Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation

BANK OF ASSESSMENT TOOLS FOR DISCIPLINE

"EVIDENCE-BASED MEDICINE"

Training program (specialty): **31.05.01 GENERAL MEDICINE**

Department: **EPIDEMIOLOGY, MICROBIOLOGY AND**

EVIDENCE-BASED MEDICINE

Mode of study **FULL-TIME**

Nizhniy Novgorod
202_

1. Bank of assessment tools for the current monitoring of academic performance, mid-term assessment of students in the discipline / practice

This Bank of Assessment Tools (BAT) for the discipline " EVIDENCE-BASED MEDICINE "
is an integral appendix to the working program of the discipline "EVIDENCE-BASED MEDICINE "
All the details of the approval submitted in the WPD for this discipline apply to this BAT.
(Banks of assessment tools allow us to evaluate the achievement of the planned results stated in the educational program.

Assessment tools are a bank of control tasks, as well as a description of forms and procedures designed to determine the quality of mastering study material by students.)

2. List of assessment tools

The following assessment tools are used to determine the quality of mastering the academic material by students in the " EVIDENCE-BASED MEDICINE ":

No.	Assessment tool	Brief description of the assessment tool	Presentation of the assessment tool in the BAT
1	Test	A system of standardized tasks that allows you to automate the procedure of measuring the level of knowledge and skills of a student	Bank of test tasks
2	Abstract	The product of the student's independent work, which is a summary in writing of the results of the theoretical analysis of a certain scientific (educational and research) topic, where the author reveals the essence of the problem under study, provides various points of view, as well as his /her own views on it.	List of abstract topics
3	Situational tasks	A method of control that allows you to assess the criticality of thinking and the degree of the material comprehension, the ability to apply theoretical knowledge in practice.	List of tasks
4	Individual survey	A control tool that allows you to assess the degree of comprehension of the material	List of questions

3. A list of competencies indicating the stages of their formation in the process of mastering the educational program and the types of evaluation tools

Code and formulation of competence	Stage of competence formation	Controlled sections of the discipline	Assessment tools

UC -1; UC -3; UC -4; UC - 6; PC - 16; PC - 19; PC - 21	Entry	**Section 1** Fundamentals of evidence-based medicine and clinical epidemiology	Test Individual survey
UC -1; UC -3; UC -4; UC - 6; PC - 16; PC - 19; PC - 21	Current	**Section 2.** Medical Intervention Research	Test Situational tasks Individual survey Abstract
UC -1; UC -3; UC -4; UC - 6; PC - 16; PC - 19; PC - 21	Mid-term	**Section 3.** Systematic review and meta-analysis	Test Situational tasks Individual survey

4. The content of the assessment tools of entry, current control

Entry /current control is carried out by the discipline teacher when conducting classes in the form of: situational tasks, individual survey, abstract

Abstract Assessment tools for current control.

Individual survey
1. Clinical epidemiology. Definition of the concept, history of formation, purpose and objectives of clinical epidemiology.
2. Clinical epidemiology as a branch of epidemiology, which includes a methodology for obtaining evidence-based evidence-based information in epidemiological studies about the patterns of clinical manifestations of a disease, methods of diagnosis, treatment and prevention, in order to make an optimal clinical decision in relation to a particular patient.
3. Epidemiological research Epidemiological research as the basis of epidemiology.
4. Types (options, characteristic features) of epidemiological studies.
5. Continuous and selective, descriptive and analytical, observational and experimental, routine and special, one-stage (transverse) and longitudinal (long-term) retrospective, dynamic and mixed, field and clinical, indicative (trial), "case-control" and "cohort". Schematic diagram of the organization, the main stages of the study.
6. Optimization of the process of diagnosis, treatment and prevention in relation to a particular patient based on the results of an assessment of the treatment and diagnostic process using data from epidemiological studies.
7. The role of clinical epidemiology in developing the scientific foundations of medical practice - a set of rules for making clinical decisions.
8. The main postulate of clinical epidemiology is "every clinical decision should be based on rigorously proven scientific facts."
9. Development of epidemiologically substantiated clinical recommendations and diagnostic standards, development of the prognosis of the course of the disease, methods of treatment and prevention.

10. Data obtained in clinical epidemiological studies necessary for the epidemiological substantiation of preventive programs in relation to the prevention of noncommunicable diseases Randomization as a way to avoid errors in the formation of experimental and control groups, methods of randomization.
11. Organization of controls - blind and double-blind experience (method). Features of observation. Test phases (KI).
12. Features of conducting clinical trials of drugs, vaccines and other immunobiological preparations (sera, interferons, immunoglobulins). Randomized field controlled trials and their purpose.
13. Evaluation of the potential effectiveness of diagnostic and screening tests.
14. Definition of the concepts of diagnostic and screening test.
15. The purpose of diagnostic (diagnosis and choice of therapy) and screening tests (early detection of cases and secondary prevention).
16. The use of experimental studies for the evaluation of diagnostic and screening tests. Features of the organization of the study for the evaluation of diagnostic tests.
17. The main scheme for testing a diagnostic test.
18. The "gold standard" is the most accurate diagnostic test.
19. Scheme for testing the effectiveness and safety of a screening program.
20. Evaluation of the effectiveness and safety of screening programs.
21. Sensitivity, specificity and validity of diagnostic criteria and their impact on the completeness of detection of patients with infectious and non-infectious diseases.
22. Possible errors of analytical studies and their sources.
23. Ethics of epidemiological research, its international principles.
24. Systematic reviews. Meta-analysis.
25. Systematic reviews. Definition**.**
26. Purpose of compilation. Requirements for the preparation of systematic reviews.
27. Use of data from systematic reviews in practical work.
28. Meta-analysis. Definition. Purpose of the event.
29. Requirements for conducting a meta-analysis

Abstract

1. The process of formation of the incidence of the population is the main subject of epidemiology. Indicators used in epidemiology.

2. Types of epidemiological studies. Descriptive-evaluative epidemiological studies.

3. Types of epidemiological studies. Experimental epidemiological studies.

4. Types of epidemiological studies. Analytical epidemiological studies.

5. Evaluation of the effectiveness of diagnostic and screening tests.

6. The concept of clinical epidemiology and evidence-based medicine.

7. Evaluation of the reliability and evidence of scientific research

8. Errors in epidemiological studies

9. Sources of evidence, databases.

10. Systematic reviews.

11. Meta-analysis.

4.1. Tasks for the assessment of competence " *UC -1; UC - 3; UC -4; UC - 6; PC - 16; PC - 19; PC - 21*" :

Task 1.
The analytic study demonstrated that the children contracted measles more frequently had not been vaccinated against this infection. What might be odds ratio (OR) to show a probable association between a disease and the tested factor in the epidemiologic study?
1) OR = 1

2) OR = 3.7
3) OR = 0.05
4) OR cannot be calculated.

Task 2. A randomized clinical trial has been performed to investigate the effectiveness of a remedy for prophylaxis of acute coronavirus infection. The treated group consisted of children with the psychoneurological symptoms (n=187). The control group consisted of 132 children. The medical observation lasted 7 days. The negative outcome was in 9 treated children (4.8%) and 21 children (15.9%) in the control group (p<0.001).
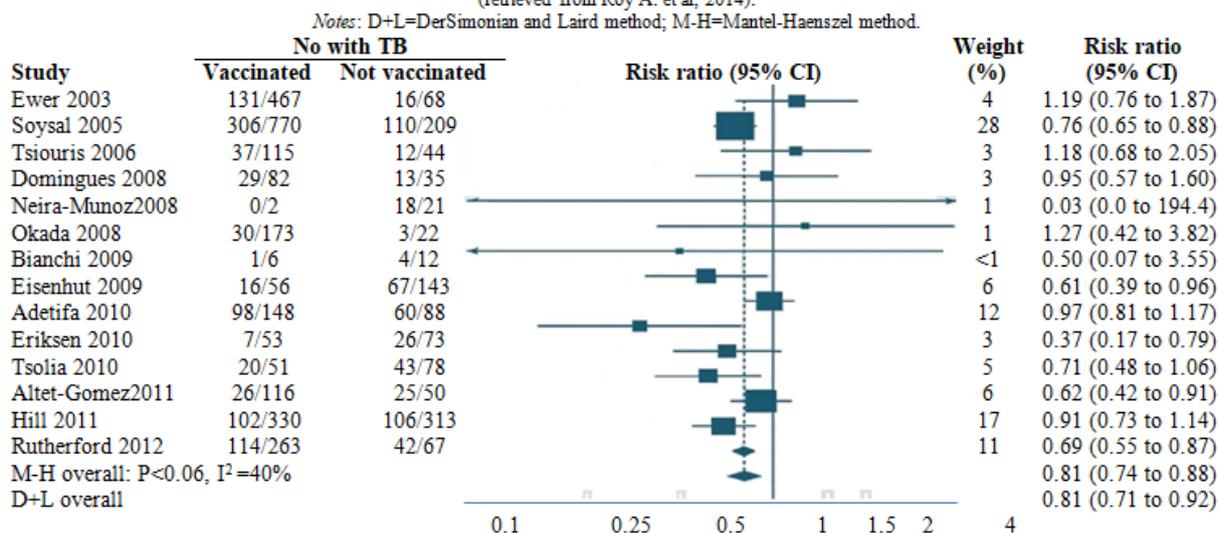   *Tasks*:
1. Calculate risks of the infection in the treated and control groups, relative risk, reduction of RR, coefficient of protectiveness, as well as number needed to treat;
2. How can the results of the RCT be interpreted?

Task 3.
    Effect of BCG vaccination against *Mycobacterium tuberculosis* infection in children was studied with the help of systematic review. The investigators searched EMBASE, Medline and the Cochrane Library as well as reference lists of retrieved articles and conference abstracts. The results of the meta-analysis are shown on the picture below (fig. 1). The authors revealed moderate heterogeneity (I^2=40 %, P<0.06) between the studies.

Fig. 1. Protection against tuberculosis determined by interferon γ release assay in children vaccinated with BCG (retrieved from Roy A. et al, 2014).
Notes: D+L=DerSimonian and Laird method; M-H=Mantel-Haenszel method.

Study	Vaccinated	Not vaccinated	Weight (%)	Risk ratio (95% CI)
Ewer 2003	131/467	16/68	4	1.19 (0.76 to 1.87)
Soysal 2005	306/770	110/209	28	0.76 (0.65 to 0.88)
Tsiouris 2006	37/115	12/44	3	1.18 (0.68 to 2.05)
Domingues 2008	29/82	13/35	3	0.95 (0.57 to 1.60)
Neira-Munoz2008	0/2	18/21	1	0.03 (0.0 to 194.4)
Okada 2008	30/173	3/22	1	1.27 (0.42 to 3.82)
Bianchi 2009	1/6	4/12	<1	0.50 (0.07 to 3.55)
Eisenhut 2009	16/56	67/143	6	0.61 (0.39 to 0.96)
Adetifa 2010	98/148	60/88	12	0.97 (0.81 to 1.17)
Eriksen 2010	7/53	26/73	3	0.37 (0.17 to 0.79)
Tsolia 2010	20/51	43/78	5	0.71 (0.48 to 1.06)
Altet-Gomez2011	26/116	25/50	6	0.62 (0.42 to 0.91)
Hill 2011	102/330	106/313	17	0.91 (0.73 to 1.14)
Rutherford 2012	114/263	42/67	11	0.69 (0.55 to 0.87)
M-H overall: P<0.06, I^2=40%				0.81 (0.74 to 0.88)
D+L overall				0.81 (0.71 to 0.92)

Tasks: 1) How many studies were enrolled? 2) How many participants were totally included in the analysis? 3) What does heterogeneity in the meta-analysis speak about? 4) What overall risk ratio do the bulbs demonstrate? And what does it mean?

Task 4..

The scientists conducted a meta-analysis to assess the impact of carbapenem resistance on mortality of patients with *Pseudomonas aeruginosa* infection. They searched Web of science, PubMed, Google Scholar, EMBASE, and the Cochrane Library to identify published cohort or case-control studies. Seventeen studies, including 6660 patients carrying *P. aeruginosa*, were identified.

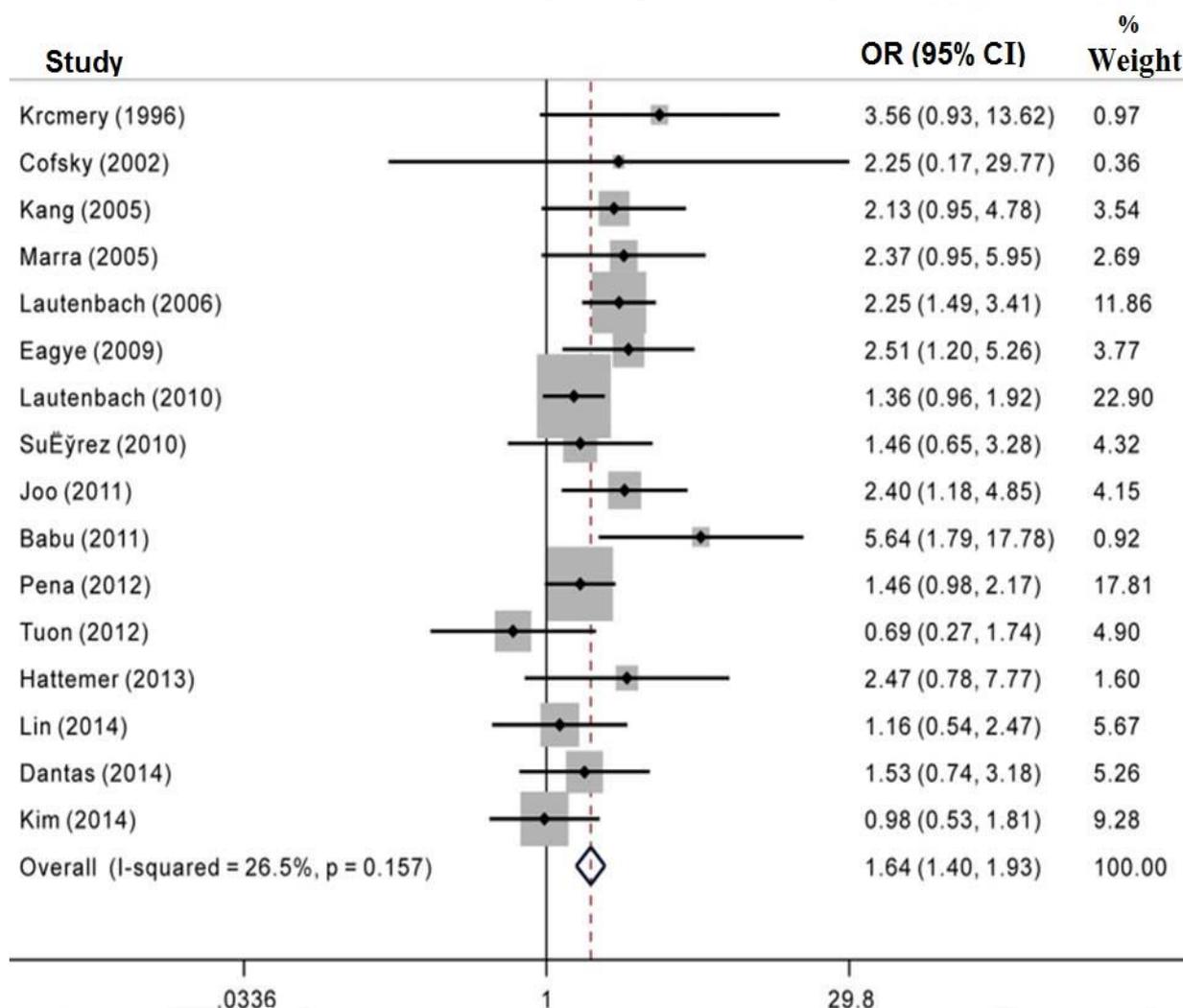| Study	OR (95% CI)	% Weight
Krcmery (1996)	3.56 (0.93, 13.62)	0.97
Cofsky (2002)	2.25 (0.17, 29.77)	0.36
Kang (2005)	2.13 (0.95, 4.78)	3.54
Marra (2005)	2.37 (0.95, 5.95)	2.69
Lautenbach (2006)	2.25 (1.49, 3.41)	11.86
Eagye (2009)	2.51 (1.20, 5.26)	3.77
Lautenbach (2010)	1.36 (0.96, 1.92)	22.90
SuËÿrez (2010)	1.46 (0.65, 3.28)	4.32
Joo (2011)	2.40 (1.18, 4.85)	4.15
Babu (2011)	5.64 (1.79, 17.78)	0.92
Pena (2012)	1.46 (0.98, 2.17)	17.81
Tuon (2012)	0.69 (0.27, 1.74)	4.90
Hattemer (2013)	2.47 (0.78, 7.77)	1.60
Lin (2014)	1.16 (0.54, 2.47)	5.67
Dantas (2014)	1.53 (0.74, 3.18)	5.26
Kim (2014)	0.98 (0.53, 1.81)	9.28
Overall (I-squared = 26.5%, p = 0.157)	1.64 (1.40, 1.93)	100.00

.0336   1   29.8

Fig. 2. Crude odds ratio for the association between carbapenem resistance and mortality of patients with *P. aeruginosa* infection
(retrieved from Qianqian Liu et al, 2014).

Tasks: What level of mortality had patients infected with the carbapenem-resistant *P. aeruginosa* in comparison with those infected with carbapenem-susceptible bacteria? According to this meta-analysis, may the resistance to these antibiotics increase the mortality of patients with *P. aeruginosa* infection?

4.3. Questions for colloquiums, interviews *(specify the competence code):*

4.4. Tasks (assessment tools) for the exam/credit
The full package of examination tasks/tasks is given *(specify the competence code):*

And then the tasks are specified for all competencies provided for this discipline.

5. The content of the assessment tools of mid-term assessment

Mid-term assessment is carried out in the form of a credit.
*The content of the assessment tool (*Test)
Section 1
Topic 1
1. A GOOD DEFINITION OF EPIDEMIOLOGY AS A SCIENCE IS
    1) the study of the distribution and determinants of health-related states and events in specified populations and the application of this study for the control of health problems
    2) the study of outbreaks and multiple cases
    3) the science of epidemics and pandemics
    4) the medical science, which investigates the causes of occurrence and spread of communicable diseases in the human society and applies this knowledge for fighting and prevention of these diseases.

2. EPIDEMIOLOGY OF INFECTIOUS DISEASES IS
    1) the science of epidemics and pandemics
    2) the branch of epidemiology, which investigates the causes of occurrence and spread of communicable diseases in the human society and applies this knowledge for fighting and prevention of these diseases
    3) the scientific study of epidemic outbreaks
    4) the study of the distribution and determinants of health-related events in specified populations and the application of this study for the control of health problems.

3. THE METHOD APPLIED IN EPIDEMIOLOGY OF INFECTIOUS DISEASES IS
    1) bacteriological method
    2) statistical method
    3) logistic method
    4) epidemiological method

4. EPIDEMIOLOGICAL APPROACH MEANS TO INVESTIGATE HUMAN'S PATHOLOGY
    1) at individual level
    2) at molecular and genetic level
    3) at population level
    4) at cellular level

5. EPIDEMIOLOGY INVESTIGATES
    1) only infectious communicable diseases
    2) all diseases and health-related states and events
    3) only noninfectious diseases
    4) chronic diseases and states

6. MODERN STRUCTURE OF EPIDEMIOLOGY COMPRISES TWO FOLLOWING MAIN BRANCHES:
    1) epidemiology of infectious diseases and epidemiology of noninfectious diseases
    2) general epidemiology and epidemiology of different nosological groups
    3) clinical epidemiology and military epidemiology
    4) descriptive epidemiology and analytic epidemiology.

Choose ALL correct answers:
7. THE MAIN GOALS OF EPIDEMIOLOGY ARE THE FOLLOWING:
    1) characterising the frequency and distribution of diseases and other conditions in population

2) reducing the morbidity and mortality from infections, preventing the spread of communicable diseases
3) providing the surveillance of diseases and other conditions
4) evaluating prophylactic means and measures
5) identifying factors causing the occurrence and spread of diseases

8. EPIDEMIOLOGY IS BASED ON THE FOLLOWING FUNDAMENTAL ASSUMPTIONS:
1) diseases do not occur by chance
2) diseases are not distributed randomly in the population, thus, their distribution indicates something about how and why that disease process has occurred
3) diseases occur by chance and have random distribution
4) diseases are distributed randomly in the population

9. EPIDEMIOLOGICAL APPROACH USED TO INVESTIGATE HUMAN'S PATHOLOGY INCLUDES:
1) investigation at the individual level
2) investigation at the level of population
3) complex investigation
4) integration of many methods from different disciplines
5) using a single specific method

10. MATCH THE TYPES OF EPIDEMIOLOGICAL STUDIES LISTED IN THE LEFT COLUMN WITH THE CORRESPONDING EXAMPLES IN THE
RIGHT ONE:

Types of epidemiological studies	*Examples of different epidemiological studies*
1. descriptive 2. analytic 3. experimental	a) cohort studies b) case reports c) clinical trials d) populations (correlation) studies e) case-control studies f) field trials

Topic 2

1. DESCRIPTIVE TYPE OF EPIDEMIOLOGICAL STUDIES
1) identifies causal relationships or factors associated with disease
2) characterizes the distribution of cases in relation to person, place, and time
3) estimates the effectiveness of treatment and prophylactic means and measures

2. ANALITIC TYPE OF EPIDEMIOLOGICAL STUDIES
1) estimates the effectiveness of treatment and prophylactic means and measures
2) characterizes the distribution of cases in relation to person, place, and time
3) identifies causal relationships or factors associated with disease

3. EXPERIMENTAL TYPE OF EPIDEMIOLOGICAL STUDIES
1) estimates the effectiveness of treatment and prophylactic means and measures
2) identifies causal relationships or factors associated with disease
3) illustrates the distribution of cases in relation to place, person, and time.

4. ANALYTIC TYPE OF EPIDEMIOLOGICAL STUDIES MAY BE
1) only retrospective

2) only prospective
3) retrospective and prospective
4) historical.

5. THE SENSITIVITY OF A RAPID DIAGNOSTICS TEST 94% MEANS:
1) the test reveals all infected individuals
2) the test does not reveal 6% of diseased persons
3) a share of true negative results
4) a share of false positive results.

6. ODDS RATION CAN BE DEFINED AS
1) the portion of the incidence of a disease in the population that is due to exposure.
2) a sort of attributable risk percent
3) an absolute difference of the risks:
4) the chances of being exposed as opposed to not being exposed.

7. THE OBJECTIVE OF RANDOMIZED FIELD TRIAL IS THE FOLLOWING:
1) evaluating the safety of drugs
2) revealing the adverse effects of a vaccine
3) evaluating the efficacy and safety of a vaccine
4) evaluating the real effectiveness of a drug.

Choose ALL correct answers:
8. VALIDITY CAN BE THE FOLLOWING TYPES:
1) test validity
2) face validity
3) external validity
4) internal validity

9. EXAMPLES OF THE DESCRIPTIVE STUDIES AMONG LISTED BELOW:
1) cross-sectional survey
2) case series report
3) cohort study
4) case report

10. EXAMPLES OF THE ANALITIC STUDIES AMONG LISTED BELOW:
1) cross-sectional survey
2) case-control study
3) randomized clinical trials
4) cohort studies

11. INSTANCES OF THE CONTROLED EXPERIMENTAL STUDIES AMONG LISTED BELOW:
1) case-control study
2) field trial
3) cohort studies
4) randomized clinical trial

12. EXPERIMENTAL EPIDEMIOLOGICAL STUDIES INCLUDES
1) controlled epidemiological experiment
2) cohort study
3) uncontrolled epidemiological experiment
4) "natural" experiment

13. EXPERIMENTAL TYPE OF EPIDEMIOLOGICAL STUDIES MAY BE
   1) blinded
   2) double blinded
   3) triple blinded
   4) four times blinded

14. THE PLAUSIBLE BIAS IN THE CLINICAL TRIALS:
   1) selection bias
   2) investigation bias
   3) performance bias
   4) exclusion bias.

15. MATCH THE TYPES OF EPIDEMIOLOGICAL ANALITIC STUDIES LISTED IN THE LEFT COLUMN WITH THEIR APPLICATION:

Types of epidemiological analytic studies	Applications of different epidemiological analytic studies
1. case-control study 2. cohort study	a) for the examination of multiple etiologic factors for a single disease b) for the examination of multiple effects of a single exposure c) for the elucidation of temporal relationship d) for the evaluation of diseases in long latent periods e) for the evaluation of rare etiologic factors f) for the evaluation of rare disease

16. MATCH A VALUE OF RELATIVE RISK LISTED IN THE LEFT COLUMN WITH THEIR MEANING IN THE RIGHT COLUMN:

A value of RR	The meaning of RR
1. RR = 1 2. RR > 1 3. RR < 1	a) a risk to have a disease is more if a factor is present b) a factor can be protective c) it is necessary to conduct an additional study d) there is no association between a risk factor and a disease

Complete the sentences

17. ANALYTIC AND DESCRIPTIVE STUDIES ARE _____STUDIES, BECAUSE INVESTIGATORS DO NOT INFLUENCE THE RESULTS BY ANY MEANS AND MEASURE.

18. EXPERIMENTAL STUDIES ARE _____ STUDIES, BECAUSE INVESTIGATORS CAN INFLUENCE THE INDIVIDUALS BY USING THE MEANS OR TAKING MEASURES.

19. THE BEST WAY TO ALLOCATE PARTICIPANTS OF THE CONTROLLED EPIDEMIOLOGICAL EXPERIMENT TO THE TREATMENT GROUP AND THE PLACEBO GROUP IS _____.

If the bank of assessment tools for conducting current control and mid-term assessment of students in this discipline is presented on the Educational Portal of the PRMU, specify a link to this electronic resource.
   link https://sdo.pimunn.net/course/view.php?id=4694

A n s w e r s:
Section 1
Topic 1
1-1; **2**-2; **3**-4; **4**-3; **5**-2; **6**-1; **7**-1,3,4,5; **8**-1,2; **9**-2,3,4; **10**- 1bd 2ae 3cf.
Topic 2
1-2; **2**-3; **3**-1; **4**-3; **5**-2; **6**-4; **7**-3; **8**-1,2,3,4; **9**-1,4; **10**- 2,4; **11**-2,4; **12**-1,3,4; **13**-1,2,3,4; **14**-
1,3,4; **15**- 1ad 2bce; **16**- 1d 2a 3b; **17**- observational; **18**-interventional; **19**-randomization;

5. Criteria for evaluating learning outcomes

For the credit

Learning outcomes	Evaluation criteria	
	Not passed	**Passed**
Completeness of knowledge	The level of knowledge is below the minimum requirements. There were bad mistakes.	The level of knowledge in the volume corresponding to the training program. Minor mistakes may be made
Availability of skills	Basic skills are not demonstrated when solving standard tasks. There were bad mistakes.	Basic skills are demonstrated. Typical tasks have been solved, all tasks have been completed. Minor mistakes may be made.
Availability of skills (possession of experience)	Basic skills are not demonstrated when solving standard tasks. There were bad mistakes.	Basic skills in solving standard tasks are demonstrated. Minor mistakes may be made.
Motivation (personal attitude)	Educational activity and motivation are poorly expressed, there is no willingness to solve the tasks qualitatively	Educational activity and motivation are manifested, readiness to perform assigned tasks is demonstrated.
Characteristics of competence formation*	The competence is not fully formed. The available knowledge and skills are not enough to solve practical (professional) tasks. Repeated training is required	The competence developed meets the requirements. The available knowledge, skills and motivation are generally sufficient to solve practical (professional) tasks.
The level of competence formation*	Low	Medium/High

* - *not provided for postgraduate programs*

For testing:

Mark "5" (Excellent) - points (100-90%)
Mark"4" (Good) - points (89-80%)
Mark "3" (Satisfactory) - points (79-70%)

Less than 70% – Unsatisfactory – Mark "2"

Developer:
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Date "_____" _____ 202__