

DISCUSSION PAPER
Estimates of the Life Table Functions of the Philippines: 1970

By MABINI JUAN *

The life table functions derived in this paper will prove helpful in comparing recent mortality experiences between the existing population and the insured lives. Such mortality rates from census figures serve as upper limits for insurance purposes mainly because of selection processes undertaken which should guarantee more favorable experience.

Two distinguished actuaries, Dr. Hizon and Mr. de Castro, have previously attempted to extract life table functions from the 1960 Census. Their ingenious method is clearly described in a paper they presented in the 1964 Annual Convention of the Actuarial Society of the Philippines. We are fortunate to be presented with another approach.

The author's conclusion that the disparity in sex ratio based on the 1970 census is caused by a serious undercount of males would imply, in the light of more favorable female mortality, that there exists a significant male birth rate predominance. However, the sex ratios at early ages, per both the 1960 and 1970 censuses, did not reveal this trend. The growth rate for the male population between 1948-1960 appeared to be quite high for no apparent reason. This aspect of the paper presents an intriguing situation since the nagging question as which sex is superior, numerically speaking, remains unanswered.

The age-sex distribution given in Table 2 appears to be unrealistic when one compares the age groups 0 - 4 in 1960 with the figures comprising age groups 10 - 14 in 1970 as follows:

	Age Groups	Male	Female	Total
1. 1960 Census	0 - 4	2,354,038	2218,377	4573416
2. 1970 Census	10 - 14	2,547,453	2478,421	5025874
	Ratio (2)/(1)	1.08	1.12	1.10

* Vice-President, Philippine-American Life Insurance Company

Such situation can only exist if there was substantial under-enumeration at these young ages in 1960.

Further, when we compare the figures for the different age groups for 1960 with the corresponding attained aged groups in 1970, the resulting ratios, which would yield rough estimates of survival probabilities for approximately 10 years, did not reveal the expected downward trend nor the sex mortality differentials for age groups 30 - 34 and below.

These observations as well as those of the author would indicate a need for closer monitoring of census data for these categories.

The high values of R under the differencing method would indicate that deaths out of those born between 1960 and 1970 is approximately 80% of deaths registered for those already living in 1960. This relationship would imply substantial juvenile mortality rates especially at the very young ages.

Incorporating in the differencing method these estimates of births from 1960 to 1970 per Table 5, the resulting crude death rates improved. The 1965 population was estimated using exponential rates of growth noted in Table 1.

	Total	Male	Female
1. B_{60-70}	13,334,636	6,909,156	6,425,480
2. P_{0-9}^{70}	11,731,439	5,966,158	5,765,281
3. DB	1,603,197	942,998	660,199
4. DA	2,364,343	1,510,389	853,954
5. TD	3,967,540	2,453,387	1,534,153
6. Growth Rate	—	2.83	3.10
7. 1965 Population	31,670,990	15,887,461	15,783,529
8. Crude Death Rate/M (5)/10 x (7)	12.53	15.44	9.71

The third method using vital indices offers better results since the only information it extracts from the 1970 census is the number of people who are below age 10. Inherent in the method is the assumption of the same degree of underreporting of births and deaths. If the observation, derived from a 1963

study, that there is a greater under-registration of total births relative to total deaths remains valid, then the resulting crude death rates would be more favorable than those calculated. It would appear that a more recent study along this line should be undertaken.

In the construction of the applicable life table, distributing the estimated aggregate number of deaths for 1970 utilizing Death Registration Data over a 5-year period is certainly the most appropriate method. It is in the allocation of the 1970 population by age and sex that would require some refinement in the light of the distribution errors noted in the 1970 census.

Once the population and estimated death figures have been distributed by sex and age groups, the necessary life table functions can be derived using standard demographic formulas and approximations.

In the derivation of the complete life tables, some adjustments will have to be applied at the higher ages in order to properly close out the life functions. Relative to such construction is the question of establishing a particular limiting age, aptly named w (omega). The use of age 100 is for computational convenience rather than a scientific measure of the last possible age. It would appear that if the current advancement in medicine and technology would result in the prolonging of human life, then we have to deal with a variable age w .

It is fitting that having brought up the problem of a limiting age, that I should now establish my own omega. This paper has given me the chance to rediscover my past interest in demographic statistics.