

DIFFERENTIAL REPRODUCTION IN ENGLAND

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PRESENT-DAY differences in reproduction between social-economic groups are usually studied in terms of legitimate fertility rates standardized for age of married women. This procedure is often apt to yield misleading results because it does not take into account three variables: marriage frequency, marriage age, and extra-nuptial fertility. Among these marriage age is the most important. Women in the United States whose husbands are engaged in professional occupations marry about four years later than do women in the unskilled labor class. This alone makes the legitimate fertility rate of the late marrying group appear higher by about one-fifth. This source of error may be avoided by standardizing not for age of wife but for duration of marriage. If this is unfeasible because the duration of marriage is unknown, then it seems advisable to group births by age of father rather than of mother and to relate them not to the number of married men in the corresponding age groups, but to the total number of men married and unmarried combined. The age-specific "paternity rates" may be computed for single years of age or else on a quinquennial or decennial basis as the material may permit. Their summation over the whole reproductive life span yields a "total paternity rate" which gives the number of births per 1,000 men during their lifetime.

If only the total number of births in each social-economic group is known, it is still possible to estimate the total paternity rate by substituting standard rates for each age group and adjusting them according to the ratio of observed to expected births. Since in all western population groups about 50 per cent of the fathers are between 25 and 35 years of age, and the patterns of age distribution as

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a whole are rather similar, such a substitution does not affect the total paternity rate very much. A series of tests showed that the error from this source does not exceed 5 per cent in most cases. The whole procedure corresponds exactly to the well-known methods of estimating total fertility rates, females being replaced by males in the calculation. It is at the same time much simpler than the technique described in an earlier article on the same subject² and has the advantage that a tabulation of the male population by occupation, age, and marital status in combination is no longer required.

Actually to compute fertility rates by relating the births to the total number of females in the corresponding age groups is not advisable. The concentration of gainfully employed women in a few occupations such as clerical work, semiskilled factory labor, and domestic service, would overweight some of the social-economic groups with unmarried females and make their total fertility rates appear unduly low. Another disturbing factor would be the presence of a large number of girls without gainful occupation. It is obvious that total paternity and fertility rates will be identical if there is no excess of either sex in the adult population.

Total paternity rates are independent of marriage frequency and marriage age. As fathers of illegitimate children are usually not reported, this part of reproduction has to be excluded from the rates. Even where illegitimate births are infrequent, their omission undoubtedly tends somewhat to understate social contrast in reproduction.

Total paternity rates can be used for the study of the present status of differential reproduction in England and Wales. Part IIA of the Registrar General's Decennial Supplement for 1931, which was issued last fall, is chiefly devoted to mortality, but it contains also the necessary basic data for the present objective. The male population is given by occupation and age in groups of 5 and 10

² Tietze, C.: The Measurements of Differential Reproduction by Paternity Rates. *Eugenics Review*, July, 1938, xxx, No. 2, pp. 101-107.

years, and legitimate births by occupation of father, but not by age of father.³ Therefore the substitution method has to be applied. As a standard, the Australian age-specific paternity rates for 1933 were chosen. The Registrar General's social-economic grouping is primarily designed for mortality studies. The material has been regrouped for the present purpose into six groups which roughly correspond to the classification introduced into American statistics by Alba M. Edwards.⁴ Each group covers as far as possible a man's whole occupational career from youth to ripe age. This is important for the following reason: Master artisans, shopkeepers, etc., as a rule do not marry before having reached economic independence, which is most often at about 30 years of age—at least in England. But if such an individual sets up a shop of his own earlier because his father has died and left him some money, or by another similar chance, he usually marries soon afterwards. The proportion of independent craftsmen, dealers, etc., below the age of 25 is very small, but a much greater proportion of these young men is already married than is the case in the population at large. The same thing may also be observed in the next age group, but in a less pronounced manner. These conditions tend to increase the number of births in the proprietary class and to reduce at the same time the paternity rates in those groups which contain a considerable number of "future proprietors." It is for this reason that within social-economic groups 2 and 6 in Table 1 employers, workers on their own, and wage earners are combined. In the professional class the non-inclusion of approximately 30,000 students in the official figures has been compensated for.

Table 1 presents the familiar pattern of an inverse relation between social status and fertility, but there are a few points worth

³ The Registrar General's Decennial Supplement, England and Wales, 1931, Part 11a, Occupational Mortality; Tables 4A, 4D, and 14. Some additional information regarding age was taken from the Occupational Tables of the Census of England and Wales, 1931.

⁴ Edwards, Alba M.: *A Social-Economic Grouping of the Gainful Workers of the United States*. Washington, United States Government Printing Office, 1938. 264 pp.

SOCIAL-ECONOMIC GROUP	MALES 20-64	LEGITIMATE BIRTHS	TOTAL PATERNITY RATE
1. Professional Persons	328,955 ¹	11,208	1,418
2. Proprietors, Managers, Officials, Clerks, and Kindred Workers	2,291,725	90,871	1,624
3. Skilled Workers	4,063,409	218,477	2,096
4. Semiskilled Workers	2,056,205	130,728	2,420
5. Unskilled Workers	1,806,980	119,016	2,657
6. Farmers and Farm Laborers	667,117	32,819	2,083
ALL OCCUPIED AND RETIRED MALES	11,214,391 ¹	603,119	2,134

¹ Including 30,000 students (estimate).

Table 1. Males, 20-64, legitimate births, and total paternity rate, by social-economic groups. England and Wales, 1931.

mentioning: More than a third of group 4 are coal miners. These are very fertile, even more so than the unskilled workers. Their total paternity rate is 2,761. The rest of the group—mostly semi-skilled factory labor—has a much lower rate: 2,223. The total paternity rate of the agricultural group is remarkably low, which is partly due to late marriages and frequent celibacy. This situation is in striking contrast to that in the United States where the farm population is more fertile than any other of the large social-economic groups.

How many of these children survive their first year? Table 14 of the report gives infant mortality rates based on the deaths of 1930-1932 and the births of 1931 only. Table 2 shows a complete parallelism between total paternity and infant mortality rates. Infant mortality in the unskilled labor class is still more than twice as high as among the children of professional men, but as the percentages surviving their first birthday are 92.3 and 96.5, respectively, the difference is unimportant and the subject has lost very much of its former interest. The subtraction of infant deaths from total births does not affect materially the picture presented by the total paternity rates. These "effective" rates are also given in Table 2.

From the English life table for 1930-1932 it can be calculated with the help of the same Australian paternity rates as used above, that

SOCIAL-ECONOMIC GROUP	INFANT MORTALITY	"EFFECTIVE" TOTAL PATERNITY RATE (BIRTHS MINUS INFANT DEATHS)
1. Professional Persons	35.0	1,369
2. Proprietors, Managers, Officials, Clerks, and Kindred Workers	44.8	1,551
3. Skilled Workers	55.7	1,980
4. Semiskilled Workers	72.4 ¹	2,245 ²
5. Unskilled Workers	77.2	2,452
6. Farmers and Farm Laborers	54.6	1,970
ALL OCCUPIED AND RETIRED MALES	61.5	2,003

¹ Coal miners 82.8, rest 65.0.

² Coal miners 2,533, rest 2,078.

Table 2. Infant mortality and "effective" paternity rate, by social-economic groups. England and Wales, 1931.

a total paternity rate of 2,365 is necessary to replace a population under present mortality conditions, and that 2,219 children must survive their first year. It is obvious that only unskilled workers and miners surpass this standard, and these only a little. The rate for the professional group is almost 40 per cent below replacement value.

It should be remembered that illegitimate births are excluded from all these figures; they number not more than 4.6 per 1,000 legitimate births in the population as a whole. It seems just possible that their inclusion would raise the paternity rate of semiskilled workers other than miners to the replacement value.

The temptation is very great to compare the total paternity rate for each group in 1931 with the corresponding rates of an earlier year, say 1911. In view of the sweeping changes in occupational classification between these two censuses such a comparison should, however, not be attempted except in the broadest and most general terms. For this reason the data for 1911 are not given here in full. Total paternity rates at this earlier period ranged from about 2,000 in the professional class to 4,900 among miners. There has been a rapid decline of the birth rate in all social-economic groups from 1911 to 1931 and it has resulted in a narrowing down of the dif-

ference between the least and the most fertile section of the population. This corresponds closely with the findings of all other investigators in the field.

SUMMARY

For the study of differences in reproduction between social-economic groups it is recommended to refer births to total males instead of females. The computation of such "total paternity rates" by the substitution method is discussed. An analysis of the 600,000 legitimate births in England and Wales in 1931 reveals a marked inverse relationship between fertility and social status which is mitigated very little by differential infant mortality. Only unskilled laborers and miners produced sufficient children at this period to replace themselves.