

# Measuring and Managing protein energy malnutrition in rural communities – postscript

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In July 1983 we were able to analyse the relation between the different factors and acute malnutrition in more detail. Table III.4 and the p values do not indicate which factors contribute the most in the development of acute PEM. There was more acute malnutrition in the resettlement villages. Is that due to the fact that the children in the resettlements are not so well immunised or attend less frequently the child welfare clinic?

This can be assessed with the multivariate analysis according to the linear logistic model and the stepwise regression method. The five most important factors thus found are:—

1. Age of the child
2. Immunisation status of the child
3. Possession of animals
4. Frequency of attending under five clinic
5. School education of the mother or caretaker

The age of 24 up to 35 months is the most critical period for both boys and girls to develop acute malnutrition. Less acute malnutrition was found if the child was better immunised, the mother had a higher school education or when the family

possessed more animals (especially cows). If the attendance to the under five clinic was once a month or more often there was less acute malnutrition than expected for that age group. It is not sure why the possession of animals is such an important factor. When analysing the different types of animals, the cow was the most important one. So it may represent wealth as well as animal proteins (meat and milk).

**Table III.4:** Significant correlations between some factors and acute malnutrition.

FACTORS	♂	♀
– number of persons p/h.h.		0,025 < p < 0,25
– number of children 6 p/h.h	0,025 < p < 0,02	
– age of the child	0,001 < p < 0,005	0,025 < p < 0,05
– attending school by caretakers yes/no		0,01 < p < 0,025
– attending school by mother yes/no		0,005 < p < 0,01
– possession of land yes/no		0,001 < p < 0,005
– possession of cattle yes/no		0,001 < p < 0,005
– building material of house		0,025 < p < 0,05
– frequency of attending UFC		0,025 < p < 0,05
– BCG scar present yes/no		0,025 < p < 0,05
– foodscore **	0,01 < p < 0,025	
– source of water (borehole/well/tap)		0,001 < p < 0,005
– kind of village (trust/traditional/resettlement)		p < 0,001

\*\* Foodscore reflects composition of diet

## REFERENCES:

1. Anderson MA: Comparison of anthropometric measures of nutritional status in pre-school children in five developing countries. *Am J Clin Nutr* 1979; **32**(11):2339-45.
2. Béhar M, Viteri FE. Disturbance of Nutrition. In: *Diseases of Children in the Subtropics and Tropics*. Ed. Jelliffe DB, Stanfield JP. 3rd Ed. Edinburgh: Edward Arnold, 1978.
3. Béhar M: Protein-calorie deficits in developing countries. *Ann NY Acad Sci* 1977; **300**:176-87.
4. Bhattacharyya AK: Common deficiency diseases – II. *J Indian Med Assoc* 1978; **70**(4):83-6.
5. Bekkers M, van der Knaap, M. A Nutritional Survey in Bophuthatswana, Febr-Jun. Rotterdam: Institute of Epidemiology, Erasmus University, 1980.
6. Brydone AM: Determination of the neonatal and infant mortality rate in Mufakose, Salisbury, Rhodesia. *Cent Afr J Med* 1975; **21**(6):124-8.
7. Campion H. *Bophuthatswana, where the Tsewnas meet*. Sandton: Valiant Publishers, 1977.
8. Chintu C, Sukhani S: Perinatal and neonatal mortality and morbidity in Lusaka, 1976. *Med J Zambia* 1978; **12**(5):110-5.
9. Standard KL. Infections and Malnutrition in Child Mortality. In: *Epidemiology and Community Health in Warm Climate Countries*. Ed Cruickshank R, Standard KL, Russell HBL. London: Churchill Livingstone, 1976:38-49.
10. Cunningham N. The under fives clinic – what difference does it make? *J Trop Pediatr* 1978; **24**(6):239-334.
11. Cunningham N. Report on the use of weight charts. Washington:

- Report USAFD Conference, 1971.
12. De Jonge N, Runke L, van Strik R. *Medische Statistiek 1979* – Eur – Rotterdam. Rotterdam: Erasmus University, 1979.
13. Bowie MD, Moodie AD, Mann MD, Hansen JD: A prospective 15-year follow-up study of kwashiorkor patients. Part I. Physical growth and development. *S Afr Med J* 1980; **58**(17):671-6
14. Evans DE, Moodie AD, Hansen JD: Kwashiorkor and intellectual development. *S Afr Med J* 1971; **45**:1413-26.
15. Evans D, Hansen JD, Moodie AD, van der Spuy HI: Intellectual development and nutrition. *J Pediatr* 1980; **97**(3):358-63.
16. Fincham RJ *The nutritional status of pre-school children in the Amatola Basin*. Grahamstown: Rhodes University; Working Papers, Institute of Social and Economic Research, 1982.
17. Galbraith NS, Cockburn WC: Deaths from whooping cough in England and Wales in 1960 and 1961. *Monthly Bull Minist Health (London)* 1963; **22**:54-9.
18. Gibson IH, Carmichael TR, Küstner HG: Measles notifications – the first year. *S Afr Med J* 1982; **61**(3):84-8.
19. Gordon JE, Wyon JB, Ascoti W: The second year death rate in less developed countries. *Am J Med Sci* 1967; **254**:357-80.
20. Graw M. *Principles and Procedures of Statistics*. London: Steel & Tonnie.
21. Gwatkin DR, Wilcox JR, Wray HD: *Can health and nutrition intervention make a difference?* Washington: Overseas Development Council, Monograph No 13 – Febr 1980.
22. Jelliffe DB: *The assessment of the nutritional status of the community*. Geneva: WHO: WHO Monograph Series No 53, 1966.



23. Jelliffe DB. *Child Health in the Tropics; a practical handbook for medical and paramedical personnel*. 4th Ed. 1974: London, Arnold.

24. Jelliffe DB. General background. In: *Diseases of children in the subtropics and tropics*. Ed Jelliffe DB, Stanfield JP. 3rd Ed. Edinburgh: Edward Arnold, 1978:1-22.

25. Karrar ZA, Omer MI: Morbidity patterns among under-five children in a rural community in Sudan. *Trop Geogr Med* 1981; **33**(1):758.

26. Keller W, Donoso G, De Maeyer EM: Anthropometry in nutritional surveillance: a review based on results of the WHO collaborative study on nutritional anthropometry. *Nutr Abst Rev* 1976; **46**:591-9.

27. Lea K, Booyens J. *Mortality rates and causes in black and white infants*. Proceedings of 9th Biennial Congress of SA Nutritional Society, 1982.

28. King MH. *Nutrition for Developing Countries*. London: Oxford University Press, 1972: Chapter 2.

29. *Kingdom of Lesotho*. National nutrition survey undertaken by the Government of Lesotho. Revised Final Report. California: Nutrition Planning Information Service, University of California, 1977:67-83.

30. Kloth TI, Burr WA, Davis JP *et al*: Sahel nutrition survey, 1974. *J Epidemiol* 1976; **103**(4):383-90.

31. Kotze JP, van der Merwe GJ, Mostert EWP, *et al*. Anthropometric survey of different cultural groups in South Africa. *J Dietetics and Home Economics* 1982; **10**:77-81.

32. Kusun JA, van Steenberg WM. *Borstvoeding*. Amsterdam: Koninklijk Instituut voor de Tropen, 1979:21-9.

33. Laugesen BM. Presentation at a workshop in the under-five clinic. Hyderabad, 1972.

34. Leitch GB: Diet and TB. *Proc Nutr Soc* 1945; **3**:156.

35. McKenzie HI, Lovell HG, Standard KL *et al*: Child mortality in Jamaica. *Milbank Mem Fund Quart* 1967; **45**:303-20.

36. Margo G, Baroni U, Brindley M, *et al*: Protein energy malnutrition in Coloured children in Western Township, Johannesburg. Part I. The ecological background. *S Afr Med J* 1976; **50**(31):1205-9.

37. Margo G, Baroni Y, Brindley M, *et al*: Protein energy malnutrition in Coloured children in Western Township, Johannesburg. Part II. Prevalence and severity. *S Afr Med J* 1976; **50**(32):1241-5.

38. Mata L: *Not just the lack of food*. Geneva: WHO, 1977 (May); 27-9.

39. Moosa A: Child health in the RSA. *The Black Sash Magazine*, 1982; **24**(4):20-2.

40. Moosa A, Coovadia HM: The problem of malnutrition in South Africa (letter). *S Afr Med J* 1981; **59**(25):888-9.

41. Morley D. *Paediatric Priorities in the Developing World*. London: Butterworths, 1977:316-9.

42. Moroney MJ. *Fact from Figures*. 2nd Ed. London: Penguin, 1983:223.

43. Nelhaus G: Head circumference from birth to eighteen years. Practical composite international and interracial graphs. *Pediatrics* 1968; **41**:106-14.

44. Newman MT. *Nutritional Adaptation in Man — Physiological Anthropology*. London: Oxford University Press, 1975: 210-39.

45. Potter OF: Epidemic nephritis and streptococcal infection in Trinidad. *Arch Intern Med* 1974; **126**:140.

46. Rao DH, Naidu AN: Nutritional supplementation — whom does it benefit most? *Am J Clin Nutr* 1977; **30**(10):1612-6.

47. Richardson BD: Studies of South African Bantu and Caucasian pre-school children. Mortality rates in urban and rural areas. *Trans R Soc Trop Med Hyg* 1970; **64**:921-6.

48. Richardson BD: Studies on nutritional status and health of Transvaal Bantu and white pre-school children. *S Afr Med J* 1973; **47**:688-98.

49. Richardson BD. Controversies surrounding the anthropometric evaluation of malnourished children. Personal communication, 1980.

50. Scrimshaw NS. *Protein malnutrition and infections*. 1959, Fed Broe 181207.

51. Scrimshaw NS: The death rate of 1-year-old children in underdeveloped countries. *Arch Environ Health* (Chicago) 1968; **17**:691-2. Cit No 3266034.

52. Seokane M, Latham MC: Nutritional anthropometry in the identification of malnutrition in childhood. *Trop Paediatr* 1971; **17**:98-104.

53. Scrimshaw NS *et al*: *The interaction of nutrition and infection*. Geneva: WHO: 1968: Monograph Series No 57.

54. Scheifele DW, Forbes CE: Prolonged giant cell excretion in severe African measles. *Pediatrics* 1972; **50**:867-73.

55. Shuenyane E, Stott RAP: A socio-economic, health and cultural survey. *S Afr Med J* 1977; **51**:495-500.

56. Southern African Development Research Unit and South African Medical Students Trust: The economics of health care in Southern Africa: a review article, Social dynamics: *Journal of the Social Sciences*, University of Cape Town 1978; **4**(2):110-58.

57. Sykes PA: Errors arising through using the Harvard tables and percentage levels of median weight-for-age in assessing nutritional status. *Arch Dis Child* 1977; **52**(5):391-4.

58. Thomas T. The effectiveness of alternative methods of managing malnutrition. In: *Hunger, work and health*. Ed. Wilson F, Westcott G.

59. Truscott A: Weaning Foods. Newsletter 1980; **3**:8-9. Primary Health Care Education Centre, University of the Witwatersrand, Johannesburg.

60. Van As B, Kasbergen J. Water research project of the Ditsobotla District, Bophuthatswana. Rotterdam: Erasmus University, 1981.

61. Waldman E: Early Bapedi Growth in Sekhukuniland, Transvaal, South Africa. *Ecology of Food and Nutrition* 1976; **5**:133-41.

62. Walker ARP, Walker BF: What is the health hazard to children who are underweight and underweight-for-age. *S Afr J Sci*, 1976; 72.

63. Waterlow JC: Classification and definition of protein-calorie malnutrition. *Br Med J* 1972; **3**:566-9.

64. Waterlow JC. *Nutrition in Preventive Medicine*. Geneva: WHO: Monograph Series No 62, 1976:530-55.

65. Westcott GM, Stott RA: The extent and causes of malnutrition in children in the Tsolo district of Transkei. *S Afr Med J* 1977; **52**(24):963-8.

66. Wilson ED. Some aspects of early diagnosis and detection in surveillance and early diagnosis in General Practice. 1966.

67. 1980 World Children's data sheet of the population. Ref Bureau Inc in collaboration with UNICEF.

68. Wyndham CH, Irwig LM: A comparison of the mortality rates of various population groups in the Republic of South Africa. *S Afr Med J* 1979; **55**(29):796-802.

69. Jelliffe DB. *Infant nutrition in the subtropics and tropics*. Geneva: WHO: Monograph Series No 29, 1955.

70. Zeitlin H: Breastfeeding and nutritional status in depressed urban areas of Greater Manila, Philippines. *Ecology of Food and Nutrition*, 1979; **7**:103-113.

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