

Historical and contemporary military epidemiology (on the 80th anniversary of the Department of General and Military Epidemiology of the S.M. Kirov Military Medical Academy)

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The article provides an overview of the activities of the Department of General and Military Epidemiology of the S.M. Kirov Military Medical Academy and its role in the development of national epidemiology. The activities of scientific schools of military epidemiologists are analyzed, showing their fundamental scientific and practical achievements. Biographical data on the managers and employees of the department demonstrates their role in the development of theoretical and practical aspects of epidemiology. The authors give an account of the research work being done in the department at present and list promising research areas, as well as the most significant results of the department's activities, reflecting the development of basic and clinical epidemiology problems, including scientific and practical evidence, and the use of the foundations of the theory of self-regulating parasite systems, developed by the department staff, in science, educational process in the country's medical universities and in practice. The article covers not only research work but also the scientific and practical work of specialists from the department of general and military epidemiology in the prevention of widespread diseases and in the anti-epidemic protection of troops during war and peacetime. A review is provided of the educational and methodical activity of the department – its staff organized the First and Second Congress of Doctors with Medical-Preventive Profiles of the Armed Forces of the Russian Federation and the all-Russian scientific conference devoted to the problems of modern epidemiology.

Keywords: *epidemiology, military epidemiology, development, history of medicine, teaching, Military Medical Academy*

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Analysis of military epidemiologists' scientific schools show that until November 1936, the main scientific and practical work on the prevention of mass diseases at the Medico-

Surgical Academy (since 1881, the Military Medical Academy [MMA]) was carried out in the departments of Infectious Diseases Featuring Clinical Studies and Medical Bacteriology (since 1924, the Department of Infectious Diseases and Independent Department of Microbiology and Epidemiology and Disinfection Studies), General and Military Hygiene, General Biology,

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Zoology with Comparative Anatomy, and Parasitology.

Since its inception in 1798, the Medico-Surgical Academy has been gaining epidemiological knowledge and teaching appropriate subjects. Epidemiology issues have been studied in the following departments:

1) Obstetrics Art and Forensic Medical Science (later named the Department of Obstetrics Art, Forensic Medicine, and Medical Police; then Forensic Medicine, Medical Police, and Hygiene; and finally the Department of General Military Land and Naval Hygiene);

2) Pathology and Therapy (later named the Department of Pathology, Therapy, and Internal Medicine; then General Pathology, General Therapy, and Medical Diagnostics; and finally General Clinical Therapy);

3) The in-hospital therapy clinic (later named the Department of Hospital Therapy Featuring Mental Illnesses, or Hospital Therapy);

4) General Studies of Infectious Diseases with a Practical and Systematic Course of Bacteriology (later named General Studies of Infectious Diseases with Bacteriology and Clinical Picture of Infectious Diseases; then Infectious Diseases Studies Featuring Bacteriology; and finally Infectious Diseases Featuring Clinic and Medical Bacteriology);

5) Epizootiology with Veterinary Police.

The term 'epidemiology' is not found in the listed department titles. However, frequent epidemics of infectious diseases forced the Academy professors to actively engage in their research. Until the late 19th century, methods of fighting widespread diseases were not divided into the sanitary and anti-epidemic, and their organization was entrusted to local administration and law enforcement bodies.

In the last third of the 19th century, discoveries in the field of bacteriology confirmed the previously estimated connection of many mass diseases with live pathogens. The study of infectious diseases became one of the main activities of the Department of General Military Land and Naval Hygiene with the arrival of Professor A.P. Dobroslavin. This department formed a galaxy of scientists who made an invaluable contribution to the development of disinfection practices (S.V. Szydlowski, V.A. Levashov, G.V. Khlopin, Ya.L. Okunevsky,

and P.A. Patsanovsky). In 1916, associate professor K.V. Karaffa-Korbut published "The fight against infectious diseases in the army during the current campaign", in which, for the first time in Russian literature, were formulated the basic principles of anti-epidemic protection of troops during wartime.

A great contribution to the study of infectious diseases was made by such outstanding MMA clinicians as F.F. Heuroth (known in Russia as Geyrot), K.K. Seidlitz, P.F. Goryanin, V.D. Shipulinsky, S.P. Botkin, L. Popov, B.E. Eck, N.F. Zdekauer, F.A. Lesh, A.A. Heidenreich, E.E. Eichwald, and F.I. Pasternatsky. Their works deal with issues of epidemiology and prevention of "typhoid diseases", "Egyptian ophthalmia", cholera, plague, "epidemic diarrhea", typhus and relapsing fever, infectious jaundice, rabies, glanders, smallpox, anthrax, diphtheria, tetanus, and other infections. Botkin played an important role in using bacteriology in clinical medicine, as well as in providing the basis for creating an independent chair of infectious diseases. His epidemiological observations convinced him that military doctors need training not only in the clinical branches of medicine, but also in hygiene and epidemiology. A major contribution to the development and implementation of anti-epidemic routines in field hospitals and surgical departments of medical institutions was made by Nikolai Pirogov, who offered to arrange a large "stowage" for pre-sorting of the incoming wounded and sick in order to identify and separate all contagious and "unclean and gangrenous ulcers" [2].

The scientific development of infectious epidemiology issues and the teaching of this discipline reached a new level when the Department of General Studies of Infectious Diseases, which implemented a practical and systematic bacteriology course, was established at MMA.¹ The staff of the department (G.P. Gladin, N.Ya. Chistovich, T.A. Zakharyan, S. Goldberg, V.F. Petrov, N. Rosenberg, V.A. Yuryevich, and others) published studies on the epidemiology of plague, tetanus, smallpox, epidemic cerebrospinal meningitis, and cholera, as well as on immunology and serological and bacteriological diagnosis.

¹ The department existed from 1897 to 1923.

Since future veterinarians as well as future physicians were studying at the Medico-Surgical Academy, in 1808, “cattle disease sciences” was introduced into the curriculum as an independent subject. Professors who taught epizootiology courses (until 1883, when the veterinary department was abolished), most notably P.I. Lukin and A.A. Raevsky, taught this subject as well, taking into account the achievements of veterinary medicine and the development of ideas about the nature of infectious diseases. The Department of Epidemiology and Veterinary Police, which existed at the MMA until March 1919, made a significant contribution to the formation of the epidemiology of zoonotic infections.

The turning point for the development of epidemiology in other departments of the Academy occurred in 1923, when by order #231 of the Military Health Department of the Red Army from May 5, 1923, the Department of Infectious Diseases Featuring Clinical Studies and Medical Bacteriology was divided into two separate departments: Infectious Diseases and Microbiology/Epidemiology and Disinfection Studies. From May 1924 to November 1928, the Department of Microbiology, Epidemiology, and Disinfection studies was supervised by D.K. Zabolotny (1866–1929) – a talented scientist, microbiologist, and epidemiologist well-known at home and abroad, a member of the Academy of Sciences of Ukraine (1922), Corresponding Member of the Russian Academy of Sciences (1923), and then a full academician (1926) – who laid the foundation for teaching epidemiology to military doctors. At the suggestion of D.K. Zabolotny, Dr. Yakov L. Okunevsky (1877–1940), a prominent specialist in disinfection, was transferred from the Department of General and Military Hygiene to the Department of Microbiology for teaching and scientific development of disinfection issues. During Zabolotny’s time at MMA, he published “Problems of plague research” (1925); “A plague on the South-East of the USSR and the reasons for its endemic” (1926)²; “Emerging issues in plague studies” (1928); and “Fundamentals of epidemiology” (1927), the first domestic manual in this field. From 1924 to 1928, D.K. Zabolotny

took an active part in preparations for the all-Russian congresses of bacteriologists, epidemiologists, and health officers. A large group of outstanding scientists and engineers that formed under his leadership made a significant contribution to the development of national epidemiology. Once Academician D.K. Zabolotny resigned from the MMA in November 1928, the teaching of epidemiology began a relative decline; therefore the Academy leadership decided to create a department of both epidemiology and infectious diseases. Thus, the decree #183 of the MMA from August 8, 1931 proclaimed the opening of the Department of Epidemiology Featuring Clinical Research of Infectious Diseases and Disinfection Course, to which V.M. Berman and I.I. Rogozin were transferred from the Department of Microbiology (headed then by V.N. Kosmodamiansky) with the purpose of teaching epidemiology, along with Ya.L. Okunevsky, who taught disinfection until 1940. Since it soon became obvious that the efforts of such a small group of teachers were not enough for the serious preparation of future military physicians in the field of anti-epidemic protection of troops [3], in 1936, the independent Department of Epidemiology was organized by the Academy. The main paragraph of the order reads as follows: “The sanitary and epidemiological provision of the Red Army in peacetime and wartime is one of the main tasks of military-sanitary service. Therefore, training of doctors produced by the Academy, should be particularly focused on anti-epidemic protection.

To achieve this goal in the field of teaching and research work I hereby command to allocate the Department of Epidemiology into an independent educational and scientific discipline.”³

Military surgeon of the 2nd rank Doctor V. Berman was next appointed as head of the department. Following the inclusion of disinfection courses (which had previously been taught separately), in 1938, the chair became known as the Department of Epidemiology and Disinfection. In the early years, the department housed eight teachers, a tutor, two lab technicians, and two preparators. V.M. Berman

² Edited by D.K. Zabolotny.

³ Order of the MMA Director from Nov 5 1936, #303-g.

headed the department from 1936 to 1949. He wrote about 100 scientific works and 2 manuals; his students have defended three doctoral and 20 pre-doctoral theses. Under the leadership of V.M. Berman, the main body of work was conducted on the experimental study of the mechanisms of immunogenesis and infection, epidemiology, laboratory diagnosis, and the prevention of a number of specific infectious diseases, as well as on developing issues of disinfection, disinsection, and deratisation. (Until 1940, the disinfection course was led by Ya.L. Okunevsky) "A Course in Clinical Epidemiology" (1936)⁴ by V.M. Berman, A.M. Levitov and I.I. Rogozin and "A Practical guide to the military disinfection" (1940) by T.E. Boldyrev and Ya.L. Okunevsky were of great importance to the training of military and civilian doctors on epidemiology and disinfection [4, 5]. V.M. Berman was engaged in the organization of the department's educational and scientific work during the evacuation of the MMA to Samarkand (November 1941 – July-August 1944) and after its return to Leningrad.

From 1951 to 1955, the department was run by Professor G.A. Znamenskiy (1901–1955). He wrote more than 50 scientific papers on issues of microbiology, epidemiology, and infectious diseases clinic. Twenty pre-doctoral theses have been defended under the guidance of Professor Znamenskiy. Due to changes in the mission of the Military Medical Service of the Armed Forces, he directed the department's activities towards the development and teaching of organizing anti-epidemic support for the troops in case of use of weapons of mass destruction.

From 1955 to 1964, the head of the epidemiology department was a member of the Academy of Medical Sciences (AMS) of the USSR, Laureate of the State Prize Professor I.I. Rogozin (1900–1973). During these years, the department's research was directed towards improving immunization practices, emergency prevention, disinfection, and disinfestation, and towards studying the epidemiology of Q fever, dysentery, salmonellosis, and hemorrhagic fevers. The research also conducted further analysis of anti-epidemic support for troops and the population during World War II and the

development of antibacterial protection issues. I.I. Rogozin published more than 220 scientific papers, including three monographs and four textbooks. He was also an advisor for 10 doctoral and 37 pre-doctoral theses.

In 1960, the Department of Epidemiology and Disinfection was renamed the Department of General and Military Epidemiology.

From 1964 to 1982, the department was supervised by member of the Academy of Medical Sciences of the USSR Professor V.D. Belyakov (1921–1996). He contributed greatly to the change in learning process based on scientific achievements in the field of epidemiology and related disciplines. During this period, the most important theoretical and practical studies for the departmental staff were in the field of systematization of epidemiology and the development of its new section – epidemiological diagnosis. Epidemiological diagnosis identified mutual variability among populations of the pathogen and the host, the direction, and the phase variation, all of which formed the basis for a new epidemiological theory of self-regulation in parasite systems.⁵ While the department was headed by Professor V.D. Belyakov, its employees defended 12 doctoral and 42 pre-doctoral theses [6].

From 1982 to 1988, the department was headed by Professor D.T. Khokhlov (1925–2008). The most significant results of research carried out during his time were the development of methods for determining the structure of biological contamination centers by levels of infective doses, the establishment of soldier immunization schemes, perspectives on immuno-correction and clinical-epidemiological assessment of a number of immunomodulators, the study of basic epidemiology patterns of hepatitis A in the army, and the study and evaluation of anti-epidemic support for Soviet troops serving in Afghanistan and dealing with the consequences of the Chernobyl nuclear plant disaster. Khokhlov was the academic advisor for six pre-doctoral theses.

From 1988 to 1996, the department was headed by associate professor

⁴ The first edition published in 1936, the 2nd and the 3rd – in 1941 and 1944.

⁵ The USSR patent certificate from May 22, 1986, #317, for scientific discovery, "The phenomena of internal regulation of epidemic process".

V.F. Korol'kov (b. 1941). During these years, the department began to study synecology of topical aerosol anthroponoses in military units. The main principles of epidemiology of acute pneumonia were established, and new data were gathered on the epidemiology of acute viral hepatitis B, C and D; Flexner shigellosis; staphylococcosis; and intestinal yersiniosis in the armed forces. A study was launched on the epidemiology of non-communicable diseases, and a number of studies were performed on the improvement of immunization among the troops. The department staff developed guidelines for the organization and conduct of sanitary and epidemiological surveillance in the armed forces in time of war and for the elimination of the epidemiological impact of natural disasters. V.F. Korol'kov was the advisor for eight pre-doctoral theses [3, 7].

Since 1996, the Department of General and Military Epidemiology has been headed by Professor P.I. Ogarkov (b. 1955). The department has continued research in areas that have been developed by faculty and staff of the department since its inception.

Currently, the Department of General and Military Epidemiology at MMA runs active research in several areas: use of the theory of parasite systems' self-regulation in science, in education, in medical universities of Russia, and in clinical practice, as the theory was supported by scientific and practical evidence; development of the organization and planning of anti-epidemic protection of troops in local armed conflicts and peacekeeping operations; development, theoretical foundation, and practical usage of the basic elements of epidemiological diagnosis, allowing professionals and researchers to competently carry out epidemiological analysis of infectious and noninfectious diseases, as well as epidemiological forecasting and appropriate selection of potentially effective sanitary and anti-epidemic (preventive) measures; study of theoretical and applied aspects of the epidemic process of infections and parasitic diseases relevant to troops and the population; study of the development process of epidemic infections associated with medical care in specialized surgical hospitals, and the establishment of a scientific basis for improving their diagnosis and prevention; identification of the current

features of biological weapons and development of biological protection measures for personnel, including the use of biological weapons in terrorist attacks; development and implementation of promising methods of immunization assessment and emergency prevention of military-related infections, exploring the effect of that assessment on models community-acquired pneumonia and acute respiratory infection prevention in groups of adults; the drafting of sections on disease control in legal documents regulating the organization of medical support for the Russian Federation (RF) Armed Forces; the organizing of congresses for medical officers on clinic and prevention, as well as epidemiology conferences, intended to summarize the work done on prevention and pass it on to interested specialists; and introduction to the educational process of numerous teaching materials developed by faculty members of the department in line with modern standards of medical education. The scientific school of epidemiology also covers such disciplines as clinical medicine (surgery and infectious diseases), medical statistics, hygiene, and microbiology.

The Department of General and Military Epidemiology has held five all-Russian professional conferences on modern epidemiology, featuring international speakers. In 2008, on the 210th anniversary of the MMA, the department held the largest all-Russian conference in the history of health-care departments, named "Theoretical Foundations of Epidemiology. Modern epidemiological and preventive aspects of infectious and mass non-communicable diseases." The conference was attended by participants from all over Russia, representing more than 150 institutions and organizations.⁶

In the first two decades of the 21st century, the educational and methodological work of the department has expanded greatly. The course of epidemiology is taught to military personnel and civilians, both Russian and foreign, in all the departments of the Academy. The academic staff of the department includes masters of sciences, assistants (adjuncts), residents, and doctoral students.

⁶ More than 850 articles by 1290 authors published in the two-volume conference compilation.

In the last 80 years of the department's history, its members have prepared 13 books (three of which have been reprinted several times), over 50 textbooks and collections of lectures, over 40 methodical guideline compilations and recommendations for physicians and medical services, over 10 collections of research papers, and 30 monographs and manuals for doctors. During the last 10 years, nine doctoral and 15 pre-doctoral theses have been defended under the academic supervision of the department members.

Employees of the department have served internationally as well, aiding the medical service of foreign countries (China, North Korea, Egypt, Yemen, Syria, Vietnam, Afghanistan, Kosovo, Angola, Indonesia, and Cuba), participating in anti-epidemic activities after the Chernobyl nuclear plant accident (1986) and the earthquake in Armenia (1988), and organizing anti-epidemic measures in the Chechen Republic [7].

For long-term and fruitful activity in training highly qualified epidemiologists, the Honored Worker of Higher Education title was awarded to employees of the Department of V.F. Korolkov (1998), A.B. Belov (2010), M.I. Ishkildin (2011), and P.I. Ogarkov (2012).

A number of students and staff of the department, after retiring from military service in the academy or transferring to other institutions of the Ministry of Defense, have successfully run epidemiology departments of other medical institutions and research organizations of the nation. One such example is Corresponding Member of the USSR Academy of Medical Sciences Professor T.E. Boldyrev (1900-1984), who became the head of the Epidemiology Department of the Kuibyshev Military Medical Academy (1939–1941), then chief of anti-epidemic control of the Main Military Medical Administration, chief epidemiologist of the Red Army (1941–1947), Deputy Minister of Health of the USSR and chief state sanitary inspector of the USSR, head of the department of epidemiology of the Central Postgraduate Medical Institute in 1948, and head of the epidemiology section at the N.F. Gamaleya Epidemiology and Microbiology Institute in 1956. Academician of the Medical Sciences Academy of the USSR

Professor V.D. Belyakov (1921–1996) headed the Department of Epidemiology of the Moscow Sechenov Medical Academy from 1982 to 1996. Professor B.L. Shura-Bura (1906–1982) headed the Department of Epidemiology of the medical institute in the town of Ryazan, beginning in 1967. Doctor of medical sciences V.T. Osipyanyan (1916–1969) served as department chairman at the State Research Experimental Institute of Military Medicine of the Defense Ministry. Doctor of Medical Sciences, professor N.I. Valvachev (1922–1990) was in charge of the Department of Epidemiology of the State Institute of Advanced Training of Physicians in the city of Minsk from 1969 to 1990. Doctor of Medical Sciences, Professor A.D. Yafaev (1923–2008) was from 1970 to 1991 the director, and from 1991 to 2008 Professor, of the Department of Epidemiology of the I.I. Mechnikov Sanitary-Hygienic Institute in Leningrad.

In 2006, the Department of General and Military Epidemiology celebrated its 70th anniversary and was awarded an I.P. Pavlov silver medal by the Russian Academy of Sciences, "for the development of medicine and health care," for achievements in research and methodological work.

Currently, the promising research areas of the department are as follows: optimization of the sanitary-epidemiological surveillance system and anti-epidemic activities against infectious and mass noninfectious diseases relevant to the military, bringing the system into line with the current challenges of the medical service of the RF Armed Forces; development of an automated system for epidemiological surveillance of communicable diseases in the RF Armed Forces; study of the susceptibility of people to infectious diseases and of mechanisms of the pathological process in order to develop means and methods of specific and nonspecific immunotherapy and emergency prevention of infections (invasions) for the various contingents; improvement of methods of laboratory diagnostics of infectious diseases and their implementation at the sanitary-epidemiological and medical institutions of the Ministry of Defense of the Russian Federation, including molecular genetic diagnosis of relevant infections using advanced technologies; summary of infected patient care experience, sanitary and epidemiological surveillance, and control

activities in war zones and disaster areas; and development of tools and methods of protection against biological weapons for the medical personnel of the Armed Forces.

Continuing the tradition of the outstanding scientists, teachers, and military epidemiologists who

have worked in the department throughout its history, the staff today maintains the department's efforts to improve the training of qualified personnel for the medical service of the army, to provide practical assistance to military units, and to conduct research on improving anti-epidemic protection of troops.

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