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Do patients registered with CAM-trained GPs really use fewer health care resources and live longer? A response to Kooreman and Baars. Eur J Health Econ (2012). 13:469-776

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We read with interest the article by Kooreman and Baars, which aimed to “explore the cost-effectiveness of CAM (*complementary and alternative medicine*) compared with conventional medicine” [3]. More specifically, this paper compared health care costs and mortality rates across two patient populations; the primary distinguishing feature being whether or not patients’ general practitioners (GP) had completed certified additional training in CAM. The paper addresses an important and thought-provoking issue, and adds to a relatively small (though not neglected) area of health economics research. The authors assert that patients registered to a CAM-GP have lower health care costs and mortality rates. Although specific policy implications are not discussed in the article, one would assume that the authors would infer that their results provide support for CAM on the grounds of cost-effectiveness. We believe these findings could be widely cited, as is commonplace for ‘supportive’ CAM research. For this reason we feel that further discussion is necessary, particularly with regard to the methods of analysis and the reporting of empirical results.

## Methodological issues

The authors are interested in two outcomes; total costs and mortality. Despite running in excess of 40 different models to address these 2 variables, there is no acknowledgement of the problems associated with multiple testing. In the log-linear regressions of total costs, only 4 of 12 total cost coefficients were significant at the 5% level. GP training in anthroposophy had no significant effect on total costs. For patients whose GPs had training in acupuncture, costs were lower only for those aged 25-49. For the linear model, only 1 of 12 coefficients were significant at the 5% level. GP training in acupuncture or homeopathy had no significant effect on total costs. For patients whose GPs had training in anthroposophy, costs were lower only for those aged over 75.

The results for mortality are even less compelling. Mortality is a questionable outcome measure when comparing primary care populations, but it is the study's only health outcome. The authors claim, in the paper's title, that "patients whose GP knows complementary medicine tend to... live longer". This claim is based on a linear probability model, but this is an incorrect model given the low number of deaths in the sample; just 3% of the sample died. Their logit model better describes the probability of death, and when this is applied no statistically significant results are found.

Clearly an important limitation of this analysis is the likely presence of unobserved heterogeneity; i.e. there is a 'selection problem'. This functions in two ways; (i) selection of GPs into offering GP-CAM services and (ii) selection of individuals who do or do not choose to be registered with GP-CAMs. Patients that choose to be treated by GPs that know complementary medicine might be different to other types of patients, but the authors only control for age, gender and postal code. Patients may differ in terms of health status or their attitudes towards medicine. The main statistically and economically significant finding is that pharmaceutical expenditure was lower for patients under 75 whose GPs had training in homeopathy. This result may simply reflect the reduced likelihood of patients that choose GP-CAMs taking conventional medicines.

The authors' 'objective', as outlined in the abstract, is "to explore the cost-effectiveness of CAM compared with conventional medicine". We believe it inappropriate to frame this study as a cost-effectiveness analysis as there is no relevant measure of health benefit. Furthermore, the cost of GP-CAM training, membership fees, capacity constraints or the provision of CAM services not covered by insurance do not feature in the analysis. Such considerations would be important when exploring the economic implications of CAM training for GPs.

## Reporting issues

While the authors discuss some limitations of their analysis, we believe that the interpretation of their findings is too bold. The authors' abstract states, for example, that additional CAM training leads to "0–30% lower healthcare costs and mortality rates". This is a misleading and, arguably, disingenuous claim.

With regard to total costs, 5 of 24 (21%) coefficients are significant at the 5% level. Despite this, the paper repeatedly asserts that patients registered to a GP-CAM have lower health care costs overall. With regard to the specific cost categories, just 16 of 96 (17%) coefficients are significant at the 5% level. As mentioned above, the more appropriate model used for the mortality outcome shows no statistically significant effect.

It is not surprising that health economists have paid less attention to CAM relative to other therapeutic areas: focus will invariably be on treatments and interventions available through the health system. This is one reason why acupuncture has received some attention in the UK [7, 4, 10, 5]. Despite providing a lengthy introduction, the authors fail to cite academic literature that

does not support CAM. For instance, the authors present St. John's wort as an example of effective treatment with scientific support, ignoring published reservations about this intervention [6]. While they present positive evidence about the effectiveness of acupuncture for pain, their review should be balanced by citing Cochrane reviews where its effectiveness has been shown to be limited (eg for low back pain[1], neck pain[9], elbow pain[2], dysmenorrhoea[8] and pain in endometriosis[11]).

## Conclusion

In summary, we have reservations about the authors' interpretation of their results due, primarily, to the limitations of the analysis. The study does not demonstrate that GP-CAM training is associated with either reduced health care costs or reduced mortality. Academics have a responsibility to communicate their research carefully and without misinterpretation. Kooreman and Baars have failed to do this.

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