

## **Public Health State Exam - VLZP11XX**

### **QUESTIONS**

(for students taking state exams after 1. September 2022)

#### **A – HYGIENE AND PREVENTIVE MEDICINE**

1. Health - definition, measuring, indicators. Individual health and population health. Indicators based on mortality, morbidity, quality of life. The importance of age standardization.
2. Disease prevention, health protection and promotion - definitions, implementation methods, types of prevention, differences in implementation and impacts.
3. Health risks - methods of their evaluation, danger vs risk. Types of dose-response relationship, deterministic and stochastic effect. Exposure, direct and indirect assessment methods.
4. Epidemiology - definition. Epidemiological methods, their division and types. Use in preventive medicine. Descriptive, analytical, observational, interventional (experimental), retrospective, prospective, correlation (ecological) studies, case-control studies, cohort studies. Randomized and non-randomized studies. RCT category - randomized clinical trials. Importance and relationship to evidence level. Bias and their types, causality and its proving. Quantitative research.
5. Air and health - climatic factors, particles, relation of global climate change to health. Optimal microclimate, indicator role of carbon dioxide concentrations in indoor environment. Suspended particles and health, “black carbon”.
6. Light and health - light pollution, the role of light in the synchronization of circadian rhythms, melatonin, rules of proper lighting.
7. Noise and health - impacts of noise on health, auditory and non-auditory effects. Noise pollution, measurement of noise, expression of results, evaluation and interpretation. Technical measures against noise.
8. Ionizing and non-ionizing radiation - sources, health effects, impacts of nuclear accidents and normal operation of nuclear facilities (powerplants) on human health, radiation sickness, radiophobia. Radon.
9. Chemical factors, environmental toxicology - influence of chemical pollution on health. Metals - characterization and cycling of metals in the natural environment, entry into the organism, distribution, interaction with the organism, metal poisoning. Mercury and its methylated forms, Minamata disease. Arsenic, lead, cadmium, iron.

10. Environment in the Czech Republic - smog, noise and vibration, ionizing and non-ionizing radiation, health impact in the Czech Republic, trends of metal pollution in the Czech Republic.
11. Water and health - drinking water, legislation, biological function and biological value of drinking water, importance of water hardness, water sources, drinking water treatment, health safety, interpretation of analysis indicators. Methemoglobinemia. Faecal contamination of drinking water, water-borne infections.
12. Waste - definition of waste, impact of waste on health. Treatment of municipal and industrial waste, specifics of waste from medical facilities, protective and preventive measures in contact with waste, risk factors in waste treatment. Wastewater, basic methods and principles of purification.
13. Smoking - definition of smoking, composition of tobacco smoke, nicotine, pandemic smoking. Impact of smoking on health. Types of exposure, active and passive smoking, prenatal exposure. Tobacco addiction, diagnostics.
14. Smoking cessation and prevention - quitting smoking, program 5A / 5P in primary and secondary care. The role and possibilities of physicians, behavioral methods, pharmacological assistance in quitting, its nature, types, importance and indications. Harm reduction. Possibilities of prevention and legislation.
15. Nutrition – grains, cereals, bakery products, pasta, rice, oats etc. - importance in terms of the content of particular nutrients (carbohydrates, proteins, fats, minerals, vitamins, other substances of a non-nutritional nature) and in terms of the impact of consumption on health. Carbohydrates. Glycemic index. Whole grains, fiber. Incomplete proteins. Gluten - diseases caused by gluten, food labeling in terms of gluten.
16. Nutrition - fruits and vegetables - importance in terms of content of particular nutrients and other biologically active substances of non-nutritional nature, importance of vegetables and fruits in terms of health impacts and prevention of specific diseases. Servings and recommendations.
17. Nutrition - milk and dairy products - importance in terms of the content of particular nutrients, in terms of health impacts and in terms of prevention of specific diseases. Myths and truths about milk. Calcium, milk as a source of calcium. Live yoghurt cultures. Allergy to cow's milk protein, lactose intolerance. Servings, recommendations and dietary guidelines.
18. Nutrition - meat, fish and seafood, eggs, pulses, nuts and seeds - importance in terms of the content of particular nutrients, in terms of health impacts and in terms of prevention of specific diseases. Proteins and protein sources.
19. Nutrition - fats - classification of fats in nutrition, importance of fats in general and individual groups (fatty acids) for health. Food sources of fats and their importance. Relationship of fats and cholesterol.
20. Nutrition - sodium and salt (NaCl) - importance and impact on health. Actual and recommended consumption, food sources, recommendations for sodium restriction. Sugar, added sugar, health impact and recommendations.
21. Nutrition - food labeling - nutrition claims and health claims, misleading claims, legislation. Labeling of foodstuffs in terms of gluten, allergens. GDA (guidelines daily amounts).

22. Nutrition - nutritional recommendations - types, dietary reference values for nutrients (DRV), general (verbal) nutritional recommendations, food-based dietary guidelines (FBDG). Principles, goals, forms. Current dietary guidelines in the Czech Republic and examples from other countries.
23. Dietary assessment – nutritional intake and dietary consumption, qualitative and quantitative aspects. The global consumption assessment. Methods of assessment of individual consumption. Retrospective and prospective methods. Advantages and disadvantages of particular methods, types of questionnaires, fast evaluation according to food groups, WHO dietary score.
24. Nutritional status – undernutrition, malnutrition. Classification and types, symptoms, causes, diagnostics. The world's most widespread micronutrient malnutrition. Evaluation of PEM using MUAC in the field studies. Standardized screening tests to assess undernutrition and malnutrition in hospitalized patients and in elderly people.
25. Evaluation of nutritional status - overview of methods- anamnestic (history), clinical (physical), anthropometric, laboratory. Anthropometry - BMI, body fat and body composition, abdominal circumference and its importance. Problematics of cut-offs for body fat percentage. NWO syndrome. Metabolic syndrome. Biochemical indicators of nutritional status evaluation. Specifics of evaluation of nutritional status in children.
26. Physical activity - importance of physical activity in disease prevention, negative impacts of insufficient physical activity. Basic components of physical activity evaluation. Methods of evaluation of the level of physical activity (PAL), subjective and objective methods, metabolic equivalent (MET), assessment of cardiorespiratory fitness. Principles of method selection for evaluation of physical activity.
27. Nutrition of children - importance of breastfeeding, composition of breast milk: nutritive and non-nutritive components, risk of non-breastfeeding. Breastfeeding support, Baby-friendly Hospital Initiative, 10 steps to successful breastfeeding (WHO / UNICEF), 4 points for breastfeeding support, International code of marketing of breast milk substitutes (WHO). Contraindications of breastfeeding. Infants and toddler nutrition, complementary feeding. Growth charts. Childhood obesity.
28. Hygiene of children and adolescents – health protection and promotion, monitoring of health condition of children and youth, factors influencing healthy growth and development, the role of education for a healthy lifestyle. Characteristics and risks of individual age categories.
29. Social paediatrics - children and adolescents - injuries in childhood, violence against children, possibilities of prevention, adolescent addiction, mental disorders. STD as specific risks in adolescence, education and prevention.
30. Lifestyle-oriented preventive counselling - goals and implementers, main steps. The importance of lifestyle factors as determinants of health, attributable risk in etiology of major non-transmissible diseases. The importance of an individual risk profile assessment.
31. Smoking in lifestyle-oriented preventive counseling – main steps within a short intervention: Diagnosis of the smoking status, tools for assessing the degree of dependence. Rationale and argumentation for the patient. Methods and assistance in quitting.

32. Alcohol in lifestyle-oriented preventive counselling - the impact of alcohol on health, an attributive contribution to the risk of major diseases. Health problems related to alcohol use - differentiation of alcohol dependence and health damage (without the presence of dependence). Defining hazardous drinking, risk criteria. Alcohol screening - a distinction between identifying alcohol-related problems and quantifying consumption. AUDIT questionnaires and other short questionnaires. Determining the amount of alcohol, alcohol unit. Recommendations for the population.
33. Nutrition in lifestyle-oriented preventive counselling - recommended methods for evaluating nutritional habits in common practice. Use of general and individualized dietary (nutritional) recommendations. Critical summary of alternative diets and dietary patterns, their possible benefits and risks (Mediterranean pattern, vegetarianism, veganism, keto-diet and others).
34. Physical activity in lifestyle-oriented preventive counselling - recommended methods for evaluation of physical activity level (PAL) in common practice, methods of quantification and categorization according to the guidelines. Current recommendations of physical activity for the population. Global recommendations on physical activity for health, WHO health, American physical activity guidelines 2018. Individual prescription of physical activity.
35. Anthropometric examination and its evaluation in lifestyle-oriented preventive counselling - importance, evaluation and use of main indicators, their strengths and weaknesses. BMI, abdominal circumference, body fat percentage. The limits of WHR index. Problematics of NWO (normal weight obesity) and sarcopenic obesity. Link to behavioral recommendations.
36. Prevention of cardiovascular diseases - counseling, recommendations for the prevention of cardiovascular diseases through lifestyle. An overview of the most important lifestyle factors affecting the risk of atherosclerotic cardiovascular disease. Based on sufficient evidence, current recommendations (European recommendations 2016 and AHA American recommendations 2019), new findings.
37. Blood pressure - evaluation in the framework of preventive examinations and lifestyle-oriented counselling, factors influencing the risk of hypertension, possibilities of non-pharmacological intervention for favorably influencing elevated BP.
38. Blood cholesterol - evaluation as part of preventive examinations and lifestyle advice. Factors affecting plasma levels, possibilities of non-pharmacological intervention for favorably influencing blood cholesterol.
39. Possibilities of primary prevention of cancer - the main causes of cancer globally. Importance of the quality of evidence for risk assessment and formulation of recommendations. A realistic look at the importance of the carcinogens (class A). Smoking as a major controllable cancer risk. Effect of nutritional and dietary factors (food groups), body weight and physical activity. Summary of main recommendations for primary prevention of cancer.
40. Obesity - obesity prevention, nutritional counseling in obesity prevention and therapy - methods, use of dietary records.
41. Osteoporosis - epidemiology, risk factors for development, possibilities of prevention and positive influencing by lifestyle.

42. Diabetes type II – epidemiology, risk factors for development, possibilities of prevention and favorable influencing by lifestyle.

## **B – EPIDEMIOLOGY OF INFECTIOUS DISEASES**

1. Chain of infection – epidemic process, environmental and social circumstances, basic epidemiological terms, sources, routes of transmission, susceptible persons.
2. Preventive epidemiological measures - prevention and control of infectious diseases; active search for possible sources; isolation of the sick; breaking the chain of infection. WHO – Health statistics and information systems, Preventive Work Programmes and ECDC long-term surveillance strategy, Global Disease Elimination and Eradication as Public Health Strategies.
3. Active and passive immunisation – main principles, use in prophylaxis and prevention of infectious diseases, prophylaxis of tetanus, herd immunity, classification and composition of vaccines, vaccination contraindications, side effects of vaccinations, vaccination programmes according to WHO and CDC.
4. Epidemiology of measles, mumps and infectious polio - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention and prophylaxis, eradication programs of WHO.
5. Repressive anti-epidemic measures – EU case definitions of communicable diseases: case classification, reporting and recording infectious diseases, co-operation with Public Health Institutions, methods and possibilities of patient isolation, epidemiological investigation of the outbreak of the disease, quarantine measures.
6. Hygiene requirements and operating conditions in healthcare facilities - epidemiological specifics and risks, culture of patient safety, rooted assumptions, values, and norms of an organisation, guidelines.
7. Clean rooms in health care - explanation of the concept, application in health care, monitoring of contamination.
8. Non-specific routes of infection transmission in healthcare settings I – linen management, healthcare waste management, food (risks, hygienic precautions and methods).
9. Non-specific routes of infection transmission in healthcare settings II - water hygiene, air (risks, hygienic precautions and methods).
10. Healthcare associated infections – epidemiological characteristic, consequences, occurrence, methods of surveillance, risk processes and preventive precautions.
11. Standard hygiene measures and isolation precaution in healthcare settings - hand hygiene and use of gloves, preventing injuries by needle and other sharp objects, etc. Type of isolation. Use of personal protective equipment.

12. Disinfection in healthcare settings – the importance and use, methods, main principles of use, microbicidal activity of disinfectants, high level of disinfection and its use.
13. Sterilization – the basic principles and methods, pre-sterilization preparation, packaging and storage sterilized items, monitoring.
14. Epidemiology of bacterial food-born infections - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
15. Epidemiology of viral food-born infections - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
16. Enterotoxigenesis - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
17. Epidemiology of viral air-born infections - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
18. Epidemiology of Influenza - causative agents, routes of transmission, incubation period, main symptoms, complications, occurrence, risk groups of population, prevention. Pandemic plans.
19. Epidemiology of bacterial air-born infections I – Tuberculosis, Pertussis, Diphtheria, Legionellosis - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
20. Epidemiology of bacterial air-born infections II – Streptococcus, Meningococcus and Hemophilus infections, non-viral atypical pneumonia - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
21. Epidemiology of sexually transmitted infections - basic characteristics, occurrence, causative agents, incubation period, main symptoms, prevention.
22. Epidemiology of human herpesvirus infections - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.
23. Epidemiology of HIV/AIDS - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, risks of transmission in healthcare settings, transfusions safety, prevention and prophylaxis.
24. Epidemiology of infectious hepatitis - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention and prophylaxis.
25. Epidemiology of skin and superficial mucous membranes - basic characteristics, occurrence, causative agents, routes of transmission, incubation period, main symptoms, prevention.

26. Epidemiology of toxoplasmosis and vector-borne infections - basic characteristics, occurrence, causative agents, sources, routes of transmission, incubation period, main symptoms, prevention.
27. Traveling and infections – risks, the most frequent causative agents, prevention.
28. Emerging diseases and actual epidemiological threats. Biological weapons.

## **C - EPIDEMIOLOGICAL METHODS AND PUBLIC HEALTH**

1. Health - definition by the WHO, aspects, measuring.
2. Disease frequency - population at risk, incidence vs prevalence, factors influencing them. Cumulative incidence, case fatality.
3. Mortality and morbidity as health indexes - death rates, mortality rates, life expectancy.
4. Morbidity - disability, impairment, handicap.
5. Health determinants - indicators and risk factors, QALYs, DALYs.
6. Comparing disease occurrence - risk difference, attributable fraction, attributable risk, relative risk, odds ratio.
7. Epidemiological studies - observational and experimental, give examples how and when these studies are used.
8. Epidemiological studies - potential errors in epidemiology (random vs systematic), sample size, selection bias, measurement bias, confounding and how can be controlled. Validity (external and internal).
9. Causation in epidemiology - sufficient or necessary, single and multiple causes, factors in causation, considerations for causation (temporal relation, plausibility, consistency, strength, dose-response relationship, reversibility, study design, judging the evidence).
10. Prevention - importance, levels of prevention, methods, problems. Screening and screening tests / diagnostic tests. Definitions of normality and abnormality.
11. Social determinants of health
12. Evidence based medicine - how to read a paper.

13. Exposure vs dose - dose-effect and dose response relationships, assessing risk, risk assessment vs health impact assessment vs risk management.
14. Epidemiology, health policy and planning - the planning cycle, assessing efficiency.
15. Practical epidemiology - basic epidemiological information about a disease, critical reading, planning a project research.
16. Health system I - general information, health equity, access to healthcare, sustainable costs and financing, governmental and non-governmental institutions in health system.
17. Health system II - supply, need, demand and use, variations in utilisation rates, inverse care law, economic issues of health systems.
18. Healthcare system financing and organisation - macroeconomic level - laws of health resource allocation, cost containment and examples.
19. Healthcare system financing and organisation - microeconomic level - payment for doctor's services and payment for comprehensive care, paying for hospital care (DRG), hospital supply, utilisation and costs.
20. Health economics - definition and its importance, economic measures of health status - the basic of economic evaluation, cost-of-illness studies (COI) / cost-minimisation analysis (CMA) / cost-effectiveness analysis (CEA) / cost-utility analysis (CUA) / cost-benefit analysis (CBA) - provide examples on each evaluation.
21. Organisation of public health systems - public health law in Europe, the role of law in society and healthcare legislation, overview, CDC, environmental health, ethical issues in public health, individual and community rights, ethics in patient care vs in public health.
22. Planning and managing health systems - elements of organisations, targeted oriented management, human relations management, total quality management, changing human behaviour, empowerment, strategic management process, transformation of health care paradigms.
23. Managing health technology in public health – overview, innovation, regulation and quality control, Health technology assessment, Dissemination and diffusion of technology, Quality assurance (adverse events; certification vs accreditation; algorithms and guidelines; organisation of care; TQM).
24. Global health – overview, priorities in global health, development and health. Key institutions WHO / UNICEF, NGOs, World bank (their purpose, structure, objectives and current activities), trends in global health.

## **D - HEALTHCARE MANAGEMENT / ADMINISTRATION AND MEDICAL LAW.**

1. Role of healthcare provider (as an institution), societal functions, duties and obligations of healthcare provider. HP as commercial and non-commercial entity. Structure. Management.
2. Communication between medical personnel and patients/relatives - common mistakes, recommendations, SPIKES, etc, arrogance towards patients, courtesy of hospital employees, lack of professional ethics, dress code and personal presentation/hygiene of hospital staff.
3. Medical documentation - medical records, gold standard, written vs electronic documentation, access, confidentiality and shredding, Common mistakes, legal issues.
4. Patient safety - Patient identification, risk of harm to patients, most common risks, patient's fall, etc risk management, incident reporting, medication errors, WHO surgical safety checklist.
5. Managing Verbal and physical aggression, sexual harassment - physicians toward patients and vice-versa (regulations, what to do, common cases, recommendations, etc.).
6. Liability for negligence and malpractice - definition, common mistakes and how to avoid them, liability, defensive medicine, good medical practice, guidelines/protocols/standards of care. Measurements to reduce medical negligence/professional malpractice claims.
7. Patient complaints and claims - definition, common mistakes and how to avoid them, , complaints and their use to improve quality of provided services, how to deal with complaints. Legal consequences, corrective measures and disciplinary actions.
8. Quality of health care I - definition, general information, history of quality in health care, how it is assessed and which parameters are under evaluation. Quality of health care indicators, etc.
9. Quality of health care II - health care accreditation systems standards in health, general information, requirements to obtain/lose the accreditation, benefits of the accreditation, costs related with it, practical examples from a selected european country.
10. Quality of health care III - measures to assess the quality of health care. Approaches for improving outcomes and patient satisfaction. Patient feedback. Provide general information and give common examples.
11. Quality of health care IV - assessment of patient's satisfaction. Attitude of personnel towards the patient. Availability of personnel. Hospital environment/facilities vs

cleanliness, smoothness of admission/discharge, etc.

12. Overview of patient's rights and obligations - elementary patient's rights and their protection.
13. Right to receive treatment - standard of care, refusal to accept patient to treatment, termination of healthcare. Statutory health insurance in Czech Republic and selected EU countries, patient's right to receive free treatment and out-of-pocket payments.
14. Authonomy of will - patient consent to treatment, patients' refusal, previously expressed wishes, surrogate consent.
15. Making decision on behalf of the patient who is unable to make a decision or express his will - Patient's autonomy vs paternalistic approach -. Underage, unconscious, intoxicated patients. Decision-making in emergency medicine.
16. Patient's privacy and confidentiality breach - Physician-patient privilege, medical confidentiality, communication with relatives, passing information to authorities in public interest.
17. Rights and duties of a healthcare worker - physician as an employee, workplace safety, working hours, remuneration, vacation, further education, liability).
18. Professional liability insurance vs legal claim - types of insurances, errors & omissions, malpractice/negligence insurance, coverage, costs related. Civil/criminal law vs professional liability.
19. Human resources for health care – overview, human resources planning. Basic medical education and post-graduate training. Competence of physician in training. Licensure and supervision. Education for public health and health management. Health policy and management of human resources.
20. Moral integrity of a medical professional – general requirements, conflict of interests, gifts of gratitude, communication with pharmaceutical companies, retention of conscience, treatment of friends and family members

Additional criterion: In addition to the questions that the student randomly selects, every student will be asked basic questions regarding sterilization and disinfection and hand hygiene.