BIRTH WEIGHTS OF SOUTH AFRICAN BABIES

BY

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This present paper is a preliminary report on the birth weights and the incidence of prematurity in groups of South African babies, with special reference to race and sex. Other factors affecting birth weight (economic status as reflected by the hospital class, birth rank, age of mother, and season of birth) are being investigated and will be reported subsequently.

MATERIAL AND METHOD

The data were collected from various hospitals and nursing homes in Durban, Pietermaritzburg, and Capetown:

European babies from two private nursing homes in Durban.

Coloured (*i.e.* half-caste) babies from two provincial hospitals, one in Pietermaritzburg and one in Capetown.

Bantu babies from a provincial hospital in Pietermaritzburg, and a mission hospital in Durban.

Indian babies from a provincial hospital in Pietermaritzburg, a mission hospital in Durban and a government aided hospital in Durban.

The data extracted consisted of birth weight, race of mother, and sex of child. Abortions and multiple births were excluded. Frequency distributions of the birth weights were drawn up for the different races and sexes, and the incidence of prematurity (birth weight less than 5 lb. 8 oz.) was determined.

RESULTS

RACE AND BIRTH WEIGHT.—The distributions of birth weights for the four groups are given in the Appendix (see also the Figure, overleaf), and the mean birth weights and differences between the means are shown in Tables IA, IB, IC (overleaf). There are substantial differences between mean birth weights:

European	7.47 lb.	Bantu	6.77 lb.
Coloured	6.85 lb.	Indian	6.46 lb.

In relation to these differences it should be noted that the kinds of persons delivered in institutions vary between the four groups. In Durban it is usual for European mothers (at all birth ranks) to have their babies in hospital, but institutional deliveries are more common for first births among Non-European mothers.

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FIGURE.—Frequency curves of birth weights of different racial groups (sexes combined).

On the other hand there are more babies of higher birth order among Non-Europeans. If, as is generally believed, first babies are lighter than later births, these differences may be expected to influence the mean birth weights.

SEX AND BIRTH WEIGHT.—Analysis of birth weights of boys and girls in the four groups showed that:

- (i) in each group boys have a higher mean birth weight than girls;
- (ii) differences between the birth weights of boys and of girls as between the groups are similar to those observed when the sexes are combined (Tables IA, IB, IC).

With one exception (Coloured) these differences are all statistically significant.

INCIDENCE OF PREMATURETY.—Births are here considered to be premature if they weighed less than 5 lb. 8 oz. The incidence of prematurity in each group was:

European 4.2 per cent.	Bantu 11.5 per cent.	} Tables IIA, IIB, IIC overleaf.
Coloured 9.6 per cent.	Indian 18.3 per cent.	

As might be expected, the incidence of prematurity is inversely related to the mean birth weight, and is in consequence somewhat higher for girls than for boys. With one exception (as between Coloured and Bantu) the differences between the four groups are all statistically significant.

It may be noted that the proportion of birth weights recorded was not the same

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TABLE IA
MEAN BIRTH WEIGHT RELATED TO SEX AND RACE

Race	European			Coloured			Bantu			Indian		
Sex	Male	F'male	Total	Male	F'male	Total	Male	F'male	Total	Male	F'male	Total
Number of Babies	902	855	1,757	471	460	931	3,866	3,742	7,611*	899	838	1,738*
Mean Birth Weight (lb)	7.59	7.34	7.47	6.91	6.78	6.85	6.89	6.64	6.77	6.59	6.32	6.46
Standard Deviation	1.16	1.12	1.14	1.22	1.13	1.18	1.14	1.08	1.12	1.14	1.14	1.15

* Including 3 Bantu and 1 Indian of unspecified sex.

TABLE Ib
DIFFERENCE IN MEAN WEIGHT BY RACE FOR EACH SEX

Sex		Male			Female			Total		
Difference Between		(a) Difference (lb.)	(b) Standard error of difference	(a) ÷ (b)	(a) Difference (lb.)	(b) Standard error of difference	(a) ÷ (b)	(a) Difference (lb.)	(b) Standard error of difference	(a) ÷ (b)
European and	Coloured Bantu Indian	0.68	0.069	9.9	0.56	0.065	8.6	0.62	0.047	13.2
		0.70	0.042	16.7	0.70	0.042	16.7	0.70	0.030	23.3
		1.00	0.054	18.5	1.02	0.055	18.5	1.01	0.039	25.9
Coloured and	Bantu Indian	0.02	0.059	0.3	0.14	0.056	2.5	0.08	0.041	2.0
		0.32	0.068	4.7	0.46	0.066	7.0	0.39	0.047	8.3
Bantu and	Indian	0.30	0.042	7.1	0.32	0.043	7.4	0.31	0.031	10.0

TABLE Ic
DIFFERENCES IN MEAN WEIGHT BY SEX FOR EACH RACE

Race				(a) Difference (lb.)	(b) Standard Error of Difference	(a) ÷ (b)
European	..	..	..	0.25	0.054	4.6
Coloured	..	..	..	0.13	0.077	1.7
Bantu	..	..	..	0.25	0.026	9.6
Indian	..	..	..	0.27	0.055	4.9

in every hospital, and in one case (an Indian hospital) 23 per cent. of births were not weighed in 1948. Infants are sometimes shown as "premature" without the actual weight being given, and it is therefore possible that the incidence of prematurity is higher than our figures indicate.

TABLE IIa
PERCENTAGE OF PREMATURE BABIES (LESS THAN 5.5 LB.) BY SEX FOR EACH RACE

Race	European			Coloured			Bantu			Indian		
	Male	F'male	Total	Male	F'male	Total	Male	F'male	Total	Male	F'male	Total
Number of babies weighed	902	855	1,757	471	460	931	3,866	3,742	7,611*	899	838	1,738*
Percentage less than 5.5 lb.	3.8	4.6	4.2	9.6	9.6	9.6	10.3	12.9	11.5	14.2	22.7	18.3

* Includes 3 Bantu and 1 Indian of unspecified sex.

TABLE IIb
DIFFERENCES IN PERCENTAGE OF PREMATURE BABIES BETWEEN RACES FOR EACH SEX

Sex		Male			Female			Total		
Difference Between		(a) Difference (per cent.)	(b) Standard error of difference	(a) ÷ (b)	(a) Difference (per cent.)	(b) Standard error of difference	(a) ÷ (b)	(a) Difference (per cent.)	(b) Standard error of difference	(a) ÷ (b)
European and	Coloured	5.8	1.50	3.9	5.0	1.55	3.2	5.4	1.08	5.0
		6.5	0.80	8.1	8.3	0.90	9.2	7.3	0.60	12.2
	Indian	10.4	1.33	7.8	18.1	1.61	11.2	14.1	1.04	13.6
Coloured and	Bantu	0.7	1.44	0.5	3.3	1.48	2.2	1.9	1.03	1.8
		4.6	1.79	2.6	13.1	2.00	6.6	8.7	1.34	6.5
Bantu and	Indian	3.9	1.26	3.1	9.8	1.55	6.3	6.8	1.00	6.8

TABLE IIc
DIFFERENCES IN PERCENTAGE OF PREMATURE BABIES BETWEEN SEXES BY RACE

Race		(a) Difference (per cent.)	(b) Standard Error of Difference	(a) ÷ (b)
European		0.8	0.96	0.8
Coloured		0.0	1.93	0.0
Bantu		2.6	0.73	3.6
Indian		8.5	1.86	4.6

DISCUSSION

Our data on mean birth weight for four racial groups may be compared with the observations by other workers which are set out in Table III (opposite).

In general mean birth weights are higher for Europeans than for Non-Europeans. In America it has been reported that white children are heavier at birth than Negro children (Bakwin, 1932; Bivings, 1934; Michelson, 1943), and it has been suggested

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TABLE III
PARTICULARS OF PREVIOUS INVESTIGATIONS

Investigation	Date	Numbers	Race	Place of Birth	Mean Birth Weight (lb.)
Le Riche	1938	942	European	Moedersbond Hospital, Praetoria	7.46
Cape Coloured Commission	1937	906	European	Peninsula Maternity Hospital, Cape-town	7.42
		1,763	Non-European (mainly Coloured)	—	7.01
Heyns and Hersch	1944	1,216	Bantu	Bridgeman Memorial Hospital, Johannesburg	6.74
		967	Bantu	King Edward Hospital, Durban	6.82
		440	Bantu	University Clinic, Alexandra, Johannesburg	7.28

that differences in economic status may have an important bearing on this observation. The same explanation may be relevant in the case of the four groups here recorded, since gross differences in net income are exhibited in Table IV (prepared from the Natal Regional Survey*).

TABLE IV
INCOMES OF DIFFERENT RACES

Race	European	Coloured	African	Indian
Number of households investigated	711	68	493	497
Average number of persons	3.9	4.4	3.1	6.0
Average net available weekly income	£7 19 9	£3 18 7	£1 7 9	£2 13 0

The sex differences in mean birth weight are also in accord with American reports (Meredith and Brown, 1939; Palmer and Ciocco, 1945). Jeans and Marriott (1947) attribute the weight difference to the difference in height and suggest that for infants of the same height there is little difference between the sexes.

The incidence of prematurity here recorded for European births, and the sex difference in incidence, are consistent with English and American reports (Dunham, Jenss, and Christie, 1939; Stevenson, 1950). Again, it seems reasonable to assume that differences in economic status have a considerable bearing on the differences in the incidence of prematurity exhibited by the four groups.

* Personal communication from Professor Burrows, Department of Economics, Natal University.

SUMMARY

Birth weights of infants (1,757 European, 931 Coloured, 7,611 Bantu, and 1,738 Indian) were studied in relation to race, sex, and incidence of prematurity, and the following results obtained:

(1) *Race*.—Mean birth weights for the four groups:

European	7.47 lb.	Bantu	6.77 lb.
Coloured	6.85 lb.	Indian	6.46 lb.

It is suggested that the observed differences may be explained by differences in economic status of the parents.

(2) *Sex*.—Mean birth weights in each racial group were higher for males than for females. The racial differences in mean birth weights already noted are again observed when the sexes are considered separately.

(3) *Prematurity*.—The incidence of prematurity (birth weight less than 5 lb. 8 oz.) in each racial group was:

European	4.2 per cent.	Bantu	11.5 per cent.
Coloured	9.6 per cent.	Indian	18.3 per cent.

The incidence of prematurity was higher for females than for males, as might be anticipated in view of the sex difference in mean birth weight.

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APPENDIX
FREQUENCY DISTRIBUTION OF BIRTH WEIGHTS

Birth Weight (lb.)	European			Coloured			Bantu			Indian		
	Male	F'male	Total	Male	F'male	Total	Male	F'male	Total	Male	F'male	Total
2 -	1	—	1	2	1	3	5	1	6	2	—	2
2½ -	—	1	1	1	—	1	6	8	14	1	4	5
3 -	2	1	3	1	5	6	22	30	52	7	8	15
3½ -	1	—	1	4	2	6	29	31	60	7	9	16
4 -	4	5	9	5	4	9	60	68	128	17	29	46
4½ -	6	13	19	14	9	23	74	105	179	28	36	64
5 -	20	19	39	18	23	41	201	239	440	66	104	170
5½ -	33	48	81	52	49	101	290	377	667	110	108	218
6 -	81	95	176	68	89	157	591	740	1,332	183	166	349
6½ -	99	140	239	94	88	182	717	774	1,492	171	153	324
7 -	160	161	321	69	84	153	799	644	1,443	154	122	277
7½ -	169	137	306	60	50	110	513	390	903	63	48	111
8 -	154	118	272	42	31	73	301	203	505	49	32	81
8½ -	83	65	148	20	15	35	169	79	248	24	8	32
9 -	47	32	79	11	5	16	49	39	88	10	5	15
9½ -	30	11	41	7	2	9	25	14	39	4	3	7
10 -	8	3	11	3	1	4	9	—	9	—	2	2
10½ -	2	6	8	—	1	1	4	—	4	2	—	2
11 -	1	—	1	—	—	—	2	—	2	1	—	1
11½ -	—	—	—	—	1	1	—	—	—	—	—	—
12 -	—	—	—	—	—	—	—	—	—	—	1	1
12½ -	—	—	—	—	—	—	—	—	—	—	—	—
13	1	—	1	—	—	—	—	—	—	—	—	—
Total	902	855	1,757	471	460	931	3,866	3,742	7,611	899	838	1,738