Reviewer's report

Title: The influence of age, gender and socio-economic status on multimorbidity patterns in primary care. First results from the MultiCare Cohort Study

Version: 3 Date: 1 December 2011

Reviewer: Thomas O'Dowd

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This study arises from a Multi-Care cohort study whose protocol has already been published. It is a large and very valuable cohort that will influence healthcare over many years. The aim of this particular arm of this study is to analyse the influence of socio-demographics on the number of diseases of patients in general and for 2 broad multi-morbidity pattern. The authors describe their recruitment strategy which is from 158 GP practices in 8 German conurbations. They conducted a chart review and categorised the diseases with the ICD 10 code and did GP interviews to allocate the illnesses to 46 diagnostic groups. They have outlined their sampling and recruitment strategy and were able to use 46.2% of their original sample for this study which gave them 3,317 patients to participate in this study. They outline a complex strategy for missing values and their descriptive data is presented as means and standard deviations and diagnostic groups were ranked by prevalence. They use an international classification for educational achievement and income is reported as an internationally accepted household size adjusted net income with a formula for additional members of the household. They also include home ownership as an additional measure of economic advantage or disadvantage.

The authors divide their multi-morbidity findings into 2 patterns, that of “ADS” by which they seem to mean psychosomatic illnesses plus pain and those of cardiovascular / metabolic disorders. They show that ADS disorders and pain were more prominent in females while cardiovascular / metabolic disorder were commoner in males. While this finding is of interest to clinicians they are either ambivalent about the finding and seem anxious to downplay this in their conclusions by stating that there is no evidence that female gender is associated with higher morbidity burden. It seems gender analysis has revealed interesting patterns of multimorbidity disease but the authors are not sure about this in the end.

They give the household adjusted income as €1,412 but do not state over what period of time this referred to. It seems to refer to per month later in the paper. The introduction of household ownership is not discriminating as most people seem to be in private accommodation. Whether this is private rented or private owned is not clear but it does not seem to be a reliable measure of affluence or deprivation.

The ranking of diagnosis groups by gender and age group will be of interest to
clinicians and I agree with the authors that this will be important in the planning of services for this age group of patients.

The overall objective of this study is more complex than it appears as in order to analyse the influence of socio demographics on disease the authors will need to refer to the extensive deprivation literature and it does not appear that there are available national reference deprivation scores within the health services in their system. To answer their objective requires more than descriptive statistics and will benefit from some simple modelling exercises. They need to explain why they have chosen two particular multi-morbidity patterns or at least as it appears to me they have chosen cardiovascular / metabolic and ADS plus pain - this is a paper on its own.

There are 16 authors on this paper and there appears to be insufficient dialogue between the clinician members and the statistical / epidemiological members of the team. It will be useful for themselves if the authors can clarify their individual contributions to the paper. Cohort studies generally involve many people in the setting up and conduct of the work but not all need to be involved in each paper that ensues from the work. The authors have requested publication in a clinical journal but the paper is as it stands it is overly statistical and insufficiently clinically oriented for the audience it has targeted. The secure findings in the study appear to me to be the impact of education (which appears in the discussion rather than in the results section) and the ranking of diseases in their table. There is further interesting analysis to be done on their multimorbidity patterns alongside gender. They need to outline the rationale for their choice of multi-morbidity patterns and to attach appropriate significance to this along the gender lines they have applied.