the exit strategy to reduce the impact of the pandemic on the health of children and adolescents.

1_Pravilnik za izvajanje preventivnega zdravstvenega varstva na primarni ravni. Official Gazette of the Republic of Slovenia, 2021; 19/98, 47/98, 26/00, 67/01, 33/02, 37/03, 117/04, 31/05, 83/07, 22/09, 17/15, 47/18, 57/18 in 57/21. Available from: https://www.uradni-list.si/1/objava.jsp?sop=2021-01-1157.

Epidemiological monitoring of dementia in Slovenia

Mercedes Lovrečič, Barbara Lovrečič

Projections indicate that the number of patients with dementia will rise. There is a need for active and continuous implementation of activities and programmes focused on promoting a healthy lifestyle, care for one's health, raising public awareness and destigmatising the disease, ensuring all rights, early recognition of difficulties, the earliest possible diagnosis and treatment, comprehensive care, and access to treatment and social care services.

Dementia is a disease with cognitive decline that hinders independent life and reduces the quality of life of the sufferer and those close to them. The phenomenon is underestimated, with dementia frequently being recognised and diagnosed late, and consequently treated late. Current information systems do not enable us to carry out epidemiological monitoring of the issue at a satisfactory level. The WHO Action Plan (2017–2025) envisages the establishing of an information system for epidemiological monitoring of dementia by 2025, along with regular reporting in at least half the countries of the world, since it is a challenge for the entire world.

According to WHO data, in 2018 there were around 50 million people with dementia in the world, and by 2050 this number should treble to 152 million. Given the growing problem of dementia, the WHO declared it a public health priority of the 21st century even before the appearance of the SARS-CoV-2/Covid-19 pandemic, which affected persons with dementia particularly badly due to their vulnerability to infection with SARS-CoV-2, greater risk of worse progress of the Covid-19 illness and complications, including death.

In June 2016 the Slovenian Government confirmed the Strategy of Controlling Dementia in Slovenia up to 2020, which represents the first and fundamental document for a coordinated and integrated approach of all stakeholders in dealing with the issue of dementia. The purpose was to provide preventive measures, early detection of the disease and an appropriate standard of health and social protection as well as healthcare for persons with dementia. Currently a strategic document for addressing dementia up to 2030 is being drawn up.

The NIJZ is establishing public health epidemiological monitoring of dementia: we have made several estimates of the prevalence of dementia based on Slovenian population data, including forecasts up to 2030, we have implemented a healthcare indicator of the use of medications for treatment of dementia, and have drawn up the first preliminary assessment of the economic costs of dementia. Epidemiological monitoring of dementia represents the foundation for successful planning of measures to combat the issue and evaluation of their effectiveness.

With the aim of reducing the stigma of dementia, raising public awareness, better early detection and treatment of dementia and with a view to the networking of various departments, stakeholders, experts and non-governmental organisations, the NIJZ in cooperation with the Scientific Research Centre of the Slovenian Academy of Sciences and Arts, in marking the world month and day of Alzheimer's disease, organises a traditional expert meeting with the active participation of Slovenian members of the European Parliament, who adopt written resolutions from the meeting with recommendations.

Ministry of Health of the Republic of Slovenia. Strategy for Managing Dementia in Slovenia up to 2020. 2016. Available from: https://www.gov.si/assets/ministrstva/MZ/DOKUMENTI/Preventiva-in-skrb-za-zdravje/nenalezljive-bolezni/Strategija_obvladovanja_demence.pdf.

WHO. Dementia: number of people affected to triple in next 30 years, 2017. Available 2021 from http://www.who.int/news-room/detail/07-12-2017-dementia-number-of-people-affected-to-triple-in-next-30-years.

WHO. Global Dementia Action Plan on the Public Health Response to Dementia 2017–2025. Geneva, 2017. Available from the website https://apps.who.int/iris/bitstream/handle/10665/259615/9789241513487eng.pdf;jsessionid=741F95B5F30AA44B98C70E02700127A8?sequence=1.

The development of integrated care for persons with complex chronic states

Jelka Zaletel, Denis Oprešnik

The model for integration of care for persons with complex chronic states includes: the reorganisation of care on a secondary health care level (the coordinator acts as a uniform entry point and together with the clinical specialist is the administrator of the patient's procedural path; the multidisciplinary clinical expert group; the protocol of care to unify clinical paths); systematic cooperation with the social care system; connecting with the community via home care and cooperation with local health improvement groups.

The fragmentation of care and difficulties in harmonising among institutions, disciplines, patients and other stakeholders who are involved in caring for people with complex chronic states, worsens health and other treatment results. Better connected and harmonised care is also one of the starting points of the *Resolution on the National Health Care Plan 2016–2025* and some other strategic documents in Slovenia. This is why Novo Mesto General Hospital and Health Center Novo Mesto, supported by the NIJZ and other partners from the EU, worked together in the common action project CHRODIS PLUS (2017–2020) to develop a model for integrating care for complex, chronic states on the basis of a study case dealing with the treatment of a chronic wound.

The group consisted of representatives of key disciplines, institutions and patients. Based on the analysis of context, aspects of key disciplines and institutions, the estimated needs of people with chronic wounds and an analysis of the pathways of patients at the highest risk (significant arterial vascular disease of the leg), key elements for the model were identified (Oprešnik et al., 2021):

- the reorganisation of care with the introduction of a coordinator for the secondary health level which is a uniform entry point and is, together with the clinical specialist, the administrator of the patient's procedural pathway;
- the establishment of a multidisciplinary clinical expert group and the preparation of a care protocol to unify clinical pathways, which defines the form of referral from the primary to the secondary level, and the course of treatment on the secondary level with the introduction of a package of services;
- the establishment of systematic cooperation with the social care system;
- connecting with the community via home care and the health education centre, or the health improvement centre by means of cooperation in local health improvement groups.

A strategic meeting was organised on a national level for the further development and broader use of the model. The main outcome of the meeting was the establishment of an ad hoc group for the development of integrated care, which includes representatives from the Ministry of Health, the ZZZS, NIJZ and other organisations, including representatives of patients. They identified necessary system changes in the field of financing (e.g., the package of services), IT solutions and legislation.

1_Joint Action CHRODIS PLUS. Available online at: http://chrodis.eu/07-fostering-the-quality-of-care-for-people-with-chronic-diseases/.

Oprešnik D, Piletič M, Mršić M, Klemenčič S, Počrvina L. Development of a model of integration for complex chronic conditions across levels of healthcare and the community in Novo mesto, Slovenia. Ann Ist Super Sanita. 2021; 57(1): 97–106. doi: 10.4415/ANN_21_01_15. PMID: 33797412.

Genetic testing and high risk cancer screening

Mateja Krajc, Srdjan Novaković

The development of molecular genetics enabled detection of genes that are associated with a higher risk of cancer. With the help of genetic tests, it is possible to identify, among patients with certain types of cancer, those individuals, who most likely inherited a genetic disorder. With genetic tests we can also identify their healthy relatives at higher cancer risk and may offer them personalised cancer screening programs.

An organized carrier screening, as well as cancer screening for mutation carriers is in place at the Institute of Oncology Ljubljana (OIL), since 1999. Carriers of defective genes can be up to 15 times more likely to develop cancer than their peers who do not have the defect. Therefore, the detection of at-risk individuals / families is of great importance for the prevention and early detection of hereditary forms of cancer. In addition to cancer prevention planning, patients may receive tailored targeted therapy.

In 2008, an important agreement was reached with the Health Insurance Institute of Slovenia to include genetic testing and counselling for hereditary cancers in the national health insurance scheme. Since then, multidisciplinary genetic assessment has been provided at OIL, including development of clinical pathways and guidelines for high risk individuals.

We introduced the latest molecular diagnostic techniques and after 2008 fully took over the implementation of genetic testing for hereditary forms of cancer. In accordance with the development of the profession, we started conducting genetic tests for sporadic forms of cancer as well. In 2014, we acquired the first powerful next-generation sequencer.

The multidisciplinary genetic team collaborates internationally with centres of excellence in other countries. In 2017, the OIL became a reference centre for rare diseases in the European Reference Network on Genetic Tumor Risk Syndromes, operating under the auspices of the European Commission.

Individuals at high cancer risk are screened at the OIL, and since September 2010, especially dedicated outpatient clinic was set up. We are one of the few institutions that provides patients not only genetic testing, but also comprehensive assessment, which includes genetic counselling, cancer screening and preventive interventions, as well as psychological support.

In 2019, we became the holder of the National Registry of tested individuals from families with hereditary cancer, which enables continuous quality control of the assessment.

Our first and most important goal remains the provision of high-quality medical care, which is in accordance with Slovenian and international guidelines and recommendations, for all individuals that are entitled to cancer genetic assessment. An equally important goal is to ensure greater access to our experts and thus enable appropriate genetic assessment of all individuals from high risk families, regardless of which part of Slovenia they come from, within an acceptable period of time.

Important links:

Department of Cancer genetics Clinic:

https://www.onko-i.si/dejavnosti/zdravstvena_dejavnost/skupne_zdravstvene_dejavnosti/genetsko_svetovanje

Department of Molecular Diagnostics:

https://www.onko-i.si/dejavnosti/zdravstvena_dejavnost/diagnosticna_dejavnost/oddelek_za_molekularno_diagnostiko

Prevention and control of non-communicable diseases at NIJZ regional offices

Teja Tovornik, Branko Gabrovec

Public health experts working at the National Institute of Public Helath (NIJZ) regional offices in the field of prevention and control of non-communicable diseases are responsible for a wide range of professional areas. Depending on local needs, their activities are focused on identifying and responding to the most pressing needs of the local and regional environment.

Public health experts at NIJZ regional offices are involved in managing databases of health care providers at regional level, through the process of data collection and control, data communication and harmonization with the reporters and informing healthcare providers about innovations in methodological guidelines.

All NIJZ regional offices perform regional coordination of various health education and disease prevention programs, developed at the national level, and take care of their implementation, expansion and provsion by partners in regional and local environments. Programs that cover various health topics and are delivered by community primary health centers, in schools and with other partners in the communities. The programs are: Health in Kindergarten; Slovenian Network of Healthy Schools; Health in the Municipality; Slovenian Network of Healthy Cities programs, Health education of children and adolescents, Dental education for children and adolescents, Programs for healty lifestyles for adults, and national cancer screening programs Svit, ZORA and DORA. In all educational institutions, public health experts of the NIJZ regional offices provide support and counseling in the field of nutrition of children and adolescents.

Regional public health offices transfer information and knowledge on protective and health risk factors to regional environments, such as healthy eating and physical activity, responsible alcohol consumption, reducing the prevalence of smoking and illicit drug use. Since 2019, in accordance with the National Mental Health Programmes, they have also been coordinating the mental health activities in the region, and since 2020 they have been paying more attention to the importance of sleep hygiene for health.

Thru its regional offices, NIJZ ensures partnerships with the local communities. In cooperation with community primary health centers and other stakeholders in local communities, including NGOs, a strong community engagement for health is showing excellent results in improving health and reducing health inequalities in local environments, with special emphasis on vulnerable population groups. In 2016, NIJZ developed the Health in the Municipality program with key health indicators for all 212 Slovenian municipalities. With this information tool, NIJZ regional offices have acquired an additional means to encourage local decision-makers and other partners to work together to strengthen the health of the population, respond quickly to their needs and reduce social inequalities in health.

The COVID-19 epidemic in 2020 and 2021 considerably impacted the content and methods of work in the field of non-communicable diseases prevention and control. NIJZ regional offices employees are working in various ways to implement and revive health promotion and disease prevention programs, which were discontinued during the epidemic and to maintain the motivation of various stakeholders for preventive work.

Other projects run by NIJZ and its regional offices are Measures to control COVID-19 with an emphasis on vulnerable populations, Together for a Responsible Attitude to Drinking Alcohol (SOPA), Joint Action Preparedness and Action at Entry Points (Healthy GateWays), Strengthened International Health Regulations and Preparedness in the EU Joint Action, Alpine Space Transnational Governance of Active and Healthy Aging, European Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections, and Good luck, student! are.

Poleg enovitih nalog, ki jih izvajajo vse OE in katerih cilj je, da so jih deležni vsi prebivalci Slovenije, OE razvijajo pristope in izvajajo naloge, ki izhajajo iz regijskih potreb in značilnosti. Nekateri od teh se zaradi specifike izvajajo zgolj v lokalnem/regijskem okolju, nekateri so prerasli na nacionalni nivo.

In addition to the common tasks, performed by all NIJZ regional offices with the aim to provide equal access to health promotion programs to all residents in Slovenia, NIJZ regional offices develop approaches and perform tasks arising from regional health needs and characteristics. Due to their specific nature, some of them are implemented only in the local / regional environment, and some have been rolled-out across the whole county.

6.5 COMMUNICABLE DISEASES CONTROL

The COVID-19 epidemic in Slovenia

Eva Leban, Manja Grašek, Matija Mozetič, Veronika Učakar

In Slovenia, the first case of COVID-19 was confirmed on 4 March 2020 in a person who arrived from Morocco. Due to the growing number of cases in the following days, an epidemic was declared by the Slovenian Government on 12 March 2020 and numerous measures were introduced to limit the spread of the disease.

By 31 May 2020, when the status of epidemic was suspended, a total of 1,473 cases of SARS-CoV-2 infection had been confirmed, with the highest daily number of confirmed cases being 61 two weeks after the start of epidemic. In the period from 1 June 2020 to 18 October 2020, the number of confirmed cases was 12,213. The highest number of daily confirmed cases was 898, which happened on 16 October 2020. An epidemic was declared again three days later. In the period from 19 October 2020 to 31 May 2021, the number of confirmed cases was 240,359, with the highest daily number of confirmed cases 3,428 at the beginning of January 2021. From the first confirmed case up to and including 31 May 2021, we confirmed 254,045 cases of SARS-CoV-2 infection and recorded 4,694 deaths within 28 days of infection confirmation.

At the end of December 2020, Slovenia started vaccinating against COVID-19, which is the exit strategy from the epidemic. Vaccination began first among care recipients and employees in retirement homes as well as among exposed health workers and their co-workers, and then among people aged 75 and over and among particularly vulnerable chronic patients. Vaccination was initially performed only with the Pfizer/BioNTech vaccine, and from the second week of January also with the Moderna vaccine. In the second week of February, vaccination with the AstraZeneca vaccine was also started in people aged 18–65 (particularly vulnerable chronic patients) in accordance with updated recommendations on priority groups for vaccination, as well as vaccination of immobile people regardless of age. Vaccination of the elderly (aged 75 and over) began in the last week of February. Vaccination of employees in education began in March in accordance with the updated vaccination strategy against COVID-19. Vaccination of people aged 70 and over began at the end of March, and vaccination of people aged 60 and over and chronic patients began in April. Vaccination of people aged 50 and over began in the last week of April, and vaccination with the Janssen vaccine was also started in the same week. From the start of vaccination until 31 May 2021, the proportion of residents vaccinated with all doses was 19.4%. Regularly updated data on the vaccination coverage are available at the following link: https://tinyurl.com/nfdutrtf.

Monitoring of adverse events after vaccination with COVID-19 vaccines in Slovenia is supported by the Register of Adverse Events after Vaccination, managed by the NIJZ. Data is submitted to the Register by all public health institutions and other legal entities and individuals in the healthcare sector, regardless of the concession. The NIJZ exchanges collected data on adverse events after vaccination and other important data related to the safety, efficacy and use of vaccines with the Slovenian Public Agency for Medicines and Medical Devices. Regularly updated data on adverse events after vaccination with COVID-19 vaccines are published on the NIJZ website in the form of weekly reports.

The epidemiological picture is improving at the time of writing this article. Due to the previously deteriorating epidemiological situation, we reintroduced strict control measures at the beginning of April 2021 (i.e., from 1 April to 11 April 2021) to gain time to achieve a higher vaccination rate of the population and thus maintain the undisturbed functioning of the healthcare system, which was threatened by a resurgence of infections.

Epidemiological and hygienic measures in school education to control the spread of COVID-19 – an example of excellent intersectoral cooperation

Milan Krek, Polonca Truden Dobrin, Mario Fafangel, Peter Otorepec, Eva Grilc, An Galičič, Ana Hojs, Simona Uršič

In the school environment, infectious agents that cause acute respiratory infections can spread rapidly, and spread the disease among many students and staff who are in contact with each other. Providing education posed a major challenge in the wake of the COVID-19 epidemic. Since March 2020, a special working group at the National Institute of Public Health (NIJZ) has been preparing recommendations for the field of education to limit the spread of SARS-CoV-2 infection, based on ever new scientific findings and monitoring of the epidemiological situation. We coordinated the action with representatives of the Ministry of Education, Science and Sport, and other key stakeholders were also involved: representatives of school principals, trade unions representing the employees in education sector, and occasionally representatives of parents and students.

After the end of the first wave of the COVID-19 epidemic in Spring 2020, new concepts and school models with recommendations for the new school year were developed in cooperation with the Ministry of Education, Science and Sport and the Institute of the Republic of Slovenia for Education. We published recommendations *Education in the Republic of Slovenia in conditions related to COVID-19 - Models* and recommendations (Kustec et al., 2020). Models and recommendations and thus epidemiological and hygienic measures have been carefully considered on the basis of scientific findings and approaches from other countries. The WHO, ECDC, CDC and other international organizations guidelines were taken into account.

Models and recommendations were presented to school management at meetings of principals, and at meetings of specialists in pediatrics and school medicine. Since the beginning of the school year, the working group at the NIJZ has been meeting regularly with representatives of the Ministry of Science, Education and Sports and has been in contact with the Ministry of Health and the Advisory Group at the Ministry of Health.

Action in the field of education is demanding because pupils and students, their educators and other employees spend several hours in closed school premises, performing various works and services to ensure the school process to run smoothly. Parents and various external contractors also enter the school premises. Many are older or have other risk factors for a severe COVID-19 disease with serious complications and adverse outcomes such as long COVID, post-COVID syndrome or fatal outcome. Safety must also be ensured for children who have health risks that put them at greater risk.

The infection can be transmitted from the environment to the school as well as from the school to the families of the children and employees. The risk of transmitting the infection into the school is high during the period of high number of infected people. The risky epidemiological situation requires a great deal of diligence and consistency in the implementation of protective measures.

Classes were held virtually due to the intensity of the epidemic wave, which in Slovenia was more severe and lasted longer than in other European countries. Live instruction started earlier than in some other countries because we designed an imaginative system of action for safe instruction in the school environment and at the same time developed appropriate protocols in the event of an infection at school.

Models and recommendations, developed in the Summer 2020 and upgraded later, enable children education in the school premises at a relatively high level of the epidemic in Slovenia. Careful handling of the infected cases and the implementation of quarantine measures create the conditions for a relatively safe environment in schools.

Great progress in controlling infections and thus restarting live lessons was brought about by the

rapid testing of school staff and the priority vaccination of employees. In the future, we expect further improvement in the epidemiological situation and a reduction in the risk of transmitting the infection in schools due to an increase in the share of vaccinated employees as well as parents and grandparents of children and adolescents living in joint households. Vaccination of children and adolescents with health risks and vaccination of students will be an important step forward in enabling live education process.

With voluntary vaccination, rapid testing and self-testing will reduce the risk of infection in schools and colleges, thus enabling live education process with all the benefits it brings to children and adolescents and the functioning of society as a whole.

Kustec S, Logaj V, Krek M, Flogie A, Truden Dobrin P, Ivanuš Grmek M. Vzgoja in izobraževanje v Republiki Sloveniji v razmerah, povezanih s covid-19 – Modeli in priporočila. Ministry of Education, Science and Sport, 2020. Available from: https://www.zrss.si/digitalnaknjiznica/Covid_19/.

Implementation, carrying out and monitoring of measures for the control of infectious diseases in Regional Offices of the National Institute of Public Health

Alenka Trop Skaza

Important measures in controlling infectious diseases are epidemiological surveillance, surveying (interviewing) infected individuals, managing clusters, outbreaks and epidemics, collecting human and environmental samples, proposing measures to prevent the spread of infectious diseases and monitoring the epidemiological situation. In the case of laboratory diagnostics, close collaboration with different laboratories is required. Protecting human health from infectious diseases involves a variety of activities, an important part of which is vaccination. The regional vaccination coordinators and our associates are responsible for coordinating all vaccinations and providing professional support to vaccination teams in the field.

Operational epidemiological measures for the protection of human health are being implemented at the level of NIJZ regional offices. Epidemiologists/public health specialists, graduate sanitary engineers and nurses are involved in the operational work.

By implementing measures and all activities before and after the occurrence of infectious diseases and their monitoring, we ensure an effective and unified response aimed at the prevention of infectious diseases and infections in Slovenia. It is important to protect people in a timely manner through vaccinations and other medicines in the event of epidemiological indications and to carry out vaccinations themselves, which includes the management of travellers. In addition to preventive vaccinations related to health indications, the work of epidemiological regional teams also includes the implementation of preventive vaccinations and chemoprophylaxis in persons who have been in contact with a patient with a specific infectious disease and are unprotected against this disease, or when infection can be prevented by timely chemoprophylaxis. Communication and ensuring professional support to vaccination providers and stakeholders in healthcare institutions, as well as cooperation with various institutions in epidemiological treatment, is the basis for successful and professional operational work.

The algorithms of action adopted in the event of the occurrence or outbreak of certain infectious diseases require immediate action by epidemiologists. The epidemiologist of the regional office is obliged to immediately and actively search for exposed persons and to ensure the urgent implementation of measures to prevent and control the spread of the pathogen. Continuous monitoring and rapid response to threats in the field of infectious diseases are carried out in all the regional offices of the National Institute of Public Health (NIJZ) according to the principle of merging regions (NM+CE; LJ+KR; RA+MB+MS; KP+NG).

In the segment of epidemiological monitoring with unified action, we provide:

- timely detection and reporting of infectious diseases for which notification is required by law,
- risk assessment for the spread of infectious diseases,
- determining an indication, proposing and implementing targeted measures to prevent the spread of individual infectious diseases, outbreaks and epidemics,
- providing sampling, transport, laboratory diagnostics of human and environmental samples.

The implementation of outpatient work not only includes the implementation of various vaccinations, but also procedures for purchasing, handling and storing vaccines and medicines, recording all work procedures, billing for services, explanatory duty, determining indications and excluding contraindications, issuing certificates, preparing reports and reporting of vaccinations performed and prescriptions issued for antimalarials and antibiotic chemoprophylaxis.

As this is one of the basic activities of public health, we assume that in order to carry out this task it will be necessary to ensure appropriate working conditions in the long run and, above all, sufficient staff support.

eRCO and surveillance of vaccination coverage

Veronika Učakar

Universal vaccination programmes have greatly reduced the burden of diseases that can be prevented by vaccination. The collection of data on vaccinations performed is very important for assessing the protection of our population. The Electronic Register of Vaccinated Persons and Adverse Events after Vaccination (eRCO) was established in 2017. The data collected in the eRCO will enable more accurate estimates of the vaccination coverage of target population groups and real-time monitoring of vaccination performance.

Vaccination is the most important among the specific measures for the prevention and control of infectious diseases. In addition to the outstanding benefits for the individual, it is important to emphasize the benefits of vaccination for the community. For some highly contagious diseases (e.g. measles), the vaccination rate must be at least 95% if "herd immunity" is to be achieved. This also protects against infection those people who, for health reasons, cannot be vaccinated or whose immunity has not developed after vaccination. As the vaccination coverage decreases, the likelihood of recurrence and spread of such diseases increases.

Vaccination coverage means the proportion of persons vaccinated against a certain infectious disease or with a certain vaccine in the target population in a certain area, or the proportion of timely vaccinated individuals in the target population. Based on the vaccination coverage, we can estimate how many people in the target population are protected. The collection of data on vaccinations, the geographical distribution of vaccination and the distribution of vaccination by individual target population groups is necessary for the planning and implementation of the Vaccination Programme (Official Gazette of the Republic of Slovenia, 2021) and the evaluation of its effectiveness in controlling infectious diseases.

In 2017, the NIJZ established the eRCO within the portal eZdravje, which gives vaccination providers a uniform method of recording performed vaccinations in local systems, and the data is then transferred to the eRCO in real time. Not all vaccination providers are yet submitting data to the eRCO; they are being gradually integrated into the system, and their inclusion in the system is gradually improving. In the period 2017–2019, the quality of data from the eRCO was not yet satisfactory for providing national estimates of the vaccination coverage of target groups, so the NIJZ continued to collect aggregated data on all performed vaccinations. A national estimate of the vaccination coverage for pre-school children was produced for the first time for 2020, based on a random sample of approximately 1,000 children for whom vaccination is mandatory based on data from eRCO. The vaccination coverage against measles/mumps/rubella was 95.2% (93.8–96.3%), against diphtheria/tetanus/whooping cough/haemophilus influenzae/polio 94.3% (92.8–95.5%) and against pneumococcal infections 69.7% (67.0–72.6%), and was higher than in previous years.

As part of the national vaccination campaign of Slovenia's population against COVID-19, the inclusion of all providers of this vaccination in the eRCO was ensured, which enabled the production of more accurate estimates of vaccination rate and a real-time overview of the implementation of vaccination. The data was available to various stakeholders and the general public through an interactive display on the NIJZ website.

Program cepljenja in zaščite z zdravili 2021. Official Gazette of the RS, No. 113/20; p. 4736–51 Available from: https://www.nijz.si/sl/program-cepljenja-in-zascite-z-zdravili-2021.

New developments in Slovenia's national vaccination programme

Nadja Šinkovec Zorko, Marta Grgič Vitek, Veronika Učakar

In the past three years a number of new features have been introduced into the national vaccination programme in Slovenia. A recommended vaccination against tick-borne encephalitis (TBE) for children and adults, vaccination of boys against human papillomavirus (HPV) infections and vaccination of children from six months to two years of age against influenza have been added. In addition, vaccination against COVID-19 began at the end of 2020.

Slovenia ranks among those countries with the highest incidence of TBE in Europe. In 2019 there was an expansion of the national vaccination programme with the recommended vaccination against TBE for adults who in the current year reach the age of 49, and for children who in the current year reach the age of three. These persons are eligible for three doses of the TBE vaccine covered by compulsory health insurance (CHI), which is also available to those who are late in getting vaccinated. In 2021 there was a shift in the age range for providing the recommended TBE vaccine for children, from three years old to one year old children.

The programme of vaccination against HPV infection has been carried out for girls in the 6th grade of primary school since the 2009/2010 school year. Girls who did not get vaccinated against HPV in the 6th grade can also get vaccinated later. Vaccinations for both groups of girls are covered by CHI. The 2021/2022 school year will see the start of vaccinations for boys against HPV, also covered by CHI, as a recommended vaccine in the 6th grade of primary school. The aim of expanding this vaccination programme is to directly contribute to reducing the burden of HPV infections and their consequences among males, while we also anticipate an indirect effect in terms of reducing the burden of HPV infections and their consequences among females.

In Slovenia, as in the other EU/EEA countries, vaccination against flu is especially recommended for groups at higher risk of severe infection. In past years vaccination against flu covered by CHI was available to persons 65 years and over, patients with chronic diseases, pregnant women and persons suffering from obesity. In the 2020/21 season children aged six months to two years were added to the groups of people eligible for flu vaccination covered by CHI.

In 2019 there was a replacement of the 10-valent pneumococcal conjugate vaccine used in the vaccination programme for children against pneumococcal infections, with the 13-valent vaccine. On 1 January 2020 there was a replacement of the 5-valent vaccine (against diphtheria, tetanus, whooping cough, Haemophilus influenzae type b and poliomyelitis) with a 6-valent vaccine (against diphtheria, tetanus, whooping cough, Haemophilus influenzae type b, poliomyelitis and hepatitis B) and a change in the vaccination schedule from 3 + 1 to 2 + 1. At the end of last year (27 December 2020) Slovenia began its rollout of vaccinations against Covid-19, which has been funded from the national budget and was added to the national vaccination programme for 2021 as an emergency vaccination.

National survey of healthcare-associated infections

Irena Klavs

In the third Slovenian national healthcare-associated infections (HAIs) prevalence survey, conducted in all Slovenian acute care hospitals in November 2017, we estimated that on the day of the survey 4.4% patients had at least one HAI and an additional 2.2% patients were still treated for HAIs. The results will inform the evidence-based prevention and control of HAIs in Slovenia, which is an important public health priority.

In the third Slovenian national HAIs prevalence survey, conducted within the European point prevalence survey of HAIs and antimicrobial use in acute care hospitals, we estimated the prevalence of all types of HAIs and identified factors associated with HAIs. The Results were published in a peer reviewed journal the Slovenian Journal of Public Health (Klavs et al., 2019).

Patients were enrolled into a one-day cross-sectional study in November 2017. Descriptive analyses were performed to describe the characteristics of patients, their exposure to invasive procedures and the prevalence of different types of HAIs. Univariate and multivariate analyses of the association of having at least one HAI with possible risk factors were performed to identify risk factors. Among 5,743 patients, 4.4% had at least one HAI and an additional 2.2% were still treated for HAIs on the day of the survey, with a prevalence of HAIs of 6.6%. The prevalence of pneumonia was the highest (1.8%), followed by surgical site infections (1.5%) and urinary tract infections (1.2%). The prevalence of bloodstream infections was 0.3%. In intensive care units, the prevalence of patients with at least one HAI was 30.6%.

Factors associated with HAIs included central vascular catheter (adjusted odds ratio (aOR) 4.1; 95% confidence intervals (CI): 3.1–5.4), peripheral vascular catheter (aOR 3.0; 95% CI: 2.3–3.9), urinary catheter (aOR 1.8; 95% CI: 1.4–2.3) and operation during hospitalization (aOR 1.6; 95% CI: 1.2–2.0).

The prevalence of HAIs in Slovenian acute care hospitals in 2017 was substantial, especially in intensive care units. HAIs prevention and control is an important public health priority. National surveillance of HAIs in intensive care units should be developed to support evidence-based prevention and control.

Klavs I, Serdt M, Korošec A, Lejko Zupanc T, Pečavar B; SNHPS III. Prevalence of and Factors Associated with Healthcare-associated Infections in Slovenian Acute Care Hospitals: Results of the Third National Survey. Zdr Varst. 2019;58(2):62-69. doi: 10.2478/sjph-2019-0008.

National survey of sexual lifestyles and health

Irena Klavs

We have described the sexual behaviour of the general population aged 18-49 years old, estimated the lifetime prevalence of self-reported sexually transmitted infections (STIs), and described STI-related health care. Sexual behaviour was very diverse and STIs were relatively common. The results will inform evidence-based national sexual and reproductive health prevention and control policies and strategies, including STI prevention and control.

Data was collected over 2016-2017 from a probability sample of the general population, aged 18-49 years old, by a combination of face-to-face interviews and self-administered questionnaires. Statistical methods for complex survey data were used to account for stratification, clustered sampling, and weighting.

A total of 1,929 individuals participated (the survey response rate was 55.5%). Having had the first experience of heterosexual intercourse before the age of 15 was reported by 7.3% of men and 3.8% of women aged 18-24 years old. The majority of men (83.5%) and women (71.8%) reported having more than one heterosexual partner during their lifetime, and having at least 10 was reported by 22.0% of men and 11.2% of women. A new heterosexual partner during the last year was reported by more men (17.2%) than women (9.8%). Having had sexual intercourse with someone while in a stable heterosexual relationship with someone else at least once in their lifetime was reported by 26.0% of men and 17.8% of women. However, both men and women reported about a similar number of occasions of heterosexual sex within the last 30 days (the median was 4). Vaginal intercourse at least once in their lifetime was reported by 95.5% of men and 95.1% of women, oral intercourse by 90.1% of men and 91.2% women, and anal intercourse by 49.3% of men and 49.1% of women.

Approximately every tenth sexually experienced individual reported having had genitourinary symptoms suggestive of STIs, but only a minority of them reported having had the respective STIs diagnosed. The proportion of sexually experienced individuals that reported having been diagnosed with an STI at least once (chlamydial infection, gonorrhoea, non-specific urethritis, syphilis, genital warts, genital herpes or hepatitis B) was 2.4% for men and 6.7% for women. Independent risk factors associated with self-reported STIs in women included at least 10 lifetime sexual partners and having been forced into sex at least once. The majority of the most recent STI episodes in women were treated by gynaecologists and in men by dermatovenerologists. Approximately half of the STI patients were advised to engage in safer sex, and the majority reported having notified their sexual contacts.

The survey showed that the sexual behaviour of the general population of Slovenia was very diverse, and that STIs were relatively common. The results will inform evidence-based national sexual and reproductive health prevention and control policies and strategies, including STI prevention and control.

Activation of the local community for vaccination against TBE in Slovenia

Irena Grmek Košnik

Tick-borne encephalitis (TBE) is the most common viral disease of the central nervous system in Slovenia. The hosts of the virus are small forest animals, and the virus is transmitted by ticks. In Slovenia, an average of 250 people per year (incidence 13.5/100,000 inhabitants) developed the disease during the years 2000–2011. The morbidity of TBE in Slovenia is highest in the Gorenjska region.

In Gorenjska, an average of 60 people per year developed the disease in 2010 (incidence 30/100,000 inhabitants), mostly in the area of the Škofja Loka administrative unit (26 people per year, disease incidence 50/100,000 inhabitants). In addition to Lithuania and Estonia, Slovenia is one of the countries with the highest TBE morbidity and the lowest immunization (12 % of the population is vaccinated). Patients with TBE are severely ill and usually need to be treated in hospital. There is no specific cure for the disease, and thus only the symptoms are treated. About 2% of patients die. Thirty-six percent of patients are left with permanent damage, such as mental and psychiatric disorders, memory disorders, thinking disorders, concentration disorders, balance and coordination disorders, tremors, paresis and paralysis, emotional instability, headaches, hearing and speech disorders.

The most effective way to prevent TBE is vaccination. It is recommended for people from one year of age who live or move around in areas where TBE occurs. Vaccination is self-paid, and since 2019 has been covered by compulsory health insurance for children aged three years and adults aged 49 years.

In 2010, employees of the then Institute of Public Health Kranj (ZZV Kranj) – one of the former regional offices of the National Institute of Public Health – developed a new model of promoting vaccination and started implementing vaccination campaigns. We, the employees, recognized the great need for vaccination. Gorenjska is the most endangered area, where in 2010 the morbidity was 2.4 times higher than in the rest of Slovenia. We designed a model for vaccinating a large proportion of the population at the lowest possible price to provide basic protection to the socially weakest part of the population. In the first campaigns, we connected with the Lions Club Brnik and the Lions Club Škofja Loka to provide free-of-charge vaccination to 850 children from socially disadvantaged families. We continued in cooperation with the municipalities so that the municipality financed the costs of the vaccination team, and people only paid the value of the purchase price of the vaccine for the entire vaccination service. Vaccination did not require making an appointment, and was carried out on weekends in the local community, more precisely in primary schools and health centres in the areas where people reside. The implementation, however, was professional, carried out by healthcare professionals. In this way, a breakthrough in vaccination was created. Vaccination campaigns are still exceptionally well-received today. The campaigns also contributed to the immunization of the population against TBE. The campaign model is followed by numerous health centres, such as Zdravstveni dom Ljubljana, Zdravstveni dom Maribor and Zdravstveni dom Celje, to mention only the largest. The model was also described in the renowned science magazine Vaccine (Košnik and Lah, 2013).

Košnik IG, Lah AK. A campaign to increase the vaccination rate in a highly endemic tick-borne encephalitis region of Slovenia. Vaccine. 2013; 31(5): 732-4. doi: 10.1016/j.vaccine.2012.12.005.

Epidemiological surveillance of antimicrobial resistance

Maja Šubelj

Antimicrobial resistance (AMR) has emerged as a major public health problem. Epidemiological surveillance of AMR is important for assessing the situation, tracking trends and planning public health measures.

The European Antimicrobial Resistance Surveillance System (EARSS) was established in 1998 in coordination in the Netherlands. In 2010 the network was transferred to the European Centre for Disease Prevention and Control (ECDC) as the European Antimicrobial Resistance Surveillance Network (EARS-Net). EARS-Net is intended to collect reliable and comparable data on the prevalence and spread of major invasive bacterial infections with clinically and epidemiologically significant AMR, and to produce analysis and reports on AMR, monitor trends, and assess the problem for public health activities and action. Slovenia joined the EU network and added its data in 2000, and since 2002 all Slovenian medical microbiological laboratories with all indicator isolates have been cooperating voluntarily. Until 2019 EARS-Net was coordinated by the National Institute of Public Health (NIJZ), and in that year it was taken over by the National Laboratory for Health, Environment and Food (NLZOH), with the NIJZ participating in data collection and analysis, data transmission to the ECDC and preparation of reports (NIJZ, 2019), as well as participating in the European Coordination Commission (Disease Network Coordinating Committee; DNCC) at the ECDC.

In 2017–2021, the NIJZ participated as a partner in the EU Joint Action on AMR and Healthcare-Associated Infections (HCAIs) (EU-JAMRAI). The main objective of the project was to take action and support the EU countries in implementing effective health policies to combat AMR and reduce the burden of HCAIs. Dissemination and promotion of these policies were placed on the website of the EU-JAMRAI project and the NIJZ, and the NIJZ regularly reported on progress to the Ministry of Health. The purpose of the visit to the Czech Republic was to provide a platform for discussions on measures in the field of human and veterinary health in the EU, in particular concerning the formulation and implementation of the National Strategy and Action Plan »One Health«(Ministry of Health, 2019). The NIJZ hosted Swedish colleagues together with the Ministry of Health and the Veterinary Faculty of the University of Ljubljana, where the main topic was the exchange of experiences and practices regarding cross-sectoral action in medicine and veterinary medicine regarding acceptance and implementation of the National Strategy and Action Plan »One Health«[2].

Since 2020, the NIJZ has been leading the European Surveillance of Antimicrobial Consumption Network (ESAC-Net). The NIJZ cooperates with the National Collaborating Mechanism at the Ministry of Health. In the future it is necessary to continue the established connections and cooperation, and we also want to strengthen research and education in this field.

1_Epidemiološko spremljanje nalezljivih bolezni v Sloveniji. Nacionalni Inštitut za Javno Zdravje, Center za Nalezljive Bolezni: Ljubljana; 2019.

2_Državna strategija »Eno zdravje« za obvladovanje odpornosti mikrobov. [National Strategy »One Health« for Microbial Resistance Management 2019–2024.] Ljubljana: Ministry of Health;2019 Available from: https://www.gov.si/novice/nov-vlada-sprejela-drzavno-strategijo-eno-zdravje-za-obvladovanje-odpornosti-mikrobov-2019-2024-z-akcijskim-nacrtom-za-obdobje-2019-2021/.

Setting up the COVID-19 vaccination website www.cepimose.si

Mitja Vrdelja, Janina Žagar

The website www.cepimose.si (let's get vaccinated) is part of the campaign to promote vaccination against COVID-19, *Nalezimo se dobrih navad – cepimo se (Let's catch some good habits – let's get vaccinated)*. It is one of the key cornerstones for successfully containing the epidemic in Slovenia, as its later planned transformation into the central national website for vaccinations is one of the more important public health activities and confidence in public health measures in Slovenia.

During the COVID19 pandemic, which has caused one of the biggest global health crisis of the past century, a central digital information platform was set up in the form of the independent website www.cepimose.si as a part of the national COVID-19 vaccination promotional campaign, The website primarily provides information about vaccination against COVID-19.Its content will be later supplemented with information about vaccination against flu, while in the long term it will provide information about all vaccinations in Slovenia. The short-term, and in the given situation extremely important aim of the website www.cepimose.si is to provide science-based vital information about COVID-19 vaccination for different population groups , while its long-term objective is to become the central national and first such website for the field of vaccinations in Slovenia. The purpose of the current site as well as its later upgraded and expanded versions is to establish and maintain confidence in the safety and effectiveness of vaccines and the recommendations of experts, to motivate various population groups to get vaccinated, increasing vaccination coverage as a result.

The website www.cepimose.si represents an important part of the campaign Nalezimo se dobrih navad – cepimo se, which the Slovenian National Institute of Public Health (NIJZ) created together with the Slovenian Ministry of Health and theGovernment Communication Office, and is conducted as part of the project *Measures to manage the spread of COVID-19 with a focus on vunerable groups* of population, funded by the Slovenian Government and the European Union from the European Social Fund as part of the Union's response to the COVID-19 pandemic. It is aimed at both the general public and health professionals covering the latest news, presenting the vaccination plan and providing updated information on vaccination centres and side effects. Frequently asked questions are addressed by experts, special sections provide information about the vaccines and their working, health tips and useful materials. The site publishes findings of the pandemic fatigue research, as well as an interactive data presentation of COVID-19 vaccination in Slovenia and a link to vaccination registration. Based on individual target groups responsiveness, public opinion monitoring and the attainment of targets, the website is upgraded accordingly, while the findings of ongoing evaluation offer important information necessary for successfully expanding content to the entire field of vaccination in Slovenia.

07
PUBLIC HEALTH LABORATORIES

NATIONAL LABORATORY OF HEALTH, ENVIRONMENT AND FOOD

Establishment and operation of the National Laboratory of Health, Environment and Food

Tjaša Žohar Čretnik

In 2013, the Slovenian Government adopted a Decision on the establishment of the National Laboratory of Health, Environment and Food (NLZOH). The NLZOH thus became the central, largest public health laboratory in Slovenia, dealing with environmental protection, diagnostic and public health microbiological activities, chemical and microbiological analyses of various types of samples, and research and pedagogical activities.

By merging the laboratory and environmental capacities of nine regional Institutes of Public Health and the Institute of Public Health of the Republic of Slovenia, the NLZOH gained the opportunity to further develop and adapt its activities to the needs of the residents of Slovenia. Almost 800 employees work at eleven locations across Slovenia. The laboratory provides its services to over 8,000 partners annually. Its work includes performing tasks for six ministries, it holds 25 permits and authorizations for the implementation of activities and is appointed as the national reference laboratory for 10 fields. By employing more than 1,000 different methods, 770 of which are accredited, it performs more than 1,500,000 laboratory analyses annually.

With the merger, the NLZOH began a gradual restructuring of the institute's activities, the main purpose of which is to provide state-of-the-art services, rational use of resources and development-oriented operations. In the first years of operation, we invested most in new laboratory and business information systems to support joint operations. In 2021, we also established electronic management and archiving of quality assurance system documentation and business documentation. We are proud to have developed electronic ordering of microbiological tests and communication of test results to the information systems of clients. We unified the quality assurance system, strengthened the accredited activities and renewed all the necessary authorizations and work permits.

The project of standardising work methods is extremely extensive and demanding, as it also includes the development and introduction of new work methods and adaptation to new technologies. These technologies, especially in the field of medical microbiology, encouraged us to develop a new form of work organization, specifically the establishment of remote laboratory units in hospitals. Such units will allow tests that can be performed quickly to be performed by appropriately trained staff virtually at the bedside. Tests requiring complex and expensive equipment, on the other hand, will be performed in central laboratories.

After almost eight years of operation, the establishment of the NLZOH is regarded as a successful move in the country's governance, which has enabled us to develop faster, attain better professional cooperation and organizational flexibility, and a greater ability to respond to emergencies.

The role of NLZOH in controlling the COVID-19 epidemic

Barbara Zdolšek

One of the key tasks of the National Laboratory of Health, Environment and Food (NLZOH) in the field of prevention and control of infectious diseases is to respond to emergencies. During the COVID-19 pandemic, the NLZOH played a key role in diagnostics, network monitoring of the pathogen, reporting, introduction of new methods and communication among stakeholders.

At the time of the pandemic caused by SARS-CoV-2, the NLZOH responded firstly in the field of diagnostics. We introduced diagnostics as early as in January 2020, and the first positive case was diagnosed on 4 March 2020. We swiftly developed and upgraded molecular diagnostics in just a few weeks, so that it was available at seven locations and mostly in a three-shift workday. Test results were available to requesters within 24 hours, and usually within 8 hours, which is an extremely short response time. We performed over half of all diagnostic tests in the state, which was over 840,000 tests, by June 2021. We perform testing for hospitals, health centres, healthcare entry points, private healthcare institutions and other clients (e.g. large sports competitions). The COVID-19 pandemic surpassed any other event that has occurred in almost a hundred years of the existence of microbiological laboratories in Slovenia. The daily volume of testing during the pandemic equalled the annual volume of testing beforehand.

We also introduced testing for the presence of antibodies in the NLZOH laboratories. An important part of the diagnostics was the establishment of faster transport routes of samples and the establishment and optimization of electronic connections for ordering tests and reporting results.

Later, the NLZOH played an important role in validating the tests used at the national level for rapid population testing and self-administered tests intended for schoolchildren.

The NLZOH coordinated the tracking of SARS-CoV-2 variants, which also involved the participation of the Clinical Institute of Special Laboratory Diagnostics (KISLD) of the University Children's Hospital of the University Medical Centre Ljubljana, which performed sequencing, the National Institute of Biology, which tested the presence of variants in waste water, the Institute of Microbiology and Immunology of the University of Ljubljana, which also performed a part of the molecular characterization of positive samples from their laboratory, and the Veterinary Faculty of the University of Ljubljana, which tested the infectivity of different lines. In the period from 1 January 2021 to 7 June 2021, 8,752 samples were analysed at the NLZOH by sequencing whole genomes, of which 1,611 genomes were sequenced in collaboration with the ECDC. Information on the distribution of variants by region, and especially the tracking of more dangerous new variants, was important in deciding on measures to contain the epidemic. Together with GISAID, we produced an animation on the variants of SARS-CoV-2 in Slovenia (https://www.nlzoh.si/phylodynamics/).

The NLZOH also has an Operational Contact Point for SARS-CoV-2 at the ECDC, which is responsible for timely entry of microbiological data for Slovenia in the European TESSy database.

e-Exchange of microbiological orders and test results

Daša Kavka

At the Centre for Medical Microbiology of the National Laboratory of Health, Environment and Food we have developed, together with the company SRC Infonet d.o.o., an e-ordering module, which enables the electronic exchange of microbiological orders and test results. Since its design in 2017 and until today, nine hospitals across Slovenia have successfully integrated the module, and during the SARS-CoV-2 epidemic, the module has enabled us to quickly connect most entry points for COVID testing across Slovenia.

The Centre for Medical Microbiology of the National Laboratory of Health, Environment and Food has been keeping up with the trends spurred by the impact of digitalization with the development of new information technologies. Together with the company SRC Infonet d.o.o., we have developed an e-ordering module, which enables the electronic exchange of microbiological orders and test results. Ordering microbiological tests is quite complicated. The reason is the great variety and large set of samples, which must be defined quite precisely to achieve quality performance of tests. The activity performed by each client must be taken into account, and all additional data must be provided for the correct interpretation of results. On the clients' part, the need to receive reports in electronic form is increasing due to the management, analysis and storage of business and professional data that we provide with the report.

The module is designed to be fully integrated into the laboratory information system (LIS) and the client's existing information system (IS). The exchange of data between the LIS and the client's IS takes place via the medGateway platform. This is a cloud service provided by the REST (API) interface. The interface is secured by encrypting traffic over the SSL server certificate protocol (HTTPS).

It offers many advantages for the client, such as easy sample definition and easier selection of the appropriate microbiological test. New tests are added as soon as they are introduced. The client has an overview of the orders and always knows at what stage an order is. As soon as any results are known in the course of a test, they are already available in the client's IS in the form of a partial report. It is also possible to transfer critical values to the client's IS.

The e-ordering module also offers advantages for the microbiology laboratory. The take-over of samples is faster because samples and tests are clearly defined. All data is automatically transferred from the client's IS to the LIS, which reduces the possibility of errors as there is no manual input into the LIS. Protocols and worksheets are created automatically. The order can be easily redirected to another laboratory.

Since its design in 2017 and up to the present day, nine hospitals across Slovenia have successfully integrated the module, and the University Medical Centre Maribor, which is our largest client, is gradually joining. During the SARS-CoV-2 epidemic, the module enabled us to quickly connect most entry points for COVID testing in Slovenia. More than 50 connections have been established, which will also enable the continuation of the project by connecting clients at the primary level.

Molecular methods for the typing of micro-organisms

Sandra Janežič

Typing of pathogens is important in understanding sources of infections, the circulation of pathogens between reservoirs, and for antimicrobial resistance monitoring. All state-of-the-art molecular methods for typing micro-organisms are available in Slovenia.

In the period from 2008 to 2021, the activity of molecular characterization of mainly bacterial pathogens developed strongly at the NLZOH and earlier at some regional Institutes of Public Health (ZZV). In the initial period, these were pulse electrophoresis (PFGE) or targeted molecular characterizations such as spa typing for Staphylococcus aureus (Dermota et al., 2015) and ribotyping for Clostridioides difficile.

In 2014, we also started introducing bacterial genome sequencing (whole genome sequencing, WGS). We are mainly active in the development of approaches for the analysis of whole genomic sequences in C. difficile (Janezic et al. 2019; Janezic et al. 2020). We are also a learning centre for this field at the European Society for Clinical Microbiology and Infectious Diseases (ESCMID Collaborative Centre).

Sequencing of whole genomes of various micro-organisms is used in Slovenia to track transmissions in the hospital environment, to track transmissions between reservoirs, to monitor antimicrobial resistance (Golle et al., 2017), to serotype problematic Salmonella strains and to study outbreaks (e.g., outbreak of monophasic S. Typhimurium in 2019).

During the SARS-CoV-2 epidemic, we have actively participated in sequencing and data analysis to track variants of the virus.

In Slovenia, all modern methods for accurate characterization of various infectious pathogens are available at the NLZOH. This knowledge enables better investigations of outbreaks, better international comparability, and in the event of an emergency such as an epidemic, it provides an important information for decision makers.

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The National Influenza Centre and its role in pandemics

Katarina Prosenc Trilar

The NLZOH Laboratory for Public Health Virology is the National Influenza Centre, which monitors the circulation of influenza viruses and other respiratory pathogens in Slovenia and makes an important contribution to the country's preparedness for pandemics. It works hand in hand with epidemiological experts and international organizations (ECDC, WHO). It played a key role in the 2009 influenza pandemic and is closely involved in managing the COVID-19 pandemic.

Systematic monitoring of the circulation of influenza and other respiratory infections in Slovenia has been carried out since 1999. The Laboratory for Public Health Virology has been appointed by the Ministry of Health of the Republic of Slovenia as the National Influenza Centre, and it has been accredited and re-accredited each year by the World Health Organization (WHO) upon verification of fulfilment of the requirements. We are actively involved in the network of national influenza centres coordinated by the WHO (Global Influenza Surveillance and Response System) and in the European Influenza Surveillance Network within the European Centre for Disease Prevention and Control (ECDC).

The Laboratory for Public Health Virology follows guidelines in the development of virological methods and epidemiological methods of monitoring the circulation of influenza and other pathogens causing respiratory infections. Monitoring has been extended to other viruses that cause respiratory diseases. We maintain methods to detect avian influenza viruses that have the potential to infect humans. In addition to the standard antigenic typing of isolates, influenza viruses are also genotyped by sequencing to determine whether viruses in circulation have a pandemic potential. We communicate our findings to professionals (epidemiologists, virologists, clinics) and the general public (websites). Our data is essential for professionals to implement measures to control the annual influenza epidemic. We report the data to ECDC and WHO, and with our isolates we contribute to the global database of viruses available for the production of vaccines. Our isolate A/Slovenia/2903/2015 (H1N1) was used in the FluMist Quadrivalent Influenza Vaccine.

Due to its activities, the NLZOH Laboratory for Public Health Virology was well prepared in 2009 when the new influenza virus A(H1N1)pdm09 appeared and caused a pandemic. The virus emerged in Mexico and the USA in April 2009, and on 10 May 2009 we had already established a molecular detection method (real-time PCR) in the laboratory, started regular testing and on 11 June 2009 confirmed the first case in Slovenia. During the first wave, the laboratory and diagnostic part of our work took place only in our laboratory, and up until the second wave, molecular detection of the new influenza virus was established with our help in other laboratories across the country.

In 2020, our laboratory immediately joined a network of laboratories in which detection of SARS-CoV-2 was established and the diagnostic capacity rapidly increased several fold. The importance of mutual cooperation of laboratories in Slovenia and close cooperation of laboratories in international networks was once again demonstrated.

The path to eradication of measles, rubella and mumps

Katarina Prosenc Trilar

One of the important goals of ECDC and WHO is to control vaccine preventable diseases. In addition to vaccination and epidemiological monitoring, laboratory confirmation of suspected cases is essential for disease management. This helps in assessing the effectiveness and success of vaccination, setting up further vaccination strategies and finding pockets of population with low rates of vaccinations. The eradication of measles and congenital rubella is one of the WHO's most important goals.

The WHO's goal of eliminating (eradicating) measles in Europe by 2020 has not been achieved. The number of measles patients is still high in Europe because the vaccination rate with two doses of measles vaccine is too low in many places. Outbreaks of measles occur in groups that are reluctant to vaccination or difficult to reach due to their particular lifestyle. The epidemiological situation in Europe dictates close monitoring of febrile diseases with rash, especially those whose clinical picture corresponds to measles. Close monitoring of mumps is also defined in the Programme for the Protection of the Population against Infectious Diseases.

Slovenia had no cases of measles between 1999 and 2009. Since 2010, there have been individual imported cases or outbreaks caused by imported cases. Attention on the occurrence of measles is therefore especially important. The NLZOH Laboratory for Public Health Virology is the national reference laboratory for measles and rubella, and confirms its status through annual prescribed activities. Legislation that does not require diagnostic and other laboratories to provide data (they are only required to report positive cases of notifiable diseases) does not provide support for epidemiology, nor does it require diagnostic laboratories to maintain a particular method. The Laboratory for Public Health Virology provides systematic monitoring and response to exceptional situations when measles, rubella or mumps occur. Since 2012, the laboratory has been performing genotyping, which enables molecular epidemiological clarification of outbreaks. Furthermore, the laboratory has been running an incentive programme for the differential diagnosis of febrile illness with rash and parotitis for years. As data on the vaccination rate are not sufficient to offer a good assessment of the population's immune status, periodic sero-epidemiological studies are necessary. The last sero-epidemiological study for the presence of antibodies against measles, rubella and mumps was performed in the Slovenian population on serum samples collected in 2018.

Europe is polio free, but the global risk remains

Katarina Prosenc Trilar

Polio caused by polio viruses is the first disease since smallpox that we have a chance to eradicate by vaccination that prevents the spread. Even when the disease no longer occurs, it takes years of monitoring and confirmation to establish that the circulation of the virus has indeed stopped. The NLZOH Laboratory for Public Health Virology maintains the required methods and, in cooperation with the WHO, carries out virological control over the occurrence of polio viruses in Slovenia.

Before the introduction of vaccination against polio viruses, the pathogens that still caused polio, in the mid-1950s, this disease was widespread throughout the world. Vaccination has effectively reduced the number of those infected. Eradication of polio is possible by stopping the transmission of polio viruses in the population. The WHO European Region was declared free of polio viruses in 2002. Wild strains are still being confirmed today in Pakistan and Afghanistan, therefore the absence of polio viruses in all other areas needs to be constantly checked and confirmed. The strategy in the post-eradication period and the population protection programme to prevent the re-spread of polio viruses are coordinated by the NIJZ and NLZOH, which has the only WHO-accredited reference laboratory for the diagnosis of polio viruses in Slovenia, and are based on the following elements: high vaccination rate against polio, advanced epidemiological monitoring of the disease, i.e. detection and throughout diagnosis of all suspected cases of polio (a key element is full epidemiological monitoring of acute flaccid paralysis – AFP) with prescribed methods, preparing an accurate inventory of materials containing polio viruses and their destruction as far as possible, providing equipment and means for diagnosing and storing polio viruses in an accredited laboratory, managing relevant data and performing analyses. The eradication programme provides public health microbiology support for the epidemiological surveillance of polio, maintains and updates the methods, and through its reference role sets tasks for the exchange of information and data in the country, in the European Community (ECDC) and with with international organizations (WHO). At the same time, the programme provides opportunities for studying the circulation of polio viruses and tracking their properties and characteristics that are important for the implementation of measures in the field of infectious diseases. Therefore, in addition to the mandatory isolation of polio viruses in cell cultures, we also introduced molecular detection and genotyping of enteroviruses and polio viruses in 2018.

Surveillance of whooping cough

Tamara Kastrin, Metka Paragi

The Ljubljana Department of Public Health Microbiology under the auspices of the NLZOH performs the tasks of a reference laboratory for monitoring diseases prevented by vaccination, including whooping cough, diphtheria and diphtheria-like diseases, and tetanus. Surveillance of these pathogens is important to detect their presence early, detect outbreaks, and evaluate the effectiveness of management programmes, especially the vaccination programme.

Whooping cough is a highly contagious acute respiratory disease caused by the bacterium *Bordetella pertussis*. The disease is prevented by vaccination, which was introduced in Slovenia in 1959. In its typical form, the disease occurs in unprotected babies, for whom it is very dangerous and can even lead to death. Despite the high vaccination rate, whooping cough remains endemic and is one of the worst managed diseases that are preventable by vaccination. The disease is on the rise in Europe and occurs cyclically with higher incidences every 2 to 5 years. Factors that have contributed to the increased incidence of whooping cough in the last decade include improved national epidemiological surveillance, the introduction of more sensitive molecular diagnostic methods, genetic changes in the bacteria and antigenic divergence from vaccines, lack of booster vaccinations and changes in vaccine composition or vaccination schedules.

Within the public health laboratory of the NLZOH in Ljubljana we are a reference laboratory and implement all microbiological methods for rapid detection and confirmation of whooping cough: isolation in culture, molecular and serological diagnostics. The occurrence of whooping cough has been actively monitored since 1998 in order to show the actual situation in Slovenia and at the same time evaluate the booster dose for children, which was newly introduced in 2009. Over the many years of our work, we have succeeded in introducing more sensitive molecular methods to show the actual epidemiological situation of whooping cough in Slovenia. We have shown that, despite the high vaccination rate, whooping cough still occurs, especially in certain age groups (Kastrin et al., 2019). Another task of the public health laboratory is to explain and limit outbreaks, which, characteristically for this disease, occur frequently. For the purposes of public health monitoring, we carry out isolation of the bacterium in culture. In this way we can determine the antimicrobial susceptibility and antigenic properties of the bacterium, type the bacterium, study its genome and assess the suitability of vaccines. By using the established methodology, we also participate in European studies and are members of the European Reference Laboratory Network for Pertussis under the auspices of the ECDC (European Centre for Disease Prevention and Control). In 2021, we took over the organization of the European congress EUPertStrain 2021.

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Surveillance of invasive diseases caused by S. pneumoniae, N. meningitidis and H. influenzae in Slovenia

Tamara Kastrin, Metka Paragi

The bacteria S. pneumoniae, N. meningitidis and H. influenzae are among the most common causes of bacterial invasive diseases. The Department of Public Health Microbiology in Ljubljana has been conducting prospective laboratory surveillance of these invasive bacteria at the national level since 1993. The surveillance system represents a national database of serotypes, genotypes, antibiotic susceptibility and other relevant clinical and epidemiological data.

In 1993, we started a national project in Slovenia to monitor invasive diseases caused by the bacteria *Neisseria meningitidis, Heamophilus influenzae* and *Streptococcus pneumoniae*. Surveillance is important in terms of public health, mainly because of the possibility of preventing these diseases by vaccination, the possibility of epidemics occurring, assessing the effectiveness of vaccination and also the high mortality rate in the case of invasive meningococcal disease. Further cases can be prevented by surveillance and laboratory and epidemiological treatment of each case. Invasive meningococcal disease belongs to the 1st group of infectious diseases according to the Communicable Diseases Act and the *Communicable Disease Reporting Rules*, so it is necessary to report it to the NIJZ and treat it in accordance with the meningococcal algorithm. In our laboratory we perform rapid diagnostics and further, detailed identification of bacteria, typing, molecular typing, determination of antimicrobial resistance and finally the use of more advanced technology, such as whole genome sequencing.

Following the introduction of regular vaccination against *H. influenzae* serotype b (Hib) at the end of 1999, pneumococci became the main causes of invasive bacterial diseases that are preventable by vaccination. In addition to the increase in incidence, we are also facing an increase in antimicrobial resistance (Kastrin et al., 2018; Kastrin et al., 2008).

Determination of pneumococcal serotypes is essential for a high-quality surveillance system, in particular due to the introduction of pneumococcal vaccination into the vaccination programme. In this way we can monitor the impact of vaccination on the occurrence of invasive pneumococcal diseases, on the possible decrease in resistance and on the change in the serotype population, mainly due to the possibility of the occurrence of replacement serotypes not covered by the vaccine. The results of our national monitoring of invasive diseases caused by the *H. influenzae* bacterium have shown that the Hib vaccine is very effective in preventing this invasive disease. Invasive meningococcal disease occurs endemically in Slovenia. All invasive isolates are typed phenotypically as well as molecularly by the whole genome sequencing method. We have proved that the isolates are genetically heterogeneous, and at the same time we have proved the presence of important hypervirulent clonal complexes. Detailed molecular laboratory based surveillance is essential to monitor and at the same time prevent and control this dangerous bacterium.

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Surveillance of diphtheria

Verica Mioč

The last case of diphtheria in Slovenia was recorded in 1967. Although the disease is rare in developed parts of the world, surveillance of diphtheria remains essential due to it still being present in many parts of the world. Potentially toxicogenic strains are tested for toxicity in the Department of Public Health Microbiology in Ljubljana (OJM Ljubljana, NLZOH). We also perform serological tests for the presence of vaccine antibodies.

Diphtheria is a rare infectious disease caused by toxigenic species of bacteria of the genus *Corynebacterium (C. diphtheriae, C. ulcerans, C. pseudotuberculosis)*. In Slovenia the last case of diphtheria in Slovenia was detected in 1967. Although the disease is rare in developed countries, surveillance of diphtheria remains essential due to it still being present in many parts of the world. The disease still occurs in Indonesia, India, the Philippines, Nigeria, Brazil and elsewhere. Travellers and emigrants from endemic and epidemic areas are an important factor. Transmission of diphtheria is possible if a person has not been vaccinated or several years have passed since their booster dose. Vaccination remains the only preventive control measure that is effective.

In order to establish effective laboratory and epidemiological monitoring of diphtheria, Slovenia participates in the European Diphtheria Surveillance Network – EDSN, which operates within the ECDC. Fast and efficient diagnostics and proof of toxigenicity of pathogenic strains of *corynebacteria (Corynebacterium diphteriae* – 4 biotypes*, Corynebacterium ulcerans and Corynebacterium pseudotuberculosis)* are particularly important for early detection and prevention of the spread of the disease. Potentially toxicogenic strains are tested for toxicity in our laboratory. We also perform serological tests for the presence of vaccine antibodies.

Surveillance of bacterial pathogens causing food and waterborne infectious diseases

Marija Trkov

The Department of Public Health Microbiology in Ljubljana (OJM Ljubljana) monitors various pathogens of infectious diseases that are transmitted through food and water. Such diseases are most commonly caused by bacteria of the genera Campylobacter, Salmonella, Listeria and E. coli species. The European Centre for Disease Prevention and Control treats them under the Food and Waterborne Diseases and Zoonoses programme in which our laboratory has been involved from the very beginning.

The most common route of infection with *Campylobacter, Salmonella, Listeria, E. coli* is by eating contaminated food. These pathogens cause individual cases of infection and outbreaks. Campylobacteriosis and salmonellosis are the most commonly reported bacterial zoonoses. Infections with *Listeria* are less common, as mostly only invasive infections are reported. The symptoms of the disease are long-lasting and severe, and the hospitalization rate and mortality of patients are high. Surveillance of diarrhoeagenic *E. coli* (DEC) is important because of their great diversity. Some pathogenic types (e.g. VTEC) can cause very severe diseases, and due to the variability of these bacteria, new pathogenic types emerge with a combination of virulence factors and consequently increased pathogenicity. This is evidenced by the outbreak of infections with enteroaggregative/verotoxigenic *E. coli* O104:H4 in 2011, for which our laboratory was well prepared due to the timely introduction of a number of detection and typing methods for DEC.

In Europe, the ECDC is responsible for surveillance of these diseases in humans and international outbreaks investigation. EU Member States, including Slovenia, contribute epidemiological and laboratory data, and this also includes our laboratory. In 2012, the ECDC established the Tessy MSS (Molecular Surveillance Service) database, which was intended for collecting data on molecular typing of *Salmonella, Listeria and E. coli*, in which the OJM Ljubljana was already involved at the time of its creation. In collaboration with the NLZOH laboratories, the Institute of Microbiology and Immunology (IMI), medical laboratories of some hospitals and the National Institute of Public Health (NIJZ), we collect and type isolates from all over the country. We use some phenotypic methods, but mostly various molecular methods. We are constantly keeping up with the development of newer methods, which enables the comparability of our data with the data of other Slovenian and European laboratories. The typing methods which were once widely used have been replaced in recent years or supplemented by next-generation sequencing methodology. This methodology has also been employed in our laboratory since the beginning of 2019, and the sequences are uploaded to the ECDC database. Prior to that, for the purposes of surveillance and international outbreaks investigation, sequencing of Listeria isolates was supported by the ECDC.

Through many years of collecting isolates and typing them, we have created valuable national collections that serve pathogens surveillance and comparison of isolates from food, animals, animal feed and the environmental samples to identify sources of infection and routes of transmission.

Diversity of *Clostridioides difficile* ribotypes

Maja Rupnik

Clostridioides difficile is one of the main causes of gastrointestinal infections in Slovenia. Since we started with the surveillance of *C. difficile* ribotypes in Slovenia in 2008, the diversity of ribotypes has changed. Since 2011, the ribotypes 027 and 014/020 have been predominant. Other hypervirulent ribotypes are uncommon. Slovenia is one of the few countries with a well-documented diversity of ribotypes in humans and in all other reservoirs that are important from the One Health point of view of.

Infections with the bacterium *Clostridioides (Clostridium)* difficile in Slovenia represent a significant portion of gastrointestinal infections. According to the current published epidemiological report, enterocolitis caused by C. difficile was the second most common diagnosis of all infectious diseases among hospitalized patients and the most common of intestinal infectious diseases in 2018. The number of reported cases almost doubled from 2014 to 2018, when there were 668 infections.

Within the *C. difficile* species, strains are classified into different ribotypes, marked with a three-digit number according to the international ECDC/Leeds/Leiden classification. The steep increase in infections in Slovenia could be associated with outbreaks or the spread of more virulent types. In Slovenia, the NLZOH has been performing ribotyping of a small set of strains since 2008. During certain periods, strains from all Slovenian laboratories were systematically collected. A total of 149 strains from all Slovenian laboratories were typed for the two-month period December 2011/January 2012. They were classified into 35 ribotypes, but 57.7% of the strains were classified into just two ribotypes (027 and 014/020). In this period, ribotype 027 was strongly predominant only in north-eastern Slovenia (Rupnik et al., 2021) For 2018, a total of 561 strains of *C. difficile* were typed, which were classified into 76 ribotypes. Despite this apparent diversity, ribotypes 027 (n = 107) and 014/020 (n = 104) were still predominant. Ribotype 027 appeared almost throughout the country during this period, but was not detected by two of the seven laboratories in that year.

Tracking ribotypes is particularly important in controlling outbreaks. In order to improve the time to obtain results, we have developed ribotyping that can be performed independently of the isolation of the pathogen (Janezic et al., 2011). The strains within a ribotype are still genetically diverse, so we also introduced typing at the whole genome level, which we also use for research purposes.

Slovenia is one of the few countries with well-characterized strains from all reservoirs where *C. difficile* spores are found, including animals, the environment and food (Tkalec et al., 2020). This places us at the top of public health research in the field of *C. difficile* and the One Health approach.

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Monitoring and control of bacterial resistance

Helena Ribič

The results of research and monitoring of antimicrobial resistance make an important contribution to decisions for the experiential treatment of infections, the rational use of antimicrobials and the control of infections at the regional and national levels.

The identification, study and monitoring of resistance are important priority areas at the National Laboratory of Health, Environment and Food (NLZOH). Within the Centre for Medical Microbiology, seven diagnostic laboratories, a public health laboratory and a research microbiological laboratory are involved in this. Laboratories with data on bacterial susceptibility participate in ECDC networks and research, including the European Antimicrobial Resistance Surveillance Network (EARS-Net), networks for monitoring *Salmonella, Campylobacter, Meningococcus*, and in detailed molecular testing of bacteria for carbapenemases – the European Antimicrobial Resistance Genes Surveillance Network (EURGen-Net) and others.

The coordination of EARS-Net, database editing and correspondence with the ECDC for Slovenia are carried out by the National Institute of Public Health (NIJZ). The results from recent years are favourable for Slovenia and show the success of many activities to limit resistance (Ribič et al., 2019). In 2019, the resistance of monitored invasive bacteria in Slovenia was close to the European average and decreased statistically significantly in six of a total of eight bacterial species. The EARS-Net data for 2015 were the basis for a study by Cassini et al. (2019), which estimated that each year in Slovenia 2,280 people become infected with resistant bacteria, 96 patients die, and patients lose 100 to 120 years of healthy life due to infection with resistant bacteria.

NLZOH laboratories, together with other microbiological laboratories, participate in the national monitoring of bacterial resistance within the Slovenian National Antimicrobial Susceptibility Testing Committee (SKUOPZ). Annual reports from the SKUOPZ have been available online since 2011. The reports are extensive, and the report for 2017 contains data for 19 bacterial species (Štrumbelj et al., 2017).

Laboratories regularly monitor the resistance of bacteria and fungi in individual hospitals and cooperate intensively with hospitals in the management of resistant bacteria.

Individual laboratories perform detailed molecular diagnostics of resistance mechanisms in *Streptococcus pneumoniae, Staphylococcus aureus*, bacteria with ESBL enzymes, carbapenemases and others. From 2016 to 2019, research for monitoring the resistance of pathogens of uncomplicated urinary tract infections was performed through outpatient clinics at the primary healthcare level (Ribič et al., 2019b).

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National system of antimicrobial susceptibility testing

Iztok Štrumbelj

Until 2010, antimicrobial susceptibility testing in Slovenia took place without national coordination. In November 2010, the Slovenian National Antimicrobial Susceptibility Testing Committee (SKUOPZ) was established.

Representatives of all clinical microbiological laboratories participate in the SKUOPZ; the NLZOH with seven diagnostic laboratories, public health laboratories and research microbiological laboratories, and the Institute of Microbiology of the Medical Faculty in Ljubljana play a key role in the creation of all SKUOPZ guidelines and reports.

The SKUOPZ reported on resistance rates in Slovenia for the first time in 2011 on Antibiotic Awareness Day. In 2013, the Committee published national guidelines for the detection of bacteria with the most concerning significant forms of resistance, namely broad-spectrum beta-lactamases and carbapenemases. These bacteria are especially important as they are resistant to many antibiotics and resistance is usually acquired on mobile elements. After intensive one-year preparations, Slovenia switched from American to European guidelines for susceptibility testing of bacteria to antibiotics; all laboratories apart from one hospital laboratory switched to EUCAST guidelines in April 2014. Since 2020, EUCAST has been used by all laboratories (Štrumbelj et al., 2019). In 2015, the SKUOPZ, together with NAKOBO, issued a uniform national classification of resistant gram-negative bacteria (definitions and labels for "significant resistance"), which greatly facilitated the participation of microbiologists and staff in the prevention of healthcare-associated infections. The NLZOH has already partly introduced and is still rapidly introducing the electronic ordering of tests and issuing of results, which shortens the time from the completion of an antibiogram to availability of the results in health institutions.

All SKUOPZ laboratories participate in monitoring the resistance of important bacterial species with nationally established methods, as part of European projects organized by the ECDC. Since 2010, the SKUOPZ Committee has published eight national annual resistance surveillance reports covering all isolates of the main bacteria, not just invasive ones; data are for as many as 19 bacterial groups for all first clinical isolates (Štrumbelj et al., 2017). The data complement the EARS-Net data and in addition to the percentages of resistance also report a national assessment of the burden of the most resistant bacteria – in 2017, we isolated 3,750 of the first isolates with significant resistance.

The NLZOH actively participated in the development of the National Strategy "One Health" for the control of microbial resistance (2019–2024), which was adopted by the Slovenian Government in September 2019, with the action plan for 2019–2021[1].

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Molecular determination of carbapenemases

Andrej Golle

Bacteria that produce carbapenemase enzymes are among the major health threats due to their resistance to carbapenems, which are antibiotics with the broadest spectrum of activity. The infections they cause occur mainly in hospitals and pose the greatest threat to seriously ill patients and those in intensive care units. Few antibiotics are available to treat these infections, and infections are associated with higher mortality due to delayed treatment.

The problem is global, bacteria with carbapenemases are appearing all over the world and are being transmitted between countries by travellers. Early detection and molecular characterization of carbapenemases are important for immediate action and for effective containment, especially in healthcare facilities.

Carbapenems are β-lactam antibiotics and are usually the treatment of last resort for infections caused by multi-resistant bacteria. However, especially among Gram-negative bacteria, resistance to carbapenems also occurs, which nullifies their efficacy. Resistance is the result of various mechanisms, the most important from an epidemiological point of view being resistance due to the action of carbapenemases, enzymes that break down carbapenems and prevent their action (Meletis et al., 2012).

In order to provide detailed molecular identification, the NLZOH Centre for Medical Microbiology introduced and validated methods for determining genes with coding for many types of carbapenemases. These methods regularly confirm the presence of carbapenemases in those strains of multiresistant bacteria where, based on phenotypic susceptibility testing, the isolate is suspected to be less sensitive or to be resistant to carbapenems. In the years 2019 to 2020, we confirmed in this way the presence of carbapenemases in 2661 bacterial strains isolated from infection samples of 2216 individuals.

In addition to identifying the carbapenemase type, typing is also important for international classification of the epidemiological situation regarding the occurrence of multidrug resistance, which enables tracking of the spread of strains through time and space and thus epidemiological, geographical and evolutionary research on the spread of isolates. In cooperation with the NLZOH Department of Microbiological Research, we conducted a study for 2014, in which we showed the occurrence of carbapenem--resistant strains of Pseudomonas aeruginosa from the environment and from clinical isolates (patients' isolates) in the Maribor region by typing based on multilocus sequences (MLST) and comparing whole genomes (Golle et al., 2017). Based on MLST, we identified 98 known sequence types and 12 new types. The data were transmitted to the PubMLST international database. The presence of carbapenemase genes was found in 6.5% of clinical strains and in 27% of environmental strains. Carbapenemase encoding genes were found in three sequential types of *P.aeruginosa* (ST111, ST235, and ST654), which also occur frequently in neighbouring countries (Guzvinec et al., 2014).

Meletis G, Exindari M, Vavatsi N, et al. Mechanisms responsible for the emergence of carbapenem resistance in Pseudomonas aeruginosa. Hippokratia. 2012;16(4):303-7.

Golle A, Janezic S, Rupnik M. Low overlap between carbapenem resistant Pseudomonas aeruginosa genotypes isolated from hospitalized patients and wastewater treatment plants. PLoS One 2017;12(10):e0186736.

Guzvinec M, Izdebski R, Butic I, Jelic M, Abram M, Koscak I, et al. Sequence types 235, 111, and 132 predominate among multidrug-resistant pseudomonas aeruginosa clinical isolates in Croatia. Antimicrob Agents Chemother 2014;58(10):6277-83.

Monitoring airborne pollen

Andreja Kofol Seliger, Anja Simčič

We monitor allergenic pollen within the National Laboratory of Health, Environment and Food as the only laboratory of its kind in Slovenia. We upgrade the quality of our routine work by developing the profession, informing the public about pollen levels, and offering short-term forecasts, information and tools that help users implement preventive measures and understand allergic diseases.

Allergic rhinitis is a global health problem, and pollen as an inhalation allergen is one of the risk factors for its occurrence.

The Aerobiology Group within the NLZOH performs year-round measurements of pollen at the national level, in accordance with the SIST EN 16868:2019 standard, which defines the sampling and analysis of pollen grains based on Hirst's volumetric method.

Pollen information is intended to help the general public understand the disease and adhere to preventive behaviours. They are published on the NLZOH website, where a newly created pollen calendar is also available. It shows information on the average start, duration and end of the pollen season in the area where measurements are made. An important part of the information is short-term forecasts for the country's continental lowlands and for the coastal area.

In cooperation with the Slovenian Environment Agency (ARSO), we publish monthly inspections of pollen levels in their newsletter Naše okolje. We are in a transitional period when new methods for bioaerosol measurement are gradually being introduced. In connection with ARSO, which is a member of the European Meteorological Services Network (EUMETNET), we are involved in the AutoPollen programme, which aims to develop guidelines for the transition from manual to automatic bioaerosol measurement in real time. We are involved in COST action CA18226 – New approaches in detection of pathogens and aeroallergens.

We cooperate with the Medical University of Vienna, which owns the European Aeroallergen Network – EAN, where we send the results of our measurements. The database is managed, operated and developed by the research unit Aerobiology and Pollen Information. This database is also the basis of the Pollen Diary, intended for users to simultaneously obtain information on exposure and self-assess their health status. The database is also used to evaluate pollen forecasting models developed within the Copernicus Atmosphere Monitoring Service (CAMS) and the European Centre for Medium-Range Weather Forecasts (ECMWF).

In the field of invasive species, the greatest emphasis is placed on ragweed. An analysis of the measurements confirmed the air pollen count gradient in a West-East direction, where it reaches the highest pollen counts in Europe. We cooperated with the Hungarian National Public Health Centre (NPHC) on a project aimed at creating the Ragweed Pollen Alarm System (R-PAS) in the Danube region.

During the epidemic, we participated in an international study on the association between airborne pollen exposure and SARS-CoV-2 infection (Damialis A. et al., 2021).

Damialis A., Gilles S., Sofiev M., Sofieva V., Kolek K., Bayr D., Plaza M.P., Leier-Wirtz V.,

Kaschuba S., Ziska L.H., Bielory L., Makra L., Trigo M., COVID-19/POLLEN study group, Traidl-Hoffmann C. 2021.Higher airborne pollen concentrations correlated with increased SARS-CoV-2 infection rates, as evidenced from 31 countries across the globe. 118 (12) e2019034118; DOI: 10.1073/pnas.2019034118.

Food safety as a public health factor

Vesna Viher Hrženjak, Barbara Škrjanc, Katja Zelenik, Jernejka Franko, Jerica Ivanoš

Healthy foods are one of the basic external factors for maintaining and improving individual health and public health. The National Laboratory of Health, Environment and Food (NLZOH) is involved in food safety processes in Slovenia at all stages of food production, processing and distribution through sampling, laboratory testing, evaluations, suggestions for improvement, awareness raising and research work.

Healthy foods are one of the basic external factors for maintaining and improving individual health and public health. For foodstuffs to be healthy, the adequacy of their composition in terms of the content of vital nutrients that affect the biological and energy value is important, as is food safety.

Ensuring food safety is one of the strategic activities of the NLZOH. As a supporting professional institution of the Administration for Food Safety, Veterinary Sector and Plant Protection (UVHVVR) and the Health Inspectorate of the Republic of Slovenia (ZIRS), we are involved in food safety processes in Slovenia at all stages of food production, processing and distribution. We participate in the preparation of national control programmes, perform food sampling, chemical and microbiological testing of foods, assess food labels and, based on the results, produce conformity, safety and risk assessments. We prepare annual reports and, in cooperation with the responsible authorities, report data on the methods and results of food testing to the European Food Safety Authority. We are the national reference laboratory for performing sets of chemical tests on foods of plant and/or animal origin (pesticide and PAH residues, heavy metals, mycotoxins, mercury, residues of certain veterinary drugs, dioxins and PCBs, organic phosphorus compounds) and for testing of materials coming into contact with food. In addition, we are the appointed official laboratory to perform chemical and microbiological tests on foods of plant and/or animal origin (contaminants, additives, allergens, quality and chemical composition) and food sampling.

In the field of ensuring food safety, we also provide professional assistance to food business operators. We participate in the verification of HACCP systems in public institutions, as well as perform chemical and microbiological testing of foods for various partners. We participate in education and raising awareness among professional public and consumers through contributions at conferences at home and abroad as well as at professional meetings, and publications in various media. We participate in national and international research projects in the field of food safety.

We are distinguished by well-equipped laboratories, high professional qualifications of staff and a large number of different testing methods. With activities accredited according to the SIST EN ISO/IEC 17025:2017 standard, we ensure internationally recognized independence and professional qualifications, confidence in test results and international recognition of our issued reports.

Our work in the field of ensuring food safety contributes to maintaining and improving public health.

Monitoring of drinking water and the MPV information system

Sandra Mertik, Darja Repnik

At a time when much of the world is facing water scarcity, the developed world sets the criteria for assessing the characteristics of drinking water that are important to humans. The National Laboratory of Health, Environment and Food (NLZOH) is the provider of drinking water monitoring in Slovenia. The results of monitoring are recorded in the monitoring information system and thus converted into useful information. In the period from 2007 to 2021, we noticed a marked improvement in the quality of drinking water.

At a time when much of the world is facing a scarcity of drinking water, the developed world sets the criteria for assessing the characteristics of drinking water that are important to humans. Drinking water is being monitored in Slovenia in accordance with the *Rules on Drinking Water* (Official Gazette of the Republic of Slovenia, No. 19/2004, 35/2004, 26/2006, 92/2006, 25/2009, 74/2015 and 51/2017) in order to protect human health from the harmful effects of any pollution of drinking water. The provider of monitoring is the National Laboratory of Health, Environment and Food (NLZOH). The drinking water monitoring programme is prepared annually and defines sampling points, sampling frequency, sampling methodology and physical, chemical and microbiological tests. Drinking water sampling is performed at consumers' water taps. Tests determine the presence of bacteria and various chemical substances, such as pesticides, metals, nitrates, drug residues and others, and we also monitor the content of minerals and other microelements. Based on the results, we make conformity and health suitability assessments of drinking water and risk assessments, and propose the most appropriate ways to reduce the risk to human health.

The results of drinking water monitoring are tracked in the *Drinking Water Monitoring Information System* (MPV IS). The providers of measurements and testing report the results to the IS MPV through their laboratory information systems. All results are verified by the system administrator before final entry. The IS MPV enables different ways of querying data and the consistency of results can be checked from different spatial and temporal aspects. This converts the data on the test results into useful information, which was one of the basic principles guiding the update performed in 2012.

Drinking water tests provide important information about the state of the environment in which we live and the water we drink. After many years of monitoring drinking water, we can establish that good quality drinking water is available in Slovenia. In the period from 2007 to 2021, we noticed a marked improvement in the quality of drinking water. In 2007, bacteria of faecal origin were detected in 20% of samples, while this share is currently 2.2%. Chemical consistency of water is achieved in 98% of samples. Monitoring of drinking water is among the factors that have contributed to good results.

Quality of ambient air with PM_{10} particles in Maribor

Uroš Lešnik, Benjamin Lukan

Polluted air is the leading environmental cause of premature death in the EU, killing ten times more people than road traffic accidents.[1] Effective reduction of pollutant levels requires as much knowledge as possible about the pollutants. We researched this issue in Maribor as part of the PMinter project[2] with partners from Klagenfurt and Lipnica in the years 2010–2013.

Polluted air has a major impact on the health of European citizens. For 2018, estimates of the impact of exposure to PM2.5 particles in Europe show around 417,000 premature deaths, 55,000 for nitrogen dioxide and 20,600 for ozone[3]. Certain groups of the population (e.g. in urban areas) are more exposed to polluted air than others. The negative impact of polluted air is also reflected in other areas, such as the impact on vegetation and on water and soil quality. Deposition of nitrogen compounds can cause eutrophication, which leads to changes in diversity and invasion of new species.

Measurements of PM_{10} particles in Maribor from 2002 to 2007 showed that the prescribed limit value was exceeded, and the reasons for this situation were still insufficiently researched at that time. The main goal of the PMinter project was to develop methods and plans for ambient air quality which would enable permanent improvement of ambient air quality and reduce the health risk for the residents of Maribor, Lipnica and Klagenfurt. The emphasis was on research of small wood biomass combustion units and their impact on quality with PM_{10} particles in ambient air. We showed that the concentrations of PM10 particles can be reduced, but it is necessary to know the detailed situation regarding the contribution of individual groups of pollutants. Based on this, it is possible to select measures and target them at the most influential sources of pollutants, taking into account local characteristics. Nevertheless, the effectiveness of measures also depends on the behaviour of individuals and the involvement of national authorities. The findings were used in drafting the *Ordinance on the air quality plan for the area of the Municipality of Maribor*.

Figure 1 shows the average annual concentrations of PM10 particles in Maribor. The data show a declining trend, which was interrupted in 2014–2018. The air in Maribor, at least as far as PM10 particles are concerned, was the cleanest in 2020 in the entire measured period 2001–2020. The findings of the PMinter project as well as other factors (natural replacement of older vehicles with newer and cleaner ones, renovation of buildings with insulating façades, replacement of building fixtures, replacement of obsolete heating devices with newer and cleaner ones), and undoubtedly the situation due to the COVID-19 epidemic all contributed to this reduction. This work should be continued, as in 2020 the measured levels of PM_{10} particles are still higher than the WHO recommended value.

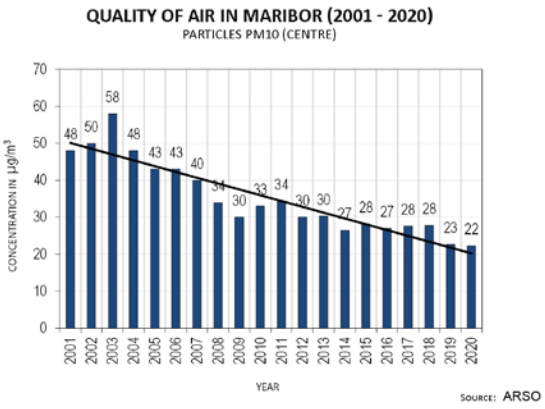

Figure: Icons from the graphic image of the programme, which illustrate the basic recommendations for protection against UV radiation.

1_http://www.mojzrak.si/vpliv-na-zdravje/

2_Operational Programme Slovenia–Austria 2007–2013, Interreg project: PMinter – interregional impact of measures for protection of ambient air against pollution with particles from road traffic and small combustion units in the border region between Slovenia and Austria.

3_Air quality in Europe – 2020 report, European Environment Agency. 2020 (9). Available from: https://www.eea.europa.eu/publications/air-quality-in-europe-2020-report.

The role of NLZOH in environmental emergencies

Vesna Viher Hrženjak, Emil Žerjal

The response of public health institutions to extraordinary environmental events is important for the protection of people's health in the affected area and, in the case of large-scale events, also of public health. The Mobile Unit of the Ecological Laboratory (MEEL) operates within the National Laboratory of Health, Environment and Food (NLZOH) for the purposes of immediate response. Once the acute danger is no longer present, NLZOH measurements and results form the basis for environmental measures and recommendations for the population.

Extraordinary environmental events (fires, floods, dumping or spillage of unknown substances, industrial accidents), pose risks to individual health and public health in addition to the risk to the environment and wild organisms. They can cause pollution of air, water (surface and groundwater, drinking water), soil, crops, objects and more. The response of public health institutions to extraordinary environmental events is extremely important for the protection of the health of the people in the affected area and, in the case of large-scale events, also of public health.

At the NLZOH, we actively respond to emergencies in several ways. The Mobile Unit of the Ecological Laboratory (MEEL) operates for the purposes of immediate response. The basic tasks of MEEL are maintaining constant readiness, rapid departure to the place of the event, performing field and laboratory chemical and biological tests, and taking measurements and participating in call-to-action measures in the event of natural or environmental disasters and terrorist actions. MEEL is activated by the national notification centre. In recent years, MEEL has been activated on average 5 to 10 times a year, most often due to the dumping or spillage of an unknown substance or fire. At the time of an accident, there is most commonly a need to take measurements of air pollution (in the case of fires), take measurements and collect samples of various elements of the environment, depending on the type of emergency. Further analyses of the samples are performed in the laboratory.

Once the acute threat is no longer present, the NLZOH cooperates with stakeholders in all sectors in environmental remediation measures and the prevention of harmful consequences for the health of the population. For the purpose of monitoring the state of the environment after the event, we perform sampling and measurement of various elements of the environment (most often surface and groundwater, drinking water, soil, crops), perform chemical and microbiological tests in laboratories and provide estimates. We have a competent team of experts from various fields involved in deciding when, what, where and how much to sample based on a preliminary risk assessment, knowledge, literature data and past experience. Our measurements and results form the basis for environmental measures and recommendations for the population.

The coordinated work of cross-sectoral experts reduces the tendency to sample absolutely everything (due to requests from different sectors and others) to the optimal number of samples and analyses required for risk assessment, preparation of measures and proposals for remediation.

Microbiological analyses for public health protection

Tatjana Rupel

The sanitary microbiological laboratories of the National Laboratory of Health, Environment and Food (NLZOH) analyse food, water and environmental samples. We have a long history, a lot of experience and our mission is to help protect the population from infections caused by inadequate water, food and the environment. We improve our knowledge and methods by participating in research, projects and international expert groups in order to provide fast and reliable results.

As part of the unified institute, which was created by merging the regional Institutes of Public Health in 2014, the NLZOH laboratories have been better connected, combining knowledge and energy to provide a wide range of analyses. We are accredited according to the ISO 17025 standard and maintain a certificate of good manufacturing practice (GMP), which allows us to participate in national monitoring and ensures confidence in our results. As the appointed official laboratory, we participate in the zoonosis monitoring programme and undergo supervision by the Administration for Food Safety, Veterinary Sector and Plant Protection, as well as supervision by the Health Inspectorate of the Republic of Slovenia. We are a key laboratory to detect infectious pathogens and food and water poisoning agents in collaboration with the National Institute of Public Health.

The laboratories perform more than 400,000 tests per year for government institutions, industries, the hospitality sector and individuals. Furthermore, we participate in several research projects that study the appropriate environment in schools, sanitary drinking water and antimicrobial activity of various materials and plant extracts. Cooperation with various Slovenian and foreign experts provides us with a high level of knowledge.

As part of the European Microbiology Expert Group (EMEG) for drinking and bathing water we exchange opinions, experiences and knowledge that provide key data for the drafting of EU legislative requirements.

We offer professional internships to high school students and university students, specialisation interns and trainees. In this way, we help with education and transfer our specific knowledge.

The laboratories are now focusing their knowledge on solving the problems caused by the epidemic. We evaluate the suitability of products used to disinfect hands and surfaces. The risk of infection with legionella and other microbiological factors has increased due to the long-term closure of catering establishments and tourist accommodations, therefore additional monitoring and demonstration of adequacy through microbiological analyses is required before reopening.

Laboratories for microbiological analysis of food, water and other environmental samples are an indispensable part of prevention, and their work provides the people of Slovenia with the information they need to prevent infections from food, water or the environment. During the epidemic, we proved that we are able to adapt and provide our services even in emergency situations, thus ensuring appropriate results based on which users decide on safety measures. Our operation will be particularly important in the future as we face the consequences of a changed lifestyle due to the epidemic.

Testing for the presence of drugs

Roman Kranvogl

Testing is intended for drug users in order to reduce the risk of overdosing and other complications associated with the use of unknown substances. The service of testing illicit psychoactive substances is provided within the project *Development and upgrading of a network of mobile units for implementing preventive action and programmes to reduce harm in the area of illicit drugs*.

Acceptance of samples of psychoactive substances is anonymous and is possible at various reception points throughout Slovenia. Upon acceptance of the sample, users are also provided with information on drug-related harm reduction and advice on drug-related problems.

Analyses of psychoactive substances are performed in the laboratory of the National Laboratory of Health, Environment and Food (NLZOH) using appropriate instrumentation, and in a mobile unit in the field. We report on the results of performed analyses and provide advice and basic information on reducing the risks of using new psychoactive substances. We guarantee the performance of accurate analyses. We work continuously to ensure development of the service from an analytical point of view.

In the stationary laboratory, we use four different analytical techniques for determining psychoactive substances: FTIR-ATR spectroscopy (FTIR-ATR), high pressure liquid chromatography with DAD analyser (HPLC-DAD), gas chromatography with mass analyser (GC-MS) and liquid chromatography with mass analyser based on ion transit time (LC-MS-QTOF) to identify new psychoactive substances. The user receives the results of the analysis within a few days.

The mobile laboratory consists of three departments. The first department is intended for photographing and weighing samples, the second for sample preparation and the third for the analytical part (FTIR-ATR and HPLC-DAD). The analysis takes 20 minutes from receipt of the sample to issuing the result.

Official quality control of medicines

Andrej Golmajer

Medicines, which are of particular importance to society as a whole, must demonstrate quality, safety and efficacy before being granted a marketing authorization. The Official Control Laboratory for the quality control of medicines operates within the National Laboratory of Health, Environment and Food (NLZOH). 450 medicines were analysed in 2020. This ensures a high level of quality control of medicines on the market and contributes to the protection of public health.

Medicines, which are of particular importance to society as a whole, must demonstrate quality, safety and efficacy before being granted a marketing authorization. After medicines are placed on the market, market surveillance is performed by the Official Control Laboratory to confirm that the quality of a medicines is met and maintained throughout shelf-life. The beginnings of official quality control of medicines in Slovenia date back to 1955 with the establishment of the Institute for Pharmacy and Drug Research in Ljubljana, at Ptujska ulica 21, where the Official Control Laboratory (UKL) of the NLZOH still operates today. The UKL is included in the European Network of Official Control Laboratories (OMCL Network) at the European Directorate for the Quality of Medicines (EDQM). The quality of UKL's work is monitored through periodic audits of the quality system carried out by EDQM. Our work involves independent quality control of medicines, which is necessary to ensure the presence of quality medicines for human and veterinary use in Slovenia and the consequent protection of public health. UKL actively participates in the following activities of the OMCL Network, which ensure a high quality of work:

- intercomparison studies organized by EDQM;
- quality control of centrally authorized medicines (CAP) available on the European market;
- collaborative studies of Ph. Eur. monographs;
- quality control of medicines authorized under the mutual recognition procedure (MRP) or the decentralized procedure (DCP).

Four types of official quality control of medicines are required by the Medicinal Products Act. The main activity of UKL is regular quality control of medicines on the market, which includes sampling of medicines (usually in pharmacies or wholesalers), analytical testing of medicines and assessment of labelling and patient information leaflet. The number of tested medicines as part of regular quality control is gradually increasing over the years – 450 medicines were analysed in 2020 – which ensures a high level of quality control of medicines on the market.

Special quality control of medicines, which is carried out for each batch of blood products and vaccines, proved to be a very important aspect of the official quality control of medicines, especially during the pandemic. This is related to the national release of these types of medicines, the number of which significantly increased especially in 2021 due to the COVID-19 vaccines. In the case of COVID-19 vaccines, regular cooperation with the NIJZ and JAZMP was necessary to ensure that logistics, national release and vaccination were implemented as quickly as possible.

08
MONITORING AND DEVELOPMENT OF HEALTH CARE

Thirty years of the health care system in Slovenia

Tit Albreht

The health care system in Slovenia is a mixed system both in means of ownership and service delivery, formed by public institutions like community primary healthcare centers, public hospitals and public institutes, with the involvement of private concessionaires. Public health measures, implemented in collaboration between public health institutions and stakeholders and the primary healthcare level, have contributed to reducing premature mortality and the burden of lifestyle-related risk factors. Hospital inpatient treatments have become shorter and more intensive and more focused on outcomes, quality, and patient satisfaction.

In the last 30 years, the Slovenian state has steered the development of the health care system through several planning and strategic documents and changes to the basic health legislation, which outlined the system in 1992.

The health care system contributed considerably to the extension of life expectancy, reaching 81.6 years in 2019, which puts Slovenia at the level of Germany and Denmark (OECD, 2019). From the public health point of view, the most important changes were the introduction of new health education, promotion, prevention and screening programs and public health measures at the population level (legislation, intersectoral health programs and measures to protect and promote health by addressing health determinants, and national programs to reduce the burden of selected priority diseases - cancer, diabetes, obesity, HIV / AIDS, rare diseases, mental health). With the latter, we were able to significantly reduce the burden of premature mortality, mainly of cardiovascular disease and suicide. This was followed by the successful introduction of three cancer screening programs (ZORA, DORA, Svit Program). These public health measures were upgraded with programs addressing the four risk factors related to lifestyle - first through the development of health education centres, and in the second decade by introduction of the so-called reference practices - family medicine practices with additional half-time registered nurse, who is responsible for monitoring well-managed chronic patients, screening for non-communicable diseases risk factors and counselling about healthy lifestyle.

Related to health care organization and financing, a key innovation was the introduction of payment for hospital treatment according to the diagnosis-related groups (DRG) system. This way, we significantly shortened the average length of stay in hospital, which at the time of independence in 1992 was 11.5 days, and has since been reduced to 7.7 days (Zdravstveni statistični letopis, 2019). This shift was underpinned by the financial incentives for daily hospitalizations, i.e., those in which the patient does not stay overnight in the hospital.

Institutional public health was transformed by merger of the Institute of Public Health of the Republic of Slovenia and nine regional institutes of health care into the National Institute of Public Health (www.nijz.si) and the National Laboratory for Health, Environment and Food (www.nlzoh.si).

Finally, it is worth mentioning the significant scale up of medical education and nursing education with opening of the second medical faculty at the University of Maribor in 2003 and a number of faculties of health sciences. Despite these measures, Slovenia still lacks a significant number of key health professionals.

More information on health system in Slovenia is available in the publication Slovenia: Health system review. Health Systems in Transition, 2021; 23 (1): pp.i-188.

OECD/European Observatory on Health Systems and Policies, Slovenija: Zdravstveni profil leta 2019, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, 2019. Available from: https://www.oecd.org/publications/slovenija-zdravstveni-profil-leta-2019-62a79a00-sl.htm.

Zdravstveni statistični letopis 2019, Available from: https://www.nijz.si/sites/www.nijz.si/files/uploaded/publikacije/letopisi/2019/6.2_bolnisnicne_obravnave_2019.pdf

1_The first Faculty of Medicine was established in the year 1919 at the University of Ljubljana.

Self-assessment of the Essential Public Health Operations in Slovenia

Pia Vračko, Eva Murko

In Slovenia, we have a long tradition of a well-developed public health system. However, despite the remarkable development over the last twenty years, the country has not yet adopted a national strategy for the development of the public health system, as envisaged by the Resolution on the National Health Care Plan 2016-2025. The COVID-19 pandemic has shown that the need to strengthen the public health system in Slovenia is now greater than ever. The Self-assessment of the Essential Pubic Health Operations (EPHO) in Slovenia presents the key findings of the current state assessment and sets out the recommendations for the development of the system that have emerged in this participatory process.

Between 2017 and 2019, the Ministry of Health of the Republic of Slovenia, in cooperation with the WHO Regional Office for Europe, the WHO Slovenia Country Office and the NIJZ, conducted a comprehensive self-assessment of the 10 EPHOs. The evaluation process was carried out systematically and was guided by the tool of the WHO European Region (WHO, 2015). Special attention was paid to the areas of financing public health activities and ofhuman resources development in public health. Over 130 experts from various institutions and organizations performing public health activities were involved in the implementation of the process and prepared a detailed description of the strengths of the public health system as well as areas to be strengthened or redeveloped (Vračko et al., 2018).

Posebnost ocenjevanja EPHO je, da v ospredje postavlja pomen procesa, ki ob ustreznem usmerjanju s strani vodij sproži razmišljanje in dialog ter iskanje rešitev v okviru najširšega razumevanja vloge posamezne funkcije. Rezultat procesa je nabor usklajenih priporočil za ukrepanje, ki so namenjena oblikovanju zdravstvene politike, pa tudi spodbujanju izboljšav ter doseganju soglasja med deležniki o prioritetah. Proces ocenjevanja EPHO je omogočil razvoj in obnovo partnerstev na vseh ravneh in med različnimi deležniki za varovanje in promocijo zdravja ter za spodbujanje vlaganja v zdravje prebivalstva. Rezultati postopka EPHO postavljajo objektivne temelje, na katerih bo pripravljena strategija razvoja sistema javnega zdravja v Republiki Sloveniji.

The uniqueness of the EPHO self-assessment is that it emphasizes the importance of a process that, with appropriate guidance from managers, triggers thinking and dialogue and the search for solutions within the broadest understanding of the role of each EPHO. The result of the process is a set of harmonized recommendations for action aimed at formulating health policy, as well as promoting improvements and reaching consensus among stakeholders on priorities. The EPHO self-assessment process has enabled the development and renewal of partnerships at all levels and between different stakeholders to protect and promote health and to promote investment in the health of the population. The results of the EPHO process lay the objective foundations on which the strategy for the development of the public health system in the Republic of Slovenia will be prepared.

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Development of a demand projection model for specialist doctors in Slovenia

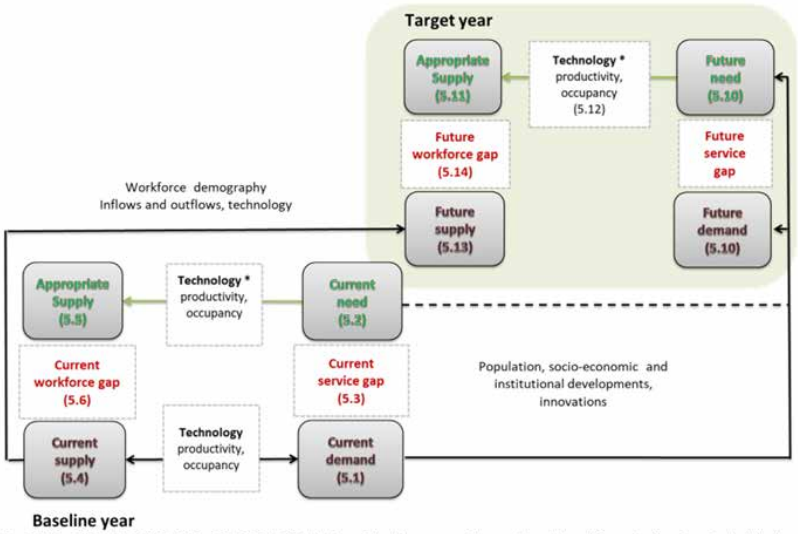
Petra Ogrin Rehberger, Blaž Povž, Stane Marn

In cooperation with the Ministry of Health and with international technical support, the National Institute of Public Health (NIJZ) has developed a demand projection model for specialist doctors designed for planning the development of the health workforce.

In the model, we focused on the supply of doctors (number of doctors, number of FTEs, retirement), demand for health services (number of citizens and treatments by age and gender, regional characteristics) and gaps (staff shortage or surplus) in individual types of healthcare activities by medical specializations. Based on the analyses, we prepared the results and findings for 25 specializations regarding the need for doctors for the entire country of Slovenia, as well as for its statistical regions (for the secondary and tertiary levels of health services) or for administrative units (for primary healthcare), in the period from 2020 to 2035.

The results of the model-based approach to determining the need for specialist doctors for individual types of health activities and specializations represent a starting point for discussion and coordination among stakeholders in the health system (MH, ZZS, SZD sections and associations, RSK and ZZZS). We believe that this data will have a significant impact on the quality of decision-making on the need for doctors in Slovenian healthcare.

The demand projection model for specialist doctors was developed as part of the two-year project *Planning and Management of the Public Health Service Network*. The Ministry of Health implemented it between 2017 and 2019 with the help of the European Commission's Structural Reform Support Service (SRSS) and the National Institute of Public Health (NIJZ) as the carrier of activities on the Slovenian side. The NIJZ has taken on the task of introducing this model, which is based on the expected development of the existing supply (both the network of providers and human resources) and future demand for health services, into regular use for strategic personnel planning in healthcare. During the process of modelling the need for doctors, the NIJZ continued with a detailed analysis of data sources in healthcare, some of which have already been connected and used, while others are still being prepared for use. Projections of the need for doctors are a continuous process based on the assumptions defined within the project and the assumptions that we have identified based on subsequent findings. The model is open to change based on population, socio-economic, institutional and political developments.



Vir: BASYS, GÖG, NIJZ, MZ, ZZZS, MZ (2019), Distribution of healthcare providers and health workforce in Slovenia, Funded by the Structural Reform Programme of the European Union, Augsburg, Vienna, Ljubljana.

Achievements in emergency medical care

Darko Čander

The system of emergency medical care (hereinafter: EMC) represents one of the key elements of a modern healthcare system. It has been proven that an effective system of EMC, in terms of positive economic effects, exceeds several times the costs of the actual operation of the EMC service, and is viewed around the world as extremely cost-effective.

In line with the strategies for developing healthcare, in the period since the last amendments to the *Rules on the EMC Service* (2008), the EMC network has been updated and enhanced in the following areas:

1. The construction and organisation of emergency centres at two University Medical Centres and in nine general hospitals.
2. Setting up a medical dispatcher service.
3. Strengthening the primary network and separating out the concurrent work of physicians on the primary level.
4. Introducing first responders into the EMC system.
5. Arranging for healthcare provision at events.
6. Introducing checks of competence and systematic training of EMC units in the area of natural and other disasters.

Along with the changes, adjustments were also made to the legal basis for the operation of the EMC system, with the issuing of new *Rules on the Emergency Medical Care Service (2015), Rules on the Conditions of Operation of Rapid Emergency Medical Care (2016) and Rules on the Medical Dispatcher Service (2017)*.

With the construction of emergency centres there was a need to reorganise the existing system of duty services into a single system that offers patients accessible, high-quality and safe treatment of emergency conditions for all inhabitants of Slovenia. At emergency centres, patients are placed at the centre of attention regarding their state of health, without any unnecessary prior examinations or contingencies in caring for emergency conditions on the secondary level. For the purpose of setting up and organising the operation of emergency centres in accordance with the guidelines *Single methodology for organising emergency centres in the Republic of Slovenia*, the Ministry of Health allocated for providers additional funds for financing two activities, specifically the urgent examination unit, observation room and triage.

Pre-hospital EMC took into account the public debate of 2015 in maintaining the existing network of EMC units and thereby access to health services. In agreement with the partners, the Ministry of Health secured an increase in funding to enhance the network and separate out the work of physicians between individual work sites (work in family medicine clinic, EMC and post-mortem examination service). Currently activities are underway on arranging the post-mortem examination service, and we are cooperating actively with the Medical Chamber of Slovenia regarding an overhaul of the EMC network, which will involve a new definition of the role of the family practitioner within the EMC system.

The medical dispatcher service, established under the aegis of the University Medical Centre Ljubljana, has been embedded in the EMC system. It represents the primary entry point for EMC, and its operation can affect the outcome of each individual intervention. Setting up and operating the medical dispatcher service in Slovenia signals one step further towards equal access to services and an improvement in the quality of EMC services for all inhabitants, an improvement in the quality of non-emergency and medical transportation of patients, and an improvement in the preparedness of the health system to function in special and emergency situations.

The Ministry of Health drafted and published two key documents in this area, the textbook *Medical Dispatcher Service* (Fink and Kolar, 2015), which is aimed at educating personnel to work in dispatcher centres, and *Slovenian EMC Index*, which is the basic decision-making tool for medical dispatchers. Using this tool, medical dispatchers can quickly determine the level of urgency for intervention, and activate an appropriate type of EMC team, and can also give instructions or guidelines to a caller over the telephone, until the EMC team arrives.

First responders, who are activated via the system called ReCO 112[1], are in practice members of protection and rescue forces, and work within the framework of volunteer firefighting societies or other organisations. In several local environments, good practices have been established through the cooperation of EMC services with local communities in rapid response in the area of cardiac arrest and activation of first responders with automatic external defibrillators (AED). Results indicate that this is an important building block in attaining access times and thereby improving survival rates following cardiac arrest.

In the Rules on the EMC Service we systemically arranged the area of AED devices in public places. The Medical Dispatcher Service will keep records. This will serve to facilitate regular and comprehensive monitoring of this substantively important area.

In accordance with the third paragraph of Article 21 of the *Rules on the EMC Service* the Ministry of Health, aiming to establish a uniform standard of knowledge and qualifications of providers of EMC outside hospitals, organises through a selected provider tests of knowledge for all health workers involved in the EMC service. The testing of knowledge and qualifications is substantively separated into a set for testing qualifications for physicians and a set for graduate health workers and emergency health workers. At the same time regular annual training is provided for EMC units for cases of responding to major disasters, and training for health team responses in the event of radiological, chemical, biological and nuclear accidents. The training has been shown to be very useful, particularly so with the occurrence of the SARS-CoV-2 epidemic, where the majority of EMC unit members were familiarised with the proper use of protective equipment.

During the crisis and the period of cutting costs, due to the reduction in the prices of services the EMC system lost nearly EUR 4 million at the pre-hospital level. A similar thing happened in the area of funding emergency activities in hospitals, which up until the introduction of emergency centres as autonomous units was conducted under the system of charging for the services of specific activities. The Ministry of Health actively embarked on rearranging the system of funding EMC activities, and thus in the period from 2015 to 2021 secured additional funds for the development of activities in the amount of almost EUR 40 million. On the primary level, cofinancing of municipalities is carried out for those that established health centres, for the procurement of equipment such as AED, ambulances (46), vehicles for emergency service physicians (35) and other vital equipment for providing EMC.

Further development of the EMC system will require the short-term addressing principally of challenges which, on the appearance of the epidemic, have pointed to systemic deficiencies in the operation of the system. A key challenge at the moment is the earliest possible conclusion of investment to include all EMC units in the operation of the medical dispatcher system, strengthening the activities of emergency centres at hospitals and an overhaul of the network of mobile units and duty stations in Slovenia, with the aim of:

- completely eliminating the concurrent work of physicians at several work sites;
- improving the access of mobile EMC teams and physicians in special vehicles in the field;
- ensuring high-quality responding in the field – of the physician to patients in terms of providing urgent medical services at home, including palliative care, and
- ensuring high-quality and comprehensive care under the EMC system at strategic points (satellite emergency centres).

Fink A, Kolar M. Dispečerska Služba Zdravstva: Učbenik Za Usposabljanje Zdravstvenih Dispečerjev. Ljubljana: Republic of Slovenia, Ministry of Health, 2015.

1_ Regional notification centres, which respond to 112 emergency calls.

Slovenia primary health care model

Pia Vračko, Tatjana Krajnc Nikolić

Multidisciplinary, integrated, patient-centred Primary Health Care (PHC) forms the foundation of the Slovenian health system. It is the entry point into the health system and provides universal access to health services to address most of the population's health care needs in one place, covered by compulsory social health insurance. As such, the model closely resembles the Declaration of Astana vision of »comprehensive, integrated, accessible« care, which is »affordable to everyone and everywhere«, and puts into practice the principle of universal health coverage (UHC).

PHC is provided by the network of 63 community health centres (CHCs), complemented by private providers – so-called concessionaires – contracted with the Health Insurance Institute of Slovenia. It provides access to a wide range of promotional, preventive, diagnostic, curative, rehabilitative and palliative health services to address the population's health needs across the life course. It also provides emergency medical care. As an entry point into the healthcare system, PHC has an effective goalkeeping role, giving primary care specialists a good position to serve as coordinators of their patients' care (WHO, 2020; Johansen, 2020).

PHC services in Slovenia are delivered by multi-profile teams that evidence suggests are needed to effectively care for a population whose burden of disease is dominated by NCDs. Slovenia's multi-disciplinary teams comprise a variety of health professionals including: general practitioners (GPs), who are specialists in family medicine; paediatricians, gynaecologists and dentists; community nurses and family medicine nurse, midwives; physiotherapists, occupational therapists, kinesiologists, psychologists, pharmacists, dietitians and other health professionals.

Adults are registered with their chosen family medicine specialists, where in addition to the treatment of acute and chronic medical conditions, performed by physician, graduate nurses perform periodic screening for the most common chronic diseases and risk factors and monitor well-managed chronic patients[1]. Women have access to a personal gynaecologist at the CHCs and receive a variety of reproductive health services, including cervical cancer screening, prenatal care and family planning. Children from birth until 19 years of age receive preventive and curative health services from a personal paediatrician in their CHCs. Preventive health checks include the monitoring of child growth and development as well as a schedule of recommended and mandatory vaccinations. As part of a national oral health programme, a paediatric dental practice is situated on the premises of primary schools, and a visiting CHC-based nurse provides repetitive oral health promotion services to children in the first three grades. Innovative approaches to promoting oral health in children include an annual competition where classes of school children compete for having the best oral health in Slovenia.

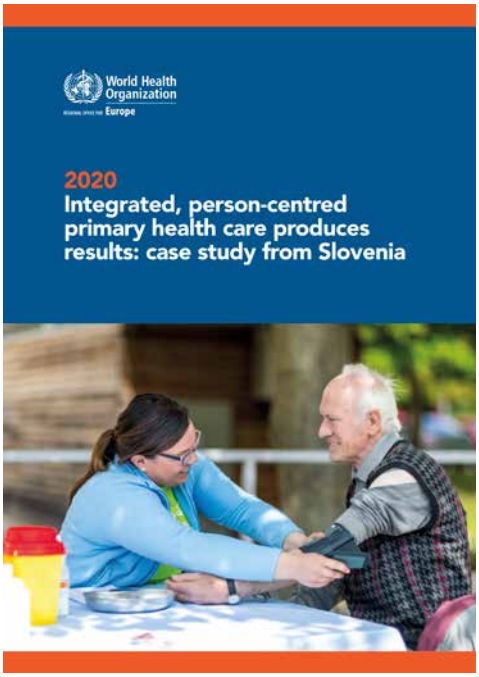
Aiming at better managing the burden of chronic diseases associated with unhealthy lifestyles, health education centers were established in 2002, and since 2016 they have been gradually upgraded to health promotion centers (HPCs)[2]. HPC is characterized by multidisciplinary teams of experts, a programmed way of working and the implementation of a community approach to health - the »whole of society approach«. They provide preventive health programs, including collaboration with partners in the local community by implementing tailored outreach approaches for vulnerable groups. An important activity of CHCs is the implementation of health education programs for various target populations. Community nurses play an important role in preventive care, and also provide home care, palliative care and long-term care. In addition, CHCs reside some secondary level specialist outpatient clinics, to facilitate access to these services closer to person's

home. Large CHCs provide comprehensive outpatient health care, from health promotion through program-based health education for all population groups, to early detection of risk factors and their appropriate management, to diagnosis, treatment and rehabilitation. Part of the structural changes to the PHC is the establishment of a national network of mental health centers for children and adolescents and for adults, which provide better access to psychological and outpatient psychiatric services, which in some places complement community mental health services.

In 2019, in collaboration with the WHO regional Office for Europe, an analysis of PHC was conducted, which resulted in recommendations to address the system challenges that threaten the sustainability of Slovenia's impressive PHC achievements. The recommendations are the basis for the designing a comprehensive strategy for the development of primary health care in Slovenia, which is envisaged by the National Health Care Plan 2016-2025.

Health promotion and disease prevention at PHC in Slovenia is based on programs aimed at managing major public health problems (early detection of risk factors, health education, community approach for health of the vulnerable population groups) and immediate action and improving the health of all population groups (including pregnant women, children, adolescents and adults). All programs are implemented uniformly across the country, their funding is solid, their performance is monitored, and are available free of charge to all residents.

Through PHC, Slovenia has achieved UHC in all three dimensions: service coverage, financial protection and population coverage. Particularly, successful cooperation between public health and primary health care is an example of good practice for countries that want to place primary health care as »the cornerstone of a sustainable health system for universal health coverage (UHC) and health-related Sustainable Development Goals (SDG)«.



Integrated, person-centred primary health care produces results: case study from Slovenia. Copenhagen: WHO Regional Office for Europe; 2020. Available from: https://apps.who.int/iris/bitstream/handle/

10665/336184/9789289055284-eng.pdf

Johansen A S, Vracko, P, West R. (2020). The evolution of community-based primary health care, Slovenia. Bulletin of the World Health Organization, 98 (5), 353 - 359. World Health Organization, 2020b. http://dx.doi.org/10.2471/BLT.19.239616

1_The family medicine nurse's role in primary health care management of patients with non-communicable diseases in Slovenia. https://www.euro.who.int/___data/assets/pdf_file/0007/441916/case-study-family-medicine--specialist-nurse.pdf

2_Health promotion centres in Slovenia: Integrating population and individual services to reduce health inequalities at community level. https://www.euro.who.int/___data/assets/pdf_file/0004/377428/hss-ncd-policy-brief-slovenia-eng.pdf?ua=1

Slovenian health system performance assessment

Denis Perko, Blashko Kasapinov

In the period 2017–2019, the first assessment of various aspects of the Slovenian health care system was performed. We have developed a framework with clear domains and relevant indicators. It turned out that the Slovenian health care system works well or very well, in certain areas, but radical changes are needed in other areas. This was a positive process that offered us the opportunity to recognize the weaknesses and strengths of the Slovenian health care system.

Health care system vary in different countries. One of the key tools for evaluating the performance of the system is the Health System Performance Assessment (HSPA), which is increasingly used by many countries as a means of monitoring the quality, accessibility, efficiency, economy and other important areas of the health care system (WHO, 2008; WHO, 2000).

In March 2016, Slovenia adopted a Resolution on the National Health Care Plan 2016–2025 "Together for a Society of Health", which recognized the need for a more comprehensive approach to monitoring the operation of the health care system. In 2017, an application was submitted to obtain funding from the Structural Reform Support Program for the development and implementation of the HSPA. The contract was signed in the fall of 2017. The project started running in late October 2017 and ended with the production of a report in the Summer of 2019.

The objectives set were to develop a framework for the HSPA, to produce the first HSPA report and to build capacity for the future implementation of the HSPA without additional external support.

The Donabedian model was chosen as the framework of the assessment of the health care system. It includes three sets of assessment: inputs, processes, and outputs. It consists of selected domains: determinants of health, sustainability of funding, creation and management of resources, health promotion and disease prevention, efficiency, quality and safety, equality and accessibility, responsiveness and focus on the person and population health status. The domains were mapped to the model according to the three sets.

2055 indicators were considered in the selection process, and 69 indicators and 26 sub-indicators were included in the final list. The results of individual indicators were presented in graphical, tabular or other form. Each indicator was presented separately, followed by a comment. Some indicators were not assessed due to missing data (Figure).

The year 2016 was chosen as the base year. According to the indicator, the time analysis was done for at least 10-15 years, depending on the availability of data. Depending on availability, EU28, EU15, OECD and WHO data were used for international comparison.

None of the domains were ranked as very good or very bad. Four domains (health, quality and safety, efficiency, equality and accessibility) were classified as good, three (resource creation and management, responsiveness and focus on the person, health promotion and disease prevention) as satisfactory and two (sustainability of funding, determinants health) as poor.

It can be concluded that the Slovenian health care system is performing well, while facing many challenges that call for its adjustments.

Tallinn Charter on Health systems for health and wealth. World Health Organisation. s.l.: WHO European Region, 2008.

World Health Organization. The world health report 2000: Health systems: improving performance. Geneva: World Health Organization, 2000.

National clinical cancer registries

Vesna Zadnik, Katarina Lokar, Ana Mihor

Clinical cancer registries enable the monitoring of indicators to evaluate the quality of care for cancer patients. In Slovenia, within the population-based Slovenian Cancer Registry national clinical registries are being set up for skin melanoma, lung, breast, colorectal and prostate cancer. A national clinical registry for childhood cancer is also being established for surveillance of late effects of cancer treatment in childhood.

Short- and long-term monitoring of quality of care indicators for cancer patients is only possible if precise and detailed data on the type of disease, method of diagnosis, treatment procedures and response to treatment are available. These data are gathered in what are called clinical registries. Data on diagnosis, treatment and disease progression are quite sparse in population-based cancer registries.

The National Cancer Control Plan 2017–2021 envisaged the establishment of national clinical registries for breast, prostate, colorectal, lung cancer, and skin melanoma. These are the five most common cancers which account for more than half of all cancers in the Slovenian population. Stepwise establishment of the five clinical registries was planned. The national *Clinical Registry of Skin Melanoma* was set up in 2017; it was for skin melanoma that a professional consensus was reached first on the set of data that should be recorded to monitor the quality of care. In 2019, the national Clinical Registry of Lung Cancer was established, and in 2021 the remaining three are being set up – breast, colorectal and prostate cancer registries. Parallel to this, a national *Childhood Cancer Clinical Registry* is being established to monitor and prevent late effects of cancer treatment in childhood and adolescence more effectively and systematically at the individual level.

The Slovenian national clinical cancer registries are set up as part of the population-based Slovenian Cancer Registry, which already has population- and health system-specific knowledge on the collection, processing, storage and analysis of cancer patient data; in particular, it already has a system in place for obtaining a core set of data on cancer patients and the legal basis for its operations.

Clinical registries allow for ongoing monitoring of quality indicators in the diagnosis and treatment of common cancers throughout the entire cancer patient pathway, from diagnosis to treatment. They also monitor compliance of treatment with current guidelines, the number of annual treatments by individual providers, treatment complications, survival and so forth. The analysed data provide invaluable feedback to clinicians, allowing them to identify and correct systemic deviations, as well as to verify that the set criteria for the network of oncology centres are met.

Figure: First report by the national Clinical Registry of Skin Melanoma.

Monitoring the consumption of prescription medicines in hospitals

Tatja Kostnapfel

In accordance with the *Databases Act* and in addition to the already established collection of data on the consumption of medicines prescribed on green and white prescription forms, the National Institute of Public Health (NIJZ) has also begun the systematic collection of data on the consumption of medicines prescribed in all hospitals. The report was supplemented with the consumption of expensive hospital medicines (List B) and the consumption of ampoules and other medicines for outpatient treatment within the framework of materials that are billed separately (List A). In this way, we established a comprehensive overview of the consumption of prescribed medicines.

Appropriate prescribing of medicines, which takes into account both professional and economic factors, has an important social role, and constant monitoring of the consumption of medicines contributes to the more responsible handling and proper use of medicines. This is one of the areas of public health whose long-term objective is to prevent disease, and to protect and improve health as well as raise the quality of life. Monitoring and analysis of data on the consumption of medicines in accordance with the Databases Act in the field of healthcare for national purposes is being carried out by the National Institute of Public Health (NIJZ) as an independent organization by using two databases, specifically NIJZ 64 – Register of Consumption of Prescription Medicines and NIJZ 66 – Register of Hospital Use of Medicines (Official Gazette of the Republic of Slovenia, 2020).

The main purposes of the analysis of data on the consumption of medicines are to provide information on the supply of medicines and on morbidity, to draw attention to the role of responsible prescribing of medicines, and promote the efficient use of resources. Monitoring of data is also the basis for monitoring and planning of the healthcare system. The information obtained through the analysis of data on consumption of medicines is also useful for identifying which groups of patients are prescribed particular medicines, which can also be used to evaluate the adequacy of therapeutic guidelines.

The NIJZ has also established a system for monitoring the consumption of medicines in hospitals on the basis of data provided by 30 hospitals, of which 26 are public and three are publicly funded private hospitals (Diagnostic Center Bled, Surgical centre Rožna dolina, Medicor), along with the public health institution Youth Climatic Health Resort Rakitna. The analysis of medicines is prepared in three sets – separately for general, specialized and psychiatric hospitals.

The Anatomical Therapeutic Chemical (ATC) Classification System is used to monitor the prescribing of medicines. The consumption of medicines is shown as the number of defined daily doses (DDD) and the number of defined daily doses per 1,000 inhabitants per day (DDD/TID) at the five levels of the ATC classification (WHO, 2020).

The Resolution on the National Healthcare Plan (ResNPZV) 2016–2025 "Together for Healthy Society" plans to ensure the correct and safe use of medicines and equal access to quality and safe healthcare for all, along with comprehensive treatment taking into account the health needs of the ageing population, user orientation and user empowerment while maintaining cost-effectiveness. Various measures based on this resolution ensure the rational use of medicines and better access to quality pharmaceutical care.

With the support of a comprehensive analysis of prescribing and dispensing of medicines, we also ensure the optimization of prescribing of medicines.

Healthcare Databases Act. Official Gazette of the Republic of Slovenia, 2000; 65/00, 31/18).

Guidelines for ATC classification and DDD assignment. WHO Collaborating Centre for Drug Statistics Methodology, 2020 Oslo: WHO Collaborating Centre for Drug Statistics Methodology. Available from: https://www.whocc.no/atc_ddd_index_and_guidelines/guidelines/.

Resolution on the National Healthcare Plan 2016–2025: "Together for a Healthy Society". Official Gazette of the Republic of Slovenia No. 25/2016.

Experience of patients in the Slovenian healthcare system

Eva Murko, Marcel Kralj, Nina Ropret

The experience of patients with medical treatment is becoming increasingly recognized as an important indicator of the quality of healthcare in developed societies. Political documents and commitments in Slovenia also emphasize the importance of patient-centred healthcare. The National Institute of Public Health has, since 2019, been conducting national surveys on patient experience at the secondary and tertiary levels of healthcare.

The experience of patients with medical treatment PREMs (Patient Reported Experience Measures) is becoming increasingly recognized as an important indicator of the quality of healthcare –– and is often mentioned in national and international health policies in developed societies (Gleeson, 2016; Klazinga and Fujisawa, 2017).

Between 2006 and 2012, the Ministry of Health conducted a national survey on the experience of patients in acute and psychiatric hospitals in Slovenia. In 2017–2019, the National Institute of Public Health (NIJZ) participated in a project of developing and upgrading tools and building capacities for monitoring the experience of adult patients in outpatient specialist care and acute hospital care with providers involved in the public health system network. As part of the project, the first national surveys were conducted in 2019 in specialist outpatient clinics and in acute hospitals. The survey in specialist outpatient clinics was responded to by over 8,000 patients, who had visited 149 specialist outpatient clinics performing six different types of healthcare activities. The clinics were rated with an average score of 9.25 on a scale of 0 to 10. Based on these results, Slovenia will be able to report patient experience indicators for the first time in the OECD publicationHealth *at a Glance* for the year 2021. Based on the data from other OECD member states published in the same publication for 20193, we estimate that Slovenia's results are slightly above the average of countries that report such data to the OECD.

Healthcare providers have received an individualized document reporting the quantitative and qualitative results at the level of the outpatient clinic, the clinical activity and at the level of Slovenia (Figure 1). Based on the results, they were able to introduce improvements in the quality of health services, as well as of their equipment, inventory, etc. Both PREMs surveys were very well received by most providers.

A PREMS website was created on the web portal of the National Institute of Public Health (NIJZ) – *My Experience, Our Healthcare: Survey on the Experience of Patients with Medical Treatment* (https://www.nijz.si/sl/prems), which offers the visitor key information about PREMs surveys.

In 2020, the NIJZ repeated the national survey in specialist outpatient clinics, but this time for other clinical activities. We are also conducting both surveys in 2021. With the implementation of this type of research, Slovenia ranks among those advanced countries that have a developed system for monitoring healthcare from the point-of-view of patient experience.

Gleeson H. Systemic review of approaches to using patient experience data for quality improvement in healthcare settings. BMJ Open 2016; 6: e011907, doi: 10.1136.

Klazinga, N. and R. Fujisawa , "Measuring patient experiences (PREMS): Progress made by the OECD and its member countries between 2006 and 2016", OECD Health Working Papers, 2017:102.http://dx.doi.org/10.1787/893a07d-2-en.

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The economic burden of public health problems

Sabina Sedlak

The National Institute of Public Health (NIJZ) assesses the economic burden of certain diseases and health conditions using a methodology of direct and indirect costs. The purpose of the calculation is to provide information on how much a certain disease or health condition burdens the healthcare system, and to highlight the importance and cost-effectiveness of investing in prevention. This can reduce the incidence of premature retirement and death and improve the quality of life for both the individual and Slovenian society as a whole.

Public health problems such as risky and harmful alcohol consumption, smoking, suicidality, and conditions such as dementia, musculoskeletal and connective tissue diseases represent a major burden on health systems. The reports, which were created in cooperation with the Faculty of Economics of the University of Ljubljana, have been prepared at the National Institute of Public Health since 2017. Data used for the analysis of the economic and social consequences of diseases and health conditions are obtained from the databases of the National Institute of Public Health (NIJZ) and from the Pension and Disability Insurance Institute (ZPIZ). All burden estimates are based on the calculation of direct and indirect cross-sectional costs incurred within one year. Direct costs are related to medical treatment, while indirect costs are related to loss of productivity due to absence from work and loss of future earnings or income due to premature retirement. Various cost analyses, such as the report titled *Economic Consequences of Dementia in Slovenia in the Period 2015–2017* (https://www.nijz.si/sl/publikacije/ekonomske-posledice-demence-v-sloveniji-v-obdobju-2015-2017), are intended for all residents of Slovenia, and particularly for the professional public, as each public health problem is also presented from the financial point of view. Research on the cost of disease in other countries also shows what a country gains from managing to reduce the incidence or eliminate a particular disease or health condition. Early detection and identification of certain diseases, warning of risky behaviours and the dangers of alcohol consumption and use of tobacco products, supported by financial data, contribute to raising awareness and the better understanding of public health goals aimed at improving the quality of life of individuals and Slovenian society in the future.

1_Available from: https://www.nijz.si/sl/publikacije/ekonomske-posledice-demence-v-sloveniji-v-obdobju-2015-2017

National Mental Health Program 2018 - 2028, MIRA Program and mental health centers

Jožica Maučec Zakotnik, Mojca Zvezdana Dernovšek

In March 2018, the Parliament of the Republic of Slovenia unanimously adopted the Resolution on the National Mental Health Program 2018-2028 (NPDZ18-28), which sets out a development strategy for mental health care in Slovenia. The national program is called MIRA Program. In the first action plan of NPDZ 18-20, we focused mainly on establishing a network of mental health centers (CDZ) in order to increase accessibility to mental health services at the primary level of health care.

The MIRA Program is action-oriented, it responds to key mental health challenges and fills gaps in the mental health care system.

The identified mental health challenges are:

- to introduce community approaches to mental health care in the local environment
- to establish supportive environments for mental health and introduce preventive and promotion programs to support mental health in all environments
- to reduce the number of suicides and provide support to those who have attempted suicide and their relatives
- to improve the availability of care at the primary level of health care
- to support deinstitutionalisation in the field of mental health
- to reduce stigma and discrimination and to increase mental health literacy
- to ensure the quality of programs and services, monitoring, evaluation, research and development in the field of mental health care

Activities aimed at strengthening mental health and prevention in the first action plan NPDZ18-20 were not carried out to the planned extent due to lack of support from decision-makers and financial resources and the outbreak of the Covid-19 epidemic, which greatly changed priorities. However, we exceeded the plan in the number of established CDZs.

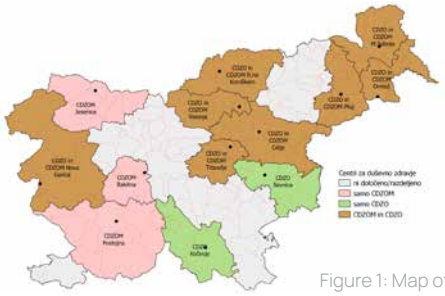


Figure 1: Map of the network

The MIRA program envisages the establishment of 25 Mental Health Centers for Adults (CDZO) and 27 Mental Health Centers for Children and Adolescents (CDZOM). CDZs represent major advances in community and outpatient care, provided by a multidisciplinary team of professionals, and are designed for geographic areas with a certain population size. They provide local access to assistance and connect with various stakeholders within the network of mental health services with the aim of integrated and continued care for people with mental health problems. During the first action plan, we exceeded the originally planned number of 3 CDZO and 3 CDZOM and established 11 CDZOM and 10 CDZO.

The COVID-19 epidemic has increased mental health problems for the entire population, and especially for children and adolescents. To address the urgently increased need for hospitalizations of children and adolescents with mental health problems during the COVID-19 epidemic, we established, in cooperation with the Ministry of Health, additional hospital beds and a day hospital.

In order to increase the availability of assistance in 2021, the CDZ network with additional 10 CDZOM (a total of 21 out of 27 required) and 4 CDZO (a total of 14 out of 25), which include existing mental health dispensaries and mental health specialists already working in community primary healthcare centers. Currently, most CDZs operate with minimal teams. In order to achieve standard interdisciplinary teams in CDZ, it is necessary to accelerate the provision of staff with clinical specialization, which can be achieved by increasing the number of specializations and redeploying staff from psychiatric hospitals to CDZ.

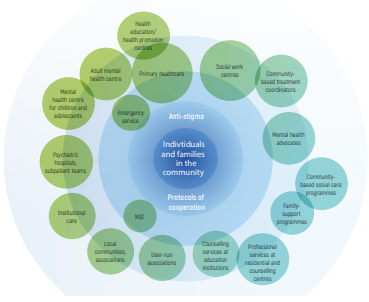


Figure 2: Mental health services network.

Intersectoral Regional Council for Public Health of Goriška

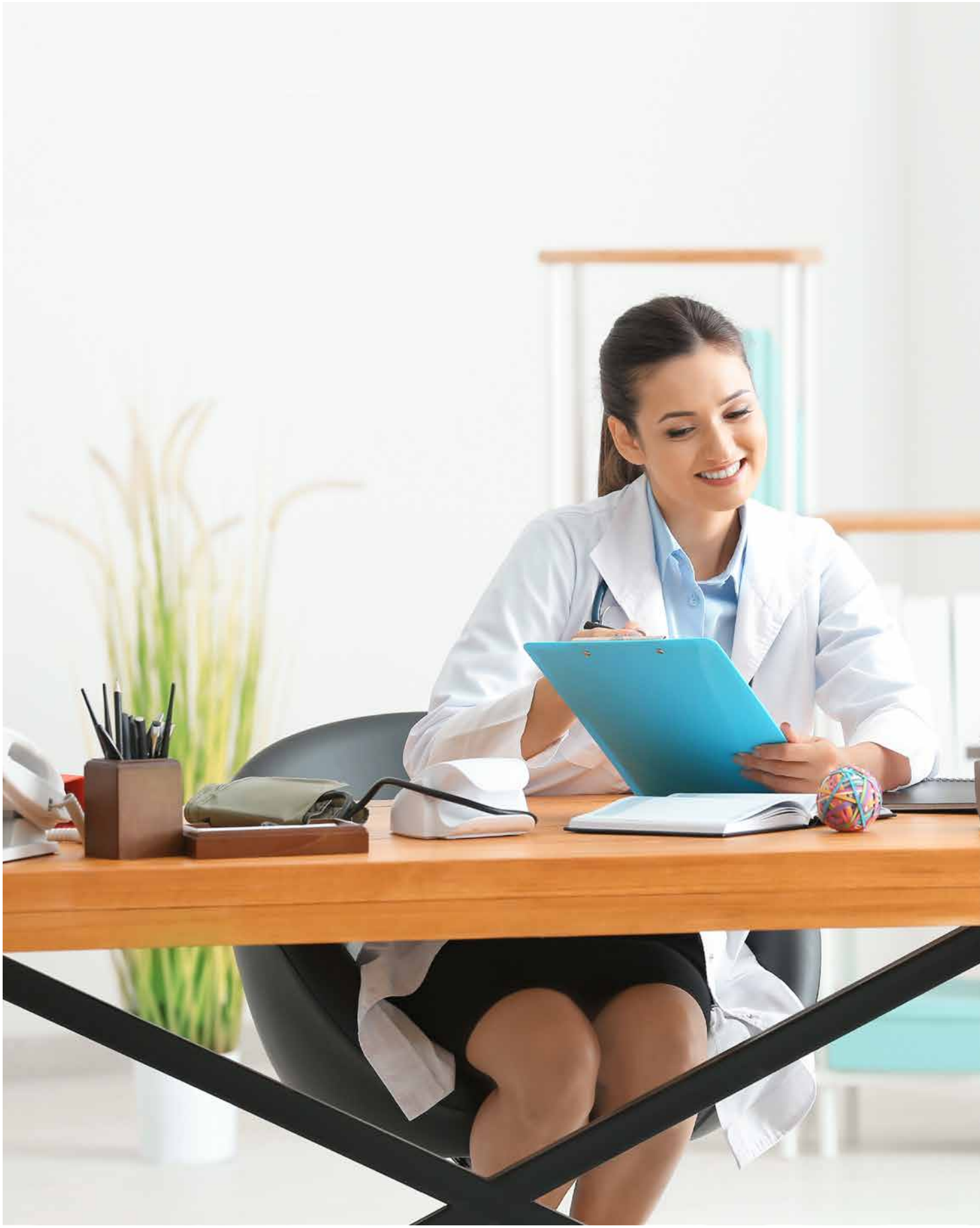
Marko Vudrag

On 10 May 2010, the Intersectoral Regional Council for Public Health (Medregijski svet za javno zdravje, MRSJZ) was established at the Institute of Public Health, which was the predecessor of the current Nova Gorica Regional Office of the National Institute of Public Health (NIJZ).

It is an informal and voluntary association of representatives of public and non-governmental stakeholders in the region (healthcare, local self-government, education, sports, culture, social work institutions, development agencies, business, NGOs, disability organizations…), where twice yearly discussions are held on critical health and social issues, as well as related topics that are important to the local community. At the first meeting, we defined the purpose, objectives, tasks and methods of monitoring and reporting on the measures that would be adopted in consensus with the decisions made at later meetings. The basic objectives of the Council are: 1) to emphasize the importance of the horizontal integration and (co)operation of all stakeholders in society to strengthen health, 2) to establish joint programme cooperation to reduce public health problems in the region, such as the rise of cancer and chronic diseases, and 3) to raise public awareness of the importance of prevention and establish a working group to prepare a regional strategy to reduce health inequalities.

In the previous period, we organized 18 meetings of the MRSJZ, and the 19th meeting will follow in June 2021, at which we will reflect on the broader social and health effects of COVID-19. The MRSJZ meetings are attended by representatives of many departments and organizations in the region, not only representatives of the health and social departments, because a network of stakeholders with predefined activities enables the target populations, especially vulnerable groups, to be reached effectively through prevention programmes and campaigns. We have also prepared an *Implementation Plan For The Reduction Of Health Inequalities*, so that in 2011 the *Strategy for the Reduction of Health Inequalities* by Strengthening Health in the Goriška Region was created. Our methodological approach is an example of good practice in cross-sectoral cooperation – *Health in all policies*. This is one of the reasons why we in the Goriška region have been successful in three screening programmes for early detection of cancer (ZORA, DORA, Svit) – as a region we have the best results in the country. Notable successes in preventive health were also achieved with the Healthy Schools project. We have carried out numerous public campaigns, including events and the public signing by all 13 mayors of several concrete collaborations in the implementation of public health activities.

The operation of the MRSJZ is of great strategic importance for the planning of sustainable development at the regional level, as cross-sectoral healthcare, together with investment in health and healthcare, makes an important contribution to economic, social and environmental development. Such collaborations and innovative bottom-up approaches are also valued as examples of good practice by international standards.



09
NGOs IN PUBLIC HEALTH

NGOs in public health

Kerstin Vesna Petrič, Samra Mušić

In the developed world it is already a tradition that NGOs cooperate in carrying out public health activities. They operate in sensitive areas in which the state's measures, for various reasons, cannot fully or appropriately meet people's needs. NGOs are the first to recognise the consequences of social and other changes for the well-being of individuals, populations and social groups, thus drawing attention to them and being the first to react.

By means of public tenders, the Ministry of Health co-finances programmes in different areas of public health such as preventing addiction to illegal and legal drugs and non-chemical addictions; improving mental health; empowering and raising awareness of patients with chronic noncommunicable diseases; the environment and health; nutrition and physical activity; preventing and controlling infections with HIV and other sexually transmitted diseases; and preventing infectious diseases by promoting vaccination.

By co-financing the activities of NGOs in the field of health, the Ministry also ensures additional employment, above all for young experts in the field of public health and others who are interested in this field of work. In this way we have improved the expertise of programme providers in the field of public health and enabled constructive cooperation between professionals and civil society. New tools have been created such as mobile applications to support the promotion of a healthy way of life, numerous consultations and trainings have been carried out, campaigns to raise awareness have been organised and guidelines for work with different population groups have been prepared.

In 2019 the first national conference took place at which NGOs and public institutions operating in public health programmes, both locally and on a national level, were presented according to their field of activity, and this showed that the greatest strength of NGOs in the field of health is their involvement in the local environment and their ability to adapt rapidly to the needs of people where they live.

This form of operation gives good results. In recent years, many NGOs that are co-financed by the Ministry have received international awards and recognition for their projects and programmes, including from the European Commission and the WHO. Some projects have also been listed as examples of good practice on an EU level.

Co-financed programmes are being carried out across the entire country and cover all fields of public health. The programmes involve different population groups with different needs, often including the most vulnerable population groups.

Here are some examples of the operation of NGOs and public institutions in the field of public health:

1. The Incredible Years programme is carried out by Javni zavod Mala ulica (public institution) in cooperation with the Paediatric Clinic. The programme helps young parents who have children aged between 3 and 9 years who have problems growing up.

2. The Slovenian Union of Autism NGOs, the ASPI Association, društvo ASPI, offers support and help to parents and children with autism or other special needs.

3. The Advisory Centre for Children and Adolescents treats children and adolescents experiencing mental health problems together with psychologists and psychiatrists.

4. The Centre for Psychological Counselling, Posvet, offers psychological advice to individuals, couples and families experiencing emotional distress and needing expert help.

5. Beli Obroč Slovenije – the Association for Assistance to Victims of Crime offers support to victims of violence and psycho-social and legal help to victims of crime.

6. Društvo UP, Projekt Človek, and ŠENT are associations that offer advice to parents and young people who are having problems connected to illegal drug use.

7. IZRIIS, IPoP, the Slovenian Association for Public Health, the Environment and Tobacco Control, Mladinsko združenje Brez izgovora (No Excuse), ARS VITAE, Association for Preventive Work, UTRIP, Zavod 7, Zavod Etnika, Društvo Vesela kuhinja, Inštitut ROK, the Association of Slovenian Socie-

ties of Cured Alcoholics, ISA Inštitut, the Federation of Slovenian Anti-Cancer Societies, Slovenian Diabetes Association, University of Primorska, Associations of Bonding Psychotherapists, NIJZ, Higher School of Applied Sciences, Debeli Rtič Youth Health and Holiday Centre, Diabetes Education Institution, and Slovenian Caritas are only some of the NGOs and public institutions organising workshops for children in schools to raise awareness about a healthy lifestyle and the risk factors they are exposed to.

8. **Slovenian Caritas Maribor and various youth associations (IMZTR, BREZ IZGOVORA, eMC PLAC, DrogArt, SKAVTI)** prepare and carry out healthy lifestyle workshops for young people outside the school environment in organised groups of young people. This is mostly a peer-to-peer approach, which demands the training of a certain number of young people.

9. Legebitra, ŠKUC, DIH, and the Association of Medical Students implement activities for the prevention of infection with HIV, hepatitis and sexually transmitted diseases, including work with hidden groups such as men who have sexual relations with men, and drug addicts. Slovenia is one of the rare countries not to have suffered an AIDS epidemic.

10. The Association of Medical Students organises activities to increase the number of vaccinated people in Slovenia and to promote vaccination. It regularly cooperates with **NIJZ**.

11. The Association of Friends of Youth Moste-Polje, ZRC SAZU, and the Association for Perinatal Medicine implement counselling programmes for couples, individuals and families in distress.

12. The Cancer Patients Association of Slovenia, Europa Donna - Slovenian Association Against Breast Cancer, Slovenian Association of Patients with Lymphomas and Leukaemia L&L, EuropaColon Slovenija Association, Slovenian Osteoporosis Association, Association of Slovenian Coronary Societies and Clubs, Federation of Slovenian Anti-Cancer Societies, Društvo League Against Epilepsy, Association Against Cancer and Other Chronic Illnesses ko-RAK.si, "Trepetlika" Parkinson's Disease Society of Slovenia, Emonicum Institute, Slovenian Celiac Disease Association, Slovenian Diabetes Association, Centre for Health and Development Murska Sobota, Sinapsa, Association for Chronic Inflammatory Bowel Disease, Institute for Research, Education and Sustainability Development Celje, Chamber of Nursing and Midwifery of Slovenia, Slovenian Stroke Support Society implement programmes of empowerment and awareness-raising in the field of chronic non-communicable illnesses and provide support for patients with chronic illnesses.

13. Kralji Ulice, Anton Trstenjak Institute, Društvo Stigma, Društvo Žarek Upanja, Zavod Vozim, Zavod Varna pot, ZA SRCE, Zavod NORA, Zavod Etnika, Center Šteker, ABSTINENT – the Association for an Ordered Life, Association of Slovenian Bonding Psychotherapists, and Association of Slovenian Societies of Cured Alcoholics, Vesele nogice, Humanitarno društvo Reto center - prijatelj upanja, MAKROBIOS PANONIJA so. p., Permakulturni center za boljšo kvaliteto življenja in za pot k samozadostnost organise programmes to prevent and reduce the use of illegal and legal drugs and non-chemical addictions to address the needs of the most vulnerable groups that usually do not ask for help from health institutions, but due to different life stories and problems rather look for help elsewhere.

14. Društvo Zdrava pot and the STOPINJE INSTITUTE for logotherapy, mediation, education and research help to female illegal drug addicts and their children (the Zdrava pot association) and implement programs for detainees and their children, partners and family.

15. The Slovene Consumers' Association, Slovenian Society for Cardiovascular Health, Nutrition Institute, Društvo Vesela kuhinja, Urban Planning Institute of the Republic of Slovenia, Institute for Spatial Policies, Jožef Stefan Institute, School of Health Association, Association for a Culture of Inclusion, Caritas of the Archdiocese of Maribor and the Chamber of Commerce and Industry of Slovenia, UNICEF, Slovenian Red Cross – Federation of Associations prepare programmes above all to raise awareness about a healthy diet and physical activity amongst different population groups – children, young people, adults and the elderly.

16. The Institute of Oncology, Slovenian Association for Clinical Nutrition, Novo Mesto General Hospital and the Clinical Department of Haematology UMCL operate in the field of patient and clinical nutrition.

17. IMZRT, UIRS, and the Adult Education Centre Ormož carry out programmes for the cooperation of young people who are active in the fields of environment and health on the basis of the Strategies of the Republic of Slovenia for the health of children and adolescents in connection with the environment 2012–2020 and the implementation of the Ostrava Declaration (Better Health and a Better Environment).

List of co-financed NGOs and public institutions 2019–2022

Ord. No.	Organisation
1.	"Trepetlika" Parkinson's Disease Society of Slovenia
2.	"UP" Association Helping Addicts and Their Families
3.	ARS VITAE - Society for the Development and Implementation of Programmes
4.	Beli obroč Slovenije, Association Helping Victims of Crime
5.	Centre for Health and Development Murska Sobota
6.	Centre for Psychological Counselling, Posvet
7.	ASPI ASSOCIATION Association Helping Adults with an Autism Spectrum Disorder - Asperger's Syndrome
8.	Društvo DIH - equal under the rainbow
9.	Društvo Ključ - the Centre Working Against Human Trafficking
10.	Association for culture, information and counselling, Centre LEGEBITRA
11.	Društvo League Against Epilepsy
12.	Cancer Patients Association of Slovenia
13.	Društvo Projekt Človek
14.	Društvo ŠKUC
15.	School of Health Association
16.	Association of Medical Students Maribor
17.	Society of Medical Students of Slovenia
18.	Društvo Vesela kuhinja
19.	Association Against Cancer and Other Chronic Illnesses ko-RAK.si
20.	Chronic Inflammatory Bowel Disease Association
21.	Association for a Culture of Inclusion
22.	Youth Association IndiJanez (Šteker Center)
23.	Association for the Help and Self-help of Homeless People Kralji ulice
24.	Association for Help and Self-help in Addiction Zdrava pot
25.	HAPPY FEET Association for Care of Persons with Developmental Disorders
26.	Association for Preventive Work
27.	ABSTINENT - Association for an Ordered Life
28.	Slovenian Society for Cardiovascular Health
29.	Stigma - Association for the Reduction of Harm due to Drug Abuse,
30.	Association Ray of Hope
31.	Europa Donna - Slovenian Association Against Breast Cancer
32.	Chamber of Commerce and Industry of Slovenia - Chamber of Agricultural and Food Production Companies
33.	Humanitarian Association Reto Center - Friend of Hope
34.	Jožef Stefan Institute
35.	Anton Trstenjak Institute for Gerontology and Intergenerational Coexistence
36.	Emonicum Institute, Institute for an Active and Healthy Life
37.	INSTITUTE STOPINJE for Logotherapy, Mediation, Education and Research
38.	Institute for Youth Participation, Health and Sustainable Development (IMZTR)
39.	Nutrition Institute
40.	Institute for Research and Development "Utrip"
41.	Institute for Developing Personal Quality - ROK
42.	IPoP – Institute for Spatial Policies
43.	ISA institute - Institute for Psychological Counselling and Educational Development Projects
44.	Public Institute Mala ulica - Centre for Children and Families in Ljubljana

Figure 1: List of co-financed NGOs and public institutions 2019–2022

45.	Clinical Department for Haematology, UMCL Ljubljana
46.	Adult Education Centre Ormož
47.	MAKROBIOS PANONIJA so. p., Permaculture Centre for a Better Quality of Life and the Path to Self-sufficiency
48.	Youth Network no Excuse Slovenia
49.	Debeli Rtič Youth Health and Holiday Centre
50.	National Institute of Public Health – NIJZ
51.	Caritas of the Archdiocese of Maribor
52.	Institute of Oncology
53.	Union of Slovenian Red Cross Associations
54.	SiNAPSA, Slovenian Neuroscience Association
55.	Slovenian UNICEF Foundation
56.	Slovenian Caritas Maribor
57.	Slovenian Association for Public Health, the Environment and Tobacco control – SZOTK
58.	Slovenian Celiac Disease Association
59.	Slovenian Association of Patients with Lymphomas and Leukaemia, L&L
60.	Slovenian Association for Clinical Nutrition (SZKP)
61.	Slovenian Suicide Prevention Association
62.	Slovenian Association for Reducing the Harmful Consequences of Drug Abuse – DrogArt
63.	Novo Mesto General Hospital
64.	Counselling Centre for Children, Adolescents and Parents Ljubljana
65.	ŠENT - Slovenian Asociation for Mental Health
66.	University of Primorska (UP IAM)
67.	Urban Planning Institute of the Republic of Slovenia
68.	VARNA POT Institute for Help for Road Accident Victims, Prevention, Education and Training
69.	Higher School of Applied Sciences Ljubljana, Independent Higher Education Institution
70.	VOZIM - Institute for Innovative Education
71.	ZAVOD 7, Design and Implementation of Socially Responsible Programmes Nova Gorica
72.	Zavod eMCe plac, Zavod mladine šaleške doline
73.	Zavod Etnika
74.	Zavod IZRIIS
75.	Zavod Nora, Centre for Modern Addictions (LOGOUT)
76.	NewPrevent Institute for Education and Prevention
77.	Diabetes Education Institution
78.	Institute for Research, Education and Sustainable Development Celje
79.	Nurses and Midwives Association of Slovenia - Union of Professional Associations of Nurses and Midwives of Slovenia, Section for Nurses in Endocrinology
80.	Slovenian Stroke Support Society
81.	Associations of Bonding Psychotherapists
82.	Slovenian Catholic Girl Guides and Boy Scouts Association
83.	Association for the Fight Against Colorectal Cancer – Europacolon Slovenija
84.	Research Centre of the Slovenian Academy of Sciences and Arts
85.	Slovenian Osteoporosis Association
86.	Slovenian Diabetes Association
87.	Association of Slovenian Societies of Cured Alcoholics
88.	Association of Slovenian Coronary Societies and Clubs
89.	Association of Slovenian Autism NGOs
90.	Slovenian Consumers' Association
91.	Slovenian Association of Friends of Youth Ljubljana Moste-Polje
92.	Federation of Slovenian Anti-Cancer Societies

Figure 1: List of co-financed NGOs and public institutions 2019–2022

10
SLOVENIA'S CONTRIBUTION TO INTERNATIONAL HEALTH AGENDA

Membership of the World Health Organization Executive Board

Kerstin Vesna Petrič

Since becoming an official member in 1992, the Republic of Slovenia (RS) has established a long-standing successful and constructive cooperation with the World Health Organization (WHO). The international community's acknowledgement of Slovenia's efforts in fulfilling the vision and commitment to attaining more just, sustainable and responsible development in confronting the challenges now facing humanity in the field of health is also reflected in the election of Kerstin Vesna Petrič as a member of the WHO Executive Board for the period 2021–2023. This is a prestigious and respected function in one of the most senior decision-making bodies of the WHO, which allows a country to cooperate directly in deciding about the WHO's priority fields of work, and indirectly contribute to the work of this international organisation.

Cooperation between Slovenia and the WHO is a two-way process, where Slovenia benefits from the technical support of the WHO while at the same time making an important contribution at the highest possible level to shaping WHO priorities, realising health policies and international strategic commitments, while on a professional level it helps in preparing new guidelines, tools, mechanisms and in the exchange of experience and good practice.

In the course of its WHO membership, Slovenia has hosted numerous WHO meetings and consultations. We should mention two of the most important international WHO events in Slovenia which represented important milestones and helped the development of further WHO processes for faster progress in ensuring better health. At the first WHO ministerial conference on health systems in 1996 in Ljubljana, one of the key documents for the strengthening of health systems was adopted: The Ljubljana Charter on Reforming Health Care in Europe (WHO, 1996). The conference also resulted in the foundation of the European Observatory on Health Systems and Policies, of which Slovenia is a partner. During Slovenia's Presidency of the Council of the EU in 2008, the Ljubljana Charter was upgraded by the Tallinn Charter (WHO, 2008), which was then supplemented in 2018. It should be emphasised that reforms and solutions for adapting health systems to new challenges always respect the values and principles written in these two charters.

The other historical milestone was the first WHO global conference on a high level to reduce inequalities in health in 2019, at which the Ljubljana Statement on Health Equity was adopted (WHO, 2019). As a leading country in the field of managing inequalities in health, Slovenia hosted an event which focused on the importance of appropriate investment in policies and interventions, which together influence the basic conditions for healthy living in the following areas: health services; income security and social protection; living conditions; social and human capital; and decent work and employment. The conference also served as a basis for further preparations for the ten-year European action plan to increase equity in health.

Slovenia's visibility on the international level is evident also in the numerous national models adopted at a local level, which also serve as case studies for other countries, e.g. integration programmes between the primary and secondary levels; enhancing primary health care by founding centres for health improvement; multidisciplinary teams for providing support to chronic patients; and various projects in which the emphasis is on intersectoral cooperation with work, social security, education, the environment, etc., and in partnership with local communities and civil society.

Slovenia is a pilot country in many fields of the WHO's operation, and has carried out many activities and projects in joint agreement with the WHO.

Numerous analyses and assessments were carried out in the period 2008–2021 with the aim of reviewing and improving the functioning of the national health system in individual health sectors depending on the altered health needs of the population. The most significant ones include: an analysis of the health system in Slovenia (2015); a joint external assessment of Slovenia's capacity to prevent and act in the event of biological, chemical and/or nuclear threats to health which have a potential cross-border effect (2017), which significantly contributed to connecting different sectors and stakeholders for readiness in the event of health threats such as COVID-19; two assessments addressing mental illnesses and the quality of institutional care for adults with psychosocial and intellectual limitations in Slovenia (2015, 2019); an assessment of the system for collecting and exchanging health information and data (2019); an analysis of the organisation and financing of primary healthcare services (2019); and an analysis is now being prepared on key functions in public health. Analyses include comparisons and good practices of other countries, an estimate of Slovenia's capacities, and proposals for further development. The performance of the analyses always includes professional representatives from Slovenia, which alongside the analysis further contributes to improving the professional capacities in areas short of professional staff.

Slovenia has so far had one representative on the WHO Executive Board, Dr. Božidar Voljč (2006–2009). Through its membership in the WHO Executive Board in the period 2021–2023, Slovenia will also have more say in negotiations for global health as part of Slovenia's Presidency of the Council of the EU. Slovenia has gained the opportunity to further improve its active role and international visibility, upgrade cooperation in international initiatives and networks and more actively co-create global politics and focus on realising jointly agreed international commitments in dealing with humanity's current challenges in the field of global health. Slovenia's representative, Kerstin Vesna Petrič, will actively contribute to promoting the WHO's values and strategic policies and to more in-depth sustainable and systematic approaches to introducing innovative solutions for resilient health systems and the creation of capacities both in the WHO and in individual countries. Improving health as the highest value and placing health at the centre of the world agenda remains the common theme, which runs throughout, from the first Presidency onwards, and remains Slovenia's most important contribution to international efforts for health.

WHO. Ljubljana Charter on reforming health care in Europe. WHO Regional Office for Europe, 1996. Available online at: https://www.euro.who.int/__data/assets/pdf_file/0010/113302/E55363.pdf.

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Coordination of European cancer projects

Tit Albreht, Marjetka Jelenc

Slovenia has been recognized in the field of cancer policies since 2008, when fight against cancer was prioritized during its presidency of the Council of Europe. Based on successful activities in the field of cancer, the European Commission has entrusted Slovenia and the National Institute of Public Health (NIJZ) the management of three projects from the group of joint action projects: *European Partnership for Action Against Cancer JA-EPAAC JA, Cancer Control JA-CANCON JA and Innovative Partnership for Action Against Cancer JA-iPAAC JA.*

The EPAAC JA project[1], which ended in 2014, involved all Member States of the European Union, Norway and Iceland. The project lasted for three years, very successfully, and the project products were remarkable and are practically useful in all participating countries. One of the very useful products of the project is the European Guide for Quality National Cancer Control Programs[2], a guide to developing high quality national cancer plans.

CANCON JA project[3] took place from 2014 to 2017, its results will undoubtedly help to improve the overall management of cancer in various health areas, from improving the quality of screening programs, to better integration of oncology health care through models of comprehensive cancer care networks, different approaches to primary care cancer care and a psychosocial approach to solving the problem of cured cancer patients, as well as in the field of palliative care. Based on the joint work of the project partners, a European Guide for Improvement in Comprehensive Cancer Control[4] was published, intended for European Member States, policy makers and the professional public. Another result of the project are the recommendtions the Cancer Control Joint Action Policy Papers[5].

The products of the ongoing iPAAC JA project will undoubtedly benefit the Slovenian and European population and cancer patients, who are present and active in most of the decisions made as part of the project work. The people of Slovenia and Europe will certainly benefit from the results of the prevention package, the updated European Code against Cancer and screening programs.

All JA projects bring together a large number of stakeholders, such as European countries, healthcare professionals, medical professionals, patient representatives, civil society representatives, NGOs and industry. Despite progress in recent years, cancer remains an important cause of morbidity in the European Union and a major burden on society, which all European countries and the European Commission are aware of.

1_http://www.epaac.eu/images/OF_Ljubljana/Cancer_book_web_version.pdf

2_https://cancercontrol.eu/archived/uploads/images/European_Guide_for_Quality_National_Cancer_Control_Programmes_web.pdf

3_https://cancercontrol.eu/archived/

4_https://cancercontrol.eu/archived/uploads/images/Guide/pdf/CanCon_Guide_FINAL_Web.pdf

5_https://cancercontrol.eu/archived/uploads/PolicyPapers27032017/CanCon_Policy_Papers_FINAL_Web.pdf

iPAAC
INNOVATIVE PARTNERSHIP
FOR ACTION AGAINST CANCER

Co-funded by
the Health Programme
of the European Union

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