

## Eighty Years of the Slovenian Institute of Public Health: Challenges for the Future

Irena Klavs, Tit Albreht, Tatjana Berger, Andreja Drev, Alenka Kraigher, Daša Moravec Berger, Peter Otorepec, Mitja Rogač, Marija Seljak, Eva Stergar, Igor Švab, Andrej Marušič

*Institute of Public Health of the Republic of Slovenia, Ljubljana, Slovenia*

Eighty years after the first national public health institution was founded in Slovenia, the Institute of Public Health of the Republic of Slovenia (IPHRS) endeavors to meet ever-growing national demands. With the independence of Slovenia in 1991, new tasks had to be tackled, many of which were initially coupled with typical difficulties of a postcommunist country in transition. Also, increasing demands of the European Union (EU) and other international partners had to be met. The IPHRS monitors the health of the Slovenian population and its determinants and contributes to planning and implementation of population-based interventions for the better health of the whole nation. The diversity of the IPHRS activities is mirrored by the organization's internal complexity, multi-disciplinary approach, and links to various sectors. Currently, activities are organized within five centers: Center for Population Health Research; Center for Health Care Organization, Economics and Informatics; Center for Environmental Health; Center for Communicable Diseases; and Center for Health Promotion. The IPHRS is the key national institution in public health research, which is an integral part of all the areas covered by the Institute. The IPHRS also provides education programs in the field of public health. In the near future, it will be important to sustain current activities while integrating into the new program of Community action in the field of public health as well as contributing to the response to challenging public health issues in the wider context of the whole European region. Our aim is to integrate the Institute's activities in the programs relevant to public health issues of outstanding importance in this European sub-region. The IPHRS, given the geographic position and recent history, can act as an intermediate between the public health networks in EU and other countries in the sub-region.

**Key words:** *Europe; public health; Slovenia*

Whereas a physician in his or her office deals with the health of individuals, a national institute of public health monitors the health in the population and its determinants and contributes to planning and implementation of population-based interventions for the improvement of health of the whole nation. Whereas medical records of any individual patient include information on date birth, risk behavior, and potentially harmful exposures, illnesses, prescribed therapies, immunizations, and advice for healthier lifestyle, national public health data sets include information on birth rates, health determinants, and population exposures to potentially harmful environmental factors, morbidity rates, death rates, premature death rates, as well as information on health care provision, health services, and health economics. Valid and reliable information on the population basis provides for evidence-based national public health policies and strategies for prevention and control of diseases and health promotion. To allow informative international comparisons, such information has to be comparable.

Eighty years after the first national public health institution was founded in Slovenia, the Institute of Public Health of the Republic of Slovenia (IPHRS) endeavors in satisfying the ever-growing national demands as well as those of the future enlarged European Union (EU), the World Health Organization (WHO), and other international partners. The diversity of the IPHRS activities is mirrored by the organization's internal complexity, multi-disciplinary approach, and links to various sectors – mostly, but not exclusively, to the health sector.

### History

With the development of preventive medicine and emergence of new approaches to public health protection in the early 20th century, the first *Hygienic Institute* (Fig. 1) was established in Ljubljana as early as 1923, on July 16. The first tasks were monitoring the quality of drinking water and milk and preparing expert opinions about safe drinking water supply. Two years later, the Institute merged with the Ljubljana Permanent Bacteriological Station, broadened its activities, and reorganized into three units: the bac-



**Figure 1.** Hygienic Institute in Ljubljana in 1923.

teriological-serological laboratory, unit for monitoring the drinking water and food provisions, and unit for hygiene promotion and education, which published educational material and organized lectures about hygiene and prevention in public health. The Institute's aims included protecting the health of the general population, promoting public health work, introducing contemporary public health methods, and providing education for physicians. The first dispensary for maternal and children's health and the first primary health care center in Lukovica were opened in 1926 (1). With the act on reorganization of hygienic institutions in 1930, the tasks of the Institute broadened and included hygiene, education, and training of general population, monitoring, and control of communicable diseases and supervision of all hygienic stations. Ivo Pirc (Fig. 2), a physician and hygiene specialist was the first director during the 1924-1932 and 1935-1945 periods. He contributed



**Figure 2.** Dr. Ivo Pirc (1891-1967): the first director and co-founder of the Hygienic Institute in Ljubljana in 1923.

to the establishment of hygienic stations and opening of the Health Museum. He developed different training courses, held lectures all over the country, and prepared numerous health topics exhibitions. He started a health journal for lay public, the *Health*, and authored and co-authored several books (2-5). During World War II, the Hygienic Institute produced vaccines, disinfectants and insecticides, laboratory chemicals, and other laboratory materials for the partisan army sanitary units. The Bacteriology and Epidemiology Unit, the core of the future Institute of Microbiology and Institute of Hygiene at the Ljubljana University School of Medicine, and the Central Laboratory for Food evolved between 1945 and 1950.

The Institute was reorganized into the Central Hygienic Institute in May 1951. Its tasks were to monitor the health of the population and improve it by taking appropriate preventive measures; to monitor and improve the hygiene in the country; to prevent and control communicable diseases; and to develop and coordinate the work of all hygienic stations. Its director was also the republic sanitary inspector. The Institute included the food and chemical laboratory and the microbiology laboratory of the city of Ljubljana.

In 1974, the Institute reorganized again into the Institute of the Socialist Republic of Slovenia for Health Care. The activities of the Institute covered the fields of social-medicine, hygiene, epidemiology, and preparation of technical recommendations for health care-related legislation. The Institute also participated in the development of public health-related postgraduate studies.

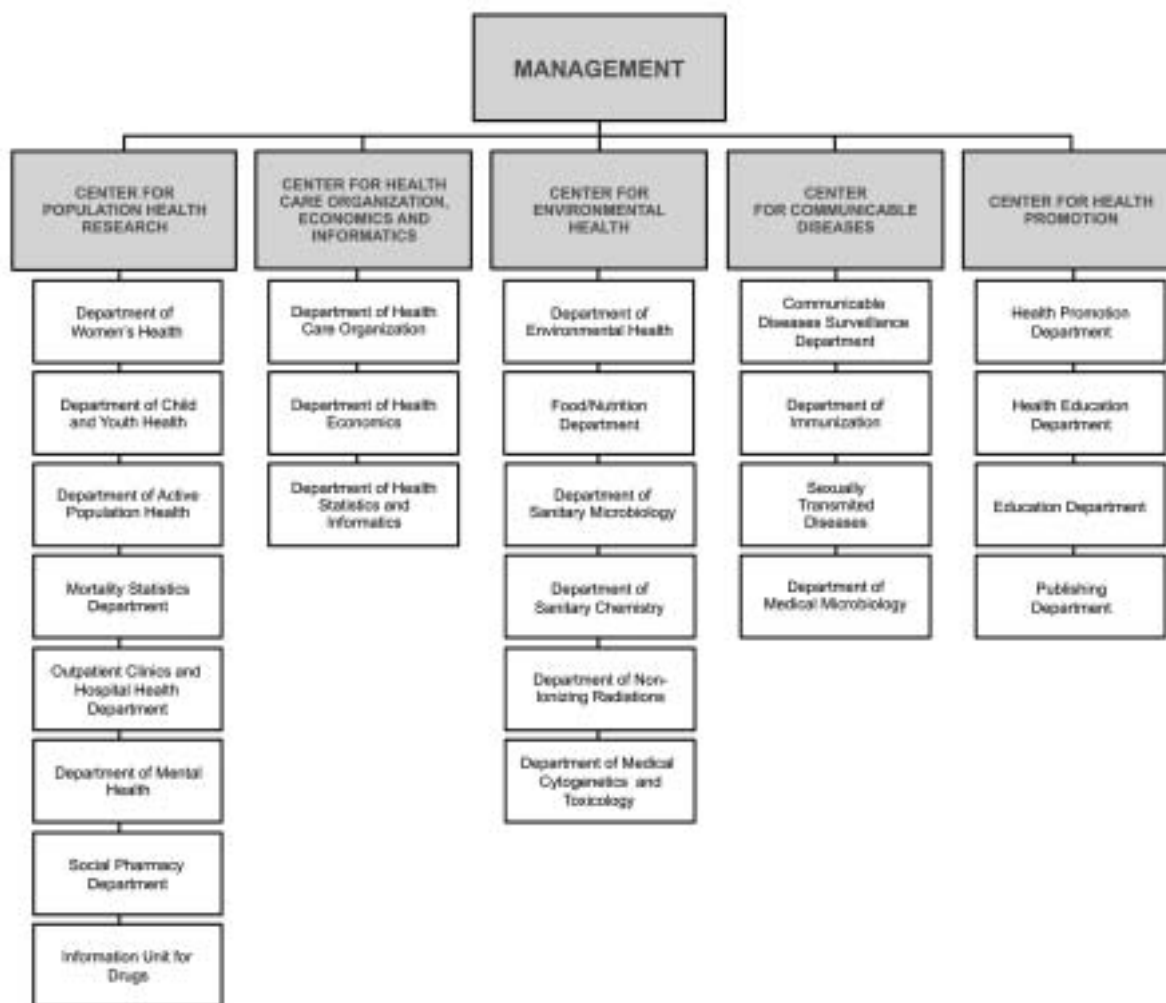
In 1985, the Institute merged with the Institute of Social Medicine into the University Institute of Health Care and Social Welfare.

The contemporary Institute of Public Health of the Republic of Slovenia, together with a national network of nine regional Institutes of Public Health, was established according to the act of the Government of Slovenia in 1992 (Fig. 3) (6). The IPHRS had to meet the demands of an independent state. There were several new tasks, e.g., import of vaccines. Initially, many of these tasks were coupled with difficulties typically experienced by a European country in transition. In addition, increasing demands of the European Union (EU) and other international partners had to be satisfied.

### Current Activities

#### *Center for Population Health Research*

The Center developed on the basis of the work of Ivo Pirc in the late 1920s and 1930s (7). Its tasks are population health, health care, and health service research. The Center maintains several important national health statistic registers and databases, namely, on mortality, hospital treatments, outpatient health care at primary and at secondary level of health care services, Perinatal Information System, and data on sickness-leave (temporary absence from work). In addition to the routine statistics and analyses of the data from these databases and surveys (8), we prepare recommendations for specific preventive activities and



**Figure 3.** The Institute of Public Health of the Republic of Slovenia in 2003: its five centers and all current departments.

suggest appropriate organizational approaches as well as legislative solutions for health care provisions in different population groups. There are nine departments: Department for Mortality and Ageing (9,10); Department for Child, School Children and Adolescent Care (11-13); Department for Women's Health (14); Department for Occupational Health (15); Department for Adult Health and Nursing (16); Department for Accidents and Injuries (17); Department for Hospital and Specialist Care (18,19); Department for Social Pharmacy (20); and Department for Mental Public Health (21,22). Two additional Units were founded in 2000: the Focal Point for Illegal Drugs Unit (23), which has been organized similarly to those in EU member states and other accession countries according to the recommendations by the European Union; and the Statistical Office (24), which assists in communications with the users of our data and those who require specially prepared data sets for specific analyses, and co-ordinates the preparation of special reports and responses to specific requests. The Center also coordinates the process to define the particularities of health related databases and registers as regulated by the Law on Health Databases (8).

The bulk of statistical results is published annually as the Health Statistical Yearbook (25) and the National Statistical Yearbook, issued by the Statistical Office of the Republic of Slovenia (26). Also, special annual reports are produced on major health problems and determinants of health, such as mortality, perinatal reports, injuries, and school children health reports (27). Statistical descriptive and analytical data are available to policymakers and incorporated in various legal and policy documents, e.g., National health plan "Health for all till 2004" (28) and White Paper on health care reform 2003 (29). Additional information is available from the Institute's website ([www.sigov.si/ivz](http://www.sigov.si/ivz)) or on request.

The Center also performs most of the IPHRS's tasks with respect to reporting of national health indicators to the WHO (*Health for All*), Eurostat (*Health Monitoring Programme*), and Organization for Economic and Cooperation Development (OECD). The Center is closely linked with the next Center, COEI, and contributing to the development of health information systems by preparing methodological background, guidelines, classifications, etc. In the future, the Center aims to develop research to explore the so-

cial causality of disease and premature mortality as well as improve the data standards and the quality of data. We also plan to get more closely involved in service and workforce planning in health care as well as in linking of various types of data across the health sector.

*Center for Health Care Organization,  
Economics, and Informatics*

The Center encompasses the activities linked to three areas: health care organization, economics, and informatics. The activities include: preparation of recommendations for evidence-based organizational changes in health care; provision of summary evidence for informed health policy; monitoring health care providers; assessing the needs for health professionals; conducting research focused on selected topics in health economics (cost-benefit analyses, financing health care, and economic value of human life); coordinating activities in health informatics (e.g., uniform coding and classification systems); and providing statistical and operational support to the entire IPHRS. Based on the "Uniformity of the Health Information System in Slovenia" project (30) carried out between 1992 and 1994, the IPHRS continued the implementation of individual information areas, most notably the hospital reporting system (31) and the outpatient statistics (32). Due to the Center's extensive experience, its experts were invited to participate in the national Health Sector Management Project launched in 2001 and financed through a loan from the World Bank ([www2.gov.si/mz/hsmp/hsmp.nsf](http://www2.gov.si/mz/hsmp/hsmp.nsf)). The solutions will include a new reimbursement system for hospitals, a modern health management training and education program, and means for standardization of national health information solutions. Furthermore, the important area of the economic evaluation of human life has been developed through research over several years (33).

The Center maintains an important national database, the Health Care Providers Database (34), which has proven to be a good source of data on health professionals and health care providers (35,36). Recently, we also started working in a new area of interest – the burden of disease, and analyzed the premature mortality (37) and indicators of the burden of alcohol abuse (38). Health care provider database has been successfully used as a blueprint for health professionals' data used when producing, processing, and updating the data on the health professionals' card. Due to the experience in conducting surveys and qualitative studies, the Center has successfully completed the research project "Future Patient" in 2003, which has shown that physicians inadequately communicate with their patients and that more communication channels should be available to patients. On the other hand, the surveyed population was satisfied with the concept of the general practitioner (GP) as such, they trusted their GP the most, and used him/her as a reference point and a source of information as well as advice on which other services to contact.

Based on the "Uniformity of the Health Information System in Slovenia" project, two other projects,

"The Hospital Reporting System" and "The Outpatient Health Care Statistics," were started to improve the quality of national health data. In the same year, the Center will be responsible for coordinating the Slovenian field work on the *World Health Survey*. We also publish *Bulletin of Economics, Organization, Informatics*, which brings articles from all three fields in a timely fashion, allowing space for a discussion forum on different burning issues related to the quickly changing environment in Slovenian health care (39, 40).

*Center for Environmental Health*

Environmental factors, such as air pollution, microbiologically and chemically contaminated food and drinking water, noise and electromagnetic radiation, may damage human health and cause various diseases. Population groups including children, the elderly, and patients suffering from chronic diseases are particularly vulnerable. Thus, the environmental pollution control and protection has become very important for the protection of public health and health promotion. As numerous studies provided evidence for the link between different environmental factors and health (41,42) and awareness of the importance of a clean environment raised, the protection of the environment against pollution has become an increasingly important task. The most important role of our institute will be in contributing to awareness raising, policy and planning at various levels, and help with concrete actions, particularly actions at the local level.

The first task of the old Hygienic Institute was to provide monitoring drinking water quality and expert opinions on water supplies. Microbiological and chemical food monitoring was added later. One of the most important activities was hygienic inspection of kitchens at kindergartens, primary schools, and different public services. It included inspection, specimens taking and testing, and preparing recommendations on how to improve the food safety and nutrition. Over the years, our laboratories broadened the range of services offered and our results have become internationally comparable. At present, our main focus is to monitor selected environmental factors, such as drinking water, food, electromagnetic fields, and evaluate their impact on individual health (43-46). This enables us to act immediately, if needed, and also to plan long-term activities to improve the health of the population at large by influencing these environmental factors. All these activities are conducted in close cooperation with health inspectors. A very important contemporary challenge is the introduction of health impact assessment of different policies, programs, and projects to provide decision-makers with sound information on their implication on public health. Currently, the national agricultural and food and nutrition policy is being assessed.

Only a handful of studies of specific diseases attributable to different environmental factors have been conducted in Slovenia. A few years ago, we started to participate in different international projects (Air Pollution and Health, European Approach - APHEA ([www.aphea.org](http://www.aphea.org)), Air Pollution and Health:

A European Information System – APHEIS ([www.apheis.net](http://www.apheis.net)), Assessment and Prevention of acute Health Effects of Weather conditions in Europe – PHEWE ([www.phewe.tmfweb.nl](http://www.phewe.tmfweb.nl)) (41,42), which all aim to establish the link between short and long-term air pollution and its impact on population health. A new field of research will be the association of low level noise and sleep disturbance in children. Participation in the EU project DAFNE ([www.gesis.org/en/social\\_monitoring/income/Info%20Sources/Data\\_banks/dafne.htm](http://www.gesis.org/en/social_monitoring/income/Info%20Sources/Data_banks/dafne.htm)), with the databank that collects and centralizes individual-level nutrition survey data as well as household budget data from across Europe, will enable us to assess the impact of nutrition and intake of chemicals via foods to human health at the national level. These projects are supported by EU and the IPHRS is one of the important partners.

#### Center for Communicable Diseases

The Center coordinates the national surveillance and prevention of communicable diseases, and contributes to control strategies and activities. The surveillance has been traditionally based on collection, analysis, and interpretation of information about notified cases of newly diagnosed diseases or infections (47). The Center manages several national databases of cases, named or anonymous, the latter only for sexually transmitted infections (STI), human immune deficiency virus (HIV), and acquired immune deficiency syndrome (AIDS). The bulk of our results is published annually in the report on communicable diseases surveillance (48), but some results are also published separately (49-54). This passive surveillance information is complemented for selected communicable diseases or infections by that obtained from sentinel surveillance systems (acute respiratory infections and HIV infection)(55). In addition, we monitor the sensitivity and susceptibility of the general population to vaccine-preventable diseases, and conduct population-based seroprevalence studies (56). The Center also coordinated a major national study about risk factors for HIV and STI, which integrated testing for genital *Chlamydia trachomatis* infection conducted in a probability sample of the general population (57). We also participated in the coordination of the first national hospital-acquired infections survey (58). Most of our surveillance activities are supported by our microbiology diagnosis laboratory, which also conducts routine clinical diagnosis for hospitals and primary health outpatient services (59).

The surveillance information is shared with the majority of the relevant currently operating EU communicable diseases surveillance systems: the European Diphtheria Surveillance Network – DIPNET ([europa.eu.int/comm/health/ph\\_threats/com/networks/network\\_dipnet\\_eu.htm](http://europa.eu.int/comm/health/ph_threats/com/networks/network_dipnet_eu.htm)), the European Antimicrobial resistance Surveillance System – EARSS ([www.earss.rivm.nl](http://www.earss.rivm.nl)), the European Influenza Surveillance Scheme – EISS ([www.eiss.org](http://www.eiss.org)), the European Monitoring Group for Meningococci – EMGM ([neisseria.org/nm/emgm](http://neisseria.org/nm/emgm)), the European Center for the Epidemiological Monitoring of AIDS – EuroHIV ([www.eurohiv.org](http://www.eurohiv.org)), the Surveillance Community Network for Vaccine Preventable Infectious Diseases – EUVAC

([www.euvac.net](http://www.euvac.net)), the European Work Group for Legionella Infections – EWGLI ([ewgli.org](http://ewgli.org)), and Hepatitis Information Network – HepNet ([www.hepnet.com](http://www.hepnet.com)). In the near future, we expect integration into the European laboratory-based surveillance network of human salmonellosis – SalmNet ([www.eurosurveillance.org/em](http://www.eurosurveillance.org/em)), the European surveillance for Sexually Transmitted Infections – ESSTI ([europa.eu.int/comm/health/ph\\_threats/com/networks/network\\_essti\\_en.htm](http://europa.eu.int/comm/health/ph_threats/com/networks/network_essti_en.htm)), and the Hospitals in Europe Link for Infection Control through Surveillance – HELICS ([helics.univ.lyon1.fr](http://helics.univ.lyon1.fr)).

Appropriate interpretation and dissemination of information is essential for informing national policies, designing strategies, and planning activities for the prevention and control of communicable diseases (60). One of our most important prevention approaches is the planning and coordination of the implementation of the national immunization program and monitoring the adverse effects of vaccinations (61-63).

Many challenges for the future include: strengthening the current communicable surveillance system including the development of additional sentinel surveillance networks, and national hospital-acquired infection surveillance system (64); contributing to the strengthening of the national antimicrobial resistance monitoring system; developing an early warning and response system to threatening outbreaks of well known communicable diseases as well as emerging diseases and potential threats of deliberately released harmful biological agents; and assessing cost-effectiveness of screening programs (e.g., for the most common curable STI, genital *Chlamydia trachomatis* infection).

#### Center for Health Promotion

Although the Center for Health Promotion is the youngest in the IPHRS, it is rich in knowledge and experience in the area of health promotion, education, and publishing. Ideas, professional postulates, and different activities related to health promotion developed gradually. In the 1990s, health promotion projects began to be implemented in line with the principles of the Ottawa Charter (65). The Center's activity plan is based on existing legislation, defined national priorities, suggestions of the Ministry of Health, new EU public health plan, and WHO recommendations (66). The Center designs national health promotion strategies and programs and contributes to advocacy for health. We participate in the preparation of strategic documents for Slovenia, programs focused on major health problems (e.g., injuries, alcohol use, tobacco use, nutrition and physical activity, reproductive health, and mental health) and a wide range of health promotion programs and projects for different settings (e.g., Health Promoting Schools, Healthy Cities, and health promotion in rural setting). Our long-term aim is to decrease social and individual burden of disease, reduce health inequalities, improve health of the population in general, and consequently, achieve better quality of life and productivity of the population by implementing different, mostly preventive programs and targeted to children/adolescents,

their parents, and teachers (e.g. "Alcohol? Adults are of influence!", "Let's promote non-smoking!", "Preventing injuries in pre-school children", and "Preventing injuries in school children").

Since 1992, in close collaboration with the Ministry of Education, Research, and Sports and The Ministry of Health, the Center has coordinated and supported the national network of the European Network of Health Promoting Schools (HPS), involving 130 Slovenian schools (67,68). The aim of the HPS program in Slovenia was not just to establish and maintain a network, but to offer the schools throughout the country an opportunity to develop a holistic approach to health. For the successful development of the concept of a holistic approach to health promotion in school setting, we received a WHO award in 1998.

The Center also coordinates two European multi-center surveys: the European School Survey Project on Alcohol and Other Drugs, coordinated by the Swedish Council for Information on Alcohol (69,70) and the HBSC – Health Behavior in School-aged Children, A WHO Collaborative Cross-National Study (71).

In addition to planning and implementing health promotion programs, the Center should become more involved in research within all priority areas of health promotion (healthy public policy, reorientation of health services, development of personal skills, supportive environments, and involvement of local communities) and especially in evaluation studies.

#### *Research and Education Activities*

The IPHRS is the key national institution in public health research, which is an integral part of all the areas covered by the Institute. Although the main source of funding are the national funds of the Ministry of Research and the Ministry of Health, the IPHRS has an abundant experience as a partner in international research projects, many of which are funded by EU. Most recently, our Institute has also become involved in two international projects funded by the Sixth Framework Programme of the European Commission, namely Europe4patients and GENDEP (Genetics of Depression). The projects are often interdisciplinary and include collaboration with other institutions that have expertise in the field of public health. Recently, resources have been allocated for the education of young researchers abroad, with the aim of improving the knowledge and skills to conduct complex research projects.

The IPHRS also provides education programs in the field of public health. For a long time, the Medical University Department of Public Health was an integral part of the IPHRS. Currently, many physicians employed at the IPHRS are involved in teaching in undergraduate and postgraduate programs at the Ljubljana University School of Medicine. The IPHRS is recognized as the key teaching institution in public health. Since its beginnings, it has been the coordinating center for specializations in general practice and public health. It also organizes postgraduate courses that are part of postgraduate training in public health,

family medicine, pediatrics, and public dentistry. The IPHRS is the main organizer of postgraduate education, ie, congresses, seminars, workshops, and other activities aimed at improving the knowledge in the field of public health, many conducted in cooperation with other institutions. Recently, the IPHRS has been involved in developing internet-based teaching. The main future challenge for the IPHRS is to adopt the leading role in the creation of the future Slovenian School of Public Health.

#### *Public Relations*

The work of the IPHRS is a focus of interest of the general public, mass media, individual experts and users, government, foreign public health partners, and also of the internal public. As relevant information must be accessed quickly and easily whenever specific problems emerge, we developed a system for swift public informing. We established various tools of communication, such as providing information at our website ([www.sigov.si/ivz](http://www.sigov.si/ivz)), press releases, and interviews with experts. We also organize press conferences, round tables, technical meetings, lectures, conferences, presentations of the IPHRS work tasks, and publish an internal newspaper. Recently, the majority of requests for information and advice addressed to our Public Relations Office were related to communicable diseases (influenza, salmonellosis, HIV, and severe acute respiratory syndrome – SARS); food, drinking water and environment safety; and mental health issues, especially suicide, which increased recently (72).

#### **Conclusion**

The IPHRS will be faced with numerous challenges in the near future. It will be important to sustain many current activities while integrating into the new program of Community action in the field of public health, as well as contributing to the response to challenging public health issues in the wider context of the whole European region.

It will also be necessary to reassess and redefine the national strategic role of the IPHRS and its organizational relationship with regional institutes. The latter will have to retain their role in implementing national public health strategies on regional level, while addressing specific public health issues in the regions. Ideally, this should be accomplished before the IPHRS becomes one of the numerous "regional" institutes of public health in the European Union.

In view of the public health challenges related to the future European Union enlargement and pressing public health issues in the South-East European countries of the former Yugoslavia, the Slovenian IPHRS may have some advantages. Although, in comparison with the national institutes of public health from other EU accession countries, we have a similar public health development history and similar current level of technical expertise, the Slovenian population is closest to the European Union member states with respect to numerous health indicators. The other advantage may be our historical relation with and in-depth understanding of the former Yugoslavia countries,

where the absence of social well-being and growing vulnerability are alarming for a large proportion of people (73). Thus, the IPHRS could have an important facilitating or bridging role in many European international public health projects in the near future and could contribute to the activities within the recently created Public Health in South Eastern Europe (PH-SEE) Network (73-75).

## References

- Mis D. Institute SRS of Public Health Ljubljana – development and meaning at 60th anniversary (1923-1983) [in Slovenian]. *Zdravstveno varstvo* 1983;22:1-15.
- Pirc I. Reading book on hygiene: for schools for teachers, higher grades of secondary schools and secondary technical schools [in Slovenian]. Ljubljana: Higijenski zavod; 1928.
- Pirc I. Our health [in Slovenian]. Ljubljana: Knjižnica Podmladka Rdečega križa; 1929.
- Pirc I. Our health [in Slovenian]. 2nd ed. Ljubljana: Knjižnica Podmladka Rdečega križa; 1937.
- Pirc B, Pirc I. Life outcomes in Slovenia in the period 1921-1935 [in Slovenian]. Ljubljana: Higijenski zavod; 1937.
- Parliament, Republic of Slovenia. Law on health care [in Slovenian]. *Uradni list (Official gazette of the Republic of Slovenia)* 1992;No. 9.
- Pirc B, Pirc I. Health in Slovenia [in Slovenian]. 1st book. Ljubljana: Higijenski inštitut v Ljubljani; 1937.
- Parliament, Republic of Slovenia. Law on health care databases [in Slovenian]. *Uradni list (Official gazette of the Republic of Slovenia)* 2000;No. 65.
- Šelb-Šemerl J, Kenda MF. Epidemiology of sudden death [in Slovenian]. In: Kenda MF, Rakovec P, editors. *Sodobna obravnava motenj srčnega ritma*. Ljubljana: Združenje kardiologov Slovenije, Delovna skupina za aritmologijo in elektrostimulacijo srca; 2000. p. 9-19.
- Grobovšek-Opara S, Švab I, Šelb-Šemerl J. How many smoking-attributable deaths in Slovenia [in Slovenian]? *Zdrav Vestn* 1996;65:393-7.
- Brcar P, Truden-Dobrin P, Kržišnik C. Rationalization or new organization of paediatric field on primary, secondary, and tertiary level of health care in Slovenia [in Slovenian]. *Slovenska pediatrija* 2002;9:40-3.
- Brcar P. Sexual behaviour of Slovenian primary school children [in Slovenian]. *Zdravstveno varstvo* 1998;37 suppl:119-32.
- Vrhovec N, Suhadolc P. Mortality in 5 to 19 years old young individuals in Slovenia during 1986 to 1996 [in Slovenian]. *Zdravstveno varstvo* 1999;suppl:1-55.
- Kirar-Fazarinc I. Health of women [in Slovenian]. In: Markota M, editor. *Health in Slovenia 2001* [in Slovenian]. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije; 2003. p. 21-5.
- Križaj M. Diseases of musculoskeletal system and connective tissue in connection with burdening in individual economic activities [in Slovenian]. *Zdravstveno varstvo* 2002;41:38-43.
- Rotar-Pavlič D, Švab I, Pas L. Factors influencing the views on prevention and preventive attitude of general practitioners [in Slovenian]. *Zdravstveno varstvo* 1998;37:438-41.
- Rok-Simon M. Risk factors for death or injury of car drivers in traffic accidents in Slovenia [in Slovenian]. *Zdravstveno varstvo* 1999;38:379-85.
- Grobovšek-Opara S, Florjančič M. Activities of specialist outpatient services on secondary health care level [in Slovenian]. *Zdravstveno varstvo* 2001;40 suppl:55-7.
- Grobovšek-Opara S, Rok-Simon M, Paučič M, Simončič A. Hospital health care [in Slovenian]. *Zdravstveno varstvo* 2001;40 suppl:61-7.
- Pečar-Čad S, Rupnik I. Consumption of medications prescribed in out-patient facilities. *Health Slov* 2003;33-6.21.
- Nolimal D. Techniques of sharing of injection equipment, social frame and prevention of infection through blood in drug users [in Slovenian]. *Zdravstveno varstvo* 2000;39:56-62.
- Marušič A, Grobovšek-Opara S, Rotar D. Epidemiology of mental health and public mental health problems in Slovenia [in Slovenian]. *Zdravstveno varstvo* 2001;40:11-3.
- Lovrečič M, Dernovšek MZ, Tavčar R, Maremmani I. The differences between heroin addicts with and without comorbidity. *Heroin Addiction and Related Clinical Problems* 2001;3:39-44.
- Moravec-Berger D, Stare J, Šošič Z, Florjančič M. Relation between risk factors and prevalence of clinically manifest atherosclerosis in 3781 inhabitants of Slovenia [in Slovenian]. *Zdravstveno varstvo* 1998;37:455-60.
- Health statistics yearbook 2001 [in Slovenian]. *Zdravstveno varstvo* 2002;41:1-382.
- Statistical yearbook 2001 [in Slovenian]. Ljubljana: Statistical Office of the Republic of Slovenia; 2002.
- Markota M, editor. *Health in Slovenia 2001* [in Slovenian]. Ljubljana: Institute of Public Health of the Republic of Slovenia; 2003.
- Keber D, Albreht T, Arzenšek J, Mlakar Bizjak J, Brcar P, Ceglar J, et al. Health reform – justice, access, quality, efficiency [in Slovenian]. Ljubljana: Ministry of Health, Republic of Slovenia; 2003.
- National health plan: health for all by the year 2004 [in Slovenian]. *Official gazette of the Republic of Slovenia* 2000;49:6650-77.
- Ilič M, Jagodic H, Paulin M, Ratkajec I, Grobovšek-Opara S, Dimec J, et al. Elements of uniformity of the health care information system in the Republic of Slovenia: II. phase report: definitions of entities and attributes [in Slovenian]. Ljubljana: Institute of Public Health of the Republic of Slovenia; 1994.
- Raič G. National information system on hospital treatment. In: Kokol P, Zupan B, Stare J, Premik M, Englebrecht R, editors. *Medical Informatics Europe '99. Studies in health technology and informatics*. Vol. 68. Amsterdam: IOS Press; Tokyo: Ohmsha, cop.; 1999. p. 146-50.
- Hristovski D, Rogač M, Markota M. Using data warehousing and OLAP in public health care. *J Am Med Inform Assoc* 2000;suppl:369-73.
- Saražin Klemenčič K, Švab I. About the price of human life [in Slovenian]. *Zdrav Vestn* 1998;67:643-5.
- Albreht T, Paulin M. National health care providers' database (NHCPD) of Slovenia – information technology solution for health care planning and management. In: Kokol P, Zupan B, Stare J, Premik M, Englebrecht R, editors. *Medical Informatics Europe '99. Studies in health technology and informatics*. Vol. 68. Amsterdam: IOS Press; Tokyo: Ohmsha cop.; 1999. p. 165-70.
- Albreht T. Analysis of physicians' and dentists' professional demography in Slovenia between 1986 and 1995 with estimates for the period 1996 until 2010 [in Slovenian]. *Zdrav Vestn* 1999;68:647-53.

- 36 Albreht T, Klazinga N. Health manpower planning in Slovenia: a policy analysis of the changes in roles of stakeholders and methodologies. *J Health Polit Policy Law* 2002;27:1001-22.
- 37 Šelb-Šemerl J, Šešok J. Years of potential life lost and valued years of potential life lost in assessing premature mortality in Slovenia. *Croat Med J* 2002;43:439-45.
- 38 Šešok J. Indicators of harmful alcohol drinking in the year 2000 [in Slovenian]. *Delo in varnost* 2002;47:15-9.
- 39 Markota M, Švab I, Saražin-Klemenčič K, Albreht T. Slovenian experience on health care reform. *Croat Med J* 1999;40:190-4.
- 40 Šlaus I. Political significance of knowledge in Southeast Europe. *Croat Med J* 2003;44:3-19.
- 41 Medina S, Plasčnca A, Artazcoz L, Quénel P, Katsouyanni K, Mücke HG, et al. APHEIS health impact assessment of air pollution in 26 European cities. Second year report, 2000-2001. Saint-Maurice: Institut de Veille Sanitaire; 2002.
- 42 Katsouyanni K, Touloumi G, Samoli E, Gryparis A, Le Tertre A, Monopoli Y, et al. Confounding and effect modification in the short-term effects of ambient particles on total mortality: results from 29 European cities within the APHEA2 project. *Epidemiology* 2001;12:521-31.
- 43 Seljak M, Kofol-Seliger A, Gajšek P, Perharič L, Gale I. Environment and health [in Slovenian]. In: Markota M, editor. *Health in Slovenia 2001* [in Slovenian]. Ljubljana: Institute of Public Health of the Republic of Slovenia; 2003. p. 76-81.
- 44 Fortuna M, Perharič L. Incidence of adverse effects managed in a Slovenian intensive care unit. *J Toxicol Clin Toxicol* 2002;40:366.
- 45 Eisenberger U, Brunkhorst R, Perharic L, Petersen R, Kliem V. *Gemella morbillorum* – spondylodiscitis in a patient with a renal graft. *Nephrol Dial Transplant* 1998;13:1565-7.
- 46 Gupta K, Perharič L, Volans GN, Murray VS, Watson JP. Apparent poisoning by wood preservatives: an attributional syndrome. *J Psychosom Res* 1997;43:391-8.
- 47 Grgič-Vitek M, Klavs I. Guidelines for the notification of sexually transmitted infections [in Slovenian]. *Zdravstveno varstvo* 2000;39 suppl:1-40.
- 48 Kraigher A, Grgič-Vitek M, Hočevnar-Grom A, Klavs I, Pahor L. Epidemiological monitoring of communicable diseases [in Slovenian]. *Zdravstveno varstvo* 2001;40 suppl 1:65-74.
- 49 Sočan M, Kraigher A, Pahor L. Epidemiology of varicella in Slovenia over a 20-year period (1979-98). *Epidemiol Infect* 2001;126:279-83.
- 50 Pikelj F, Tomažič J, Matičič M, Sočan M, Muzlovič I. Severe forms of tick-borne meningoencephalitis in Slovenia. *J Infect* 1995;31:83-5.
- 51 Sočan M, Marinič-Fišer N, Kraigher A, Kotnik A, Logar M. Microbial aetiology of community-acquired pneumonia in hospitalised patients. *Eur J Clin Microbiol Infect Dis* 1999;18:777-82.
- 52 Grgič-Vitek M, Klavs I, Potočnik M, Rogl-Butina M. Syphilis epidemic in Slovenia influenced by syphilis epidemic in the Russian Federation and other newly independent states. *Int J STD AIDS* 2002;13 Suppl 2:2-4.
- 53 Vidmar L, Poljak M, Tomažič J, Seme K, Klavs I. Transmission of HIV-1 by human bite. *Lancet* 1996;347:1762.
- 54 Paragi M, Kraigher A, Čižman M, Gubina M, Caugant DA. Epidemiology of invasive meningococcal infections of children in Slovenia during 1993-1999. *Cent Eur J Public Health* 2001;9:79-82.
- 55 Klavs I, Poljak M. Unlinked anonymous monitoring of human immunodeficiency virus prevalence in high- and low-risk groups in Slovenia, 1993-2002 *Croat Med J* 2003;45:545-9.
- 56 Sočan M, Kraigher A, Fišer-Marinič N. Hepatitis A seroprevalence in Slovene travellers. *Eur J Epidemiol* 2001;17:925-6.
- 57 Klavs I, Rodrigues LC, Wellings K, Keše D, Švab I. Feasibility of testing for *Chlamydia trachomatis* in a general population sexual behaviour survey in Slovenia. *Int J STD AIDS* 2002;13 Suppl 2:5-8.
- 58 Klavs I, Bufon Lužnik T, Škerl M, Grgič-Vitek M, Lejko Zupanc T, Dolinšek M, et al. Prevalence of and risk factors for hospital-acquired infections in Slovenia – results of the first national survey, 2001. *J Hosp Infect* 2003;54:149-57.
- 59 Sočan M, Marinič-Fišer N, Keše D. Comparison of serologic tests with urinary antigen detection for diagnosis of legionnaires' disease in patients with community-acquired pneumonia. *Clin Microbiol Infect* 1999;5:201-4.
- 60 Klavs I. Prevention of HIV infection – overview of policies and practices in Slovenia by 1999 [in Slovenian]. *Zdravstveno varstvo* 2000;39:271-89.
- 61 Kraigher A, Sočan M, Šmon L, Arhar D, Imenšek I, Vrbanc A, et al. Analysis of the implementation of the immunization program and other measures to protect the population against communicable diseases in Slovenia in the year 2001 [in Slovenian]. *Zdravstveno varstvo* 2002;41 suppl 6:1-121.
- 62 Galazka AM, Robertson SE, Kraigher A. Mumps and mumps vaccine: a global review. *Bull World Health Organ* 1999;77:3-14.
- 63 Kraigher A. Adverse reactions after vaccination in Slovenia in the year 1999 [in Slovenian]. *Zdravstveno varstvo* 2000;39 suppl:1-26.
- 64 Klavs I, Grgič-Vitek M, Škerl M, Grošek Š, Kompan L, Kramar Z, et al. Surveillance of hospital-acquired infections [in Slovenian]. *Zdravstveno varstvo* 2001;40 suppl:1-93.
- 65 Ottawa Charter for Health Promotion. First International Conference on Health Promotion. Ottawa, November 17-21, 1986. Available from: <http://www.who.int/hpr/archive/docs/ottawa.html>. Accessed: June 27, 2003.
- 66 World Health Organization, Regional Office for Europe. Health 21: health for all policy framework for the WHO European region. European health for all. Series No. 6. Copenhagen: WHO; 1999.
- 67 Bruun Jensen B, Simovska V, editors. Models of health promoting schools in Europe. Copenhagen: World Health Organization; 2002.
- 68 Samdal O, Nutbeam D, Wold B, Kannas L. Achieving health and educational goals through schools: a study of the importance of school climate and students' satisfaction with school. *Health Educ Res* 1998;13:383-97.
- 69 Hibell B, Andersson B, Ahlstrom S, Balakireva O, Bjarnason T, Kokkevi A, et al. The 1999 ESPAD report. Alcohol and other drug use among students in 30 European countries. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs, CAN, Council of Europe; 2000.



- 70 Bjarnason T, Davidaviciene AG, Miller P, Nociar A, Pavlakis A, Stergar E. Family structure and adolescent cigarette smoking in eleven European countries. *Addiction* 2003;98:815-24.
- 71 Currie C, Samdal O, Boyce W, Smith B. Health behaviour in school-aged children: a World Health Organization cross-national study. Research protocol for the 2001/2002 survey. Edinburgh: Child and Adolescent Health Research Unit, University of Edinburgh; 2001.
- 72 Marušič A, Roškar S, Zorko M. Open verdicts: are they suicides? *Croat Med J* 2003;44:550-2.
- 73 Levett J. Contributing to Balkan public health: a school for Skopje. *Croat Med J* 2002;43:117-25.
- 74 Donev D, Laaser U, Levett J. Skopje declaration on public health, peace & human rights, December 2001. *Croat Med J* 2002;43:105-6.
- 75 Laaser U, Donev D, Bjegović V, Sarolli Y. Public health and peace. *Croat Med J* 2002;43:107-13.

Received: July 22, 2003

Accepted: September 8, 2003

**Correspondence to:**

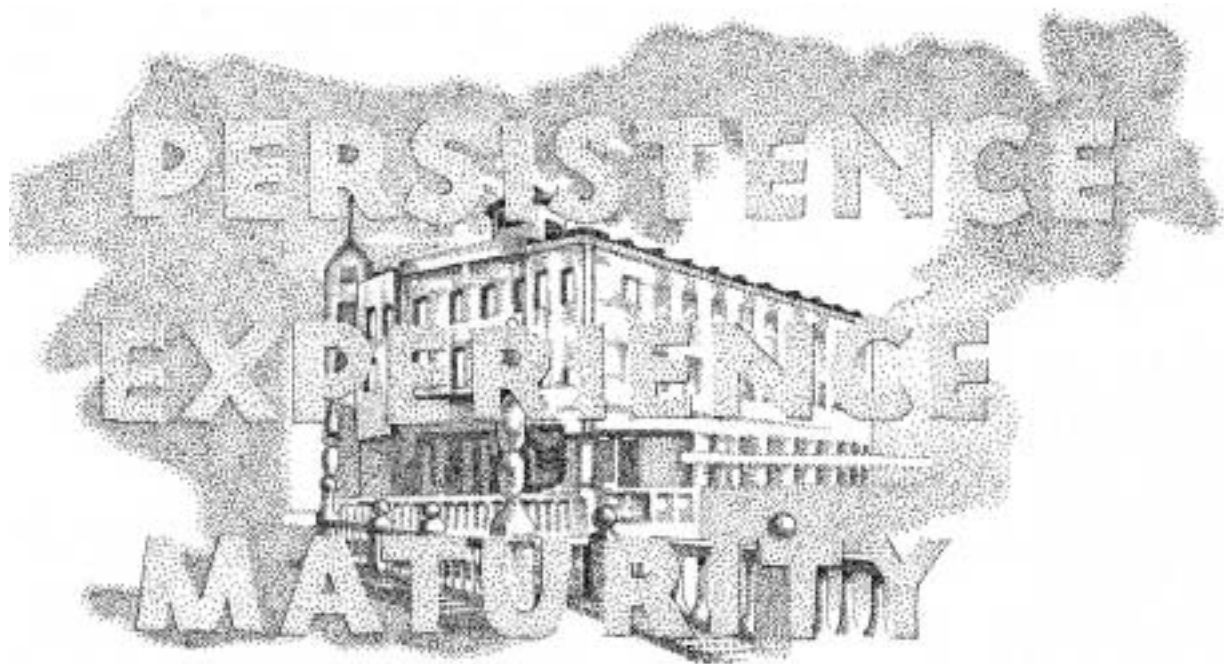
Andrej Marušič

Institute of Public Health of the Republic of Slovenia

Trubarjeva 2

1000 Ljubljana, Slovenia

*Andrej.Marusic@ivz-rs.si*



Institute of Public Health of the Republic of Slovenia  
(Illustration by Siniša Kovačič)