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EVALUATION OF WIDOWHOOD DATA IN INDIAN CENSUSES
A LIFE TABLE INVESTIGATION (*)

1. INTRODUCTION

Under-reporting and mis-reporting of age have been found to be chronic problems with the national censuses. Different indices have been suggested in the literature to evaluate the accuracy of age data as recorded in a census. But no systematic analysis has been made to test the accuracy and/or consistency of data on marital status. It has been mentioned by various scholars that data on marital status may not be reliable for many populations particularly those on proportions widowed and divorced. A method has been devised in this research note to examine the reliability of data on widowhood in the Indian Censuses by using life table techniques under two different sets of assumptions.

2. METHODOLOGY

The proportions widowed in different age groups depend on various factors such as age distribution of marriages by ages of males and females, incidence of remarriage and mortality rates for the two sexes. Again the mortality rates are generally related to the marital status of the population. In most populations, the married enjoy lower mortality compared to that of the single, widowed or divorced. In our analysis we will assume all marriages to be first marriages for females (i.e., incidence of remarriage to be negligible among the female population). As a partial justification of this assumption, it may be mentioned that in a survey among one thousand couples in Calcutta City in the late 1950s the extent of remarriage among females was estimated to be of the order of 2 percent (Poti, Malaker and Chakraborti, 1960). Though there has not been any national survey on this aspect, from all indirect evidences and local studies it appears attitude towards widow remarriage has not changed substantially over time in the Indian Society. In the first method all females are assumed to marry at age 15 with males at 20. In the second method marriage function is introduced assuming age difference at marriage between the two sexes to be 5 years.

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For mortality levels, we assume male mortality to be represented by Coale Demeny West Model (Coale and Demeny, 1966) at level 13 ($e_0^m = 47.13$), female mortality at level 11 ($e_0^f = 45.02$) and widowed female mortality at level 3 ($e_0^w = 37.50$). Regarding the choice of different levels and their justification, discussion is made in Appendix 1.

The following symbols have been used for the present investigation:

l_x = life table survivors at age x .

μ_x = force of mortality at age x .

L_x = life table population in the age group $(x, x + 1)$.

T_x = life table population above age x .

d_x = number of deaths in the life table in the age group $(x, x + 1)$.

$n_x dx$ = number of marriages in the age group $(x, x + dx)$.

The above functions are used for females. A prime ($'$) has been used to denote the same function for males. A subscript 'w' has been used to denote the function for the widowed females. The formulae for the proportions of widowed females in quinquennial age groups have been derived and are presented below for methods 1 and 2.

Method 1: Here we assume all females marry at age 15 with males at age 20. For our analysis, the average number of widowed females in any five year age group has been taken as equivalent to the number of years lived as widowed in the same age group. Consider any 5 year age group $(a, a + 5)$. The number of years lived as widowed in $(a, a + 5)$ by l_{15} married women at age 15 can be decomposed into two parts:

a) Number of years lived (N_{a-}) by those who become widowed before age a ;

b) Number of years lived (N_{a+}) by those who become widowed in $(a, a + 5)$.

$$N_{a-} = l_a \left(1 - \frac{l'_{a+5}}{l'_{20}} \right) \left(\frac{l_a^w}{l'_{a+15}} / \frac{l_a}{l'_{a+15}} \right) \left(\frac{T_a^w - T_{a+5}^w}{l_a^w} \right) \dots \quad [1]$$

The first term denotes the number of widowed females at age a assuming no mortality differential between marital status. The second term makes an allowance for mortality differential assuming those who become widowed before age a become widowed at age $\frac{a+15}{2}$ on the average. The third term is the contribution to

the number of years lived as widowed in $(a, a + 5)$ by a widowed female at age a .

$$N_{a+} = l_{15} \int_a^{a+5} l_x \cdot \frac{l'_{x+5}}{l'_{15} \cdot l'_{20}} \mu'_{x+5} \frac{(T_x^w - T_{x+5}^w)}{l_x^w} dx =$$

$$\begin{aligned}
&= \left(\frac{l_{a+2.5}^w}{l_{a+2.5}^m} \right) \frac{1}{l_{20}'} \int_a^{a+5} l_{x+5}' \mu_{x+5}' (T_x^w - T_{a+5}^w) dx = \\
&= \left(\frac{l_{a+2.5}^w}{l_{a+2.5}^m} \right) \frac{1}{l_{20}'} \sum_{x=a}^{a+4} (T_{x+1/2}^w - T_{a+5}^w) d_{x+5}' \dots \quad [2]
\end{aligned}$$

$$\begin{aligned}
&[\because \int_a^{a+1} l_{x+5}' \mu_{x+5}' (T_x^w - T_{a+5}^w) dx \cong \\
&\cong (T_{a+1/2}^w - T_{a+5}^w) \int_a^{a+1} l_{x+5}' \mu_{x+5}' dx = \\
&= (T_{a+1/2}^w - T_{a+5}^w) d_{a+5}' \text{ and so on.}]
\end{aligned}$$

Thus the proportion of widowed females in the age group $(a, a+5)$

$$= \frac{N_a + N_{a+5}}{T_a - T_{a+5}} \dots \quad [3]$$

Method 2: In this method the distribution of marriages for the single females has been taken from Malaker (1973). The age difference at marriage between the two sexes has been taken as 5 years. Number of years lived as widowed in any 5 year age group $(a, a+5)$ can be decomposed as:

(A): Number of years lived by those who become widowed in $(a, a+5)$;

(B): Number of years lived by those who become widowed before age a .

(A)_k: Has several components as follows.

(A)₁: Number of years contributed by those marrying before age a ;

$$A_1 = \int_{x=10}^a n_x \left[\int_a^{a+5} \frac{l_y \cdot l_{y+5}'}{l_x \cdot l_{x+5}'} \mu_{y+5}' \frac{(T_y^w - T_{a+5}^w)}{l_y'} dy \right] dx \cong$$

$$\approx \sum_{x=10}^{a+1} \frac{R'_x}{L_x L'_{x+5}} \left[\sum_{y=a}^{a+4} (T'_{y+1/2} - T''_{a+5}) d'_{y+5} \right] \left(\frac{l_{a+2.5}}{l''_{a+2.5}} \right) \dots \quad [4]$$

(Applying similar technique as used in equation [2], v'_x = number of first marriages for females in the age group $(x, x+1)$ (Malaker, 1973; p. 236, Table 4). In our symbol, as used in the present paper, $v'_x = \int_x^{x+1} n_x dx$. Minimum age at marriage for females has been assumed as 10).

(A_2) : Number of years contributed by those marrying in $(a, a+5)$.

(A_2) can be decomposed into two parts:

(A_{21}) : Number of years contributed by those marrying in $(a+i, a+i+1)$ and becoming widowed in the same interval; $(i = 0, 1, 2, 3, 4)$

(A_{22}) : Number of years contributed by those marrying in $(a+i, a+i+1)$ and becoming widowed in $(a+i+1, a+5)$ $(i = 0, 1, 2, 3)$

$$A_2 = A_{21} + A_{22}$$

$$\begin{aligned} A_{21} &= \sum_{i=0}^4 \int_{a+i}^{a+i+1} n_x \left[\int_x^{a+i+1} \frac{l'_y \cdot l'_{y+5}}{l'_x \cdot l'_{x+5}} \mu'_{y+5} \frac{(T'_y - T''_{a+5})}{l''_y} dy \right] dx = \\ &= \sum_{i=0}^4 \frac{v'_{a+i}}{L_{a+1} L'_{a+5+i}} (L'_{a+5+i} - l'_{a+6+i}) (T'_{a+i+3/4} - T''_{a+5}) \times \frac{l_{a+3/4}}{l''_{a+3/4}} \dots [5] \end{aligned}$$

$$\begin{aligned} A_{22} &= \sum_{i=0}^3 \int_{a+i}^{a+i+1} n_x \left[\int_{a+i+1}^{a+5} \frac{l'_y \cdot l'_{y+5}}{l'_x \cdot l'_{x+5}} \mu'_{y+5} \frac{(T''_y - T''_{a+5})}{l''_y} dy \right] dx = \\ &= \sum_{i=0}^3 \frac{v'_{a+i}}{L_{a+1} L'_{a+5+i}} \sum_{y=a+i+1}^{a+4} (T''_{y+1/2} - T''_{a+5}) d'_{y+5} \frac{l_{a+3+1/2}}{l''_{a+3+1/2}} \dots \quad [6] \end{aligned}$$

$$B = \int_{10}^a n_x \left[\int_x^a \frac{l'_y \cdot l'_{y+5}}{l'_x \cdot l'_{x+5}} \mu'_{y+5} \frac{l''_a - T''_{a+5}}{l''_y} dy \right] dx =$$

$$= \sum_{x=10}^{a-1} \frac{v'_x}{L_x L'_{x+5}} (T''_a - T''_{a+5}) (L'_{x+5} - l'_{a+5}) \frac{l'_{(x+1)(2+a)/2}}{l''_{(x+1)(2+a)/2}} \dots \quad [7]$$

Thus the total number of years lived as widowed (by a female birth cohort of 100,000 out of which emerges the v'_x column in the net nuptiality tables) in the age interval $(a, a+5) = A_1 + A_2 + B$, (equations [4], [5], [6] and [7]).

$$\text{Proportion of widowed females in the age group } (a, a+5) = \frac{A_1 + A_2 + B}{T_a - T_{a+5}} \dots \quad [8]$$

3. RESULTS

The final results are shown below in a tabular form. For details of calculation, see Appendix 2. To have a rough check in our calculation we have also provided a check column obtained under the following assumptions.

For any 5 year age group $(a, a+5)$, average age of women is $a+2.5$. Assuming that a female aged $a+2.5$ was married at age 15 with a male aged 20, probability

that she is widowed = $1 - \frac{l'_{a+7.5}}{l'_{20}}$ where (l') denotes the male functions corresponding to West Model Life Table at level 13. Thus the percentage of widowed females in the age group $(a, a+5)$ is approximately $100 \times (1 - \frac{l'_{a+7.5}}{l'_{20}})$. The figures

are shown in the same table (column (4)). Along with the above percentages we have also provided the percentages widowed in the censuses of India in 1961 and 1971.

From table 1 it is observed that the proportions widowed, obtained under the two different sets of assumptions (Methods 1 and 2), agree closely in all the 5 year age groups. There is also a close agreement with the proportions obtained under the check column. The findings are interesting and suggest that the assumptions made as well as the distribution of marriages and the mortality levels used for the derivation of the theoretical proportions widowed are quite reasonable.

In comparing the proportions of table 1 with the census proportions it is observed that the census proportions are always underestimates. Even with 1961 census proportions, which are 50 percent higher compared to the 1971 proportions, the overall discrepancy is of the order of 40 percent. Another interesting feature of the following table is that the under enumeration seems to be higher in the younger age groups. In explaining the reasons for such under enumeration *prima facie* three factors seem to be operating.

TABLE 1

Percentage of Widowed Females in Five Year Age Groups According to Different Methods

| Age group | Method 1 (All females marry at age 15 and males at 20) | Method 2 (Assuming distribution of marriages and age difference at marriage = 5 years) | Check column | Censuses of India | |
|-----------|---|---|--------------|-------------------|--------|
| (1) | (2) | (3) | (4) | 1961* | 1971** |
| 15-20 | 1.5 | 1.3 | 1.4 | 5 | .5 |
| 20-25 | 5.0 | 3.9 | 4.7 | 1.3 | .9 |
| 25-30 | 8.7 | 7.4 | 8.2 | 2.9 | 1.9 |
| 30-35 | 12.8 | 11.5 | 12.1 | 6.4 | 4.1 |
| 35-40 | 17.2 | 16.2 | 16.7 | 11.2 | 7.0 |
| 40-45 | 21.6 | 21.7 | 21.9 | 20.7 | 14.4 |
| 15-45 | 10.6 | 9.8 | 10.1 | 5.8 | 4.0 |

(*) Census of India, 1961, Vol. 1, Part. II c(1), Social and Cultural Tables, pp. 19-21.

(**) Census of India, 1971, Series 1, Part. II c(1), Social and Cultural Tables, pp. 5-9.

The first is the incidence of marriage. The question is whether the remarriage as assumed to be negligible in our analysis is really negligible. As we have already pointed out, all indirect evidences suggest that remarriage is not an important factor, at least at the national level, and as such can not explain the differences between the proportions obtained in a census and the expected proportions obtained under the two different sets of assumptions.

The second factor likely to contribute to the smaller proportions of widowed as recorded in a census is the misclassification and omission of widowed females in a census. It appears that a sizeable proportion of those who are actually widowed report themselves as married as they feel shy to report themselves as widowed, particularly in the younger age-groups. Some of the widowed females may not be reported at all in the census. The incidence of such misclassification and omission seems to be higher at the younger ages of females resulting in a very low proportion of widowed in those age groups in the census. One might as well argue that some widowed may also report themselves as single. True, theoretically we cannot make any counter argument, and if this is really the case the proportion single will be affected and so will be the distribution of marriages. But we should note that, firstly, from all known evidences the probability of such occurrence is small and, secondly, if this were the case with a sizeable number of widowed females, the proportions obtained by using distribution of marriages in our second model should not have shown such close agreement with those obtained under the first model.

The third factor is the mortality level of the widowed population. In India, as in most of the developing countries, mortality rates by marital status are not available and one must use indirect method for estimating the mortality level of the widowed females. We are quite aware that such indirect method may bring in some inaccuracy in our result and as such examination of the effect of mortality on widowed proportion will be in order. To examine how far mortality can affect our calculation, let us note that in our method we have allowed for widowed mortality which is approximately 30 percent higher than the combined mortality of females irrespective of marital status. It is very unlikely that the mortality of the widowed females will be at a still higher level and probably we have made allowance for maximum difference. Going to the other extreme the widowed mortality can not be lower than the combined mortality of females. The proportions widowed for different levels of widowed mortality were estimated under assumption 1 and the effect of mortality on proportions widowed was found to be insignificant. To save space the results of such an analysis have not, however, been presented.

Finally we may add that though the age difference at marriage between the sexes may theoretically contribute to the differences in the proportions widowed, it is very unlikely that this factor can explain such a large difference between the proportions widowed obtained under different models and those observed in the census.

APPENDIX

I. CHOICE OF MORTALITY LEVELS

The mortality levels for males and females were taken from the Coale Demeny West Model Life Tables. The expectations of life at birth (e_0^c) for 1961-70 were observed to be 46.4 for males and 44.7 for females (India, 1977). The values of e_0^c according to West Model Life Tables at level 13 for males ($e_0^c = 47.13$) and at level 11 for females ($e_0^c = 45.02$) showed close agreement with the observed values of e_0^c in the All India Life Tables 1961-70 and as such West Model at level 13 for males and 11 for females was considered for our analysis.

Regarding mortality rates by marital status no data are available at the national level, and we have used indirect method for the estimation of mortality rates for the widowed females. Mortality rates by marital status are available for most of the developed countries. The rates for the widowed females for Sweden (Larsson, 1965) in the age group 17-47 have been studied and observed to be 20-35% higher compared to the rates for the combined female population in the same age bracket. The values of the life table mortality rates for females in the age group 15-45 (${}_{30}m_{15}$) at different levels of the West Model have been computed and shown in the following table.

| Level | e_0^o | $30^{m}15$ | Index ($30^{m}15$ at level 11 = 100) |
|-------|---------|------------|---------------------------------------|
| 11 | 45.02 | .00865 | 100 |
| 10 | 42.51 | .00956 | 110 |
| 9 | 40.01 | .01053 | 122 |
| 8 | 37.50 | .01157 | 134 |

From the above table, it appears that a reasonable representation of widowed mortality is a level lying between 8 and 9 as against level 11 for the combined females irrespective of marital status. As such, in our analysis we have used West Model at level 8 for widowed mortality.

2. STEPS OF CALCULATION USED IN THIS PAPER

Calculation of N_{a-} , N_{a+} and Percentages of Widowed Females in 5 Year Age Groups under Assumption 1

| a | $l'_{20} - l'_{a+5}$ | $\frac{7^{m}_{a} - 7^{m}_{a+5}}{7^{m}_{a}}$ | (2) X (3) | $\frac{(l'_{a} / l'_{a+5})}{4}$ | (5) X l'_{a} X (4) |
|-----|----------------------|---|-----------|---------------------------------|----------------------|
| (1) | (2) | (3) | (4) | (5) | (6) |
| 15 | - | - | - | - | - |
| 20 | 2594 | 4.08118 | 12661.78 | .99432 | 901379528 |
| 25 | 5372 | 4.86537 | 26136.23 | .98703 | 1786582941 |
| 30 | 8410 | 4.84759 | 40768.23 | .97888 | 2642806639 |
| 35 | 11638 | 4.83115 | 56202.22 | .96942 | 3442610690 |
| 40 | 15002 | 4.81621 | 72262.42 | .95902 | 4153522437 |

Table continued

ATTI DEL SEMINARIO SULLA
"EVOLUZIONE DELLA FAMIGLIA IN ITALIA"

VOL. I

LA FAMIGLIA NELL'APPROCCIO STORICO

L'istituto familiare ha subito una profonda evoluzione nel contesto delle grandi trasformazioni che in questi anni hanno caratterizzato l'intera società italiana. Al centro dell'attualità, l'evoluzione della problematica della famiglia costituisce il punto di incontro di vasti interessi interdisciplinari e un oggetto di ricerca particolarmente stimolante.

La pubblicazione del presente volume e di quello attualmente in preparazione, nasce dagli sviluppi di un'iniziativa del CISP con la quale si proposero al CNR, che li approvò sostenendoli finanziariamente, due seminari sul tema "Famiglia e società nella prospettiva storico-demografica". Il primo seminario (Spello, 15-16 novembre 1977) è stato dedicato a "Fonti e metodi per lo studio dell'evoluzione della famiglia in demografia". Il successo ottenuto ha suggerito l'opportunità di sviluppare ancor più lo sforzo interdisciplinare anche in vista di iniziative atte a realizzare uno sbocco più concreto di attività integrata.

Dalla fusione e dalla collaborazione tra il gruppo di ricerca CISP e quello già esistente di "Sociologia della famiglia" — e ancora con il sostegno del CNR e di altri enti — è derivato il secondo seminario, tenuto a Corciano il 5-7 giugno 1978. Altri due seminari, l'uno organizzato a Ponte di Taro di Parma (8-9 dicembre 1978) sui rapporti tra demografia e genetica; l'altro a Vietri sul mare (14-16 giugno 1979) sul tema "Processi di trasformazione della famiglia italiana contemporanea: aspetti demografici, economici e sociologici", hanno ulteriormente rafforzato l'interesse e l'impegno per una ricerca interdisciplinare su linee unitarie. In tali ambiti è però stata evidenziata anche la mancanza di uno strumento informativo ispirato a una visione globale del fenomeno e capace di chiarire le trasformazioni strutturali delle famiglie e l'evoluzione delle strategie familiari. La stesura di un apposito questionario di rilevazione — attualmente all'esame dell'ISTAT — è stato appunto l'oggetto di un seminario conclusivo tenuto a Salsomaggiore il 20-22 giugno 1980.

Il primo volume contiene le comunicazioni di Demografia storica. Il secondo volume conterrà le comunicazioni che riguardano la situazione attuale, e quelle presentate al seminario su "Demografia e Genetica" oltre alla documentazione relativa alla proposta di indagine periodica sulla famiglia, presentata dal CISP all'ISTAT.

Vol. I — La famiglia nell'approccio storico, p. 310, L. 12.000

Vol. II — Caratteristiche attuali della famiglia, p. 400 circa, L. 18.000
(in corso di stampa).

Per ordinazioni rivolgersi alla: Segreteria del Comitato Italiano per lo Studio dei Problemi della Popolazione — Via Nomentana, 41 — 00161 - Roma.

Table continued

| a | $\sum_{x=a}^{a+4} (T_{x+1/2}^{w} - T_{a+5}^{w}) d'_{x+5} \left(\frac{l_{a+2-1/2}^w}{l_{a+2-1/2}^m} \right)$ | (7) X (8) = | (6) + (9) = |
|-----|--|-------------|------------------------------|
| (1) | (7) | (8) | (9) |
| 15 | 363840723 | 1.133 | 412231539 |
| 20 | 375647538 | 1.147 | 430867726 |
| 25 | 390410249 | 1.163 | 454047120 |
| 30 | 418387310 | 1.181 | 494115413 |
| 35 | 459488942 | 1.202 | 552305708 |
| 40 | 495346031 | 1.224 | 606303542 |
| | | | $l_{20}^w (N_{a+} + N_{a-})$ |

Table continued

| a | $(T_a - T_{a+5})$ | $N_{a+} \cdot N_{a-}$ | % of widowed females in the age group (a, a+5) (12)/(11) X 100 |
|----------------|-------------------|-----------------------|---|
| (1) | (11) | (12) | (13) |
| 15 | 363448 | 5463 | 1.5 |
| 20 | 351685 | 17656 | 5.0 |
| 25 | 338200 | 29615 | 8.7 |
| 30 | 323612 | 41573 | 12.8 |
| 35 | 307934 | 52944 | 17.2 |
| 40 | 291437 | 63107 | 21.6 |
| Combined 15-45 | 1976316 | 210358 | 10.6 |

Calculation of A_1, A_{21}, A_{22} and B , and Percentage of Widowed Females in 5-Year Age Groups under Assumption 2

| a | A_1 | A_{21} | A_{22} | $A_2 = A_{21} \cdot A_{22}$ | B | $A_1 \cdot A_2 \cdot B$ | $T_a - T_{a+5}$ | % of widowed females in the age group (a, a+5) (7)/(8) X 100 |
|----------------|-------|----------|----------|-----------------------------|-------|-------------------------|-----------------|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 15 | 2208 | 222 | 634 | 856 | 1555 | 4619 | 363448 | 1.3 |
| 20 | 4787 | 148 | 450 | 598 | 8363 | 13748 | 351685 | 3.9 |
| 25 | 6321 | 15 | 46 | 61 | 18769 | 25151 | 338200 | 7.4 |
| 30 | 7037 | 5 | 15 | 20 | 30199 | 37256 | 323612 | 11.5 |
| 35 | 7914 | 2 | 6 | 8 | 42039 | 49961 | 307934 | 16.2 |
| 40 | 8710 | - | - | - | 54632 | 63342 | 291437 | 21.7 |
| Combined 15-45 | | | | | | 194077 | 1976316 | 9.8 |

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SUMMARY

In this paper the reliability of widowhood data in the censuses of India 1961 and 1971 has been examined by using two different methods. Life table techniques have been used for this investigation.

In the first method all females are assumed to marry at age 15 with males at age 20 while the second method utilises the distribution of marriages of single females as obtained by the author in an earlier paper. The values of the expected proportions widowed are obtained in the form of integrals. Numerical method has been used for the evaluation of these integrals. To check the accuracy of our calculation a check column obtained under a very simplified assumption has also been provided.

For both the methods, the incidence of remarriage has been assumed to be negligible and the age difference at marriage between males and females has been assumed to be 5 years. Regarding mortality, West Model Life Tables at appropriate levels have been considered. Allowance has been made for mortality differentials by marital status.

It has been observed that the estimated proportions widowed under the two different methods as well as those obtained under the simplified assumption agree closely in each 5 year age group. This finding justifies the rationale behind different methods and assumptions.

In comparing the estimated proportions widowed with the census proportions widowed in the census are always under estimates. The extent of under estimation seems to be higher in the younger age groups, the overall under estimation being of the order of 40 percent in the 1961 census.

In analysing the different factors contributing to such lower proportions of widowed females in the census, particularly in the younger age groups, two factors seem to have dominant role. The first is the misclassification of widowed, or in other words a sizeable proportion of the widowed, particularly at the younger ages, appear to report themselves as married, as the younger girls feel shy to report themselves as widowed because of social taboos. The second is the omission of widows from the census again reflecting the utter negligence to this section of population on the part of our society.

The factors remarriage, mortality by marital status, and age difference at marriage between males and females do not appear to have significant effect in explaining the low proportions of widowed in the census at the national level.

RIASSUNTO

L'autore usa due diversi metodi -- avvalendosi di tavole di mortalità -- per valutare l'attendibilità dei dati sulla vedovanza rilevati nei censimenti dell'India del 1961 e del 1971.

Con il primo metodo suppone che tutte le femmine si sposino a 15 anni con maschi di 20. Con il secondo metodo utilizza invece la distribuzione per età dei matrimoni di nubili ottenuta in un suo precedente lavoro. I valori attesi delle proporzioni di vedove alle successive età sono determinati in forma di integrali e calcolati mediante metodi numerici. L'attendibilità dei risultati ottenuti è confermata da dati di controllo ricavati in base ad ipotesi assai semplici.

Per entrambi i metodi si è supposto che:

- l'incidenza di nuovi matrimoni sia trascurabile;
- la differenza di età tra i due sposi sia di cinque anni.

Per quanto riguarda la mortalità si sono considerati a opportuni livelli le tavole di mortalità del "West Model". Si è anche tenuto conto di differenze di mortalità per stato civile.

Si è osservato che le proporzioni di vedove stimate con i due diversi metodi concordano strettamente con le proporzioni di vedove calcolate in base alle ipotesi più semplici, per tutti i gruppi quinquennali di età. Ciò dimostra la razionalità dei metodi e delle ipotesi adottati.

Dal confronto tra le proporzioni di vedove calcolate in base ai dati censuari, e quelle che risultano direttamente dai censimenti, emerge una sottovalutazione per questi ultimi dati, specialmente per i gruppi di età più giovani (nel censimento del 1961 la sottoestima è dell'ordine del 40%).

Dall'analisi dei diversi fattori che concorrono a questa sottovalutazione, in particolare nei gruppi di età più giovani, emergono due fattori dominanti. Il primo è l'errore di classificazione di una notevole proporzione di vedove dovuto alla ten-

denza, specialmente tra le più giovani, di qualificarsi come coniugate anziché come vedove a causa di certe prevenzioni. Il secondo è l'omissione di registrazione di veve dovuta allo scarso interesse della società per questa categoria di persone.

Altri fattori, quali un nuovo matrimonio, la mortalità secondo lo stato civile, la differenza di età tra i sensi al matrimonio, non sembrano invece avere effetti tali da giustificare la bassa proporzione di vedove a livello nazionale.

RESUME

Dans le présent travail nous avons examiné la confiance qu'on peut poser sur les données de veuvages qui se trouvent dans les recensements indiens de 1961 et 1971, en employant deux méthodes différentes. On a adopté les techniques de "Life Table" pour parvenir à ce but.

Dans la première méthode, on suppose que chaque femme se marie à l'âge de quinze ans à un époux âgé de vingt ans. Dans la deuxième méthode, on emploie, pour l'âge de mariage d'une femme, la répartition obtenue dans les travaux antérieurs de l'auteur. Les résultats de calculs des espérances mathématiques des proportions de veuvage ont été présentés en forme d'intégrales. On a calculé les valeurs de ces intégrales par des méthodes numériques. Les résultats obtenus ont été confirmés par une formule basée sur des hypothèses très simples.

Pour les deux méthodes différentes on a supposé que l'incidence de remariage est négligeable et que la différence d'âge entre l'époux et sa femme est de 5 ans. En ce qui concerne la mortalité, on a considéré les "West Model Life Table" à niveau propre. On a tenu compte des différentiels de mortalité selon l'état civil.

Les proportions de veuvage calculées, pour chaque groupe de cinq ans, par les deux méthodes différentes et celles calculées en faisant des hypothèses simples, nous ont conduit à des résultats peu différents. Les résultats précédents mettent en évidence l'efficacité des différentes méthodes adoptées et des hypothèses faites.

Quand on compare la proportion de veuvage calculée à celle tirée des données de recensements, on remarque que la dernière est toujours inférieure à celle obtenue par les calculs. Les différences constatées entre les calculs et les données de recensement paraissent plus importantes pour le groupe de plus jeune âge. La sous-estimation est d'ordre de 40 pour cent dans les données de recensement de 1961.

Quand on recherche les facteurs différents qui contribueraient à cette basse proportion de veuvage dans les données de recensement, parmi les groupes jeunes en particulier, on constate que le défaut pourrait provenir de deux causes. La première est l'erreur de classification de veuve, c'est-à-dire qu'une bonne pro-

portion des veuves, en particulier parmi le groupe jeune, paraît se présenter comme mariée. Peut-être les femmes jeunes hésitent-elles à se présenter comme veuves à cause du tabou social. La deuxième cause est l'omission d'enregistrement des veuves dans les données de recensement. Ce fait reflète la négligence complète de cette section de la population par notre société.

Les différentes causes citées ci-dessus, remariage, mortalité selon l'état civil et différence d'âge entre la femme et son époux au temps du mariage, ne paraissent pas avoir d'effet assez important pour expliquer la basse proportion de veuve qui se trouve dans les données de recensement.