

BIRTH WEIGHTS OF SOUTH AFRICAN BABIES

III. SEASONAL VARIATION IN BIRTH WEIGHT

BY

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Reports on seasonal variation in birth weight are conflicting and inconclusive. No variation was observed by Brenton (1922) or by Bakwin and Bakwin (1929); babies born in the summer were said by Murray (1924), Abels (1926), Toverud (1933), Bivings (1934), Li (1936), and Donald (1939) to be heavier than those born in the winter; Adersen (1899) reported that babies born in the winter were heavier.

We have previously examined the birth weights of South African babies in relation to racial group, sex, and birth rank. (Salber and Bradshaw, 1951 a, b). The data were obtained from records of 3,165 European, 1,058 Coloured†, 2,190 Bantu, and 1,403 Indian births in Durban, Capetown, and Pietermaritzburg. Using the same data, we here explore the possibility of seasonal variation in birth weight.

It has been shown that distribution of births by birth rank is very different in the four racial groups; for example over 20 per cent. of the Indian babies are of birth rank "6 and over" as compared with less than 1 per cent. of the European babies (Salber and Bradshaw, 1951b). Since it is also known that mean birth weight is related to birth order (Pearson, 1914; Martin, 1931), we have separated our data, as far as numbers permit, according to birth rank, and for each of the four racial groups the mean weight of babies born during the South African summer (October to March) is compared with the mean birth weight of winter-born babies of the same sex and birth rank. The number of European babies of birth rank "6 and over" (eighteen males and twelve females) was too small to permit subdivision by season of birth; they have therefore been omitted from the Table.

RESULTS

In none of the four racial groups is there any appreciable difference between the mean weights of summer-born and winter-born babies of birth

ranks 1 or 2-5. In the group "6 and over", however, some seasonal variation is apparent. The variation is most obvious in the case of Indian babies, summer-born infants of both sexes being heavier than those born in the winter (males 0.52 ± 0.24 lb. heavier). and females 0.77 ± 0.22 lb. heavier). There also appears to be some seasonal variation in the birth weight of Coloured and Bantu females, but the males of both these racial groups show no appreciable variation. Like Indian babies, female Coloured babies are heavier in the summer months (by 0.85 ± 0.32 lb.); female Bantu babies on the other hand are apparently heavier when born in the winter months (by 0.44 ± 0.20 lb.).

DISCUSSION

Indian babies show more seasonal variation in birth weights than the other racial groups. Those born in summer are heavier than those born in winter. At the lower parities this difference is insignificant, but at birth rank "6 and over" the seasonal variation is unequivocal, and for both sexes is approximately half a pound.

It is possible that seasonal variation in birth weight, where it exists, may be related to gross maternal malnutrition. If this is so, one might expect to find a more pronounced variation at the higher birth ranks, where the strain of repeated pregnancies and lactations further undermines the nutritional state of the mother. In Durban poor Indians are certainly the worst nourished of the four racial groups (Kark, 1951), and the majority of the Indian babies in this series were born to mothers falling into this category.

If this is indeed the explanation of our findings, it is difficult to see why female infants should be subject to greater seasonal variation than males, or why female Bantu babies should be heavier at birth in the winter months.

SUMMARY

The relation between season of birth and birth weight in South African babies is explored by racial group, sex, and birth rank. The data used were

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† Coloured people are persons of mixed race, at least one of whose progenitors is a European.

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TABLE
MEAN WEIGHT OF BIRTHS RELATED TO BIRTH RANK AND SEASON OF BIRTH

Race	Sex		Male			Female		
	Birth Rank ..		1	2-5	6 and over	1	2-5	6 and over
European	Season of Birth	Summer (a)	7.40 (424)	7.80 (410)	—	7.23 (357)	7.54 (403)	—
		Winter (b)	7.51 (394)	7.79 (371)	—	7.20 (376)	7.64 (400)	—
	Difference (a - b)		- 0.11 ± 0.08	+ 0.01 ± 0.09	—	+ 0.03 ± 0.08	- 0.10 ± 0.08	—
Coloured	Season of Birth	Summer (a)	6.79 (87)	7.05 (115)	7.59 (40)	6.53 (81)	7.03 (119)	7.43 (39)
		Winter (b)	6.61 (117)	7.06 (141)	7.70 (38)	6.58 (109)	6.94 (140)	6.58 (32)
	Difference (a - b)		+ 0.18 ± 0.16	- 0.01 ± 0.15	- 0.11 ± 0.36	- 0.05 ± 0.15	+ 0.09 ± 0.14	+ 0.85 ± 0.32
Bantu	Season of Birth	Summer (a)	6.94 (174)	7.31 (335)	7.27 (43)	6.60 (189)	6.94 (290)	6.93 (52)
		Winter (b)	6.79 (176)	7.25 (349)	7.40 (58)	6.67 (169)	6.99 (300)	7.37 (61)
	Difference (a - b)		+ 0.15 ± 0.11	+ 0.06 ± 0.09	- 0.13 ± 0.29	- 0.07 ± 0.10	- 0.05 ± 0.09	- 0.44 ± 0.20
Indian	Season of Birth	Summer (a)	6.29 (107)	6.72 (179)	7.13 (64)	6.19 (108)	6.61 (149)	7.08 (80)
		Winter (b)	6.17 (88)	6.65 (201)	6.61 (76)	6.13 (102)	6.38 (158)	6.31 (91)
	Difference (a - b)		+ 0.12 ± 0.14	+ 0.07 ± 0.12	+ 0.52 ± 0.24	+ 0.06 ± 0.14	+ 0.23 ± 0.12	+ 0.77 ± 0.22

obtained from records of 3,165 European, 1,058 Coloured, 2,190 Bantu, and 1,403 Indian births in Durban, Capetown, and Pietermaritzburg. The following conclusions were reached:

(1) At birth ranks 1 and 2-5, there is no appreciable difference between the mean weights of summer-born and winter-born babies in any of the four racial groups.

(2) At birth rank "6 and over", both male and female Indian babies born in the summer months are heavier than those born in the winter months, males by 0.52 ± 0.24 lb. and females by 0.77 ± 0.22 lb., respectively.

(3) Results for Coloured and Bantu babies of high birth rank are conflicting. The males of both these racial groups show no appreciable seasonal variation, but female Coloured babies are 0.85 ± 0.32 lb. heavier in the summer months, and female Bantu babies are 0.44 ± 0.20 lb. heavier in the winter months.

(4) The number of European babies of high birth rank is too small to permit a seasonal comparison.

No satisfactory explanation is offered for these anomalous findings.

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REFERENCES

- Abels, H. (1926). *Arch. Kinderheilk.*, 78, 187.
 Adersen, H. (1899). *Nord. med. Ark.*, N.F. 10, 24.
 Bakwin, H., and Bakwin, R. M. (1929). *Amer. J. Obstet. Gynec.*, 18, 863.
 Bivings, L. (1934). *Ibid.*, 27, 725.
 Brenton, H. (1922). *Amer. J. Phys. Anthropol.*, 5, 237.
 Donald, H. P. (1939). *Proc. roy. Soc. Edin.*, 59, 91.
 Kark, S. L. (1951). Personal communication.
 Li, T. A. (1936). *J. Pediat.*, 8, 459.
 Martin, W. J. (1931). *Ann. Eugen. Camb.*, 4, 327.
 Murray, M. B. (1924). *Spec. Rep. Ser. med. Res. Coun. Lond.*, No. 81.
 Pearson, K. (1914). "On the Handicapping of the Firstborn". *Eugenics Lecture Series X*, p. 23. Dulau, London.
 Salber, E. J., and Bradshaw, E. S. (1951a). *Brit. J. Soc. Med.*, 5, 113.
 ——— (1951b). *Ibid.*, 5, 247.
 Toverud, K. U. (1933). *Amer. J. Dis. Child.*, 46, 954.



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