

## AGE DISTRIBUTIONS AS AFFECTED BY CHANGES IN FERTILITY AND MORTALITY

THIS is a general note in connection with three papers recently published concerning the effects of fertility and mortality on age distribution.<sup>1</sup> Specifically, however, it refers to the first article by Coale, mentioned in the footnote, in which the author indicates that the current increases in the 65 and over age groups could be due primarily to declining fertility. Theoretically, increases in these age groups could be, of course, a function of either mortality, or fertility, or a combination of both. This can be corroborated by the following partial data abstracted from a study of mine published in 1939<sup>2</sup> in which the age distributions of populations stabilized at different true rates of increase ( $r$ 's) are given, based on three different life tables. The abstracted data, limited to the age groups of 65 and over, are presented in Table 1 for five different  $r$ 's (two on each side of  $r = 0.0$ , namely, stationary populations), and are based on the 1929-1931 Negro Life Table—of relatively low survivor-

Table 1. Per cent of 65 years and over in populations stabilized at different true rates of increase ( $r$ ), based on three different life tables.<sup>1</sup>

$r$ 's	PER CENT OF 65 YEARS OF AGE AND OVER, BASED ON LIFE TABLES		
	Negro	White	Hypothetical
.0050	5.85	9.41	13.02
.0025	6.54	10.41	14.29
.0000	7.27	11.48	15.68
-.0025	8.08	12.60	17.17
-.0050	8.95	13.80	18.73

<sup>1</sup> Abstracted from: Karpinos, Bernard D.: Stabilized Method of Forecasting Population. *Public Health Reports*, October, 1939, 54, No. 40, pp. 1807-1822, or Reprint No. 2104. The life tables of the Negro and White, used in this study, are the respective United States Life Tables, 1929-1931. The Hypothetical Life Table is that published by Dublin, L. I., and Lotka, A. J.: *LENGTH OF LIFE*, Chapter 11, Ronald Press, 1936. These  $r$ 's approximate the following net reproductive rates: 1.15, 1.07, 1.00, 0.93, and 0.87, respectively. (See Tables 1 and 2, *op. cit.*)

<sup>2</sup> Coale, Ansley J.: The Effect of Declines in Mortality on Age Distributions. *TRENDS AND DIFFERENTIALS IN MORTALITY*, Proceedings of a Round Table at the 1955 Annual Conference, Milbank Memorial Fund; Coale, Ansley J.; The Effects of Changes in Mortality and Fertility on Age Composition, *Milbank Memorial Fund Quarterly*, Jan., 1956, 34, No. 1; Stolnitz, George J.; Mortality Declines and Age Distribution, *Milbank Memorial Fund Quarterly*, April, 1956, 34, No. 2.

<sup>2</sup> See footnote to Table.

ship, 1929–1931 White Life Table—of relatively higher survivorship, and Hypothetical Life Table—of high survivorship.

Following down the data given in the table, column by column, one readily notices the expected increases in these age groups due to declining fertility, since the same life table has been used within each column. Increases in these age groups may be noted in following these data across, row by row, reflecting mainly changes due to declining mortality. Greater increases may be expected under analogous conditions from simultaneous changes in both fertility and mortality, provided these changes are in the same direction. Thus, if a population, reproducing itself, say, at  $r = .0050$  and having a survivorship equivalent to the Negro life table, should change to  $r = .000$  and a life table equivalent to that of white population, its per cent of 65 years of age and over would change under stabilized conditions from 5.85 to 11.48.

Of course, these are ideal percentages; the trend, however, toward such distributions may be considered as real.

As stated above, only partial data have been presented in the table. In the mentioned study, a wider range of  $r$ 's has been used and complete age distributions have been presented in quinquennial age groups. It seems that these age distributions, though theoretical, can be advantageously utilized in general discussions on the expected effects of mortality and fertility on age structures.

BERNARD D. KARPINOS

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### LIFE TABLES FROM LIMITED DATA<sup>1</sup>

THE purpose of this monograph is “to develop a way of constructing life tables when conventional methods cannot be applied and primary reliance has to be placed on the information found in a single enumeration.” It is assumed “that data on deaths by age are not available and that substitute measures cannot be deduced from successive censuses.” Influenced by his training in actuarial methods, the reviewer frankly

<sup>1</sup> Stolnitz, George J.: *LIFE TABLES FROM LIMITED DATA: A DEMOGRAPHIC APPROACH*. Princeton, Office of Population Research, Princeton University, 1956. Pp. xii + 164. \$4.00.