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REVIEW

Demographic Estimation for Developing Societies. By N. CARRIER and J. HOBCRAFT. [Pp. 204. London: Population Investigation Committee, London School of Economics, 1971. £5.00.]

THE AUTHORS originally intended to write a manual to cover a part of the M.Sc. demography course at the London School of Economics, but they decided instead to produce a book of more general value for those who work with the often defective population data of developing countries. It is a rather densely worded book, and it is a matter for doubt as to how successful they have been in changing over to the wider readership. Nonetheless, it is a practical book as its arrangement clearly shows: it has about 40 pages of text, 30 pages of appendices and over 130 pages of tables for use in applying the methods described in the text. Familiar problems, e.g. age mis-statements, are naturally covered, but much of the book deals with two topics on which it is of interest to comment.

The first is Brass's Model Life Table System: a single standard table is chosen and from it other life tables are generated by the following formula:

$$\text{logit } l'_x = A + B \text{ logit } l_x$$

where the radix of the standard table (l_x) is unity; and 'logit' is defined

$$\text{logit } y = 0{\cdot}5 \log_e [(1-y)/y].$$

New tables (represented by l'_x in the formula) are generated by varying A and B: A affecting the level of mortality (heavier or lighter than the standard), and B tilting the mortality, i.e. increasing the mortality at younger ages and decreasing it at the older ages, or vice versa.

Logit transformation of probabilities is helpful in certain types of statistical analysis where it is difficult to deal with a probability's restricted range from 0 to 1; the transformed 'logit' probabilities are unbounded, lying between minus and plus infinity. l_x (with radix unity) can be considered to be a probability, but no grounds are stated for supposing that a logit transformation is of any relevance in generating one life table from another; its use in practice can be justified only if it is found to produce reasonable results. The authors claim that for developing countries it does in fact produce plausible life tables to which population mortality can be fitted—indeed on p. 10 of the book they go further: to them the formula does not just look like giving good shapes but may actually represent the manner in which mortality operates. They do not elaborate on this.

About half the text and virtually all the tables are devoted to the other topic: 'The Uses of Stable Population Models'. The models are constructed from Brass's life table system together with fertility rates considered suitable for developing countries; a great number of these model populations are collected together in the tables of the book. In the fullest set of models, there are three parameters: two defining the life table (i.e. A and B) and one determining the level of fertility (the shape of the set of fertility rates is fixed being based on an average taken over 15 developing countries). If three items of reliable information can be culled from the population data and a stable population can be assumed, it should be possible to find a suitable model of the population from among these tables. The purpose of choosing a model is to force the data into a jacket having the characteristics of a population of a developing country. It is an extension of the idea of fitting a curve to raw data in order to reduce errors.

Two of the three items chosen by the authors to fix on a model are the percentage of population under age 15 and the percentage over age 45, both of which may be fairly reliably known from a census; the wide age grouping would avoid problems of age mis-statements. The third item is the rate of increase of the population, which might be estimated from two censuses or by other means. With these three items a model is found by inspecting the tables. The authors show (by using what they call 'isomers') that, in fact, the two percentages determine fairly

accurately the parameter B in the Brass life table and the mean reproduction rate of the population (a measure devised by the authors equal to the gross reproduction rate times ${}_2p_0$), while the rate of population increase is more to do with the other life table parameter A.

The methodology has origins in work done by the United Nations and sounds promising, but there are practical difficulties: neither the life tables nor the shape of fertility rates may be suitable, for instance. More fundamentally the population may not be stable and, as this is only too likely, the authors have found it necessary to develop their work further. Where mortality has been declining but not for more than a few decades, they discovered that the mean reproduction rate does not appreciably differ from that of a stable population; but, in the case where it is fertility that has been changing, the authors have altered their approach and have chosen to examine another statistic: the ratio of children to adults. By experimenting with the model populations they consider that the mean reproduction rate can be reasonably well deduced from this ratio.

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