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Third Faculty of Medicine

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The opponent's assessment of the habilitation thesis.

Author: Abanoub Riad, PhD, DDS, FRSPH,
Habilitation thesis title: COVID-19 Vaccine Hesitancy: A Tale of Two Pandemics
Habilitation field: Hygiene, preventive medicine and epidemiology.
Opponent: Assoc. Prof. RNDr. Marek Petráš, Ph.D.,
Department of Epidemiology and Biostatistics, 3rd
Faculty of Medicine, Charles University in Prague

The submitted habilitation thesis by Abanoub Riad, PhD, DDS, FRSPH, comprises a total of 121 pages and is logically organized into individual chapters. The document incorporates 22 tables, 39 figures, and 9 appendices. The literature section encompasses 317 references.

Abanoub Riad, PhD, DDS, FRSPH, has chosen the field of hygiene, preventive medicine, and epidemiology for his habilitation thesis. This work represents a qualitative synthesis of his own published studies, particularly addressing factors contributing to vaccine hesitancy among both the general and specific public in the context of COVID-19 vaccination. This is an exceedingly pertinent issue, given the extensive, often unscientific, and emotionally charged public debate on the matter, leading to delays or refusals in vaccination and subsequently disrupting national immunization programs.

The introductory part of the thesis is divided into five chapters, in which the author discusses the history of vaccination and its acceptance, both in the global and Czech contexts, along with theoretical models of vaccine hesitancy. For comprehensive information, the author has included a review of knowledge about the COVID-19 pandemic and vaccination, addressing the efficacy and safety of implemented vaccines.



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The author has very clearly summarized the use of various models to assess population hesitation, highlighting their advantages and limitations, including the quality of model outcomes.

This work represents a qualitative synthesis of seven studies by the author published in the years 2021-22. The author has defined several primary and secondary objectives.

The primary objectives can be succinctly summarized as an assessment of the prevalence of vaccine hesitancy in specific populations recruited in the Czech Republic during the period of vaccine initiation (first half of 2021) and the reception of the booster dose (late 2021/early 2022), including an investigation of demographic, anamnestic, and psychological risk factors influencing this hesitancy. Secondary objectives evaluated specific procedures and instruments, including a comparison of results obtained in the Czech population with populations in other countries.

All of the author's studies were performed as cross-sectional studies using a questionnaire. The studies were conducted in different specific populations, such as students of Charles University, pregnant and breastfeeding women, healthcare workers, and dental students in the Czech Republic. Similarly, specific populations from other countries (Germany, Poland, Algeria, etc.) were assessed and subsequently compared with Czech study populations.

A qualitative synthesis of the author's studies showed altruistic motivation supported by evidence on vaccine safety and efficacy as a clear benefit for vaccine uptake. Lower age and female gender were identified as risk factors for vaccine hesitancy. The author concluded this work by suggesting the possibility of overcoming barriers to hesitancy with strategies tailored to hesitant groups to address gaps in their knowledge and misconceptions. In addition, he highlighted the need for quality public health communication based on the key role of vaccination in community protection and collective responsibility.



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Formally, Abanoub Riad's habilitation thesis, Ph.D., DDS, FRSPH, fulfills all the requirements. The thesis is meticulously prepared. The statistical procedures are appropriately chosen, the methodology is precisely described, and the work is supplemented with clear figures, tables, and maps, demonstrating the author's expertise. Linguistically, the thesis is written in good English, ensuring clarity and good readability.

Minor errors and ambiguities occur sporadically in the text, for example, in Table 20 - where $B=0.547$ corresponds to $OR=1.728$ instead of 1.729, as reported in the table. It is regrettable that such a high-quality work does not include a separate list of abbreviations, which would have facilitated better orientation in the text.

The selection of literature used is representative. The submitted habilitation thesis is the result of the scientific research activities of Abanoub Riad, PhD, DDS, FRSPH, who is a recognized expert in the field of public health not only in the Czech Republic but also abroad. The work has confirmed and expanded knowledge and is a significant contribution to the issue of achieving a higher vaccination rate. Overall, I evaluate the submitted habilitation thesis as very successful, methodologically sophisticated, and, given the issues it deals with, highly topical.

I will ask the author of this work the following question:

Each observational study is conducted only on a limited sample of the population, which sometimes does not allow a sufficiently good assessment of the influence of a larger number of predictors. Therefore, Bayesian statistics has recently been used not only in economics but also in psychosocial fields, including medicine, where sensitivity to sample size is not as critical. Have you ever considered the possibility of using this particular approach for analyses with a larger number of predictors?



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Conclusion:

The submitted habilitation thesis is methodologically very well elaborated, employing appropriate mathematical, statistical, and graphical methods. The thesis addresses topical issues and presents its own original and unique outcomes. In its scope and content, the work meets the standard requirements for a habilitation thesis. The originality of the thesis lies in the revelation of the acceptance and hesitation over COVID-19 vaccination during the pandemic.

I recommend that the submitted thesis be accepted, and based on the thesis, I recommend that Abanoub Riad, PhD, DDS, FRSPH, be awarded the degree of Associate Professor in Hygiene, Preventive Medicine, and Epidemiology.

In Prague on 17.2.2024

Assoc.prof. RNDr. Marek Petráš, Ph.D.
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and Biostatistics
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