Reviewer’s report

Title: Patterns of multi-morbidity in working Australians

Version: 1 Date: 18 November 2010

Reviewer: Helena Britt

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This paper aims to identify patterns of non-randomly occurring clusters of multi-morbid health conditions using a new statistical approach: using two approaches, hierarchical clustering Algorithm and Exploratory Factor Analysis methods. Both methods are said to have ‘findings similar to those found in the Cumulative Illness Rating Scale based around body system groupings.

Minor essential revisions

1. Abstract:
   1.1 Background: Not all previous methods have relied on counting the ‘number of health conditions (e.g. ref 23 groups to CIRS)… ‘often in relation to an index condition’ (not indexed)…. You need to add in brackets after this statement (comorbidity).

2. Introduction.

2.1 You need to move reference 23 to a position after ref 5, and use this reference in para 2, line 2; in para 2 last line (this line uses results from ref 23 data but it is not referenced here); para 3 line 2; par 3 line 5.

3. Methods

3.1 Sample- response rate of valid responses used in this paper is 21.5%. This is the response rate you should quote here, not the 24.7%.

3.2 The inclusion of fatigue in the list of 26 selected conditions is interesting—usually multimorbidity is limited to chronic conditions, and ‘fatigue’ (without further detail) can be either acute or chronic, but is largely non-chronic. Perhaps this should be discussed in the discussion.

3.3 Page 4 last sentence: Do you mean all responses were exclude if this was the case for any one condition, or was the respondents positive response to that single condition for which treatment had not been received exclude while their remaining morbidities were included?


I do not have the statistical knowledge to review these methods. They require a statistician.
4.1 My comments in this section are therefore limited to the use of the English language. --Everywhere you use ‘degree of co-occurring’, it should read ‘co-occurrence’.

--“where kappa equals to zero’ should read ‘where kappa equals zero’.

5. Results:
The results for the clusters identified by the HCA method and the Factors identified by the EFA method are clearly stated.

5.1 Page 7, last three line: This belongs in the discussion, not in the results, as it is an explanation of WHY the different methods results in a different number of clusters/factors.

5.2 What is a ‘loading’?

Major essential revisions

6. Discussion:
The discussion needs major revision.

6.1 The whole of the discussion relies on your opening statement, that the grouping of health conditions identified through both methods appear to be grouped loosely into organ system functioning. You further state that the groupings are consistent with the CIRS groupings. These statements are not really correct.

The statements ARE correct for Cluster 7 and you could almost get away with Factor 2, though ‘allergies’ are often related to the skin, not the respiratory system.

For the other cluster and factors the groupings are not to body system, as classified by the International Clasasifcation of primary Care, and are not grouped according to the CIRS. For example:

Using ICPC-2 – the Australian and WHO recommended standard for reporting patient self reported and general practice morbidity – and which is based on body systems.

In Cluster 4 you have back/neck pain ( ICPC chapter L musculoskeletal) + injuries ( what type?- if in juries of the musculoskeletal system they also fit into ICPC chapter L, but there are other injuries related to other body systems) + migraine ( ICPC chapter N neurological).

Another example: Cluster 6: high blood pressure ( ICPC chapter K circulatory) + high cholesterol and obesity ( both in ICPC Chapter T – Endocrine, Metabolic Nutritional).

Another: Fctor 1 is a mixture of musculoskeletal and Urinary and Digestive ICPC chapters.

Using CIRS ( Ref: Jour Clinical Epi,60 (2007) 212 Abbreviated guidelines for Scoring the Cumulative Illness Rating Scale (CIRS) in family practice.

In Cluster 4 you have back/neck pain (CIRS Endocrine, metabolic, breast) + injuries ( what type?)- if injuries of the musculoskeletal system they also fit CIRS
Musculokeletal and tegumental, but there are other injuries related to other body systems) + migraine (CIRS Neurological).

Another example: Cluster 6: high blood pressure (CIRS Vascular) + high cholesterol and obesity (both in CIRS Endocrine, metabolic).

Another: Factor 1 is a mixture of CIRS groups Musculoskeletal & Tegumental, Genitourinary and Lower gastrointestinal.

The Saltman paper reports management frequencies not prevalence so I don’t think it should be included. Ref 23 adjusted for attendance rates by age-sex and for non attenders so the statement of not being representative is inappropriate.

6.3 Page 89: perhaps your use of the term ‘psychological distress” may have mislead the respondents. The Britt et al paper compared their results with the patient self reported prevalence of ‘psychological problems’ and found the self report to be low. Other studies have demonstrated the same under-reporting by self report. Are you sure Fortan used the term ‘psychological distress’ or was it ‘Psychiatric problem’.

6.4 Limitations. There is a distinct lack of a section on limitations. This needs to be added. Limitations include:
- lack of generalisability to the population at large (because subjects were ‘workers’ – you could move the last sentence of the Methods section into the discussion, where it belongs.
- You have offered only 28 common conditions or risk factors. The selective nature of this list will effect your results.
- Limitations of patient self report: there is wide ranging literature on this topic

7 Conclusion
In light of my comments about the discussion, the conclusion needs to be changed, removing the statement that the clusters were around ‘body systems’ and that this was consistent with CIRS.

8. Tables and Figures
I have no comments on the Tables and figures as I have insufficient knowledge of statistical methods to judge their appropriateness.

**Level of interest**: An article whose findings are important to those with closely related research interests

**Quality of written English**: Acceptable

**Statistical review**: Yes, but I do not feel adequately qualified to assess the statistics.
Declaration of competing interests:

I declare that I have no competing interests