

## HISTORY AND INTRODUCTORY NOTE

Hygiene and epidemiology we conceive classically as tightly connected, partially overlapping disciplines of the public health. The goal of hygiene and epidemiology in our present situation is to positively influence the **quality of human life** by systematic efforts in **primary prevention of diseases**.

Hygiene, together with **epidemiology**, represent the **fundaments of preventive medicine or community medicine** representing a more recent concept. Unlike the social medicine, which is the third indispensable component of public health, that strongly accentuates moral, ethical, and organizational aspects of health care, hygiene and epidemiology since ancient times, have been **developing out of empiricism**, and over a hundred years, these two disciplines have shared the same rules as other sciences. For example from the thousand year of empirical experience, some correct anti-epidemic measures were deduced even times of. The **threat of vast epidemics** depopulating countryside and towns and paralysing the fighting armies, compelled medicine to develop a new medical discipline. Hygiene bears the name of the **Goddess of Health** – the Greek **Hygieia** who together with Asclepias worshipped in Epidaurus of the Peloponnesian Peninsula. She is presented as beautiful woman, whose symbol is a snake drinking water from a bowl the goddess holds in her hand.

Hygiene is science of **health preservation**. Originally, it deals with all factors affecting the physical health and psychic well being of man. Relating to man's health it includes the **quality of water and other drinks, food and nutrition, clothing, working conditions and physical strain** as such, **sleep, cleanliness of the body, bad habits like tobacco, alcohol** and the other **drug abuse, and mental health**. As to the public aspects, it covers **climate, soil, sorts of building materials and housing arrangements, heating, ventilation, waste disposal**, medical knowledge of **disease incidence and prevention**, down to burial of the dead.

The firm link of hygienic theories and practice with health status of the population remained preserved in the original form only in **infectious diseases**, later on in the self-contained **epidemiology** the remarkable course of which to **non-infectious epidemiology** of today is sufficiently well known.

Since the Enlightenment era, the efforts for disease prevention in our country have traditionally enjoyed a good standard. The important drive was the charitable attitude of many physicians and health personnel and straining create organizational, and educational conditions enabling **primary prevention principles** to be introduced into practice. The Institute of Hygiene at Czech Faculty of Medicine at by that time Charles-Ferdinand University of Prague (the present Institute of Hygiene and Epidemiology, First Faculty of Medicine, Charles University in Prague) was founded in the school year 1897/1898. An analogical Institute at the German Faculty of Medicine in Prague was founded in 1884. However, it ceased to exist along with the German section of Charles University in the turbulent post-war time when the Czech sector, after Nazi-close down was re-opened.

The current institutional integration of hygiene and epidemiology at the First Faculty of Medicine in the school year 1992/1993, including teaching programme and final state examinations reflect the rational integrative efforts in the past decade in the field of education and training of medical youth at the break of millenniums.

Here follow some examples of various successful **practical applications** of our **preventive medicine**, more specifically, in epidemiology branch. The post-war activities against **venereal diseases** and the starting campaign resulting in a significant drop of the incidence of **tuberculosis** and then **brucellosis**, requiring a close cooperation with the veterinary service, deserve, by extent and organization, as well as by achieved positive results, and despite a fairly long time lapse, the highest appreciation.

The former Czechoslovakia was the first country in the world

that started **anti-polio** mass **vaccination** already in beginning of the sixties, thus being an example for other countries. Our physicians shared in the first and until today unique **eradication** action of another infectious disease – **smallpox**. Neither of the two praiseworthy deeds has ever been fairly appreciated on the international scene, though, e.g. smallpox eradication surely was a big success of the preventive medicine on a global scale, and deserved the highest esteem by awarding a prize equivalent to the Nobel prize.

**John Snow** is often recognized as the **founder of epidemiology**. He, a practicing physician, conducted what is regarded today as a classic study of the transmission of **cholera in London** in the mid – 1800s. For the development of epidemiology in our country became important establishment of the National Institute of Public Health founded in 1925 in Prague. The Institute's collaborators had been acquiring experience mostly in the USA. Thus a modern school of epidemiology was born, of its representatives at least Raška should be remembered. He was head of the contagious diseases division at WHO headquarters in Geneva, and was one of the authors and managers of the smallpox eradication programme. In the post-war time our top specialists passed the training courses in epidemiology at the London School of Hygiene and Tropical Medicine with which some of our health research and educational institutions have been keeping up busy working contacts ever since.

Concerning the non-infectious diseases we must remember the extensive epidemiological study on **endemic goitre** performed by our clinical endocrinologists in the late forties and early fifties, which can still stand the current, relatively strict qualitative criteria for epidemiological studies, resulting in the systematic *iodination of salt*. Again we were among the first to introduce **fluoridation of drinking water** for caries prevention. This campaign was as well preceded by thorough epidemiological study.

The frequent socio-political changes, occurring in our country in the last century unfortunately too often, used to disrupt the balanced

system of prevention. Today we have to adapt the primary prevention system to the extensive social and economic changes we are now undergoing. Much has already been done but a backup to **complexly structured primary prevention** is urgently needed.

Our school of **hygiene** rooted from the traditional German school of hygiene founded by **Max von Pettenkofer** who implemented a sand filtration into production of a safe drinking water, and **Robert Koch**, world famous for discovery of pathogenic bacteria causing anthrax, cholera, tuberculosis and other infectious diseases. Our school of hygiene enriched it with an experimental aspects e.g. by providing a **safe drinking water** (Kabrhel's index), later on with pathophysiological factors to be demonstrated in the works of Teissinger, founder of our modern school of occupational medicine, who already in the mid-thirties laid the foundations of the present day **biological exposure tests or biomarkers of exposure to environmental toxicants in occupational settings**. A few years following the last London smog episode when the best reliable health indicator was recorded mortality, Kapalin and Symon tried to demonstrate the adverse environmental effects on the changes of **growth and haematological parameters** in exposed children, and in this way, they contributed to the application of rather sophisticated and more sensitive indicators of the health status.

There are two circumstances likely to make the problem of judging effectivity of primary prevention still very difficult. The first: the **effectivity of our hygienic service** (the core institution dealing with public health related activities since the half of fifties of the last century in the previous Czechoslovakia) can be rated by success in preventing health threatening factors. This brings us, in the first place, to skating on a thin ice of any kind of conditionals. The other serious issue, undoubtedly, was the advanced **public health legislation**, which, owing to **profuse numbers of exceptions** became little effective. Thanks to "granting the indulgences", the quality of our surface waters often heavily polluted from industrial activities and housing facilities, and above all not sufficiently processed in waste

water treatment plants got drowned in the sea of legal exemptions. Then the famous Parkinson-laws relentlessly operated on either side of the iron curtain. From the relatively modest beginnings the hygienic stations became inflated to the “maxi” size in the late eighties, heavily criticized by the Western experts on the problems of preventive medicine of the public health system. However, it is necessary to underline that these critics envy us the institutionalised structure of public health engaged in primary prevention, i.e. disease prevention by influencing **life style, living conditions, resistance of the human organism**, etc., and warn against total disruption of this structure while trying to square up with the totalitarian legacy.

The trends in **integrating primary prevention** into the current activities of every physician and paramedical personnel have been implemented but slowly and with **many obstacles** in all social systems in global scale. This is evident in the problems related to implementation such global WHO programs, like the decade dedicated to the “Drinking water for all”, or “Health for all by 2000” anchored in national programmes adapted to the local conditions. Intentionally, primary prevention tries to **suppress the causes of the diseases, reduce their incidence, and improve life expectancy and quality of life**. The constituents of **primary prevention** are **protection and promotion** of health.

**Health protection** strives to safeguard humans against any **unacceptable health risks** produced by the activities of man. In the Health Protection Programme the government and industry invest in our country tens of thousands millions crowns yearly. There is no need to glorify or condemn this fact, as it is a must. But for that the present day industrial sphere would collapse because of incompatibility of harmful living conditions with human existence.

The purpose of the preparatory studies of the students for your final state examination in hygiene and epidemiology is **to understand the fundamental principles and importance of the primary prevention in context with medical practice**. This also covers timely notifications of infections, their flexible surveillance

thereof, reports on incident malignities enabling administration of the national cancer register, and chiefly, the necessity of your **personal engagement** as physicians in primary prevention programmes and last but not least in the early diagnosis and a rational treatment of your patients, that is, the **secondary prevention**. The qualified advice on life style, occupational risks and health risks from bad habits considering the social and health situation in the family at your patient may significantly help to create your profile of a desired, competent family doctor.

Here are some closing notes: By the old proverb “Cut your coat according to your cloth” we naturally try to introduce the up to date style of teaching and research work of our Institute, as you can see from the quotations on important projects and publications by the staff of the Institute published during the past decade. It consists of **biological monitoring** and **health risk assessment of human exposure to environmental toxicants**, mostly **toxic metals** and **polyhalogenated hydrocarbons**, and health aspects of ever increasing risks from **traffic emissions**. Our interest involves the selected issues of **hospital hygiene**, e.g. **waste disposal** from health care facilities. Presently, the Institute is dealing with **indoor environment** problems including the permanent urgent problems of smoking being one of the important **risk factors of life style including those in occupational settings**.

Currently, we participate in international multicentric studies organized by International Agency for Research on Cancer (IARC), WHO/Lyon and National Cancer Institute (NCI) Bethesda, concerning **epidemiology of cancer** and **ethical aspects of environmental epidemiology and quality of life**.

Like other institutes engaged in the field of primary prevention we also try to continue meaningful cooperation on the international scene with WHO, IPCS, CCMS/NATO, etc. A certain hope open to us in the future is the **steadily rising cost of patients' treatment** that will urge responsible political bodies to recognize the **importance of primary prevention** from cost/benefit aspects and introduce its principles in the

health care practice policy.

These questions are related to, the key issues of philosophy, and hopefully as well to the future practice of **sustainable survival philosophy** – or in a more euphemistic term – the sustainable development principle. Apart from the expected progress of non-infectious epidemiology there exist a number of potential risks arising from **gene manipulations** in microbiology, pharmaceutical microbiology and, e. g. **bio transformation of persistent xenobiotics** – all of them involved in the solution of **waste disposal** problems. The described future tasks require, under consideration of some hygienic and epidemiological specifics, **unrestrained mutual cooperation** of the both medical branches. As documented by experience of some other fields of sciences the fastest progress is expected when the individual disciplines overlap, e.g. in methodical applications of **molecular toxicology** in **environmental epidemiology**. A wider range of applied epidemiological methods in clinical studies is awaiting us as well.

The focus of interest of both disciplines remains the **primary prevention** of most widespread diseases and subsequent efforts to positively influence the **quality of human life**.

In medicine, until our days, the Hippocrates' statement still holds: Life is short, and Art is long; the occasion is fleeting, experience fallacious, and judgment difficult. The physician must not only be prepared to do what is right himself, but must also make the patient, the attendants, and externals cooperate. If we honour this in curative medicine, we should do so in preventive medicine twice as much.

*In Prague October 2011*

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