Reviewer's report

Title: Increased number of Judo therapy facilities in Japan and changes in their geographical distribution

Version: 1 Date: 16 December 2010

Reviewer: Alan Tennant

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The raison-d'être of this study appears to be the desire to determine if the expansion of Judo Therapy (JT) in Japan since 1998 has been equitable between urban and rural areas, rather than concentrating in the urban areas where orthopaedists are already established (p3). (This assumes the orthopaedists have a primary right to be located where they are, and do not require redistribution themselves). Consequently an appropriate hypothesis for the study would have been that as the number of therapists expanded, so a more equal pattern of provision would have been observed. The work of Kobayashi and others have suggested that saturation of local markets for health professionals may result in geographical redistribution, producing a more equal pattern of provision across the national space.

The authors adopt a descriptive technique commonly used in economics to describe income inequality, the Lorenze Curve, and associated Gini coefficient. This approach has also recently been introduced into epidemiological studies to investigate the geographic variation in disease etiology. It appears that some such studies use aggregate data for this purpose, for example by estimating inequity of death rates over regions.

One reviewer has raised issues about the approach, which is recognised to be appropriate, but for which certain assumptions and implications need to be explained (e.g. the use with group data), and a clear explanation given. While the Gini index is explained, there is no indication of how to interpret the coefficient of variation. Likewise, and as raised by the reviewer, a more detailed explanation of bootstrapping would be valuable, particularly as readers will largely be unfamiliar with the whole approach. These are all perfectly valid comments. The reviewer also raises issues about the choice of the inequality indices, given others are also available. This is also a valid comment, and would appropriately be raised in the discussion.

The reviewer also makes several points in relation to the economic theory behind the approach, the necessity for a full understanding on the theories and their implications, and the work upon which the authors are building. The fundamental issue with respect to these comments is the context within which the paper is presented. Is the paper an analysis of the economics of service provision, in which case all the comments would be relevant? Or is the paper a use of a particular descriptive technology in a different setting? If the latter, this is much
like statistical analyses where it is not necessary to understand the detailed mathematical basis of, for example, maximum likelihood, in order to appropriately and correctly use a procedure which is based upon that likelihood. It would appear that the emerging use of this technology in health service distribution and epidemiology focuses on the latter, which is quite acceptable if the method is appropriate, the assumptions have been met (and tested where appropriate), the technique correctly applied, and any limitations discussed. Economists working in the field of health service provision may well wish to present the results within the context of economic theory, and thus may have a different perspective, but given the method is applied correctly, the underlying results will be the same. Consequently the matter resolves to whether or not it is possible to apply and interpret the results of these indices outside of the framework of economic theory. As the technique is essentially similar to an Area Under the Curve (AUC) analysis, developed by electrical engineers and radar engineers during World War II for detecting enemy objects in battle fields (Wikipedia), and now widely applied in health research, I would argue that it is possible to understand, apply and interpret the results as with any other statistical procedure, and do not support the argument that a full understanding of the economic theory and antecedents is a requirement for their use. This position is consistent with the authors’ most recent re-submission letter.

In summary the authors must take into account the fact that most readers will be unfamiliar with the approach. As there is generally no restriction on word count in BMC publications (and supplementary data can be presented where appropriate), and consistent with some of the reviewers comments, the paper should be expanded to include clear explanatory text so that the approach is clearly defined, the assumptions clearly stated and tested, and the limitations, and issues, clearly discussed.