

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	ANALYSING FALLS IN CORONARY HEART DISEASE MORTALITY IN THE WEST BANK BETWEEN 1998 AND 2009
AUTHORS	Abu-Rmeileh, Niveen ; Shoaibi, Azza; O'Flaherty, Martin; Capewell, Simon; Husseini, Abdullatif

VERSION 1 - REVIEW

REVIEWER	Ofra Kalter - Leibovici, M.D. Director Unit of Cardiovascular Epidemiology Gertner Institute for Epidemiology and Health Policy Sheba Medical Center Israel. I have no conflicts of interests to declare.
REVIEW RETURNED	22-Mar-2012

RESULTS & CONCLUSIONS	The results rely on data of varying quality and validity. Some of the data are derived from personal communication with healthcare professionals.
REPORTING & ETHICS	There are no guidelines that I am aware of for reporting a study based on modeling. The investigators mostly used data collected for administrative purpose or previous research published elsewhere.
GENERAL COMMENTS	<p>The authors evaluated the change in mortality attributed to coronary heart disease (CHD) between 1998 and 2009 in the occupied Palestinian West Bank territory. They used the CHD IMPACT model to analyze the contribution of change in cardiovascular risk factors (primary prevention) and utilization of evidence-based medical and surgical interventions for people with acute and chronic CHD (secondary prevention). Data on population size, CHD mortality rates, prevalence of cardiovascular risk factors, rates of surgical and medical interventions for secondary prevention, and adherence to medical therapy came from various sources, including administrative data, data collected in surveys, and estimates provided by experts. The authors found that there was a 20% decline in CHD mortality rate during this period. They report that 66.5% of the deaths averted were the result of decline in cardiovascular risk factors (mainly hypertension and hypercholesterolemia in both sexes, and cigarette smoking in men), while medical and surgical interventions provided to CHD patients contributed another 29% of total lives saved.</p> <p>Comments Methods: The authors report that information on uptake of evidence-based interventions for the year 1998 relies on assumptions rather than on measurements (page #6 line #13, page #7 line #14, and e-table 2).</p>

	<p>This is true also for patients' adherence to prescribed medications (page #8 paragraph: "treatment adherence"). One cannot assume that estimates of rates of adherence to prescribed medications made in developed countries are necessarily valid also for less affluent economies and health systems, such as the West Bank.</p> <p>Although the authors conducted sensitivity analyses to address this problem, I wonder if it provides a true reassurance as to the validity of the results and conclusions, in case where the data provided rely on impressions and reports of individual experts.</p> <p>Results:</p> <p>Table 2: The range for most of the estimated averted deaths attributed to specific risk factors is quite wide (e.g. cholesterol, smoking, blood pressure). This is especially true for blood pressure among women.</p> <p>The marked increase between 1998 and 2009 in BMI values among men (+3.93 kg/m²) is intriguing, especially since the magnitude of the corresponding BMI increase among women was less than half; There is no information on the confidence intervals of point estimates of prevalence rates of individual cardiovascular risk factors or the dispersion of their levels (for total cholesterol and systolic blood pressure).</p> <p>The authors do not provide information on minimum and maximum estimates for the best estimated total risk factor effect (bottom line, table-2).</p> <p>The confidence limits for the total estimated effect of medical and surgical treatments on the number of deaths averted is wide, reflecting a high level of uncertainty (page #12).</p> <p>Discussion:</p> <p>The authors do not discuss the sex-difference in the validity of the model. The model tends to overestimate the number of deaths averted in almost all age groups, especially among women.</p> <p>Technical appendix:</p> <p>1. The authors use frequently abbreviations without adding the complete terminology the first time they use them in text or in table footnotes.</p>
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REVIEWER	Alwan, Alaa WHO
REVIEW RETURNED	24-May-2012

GENERAL COMMENTS	<p>As the IMPACT model depends on the quality and the extent of data availability, this issue needs to be discussed in more details given that some of the input data were imputed or anecdotal.</p> <p>The generalization of efficiency estimates from meta-analysis of controlled clinical trials to effectiveness in clinical practice merits further discussion in the West bank setting.</p> <p>Justification of using relative risk which is not stratified by sex, especially for smoking may need to be address as one of the study limitations</p> <p>Although most of the studies that used the IMPACT CHD model in developed countries showed that some of the CHD mortality were not attributed to treatment or risk factors, and labeled as "unexplained", however, this study showed that all CHD DPP were either due to risk factors or treatment, which may need the model validation to be revisited.</p>
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	<p>Level of physical in activity was not mentioned in table 2 but presented in Figure 1.</p> <p>Figure 1 should also give the % decrease and/or increase in CHD mortality for each factor as presented in similar studies (such as Beijing study: reference 11) for easy of reference.</p> <p>The decrease in mortality was offset by increase in BMI, prevalence of diabetes and physical inactivity; these 3 negative factors should be discussed in the public health implication section with suggestions to reverse their impacts</p>
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VERSION 1 – AUTHOR RESPONSE

Ref no Reviewer comment Action/suggestions

Reviewer: Ofra Kalter - Leibovici,

Methods:

The authors report that information on uptake of evidence-based interventions for the year 1998 relies on assumptions rather than on measurements (page #6 line #13, page #7 line #14, and e-table 2). This is true also for patients' adherence to prescribed medications (page #8 paragraph: "treatment adherence"). One cannot assume that estimates of rates of adherence to prescribed medications made in developed countries are necessarily valid also for less affluent economies and health systems, such as the West Bank.

Thank you.

The context of the West Bank, given that it is not part of a State yet and not functioning independently, is not different from other developing and sometime developed countries in term of available data.

The authors decided to use the standard values for treatment adherence described in the methods section (page 8) in order to maximize comparability with other studies. Reassuringly, local estimates of adherence rates were also obtained from a local study in Nablus and validated with expert opinions. These local estimates were around 50% and 70% and are thus entirely consistent with the values used. Furthermore, these assumptions were all tested in the sensitivity analyses, as discussed below.

Although the authors conducted sensitivity analyses to address this problem, I wonder if it provides a true reassurance as to the validity of the results and conclusions, in case where the data provided rely on impressions and reports of individual experts.

Thank you. We agree with the reviewer. We are very aware of this limitation and the sensitivity analysis method is used as one approach to quantify the level of such uncertainty.

We have now generated additional text in the limitations paragraph to acknowledge this:

"Assumption on treatment uptake at the starting point were also based on expert opinions working in the system for more than 10 years. Estimates of treatment uptake were collated from international and regional literature then validated with the expert opinions."

Results:

Table 2: The range for most of the estimated averted deaths attributed to specific risk factors is quite wide (e.g. cholesterol, smoking, blood pressure). This is especially true for blood pressure among women.

Thank you. The total CHD mortality in the West Bank were 746 and 944 in the years 1998 and 2009 respectively. The number of deaths is relatively small which results in estimates with a wide confidence interval.

The numbers presented for Blood pressure estimates for women were incorrectly labeled. We apologise for this typographical error. The numbers in the table have now been double-checked and placed in the correct cell.

The marked increase between 1998 and 2009 in BMI values among men (+3.93 kg/m²) is intriguing, especially since the magnitude of the corresponding BMI increase among women was less than half; Thank you. The increase in obesity prevalence (based on published reports and papers) has increased in both men and women but the increase in men was indeed much higher. This might be partially explained because of a lower starting point, (the prevalence of obesity among women was high compared to men).

The following text was added to the discussion on page 15

“In the year 1998, the prevalence of obesity was 49% for women and 30% for men aged 35-64 years old. [24] Since then, the prevalence of obesity has increased mainly among men. [25, 26]”

There is no information on the confidence intervals of point estimates of prevalence rates of individual cardiovascular risk factors or the dispersion of their levels (for total cholesterol and systolic blood pressure).

Thank you. The model is based on mean blood pressure (continuous variable) not prevalence of hypertension. Table 2 presents the change in mean blood pressure and cholesterol and the DPP estimates with Minimum and maximum values.

The authors do not provide information on minimum and maximum estimates for the best estimated total risk factor effect (bottom line, table-2).

Thank you for pointing out this oversight. The minimum and maximum estimated have now been added.

The confidence limits for the total estimated effect of medical and surgical treatments on the number of deaths averted is wide, reflecting a high level of uncertainty (page #12).

Thank you. We agree. The observation is correct and this wide interval was expected because the treatment uptake data for the first point was estimated based on the literature and local experts' estimations. We further hope that showing the wide confidence limits will send appropriate signals to the reader- these are estimates, not precise projections.

Discussion:

The authors do not discuss the sex-difference in the validity of the model. The model tends to overestimate the number of deaths averted in almost all age groups, especially among women.

Thank you. A sentence has now been added to the limitations paragraph:

“Furthermore, the model tended to overestimate the number of deaths averted in almost all age groups, especially among women. This may reflect less precision in female data.”

Technical appendix:

1. The authors use frequently abbreviations without adding the complete terminology the first time they use them in text or in table footnotes.

Thank you. The complete terminology has now been added when each abbreviation is used for the first time.

Reviewer: Alaa Alwan, WHO

As the IMPACT model depends on the quality and the extent of data availability, this issue needs to be discussed in more details given that some of the input data were imputed or anecdotal.

Thank you. We agree. The sources of data and their quality are summarised in the methods section and are more fully documented in the technical appendix. We would be happy to provide further details if these are required.

The text has been modified to more clearly indicate the basis of each assumption, especially the data based on literature review or expert opinion (as indicated above)

The generalization of efficiency estimates from meta-analysis of controlled clinical trials to effectiveness in clinical practice merits further discussion in the West Bank setting.

Thank you. We agree. A sentence has now been added to the limitations section:

“The generalization of efficiency estimates from meta-analysis of controlled clinical trials to effectiveness in clinical practice in the West Bank setting were clearly optimistic, and may have resulted in an over-estimate of the true treatment benefits.”

Justification of using relative risk which is not stratified by sex, especially for smoking may need to be address as one of the study limitations

Thank you. We apologise for not making this clearer. The relative risk used for the risk factors included in the model were stratified by age and sex. This has been now clarified in the Methods section.

Although most of the studies that used the IMPACT CHD model in developed countries showed that some of the CHD mortality were not attributed to treatment or risk factors, and labeled as "unexplained", however, this study showed that all CHD DPP were either due to risk factors or treatment, which may need the model validation to be revisited.

Thank you. We agree with this observant comment.

This point has been added a new sentence in the limitations section:

“By good luck, the overall model fit approached 100%. However, it should be noted that fit within specific age groups was much less perfect.”

Level of physical in activity was not mentioned in table 2 but presented in Figure 1.

Thank you. The results of physical inactivity are now highlighted in table 2.

Figure 1 should also give the % decrease and/or increase in CHD mortality for each factor as presented in similar studies (such as Beijing study: reference 11) for easy of reference.

Thank you for this excellent comment. The figure has been revised.

The decrease in mortality was offset by increase in BMI, prevalence of diabetes and physical inactivity; these 3 negative factors should be discussed in the public health implication section with suggestions to reverse their impacts

Thank you. We agree, this has now been included in the discussion page 15

“However, the increasing Westernisation of diet, particularly junk food and soda represent an ominous future threat. Furthermore, diabetes, obesity and physical inactivity increased substantially between 1998 and 2009.[21-23] In the year 1998, the prevalence of obesity was 49% for women and 30% for men aged 35-64 years old. [24] Since then, the prevalence of obesity has increased mainly among

men. [25, 26] The increase in diabetes prevalence generated approximately 30 additional CHD deaths. Rising diabetes and obesity, especially among men, represents a public health priority . Effective evidence-based interventions exist and should be considered, notably junk-food taxes, labelling and reformulation issues, and advertising bans.[27, 28] “ and also at the bottom of page 18:

“Our results clearly indicate that risk factor improvements in the general population saved substantially more lives than specific treatments for individual patients. This emphasizes the importance of population-wide primary prevention strategies. Such strategies should also emphasize the risk factors which had a negative effect on the reduction of CHD in the model especially, diabetes, BMI and increased levels of physical inactivity. The Palestinian policy and strategic plan for NCD had focused on health diet and physical activity as its 2nd a 3rd policy objective [32]s.”

VERSION 2 – REVIEW

REVIEWER	Alwan, Alaa WHO
REVIEW RETURNED	18-Jul-2012

- The reviewer completed the checklist but made no further comments.