Author's response to reviews

Title: Optimizing Strategies for Population-based Chlamydia Infection Screening among Young Women: An Age-Structured System Dynamics Approach

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Author's response to reviews: see over
Dear Ms. Zapanta and Reviewers,

We are submitting a revised manuscript of our paper entitled “Optimizing Strategies for Population-based Chlamydia Infection Screening among Young Women: An Age-Structured System Dynamics Approach.” We appreciate the referees’ constructive comments very much. We believe by addressing these comments, our paper has been improved.

In addition to submitting the revised manuscript, we provide detailed responses to the referees’ comments.

Thanks!

Nan Kong, PhD  
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Response Letter to Reviewer Alberto Matteelli

Dear Dr. Matteelli,

Thank you very much for your comments. In the following, I provide detailed responses to your three major comments.

*Comment “The topic is important. However, in general, the authors use a language which is difficult to appraise for the average medical reader.”*

Response: The focus of this research is to apply age-structured compartment modeling to an important public health problem. We understand compartment modeling for the conceptual design and partial differential equations for the mathematical formalization may read alien to the average medical reader. We provide a short introduction on compartment modeling and age-structured compartment modeling at the bottom of Page 6 and the top of Page 7. We also provide a short introduction on partial differential equations and ordinary differential equations in the middle of Page 8.

In the following, we provide a nut-shell description on the changes. Our research is based on age-structured compartment modeling. These models are derived from partial differential equations that depict the system dynamics of chlamydia infection acquisition, screening, and treatment. This is a technique that has been widely used in mathematical epidemiological research of infectious diseases. A more detailed description of the method can be found in the references inserted to the revised manuscript. For example,


Regarding the mathematical models presented, we have two paragraphs summarizing what we do in this paper. Please see the two paragraphs on Page 5. Note that these models are believed to be beneficial to the area of mathematical epidemiology.

*Comment “The current model they propose, which does not include behavioral variables, make little sense to the health practitioners: for example, the existing recommendation to start screening as early as the debut of sexual activity seems more rationale than starting for all girls at a given age. In addition, re-screening every 8 months in girl with monogamous partnership or who even interrupted sexual activity is likely to be ineffective.”*

Response: As a sexually transmitted disease, chlamydia infection acquisition is strongly influenced by the individual’s sexual behaviors such as condom use, as well as the number and infection status of the sexual partners. So it is not illogical to stipulate that screening strategies should be based on sexual
behaviors. In practice, however, there are significant barriers to implement behavior-based screening strategies. For one thing, ascertainment of personal behavioral information from young women through invasive questioning is not an accepted practice. It also increases the burden of care providers in a very significant way. Many states in the US have regulations that require care providers to report underage sexual behaviors to the authority. As a result, many providers choose to screening without asking. For similar reasons, the current guidelines from CDC and USPSTF do not recommend screening based on sensitive behavioral information. As a compromise, we proposed a strategy based on age-specific infection risks. It is perhaps not as efficient as one based on full set of behavioral variables, it nonetheless is more acceptable under the current cultural norm of our country.

Response to “The effect of screening after the age of 25, which is also a source of debate, is neglected in the model”.

Response: we agree with the reviewer that the effect of screening after the age of 25 can be of interest to the STD research and policy community. The current guidelines recommend screening for women under or at 25 years of age. Older women can still be tested, but those tests tend to implement under specific situations, such as pregnancy, or at the presentation of certain symptoms. The goal of the current paper is to stimulate thoughts on the improvement of the current guidelines; as a result we restrict our attention to the age range on which the guidelines have focused. We felt that it was somewhat beyond the scope of the current paper to consider the special circumstances in which older women are screened. This said, we point to the evidence suggesting annual or biannual universal screening between 15 and 29 years of age is likely to be cost-effective but not cost-saving (e.g., see Hu et al. 2004 in the following) and added a brief discussion. Please see the bottom of Page 15 and top of Page 16.

Response Letter to Reviewer Massimo Giuliani

Dear Dr. Giuliani,

Thank you very much for your comments. We have complied with reviewer’s suggestions on minor essential revisions. Please see the revised manuscript. Specifically, Figure 1 has been removed. More information has been provided along with Figures 2 and 3. We believe such additions will help the majority of the readers to better understand the compartment models used in the paper.