Author’s response to reviews

Title: An Evaluation of the Impact of Aggressive Hypertension, Diabetes and Smoking Cessation Management on CVD outcomes at the Population Level: A Dynamic Simulation Analysis

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Version: 2 Date: 15 Jul 2019

Author’s response to reviews:

Reviewer comments:

Comment # 1: Clarify the conclusions section of the abstract. The meaning is a bit unclear.

Response: Thanks for the comment. The conclusions section of the abstract has been modified and reads as follows:

“Due to aging population and the increasing prevalence of chronic conditions in Singapore, the number of CVD events in Singapore is projected to rise significantly in the near future—hence the need for proactive planning to implement needed interventions. Findings from this research suggest that CVD events and its associated deaths and disabilities could be reduced significantly if diabetes and hypertension patients are aggressively managed.”

Comment # 2: In the Background section, you present prevalence rates for diabetes and hypertension in Singapore. It would provide a useful context for the reader to present comparable rates for other OECD countries and countries with primarily Asian populations.
Response: Thanks for the comment, we have included comparable prevalence rates of hypertension, diabetes and smoking from USA, Canada, Japan and South Korea. The sections now read as:

“Coupled with the prevalent issue of rapid population aging, Singapore also faces the concern of a growing number of people developing hypertension [12] and diabetes [13]. As of 2010, the prevalence of hypertension stood at 23.5% [14] compared to other developed countries; 33.4% in 2016 in USA [15], 17.8% in 2017 for Canada [16], 48.9% in Japan [17], and 29.1% in 2016 for South Korea [18]. Likewise, the prevalence of diabetes in Singapore was 11.3% in 2010 [14] compared to 12.6% in USA as of 2016 [15], 7.0% in Canada in 2016 [19], 7.9% in Japan in 2010) [20] and 13.7% in South Korea as of 2010 [21]. The smoking rate is estimated to be 13% in Singapore compared to 20.9% in the USA [22], 13.7% in Canada [22], 20.0% in Japan [22] and 22.8% in South Korea [22]. If not adequately managed, such risk factors can become complicated and increase the risk of CVD events.”

Comment # 3: On Page 8, you mention that, due to a lack of data, you had to use the expert judgement of a senior clinician to estimate the prevalence of risk factors among the population that has already experienced a CVD event. Is there literature you can cite based on other populations that offer similar risk factor prevalence rates for the post-CVD population?

Response: Thanks for the suggestion. We were unable to find from literature other population that offer similar risk factor prevalence rates for the post-CVD population.

Comment # 4: You describe the population that has had a CVD event and survived as "disabled". Some of these people, in fact, may be quite fit and able to return to all of their previous activities, though some are functionally disabled. You might use a different term such as "Post-CVD" that would include both groups. You don't make it clear in Figure 1 how risk factor management affects the mortality rates of the Post-CVD group.

Response: Thank you for the comment. We have replaced “CVD Disabled Population” with “Post-CVD Population” to reflect the fact that some of the patients that survived the CVD event(s) may eventually be fit and able to return to pre-CVD functional status. In addition, we have included the impact of risk factor management on mortality for diabetes and hypertension as illustrated in figure 1.
Comment # 5: Table 3 should include age-adjusted incidence rates. The raw numbers include the effects of population growth and aging.

Response: We have included age-adjusted incidence rates of CVD in table 3 as recommended.

Comment # 6: It's not clear if people in the Post-CVD population had their risk factors treated more aggressively to prevent recurrent events or if they were subject to the same assumptions about treatment as the pre-CVD population. This should be clarified and if this is not the case, discussed as a limitation of the model since one would expect these risk factors to get greater attention once someone has had a CVD event.

Response: We have addressed the problem by including the risk factor management of Post-CVD population into the model. As rightly pointed out, we assumed that Post-CVD population will have their risk factors treated more aggressively to prevent recurrent events; hence the fraction of post-CVD population receiving treatment on risk factors is assumed to be one.


Response: We have included the reference to the introduction section of the manuscript—see line 66 and the reference list.