Part 2 – Evaluation

This section will be released to the candidate prior to the Oral Examination and to those candidates required to revise and resubmit

Candidate's name**: Liza Bolton**
Thesis Title**: Longitudinal Predictors of Mortality Inequalities in Aotearoa New Zealand**

The examiner is requested to provide a report on the quality of the work, according to the following criteria. Please note that in order to accommodate your detailed and comprehensive comments, the boxes below are expandable.

Is an original contribution to knowledge or understanding in its field.
(Please comment)

This is an interesting and well-written program of work. The candidate has used data from the mortality records linked to multiple census records to address key questions regarding the associations between SEP and mortality in Aotearoa New Zealand. The findings from this thesis were original and comprehensive.

Meets internationally recognised standards for such work.
(Please comment)

Aotearoa New Zealand is one of a handful countries that has the capability to link census records to mortality data. This project was able to utilise this rich data resource to address key research questions on the impact of SEP on mortality risk. The results would make a useful contribution to the literature.

Demonstrates knowledge of the literature relevant to the subject and the field or fields to which the subject belongs, and the ability to exercise critical and analytical judgement of it.
(Please comment)

Throughout the thesis, candidate has clearly demonstrated a good grasp of the literature and the ability to put the results into context.

Is satisfactory in its methodology, in the quality and coherence of its expression, and in its scholarly presentation and format.
(Please comment)

The methodology employed and presentation of results were appropriate. However, I have highlighted some additional analyses and clarification of results in Part 2 below.

Additional comments:
It would have been good to know if there were published work from the thesis.

Questions for the oral examination:

Page 33: Table 3.1 summarised the classification of each SEP trajectory under different hypotheses. Trajectories of High-Low-High and Low-High-Low were classified as variable. Was the mortality risk of these two groups the same?

Page 34: As the candidate noted, it is difficult to assess the added value of a new variable from the of increment in the c-index or AUC. Did the candidate calculate more sensitive statistics such as Net Reclassification Index (NRI)?

Page 41: In fitting the accumulation model, we assume a linear association between the additional low SEP exposure and mortality. Was this assumption tested?

Page 43: The association between SEP and mortality was stratified by sex. Was there any evidence of interaction between the exposure variable and sex?

Page 57: The candidate noted that the total effect was equal to the summation of direct and indirect effects. However, the estimates come from different models. Was any constraint in the estimation of coefficients to force this equality?

How was the multicollinearity between several measures of SEP tackled?

Page 72: The outcome was 3-year mortality for 1996 and for 2006 cohorts. The third outcome has been defined as the mortality in the three years after the 2006 census for the longitudinal cohort. It has not been explained what the 'longitudinal cohort' means here.

Part 2 continued – Corrections and/or Revisions

Recommended minor corrections, if any:
(lists of typographical errors, while welcome, are not expected)

Page 41: In the saturated trajectory model, the high-high-high trajectory was defined as the reference group, and the other seven categories were compared with that. Another interesting presentation might be to compare consecutive categories. For example, what is the OR for Low-low-low versus Low-Low-High? And what is the OR for Low-Low-High versus Low-High-High?

Page 54: The creation of a 'cross-world' data set needs further clarification and justification. It was noted that the data comprised of the covariate levels from one group and the exposure level from the other group of interest. Please provide more explanation as to how and why this data format was used.

Pages 56 and 57: More information is needed on the calculation of mortality risk in the cross-world approach. Based on the formulas on page 56, it seems that separate models were fitted to Maori and European subjects. In the models A and B, regression coefficients specific to each ethnicity were used to estimate the risk of mortality in that ethnicity. However, in model C, the estimated mortality for Maori subjects was based on coefficients from the model fitted for Europeans.

Page 61: Please elaborate on how the percentage mediated were calculated.

Page 57: The candidate claims that the direct effect can be estimated by subtracting the estimates for Maori ethnicity using Maori coefficients from estimates for Maori ethnicity using European coefficients. This needs further explanation.

Page 74: The fourth research aim was to study how association between mortality and other variables differ across ethnic groups. To fulfil this aim, models were stratified by ethnicity. I suggest first analysing the whole cohort with interaction terms between ethnicity and other variables. In the case of significant interaction terms, the models can be stratified by ethnicity to provide more interpretable results.

Page 76: Table 5.2 summarised descriptive statistics by religious status. The percentages are provided for each level of religious status. For example, in the 1996 cohort, among the religious subjects, 54% were female and 46% were male. It might be more informative to report the proportion of religious and non-religious among women instead. The same comment can be applied to other categories.

Page 89: After adjustment for demographic, economic, and health-related variables, the results suggested that the odds of mortality among the consistently non-religious group were lower than the other three groups (Figure 5.5). This is an interesting finding. I suggest that the candidate discuss whether this is a causal effect or due to residual confounding?

Page 91: Figure 5.6 suggested that the finding in Figure 5.5 was only significant in the European ethnicity. This suggests that the association between religious-trajectory and mortality is modified by ethnicity. Therefore, Figure 5.5 may be misleading and would need to be interpreted with caution.

I suggest the candidate fit a regression model including the main effect of all variables and appropriate interaction terms. The ORs presented in the graphs should be based on the results of the model.