REVIEW
of the official reviewer for dissertation work
on the theme «Oral health status and adverse pregnancy outcomes» presented by ORALKHAN ZHIBEK for the degree of Doctor of Philosophy (PhD) in the educational program «8D10102 - Medicine».

№	Criteria	Eligibility (one of the options must be checked)	Justification of the position of the official reviewer
1.	The topic of the thesis (as of the date of its approval) corresponds to the directions of development of science and/or state programs	1.1 Compliance with priority areas of science development or government programs: 1) The thesis was completed within the framework of a project or target program financed from the state budget (indicate the name and number of the project or program) 2) The thesis was completed within the framework of another state program (indicate the name of the program) 3) The dissertation corresponds to the priority direction of the development of science, approved by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan (indicate the direction)	The dissertation was carried out within the framework of the scientific project "Clinical, Genomic and Environmental Variable Approach to Preterm Birth" funded by the Ministry of Science and Higher Education of the Republic of Kazakhstan. State registration number AP14869249. The research included epidemiological, clinical, and molecular investigations aimed at identifying risk factors for adverse pregnancy outcomes and improving preventive strategies in maternal healthcare.
2.	Importance for science	The work makes/does not make a significant contribution to science, and its importance is well disclosed/not disclosed	The work makes a significant contribution to science. The study provides a comprehensive multidisciplinary analysis integrating epidemiological, clinical, and molecular data. It contributes to understanding the oral-systemic health link, particularly in the context of preterm birth.

3.	The principle of independence	Self-reliance level: 1) High; 2) Medium; 3) Low; 4) No independence	The doctoral candidate demonstrates a high level of independence, including data collection, statistical analysis, interpretation, and manuscript preparation.
4.	The principle of inner unity	4.1 Justification of the relevance of the thesis: 1) Justified; 2) Partially justified; 3) Not justified.	The dissertation shows strong internal coherence. The structure logically progresses from literature review to empirical studies and integrates findings effectively.
		4.2 The content of the thesis reflects the topic of the thesis: 1) Reflects; 2) Partially reflects; 3) Does not reflect	The content of the dissertation reflects the research topic. The author comprehensively examines the relationship between oral health status and adverse pregnancy outcomes, integrating epidemiological, clinical, and molecular evidence. The work consistently addresses the role of periodontal disease and other oral conditions in the risk of preterm birth and evaluates their interaction with maternal and socioeconomic factors. The presented results directly correspond to the stated aim and support the investigation of oral health as a modifiable risk factor for adverse pregnancy outcomes.
		4.3. The purpose and objectives correspond to the topic of the	The objectives are clearly formulated

		thesis: 1) correspond; 2) partially correspond; 3) do not correspond	in the introduction and consistently addressed throughout the research process, including systematic review, cohort, and case-control analyses, as well as molecular detection of Fusobacterium nucleatum. The stated aims are achieved and reflected across all sections of the dissertation.
		4.4 All sections and provisions of the thesis are logically interconnected: 1) completely interconnected; 2) the interconnection is partial; 3) there is no interconnection	All sections and structure of the dissertation are logically interconnected and preserves continuity between chapters. The systematic review, cohort study, case-control analysis, and molecular investigation are integrated and collectively support the research objectives. The logical flow of the dissertation ensures coherence between the aims, methodology, results, and conclusions.
		4.5 The new solutions (principles, methods) proposed by the author are reasoned and evaluated in comparison with the known solutions: 1) there is a critical analysis; 2) partial analysis; 3) the analysis does not represent one's own opinions, but quotes from other authors	The author compares existing evidence on oral health and adverse pregnancy outcomes and identifies gaps in current knowledge. Based on this analysis, the dissertation formulates well-reasoned conclusions regarding the association between periodontal disease and preterm birth, and provides interpretation within the context of Kazakhstan’s population. The

			integration of epidemiological, clinical, and molecular findings, including the assessment of Fusobacterium nucleatum, further strengthens the analytical depth of the study.
5.	Scientific novelty principle	5.1 Are the scientific results and provisions new? 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	The study is novel in the regional context and in its integrative methodological approach combining epidemiological, clinical, and machine learning analyses.
		5.2 Are the dissertation findings new? 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	The dissertation findings are partially new, particularly in the regional context where data on the association between oral health and adverse pregnancy outcomes are limited.
		5.3 Technical, technological, economic or management decisions are new and reasonable: 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	Technical and methodological decisions presented in the dissertation are partially new and well justified. The use of multivariable statistical analysis and machine learning models for predicting adverse pregnancy outcomes represents an innovative methodological contribution. These approaches improve risk assessment and provide a basis for integrating oral health evaluation into prenatal care and public health strategies.

6.	The validity of the main findings	All main conclusions are/are not based on scientifically significant evidence or well-grounded (for qualitative research and areas of training in the arts and humanities)	All conclusions are based on scientifically significant evidence. The conclusions are supported by systematic review, cohort, and case-control data, as well as appropriate statistical analysis.
7.	The main provisions for the defense	It is necessary to answer the following questions for each provision separately: 7.1 Is the provition proven? 1) proven; 2) rather proven; 3) rather not proven; 4) not proven 7.2 Is it trivial? 1) yes; 2) no 7.3 Is it new? 1) yes; 2) no 7.4 Application level: 1) narrow; 2) medium; 3) wide 7.5 Is it proven in the article? 1) yes; 2) no	The main provisions submitted for defense are clearly formulated, scientifically sound, and adequately supported by the data presented in the dissertation. Each provision is based on a solid combination of evidence derived from the systematic review, cohort study, and case-control study, ensuring methodological triangulation. The results are convincingly demonstrated through appropriate statistical analyses and are further supported by publications in peer-reviewed journals. The findings are not trivial, as they contribute to the growing body of evidence on the association between oral health and adverse pregnancy outcomes, particularly within a regional context where such data are limited. Moreover, the integration of machine learning approaches adds an innovative dimension to the work, enhancing its analytical depth and practical applicability. The

			provisions have a medium to wide level of application, particularly in public health, preventive medicine, and interdisciplinary clinical practice.
8.	The principle of reliability Reliability of sources and information provided	8.1 Choice of methodology - is justified or the methodology is described in sufficient detail 1) yes; 2) no	The reliability of the dissertation is ensured through the use of well-established and appropriate research methodologies. The study design includes a systematic review and meta-analysis conducted according to recognized standards, as well as original cohort and case-control studies, which strengthens the overall validity of the findings.
		8.2 The results of the thesis were obtained using modern methods of scientific research and methods of processing and interpreting data using computer technologies: 1) yes; 2) no	The methods are described in sufficient detail, allowing reproducibility. The use of modern statistical techniques, including multivariable analysis and machine learning models, further supports the robustness of the results.
		8.3 Theoretical conclusions, models, identified relationships and patterns have been proven and confirmed by experimental research (for areas of training in pedagogical sciences, the results have been proven on the basis of a pedagogical experiment): 1) yes; 2) no	The conclusions are supported by acomprehensive and up-to-date body of scientific literature, and references are relevant and sufficient for the scope of the research. The combination of epidemiological, clinical, and molecular data (including detection of Fusobacterium nucleatum) enhances

			the credibility and scientific rigor of the study.
		8.4 Important statements are confirmed / partially confirmed / not confirmed by references to current and reliable scientific literature	The main statements in the dissertation are based on reliable scientific sources and are thoroughly substantiated. The author used up-to-date literature from internationally recognized researchers in the fields of obstetrics, epidemiology, and oral health. The dissertation includes references to systematic reviews, cohort and case-control studies, and clinical research relevant to preterm birth and periodontal disease. Statistical data and evidence from peer-reviewed journals and authoritative scientific sources are appropriately cited, supporting the validity of the conclusions.
		8.5 Used literature sources are sufficient/not sufficient for a literature review	The literature used in the dissertation is sufficient and relevant to the research topic.
9	Practical value principle	9.1 The thesis has theoretical value: 1) yes; 2) no	The dissertation has clear theoretical and practical significance. From a theoretical perspective, it contributes to a deeper understanding of the relationship between oral health and preterm birth,integrating biological, clinical, and socioeconomic determinants.

		9.2 The thesis is of practical importance and there is a high probability of applying the results obtained in practice: 1) yes; 2) no	From a practical standpoint, the findings have important implications for clinical practice and public health. The identification of oral health as a modifiable risk factor supports the inclusion of dental assessment and preventive strategies within prenatal care programs.
		9.3 Are the practice suggestions new? 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	The proposed recommendations are relevant and applicable, particularly in settings with limited resources, where cost-effective and preventive approaches are essential. Although some recommendations build on existing knowledge, their integration into a unified framework tailored to the regional context represents a valuable contribution.
10.	The quality of writing and design	Academic writing quality: 1) high; 2) average; 3) below average; 4) low.	The dissertation is generally well written and structured; however, minor grammatical and stylistic inconsistencies are present and could be improved.
11.	Notes on a thesis		Minor language and typographical errors are present.Machine learning methodology could benefit from clearer explanation for clinical readers.
12.	Scientific level of the doctoral		The candidate has published in peer-

	student's articles on the topic of research (in case of defense of the dissertation in the form of a series of articles, the official reviewers comment on the scientific level of each article of the doctoral student on the topic of research)		reviewed journals, including indexed international journals, demonstrating an appropriate scientific level.
13.	Decision of the official reviewer (pursuant to paragraph 28 of the present Model Regulations)		It is my strong conviction that the dissertation of Oralkhan Zhibek, entitled “Oral health status and adverse pregnancy outcomes”, is of considerable relevance and scientific significance. The provisions submitted for defense demonstrate notable scientific value and are supported by comprehensive epidemiological, clinical, and molecular evidence. The results highlight the association between oral health status, particularly periodontal disease, and adverse pregnancy outcomes, and emphasize the importance of oral health as a modifiable risk factor. The findings have theoretical and practical implications for maternal healthcare and preventive medicine. Based on the presented work, Oralkhan Zhibek deserves to be awarded the degree of Doctor of

			Philosophy (PhD) in the educational program «8D10102 - Medicine».

In reviews, official reviewers indicate one of the following solutions:

1) to award the degree of Doctor of Philosophy (PhD) or Doctor of Specialization;

2) send the thesis for revision (except for cases of thesis defense in the form of a series of articles);

3) refuse to award the degree of Doctor of Philosophy (PhD) or Doctor of Specialization.

Copies of the reviews of the official reviewers are handed over to the doctoral student no later than 5 (five) working days before the defense of the thesis.

Official Reviewer:
University of L'Aquila, Italy
ANATOMY ASSOCIATE PROFESSOR
DDS, PhD

(place of work, academic degree)

(signature)

Sara Bernardi

(FULL NAME)