Health status of hostel dwellers

Part III. Nutritional status of children 0 - 5 years

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Summary

The standards laid down by the National Center for Health Statistics in the USA were used to assess the nutritional status of children (0 - 5 years) in the Zones, an urban migrant council-built hostel complex in Langa, outside Cape Town. Of the children, 5,7% were below the 3rd percentile of weight-for-age (acute undernutrition). There was a significant difference between age categories and an increase in age was associated with an increase in proportion of children below the 3rd percentile. Acute undernutrition was significantly higher for children born outside Cape Town. There was a significant difference between age groups and percentage of children below the 3rd percentile of height-for-age (chronic undernutrition). Chronic nutritional levels were also significantly higher for children not born in Cape Town. Yet there were no significant differences between proportions of children under the 3rd percentile of height-for-weight (current nutritional status) for age category or place of birth. These results suggested that while in town children were adequately nourished, this was not the case at their home-base. Chronic undernutrition findings indicated an incremental negative effect of the poverty of the home-base on the long-term health status of hostel migrant children.

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Assessment of nutritional status provides an inexpensive, quick and objective measure of the health status of children.[1] The nutritional status of children (0 - 5 years) in the Zones, an urban migrant hostel complex in Langa outside Cape Town, was assessed as part of a larger health status survey. The larger survey investigated the health status of the residents of the urban migrant council-built hostels of Langa, Nyanga and Guguletu.[2-6] In line with the larger survey, this study focused on the effects of migrant labour on the health status of hostel children and the influence of two related aspects of migrant labour as it pertained to the Cape Town hostel dwellers, viz. the cumulative effects on nutritional status of circular migration as a process over time and place, and the results of differential access to cash-wage income.

At a broad level migrant labour is a well-known phenomenon in southern Africa. The regional and local variations are less well known. A preparatory social investigation (by survey and in-depth interview and group discussion)[7] was carried out before the health status survey to identify migrant labour as it affects Cape Town hostel dwellers. The regional and local peculiarities of the migrant labour system as it affects these Cape Town hostel dwellers, their poverty and the material and physical impoverishment of the hostel environment have been described.[2] This description provided the background to this article. It is nevertheless useful to reiterate briefly a number of central issues.

The migration pattern of Cape Town hostel dwellers may be described as circular.[8] The hostel dwellers continue to oscillate between the home-base, the eastern Cape, and the workplace, Cape Town, despite the lifting of the Pass Laws in 1986. A serious lack of suitable accommodation at the workplace continues to curtail permanent urban settlement. At the same time, investment in land and livestock at the home-base offers security of shelter both for the migrant's dependants, and for the worker, for periods between work contracts, during times of unemployment, and during retirement from working life.[9-11] The variation in the circular migratory pattern of the Cape Town hostel dweller on the basis of age and gender and over time, both in the long- and short-term, has been described.[2,3]

The negative effects of circular migration on the health status of the hostel population as a whole is suggested by the

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infant mortality rates.[3] In Cape Town, the infant mortality rate for the hostel dwellers is high in comparison with the township residents. This suggests that, in comparison, overall health status remains poor for the hostel dwellers despite considerable contact with the city. The average length of contact with the city for the male bedholder[2] contract workers is 26 years; for their wives it is 12 years.[12] For the majority of township residents urban settlement is more permanent. Unlike hostel dwellers, the majority of township residents earned rights to permanent settlement and access to relatively more suitable accommodation before 1986.

The mobility of the hostel population and their circular migratory patterns proved to be the major methodological challenge for the survey as whole. Mobility is generally acknowledged as a neglected and difficult area in epidemiology.[13] Data for the health status survey were collected in Cape Town, a single geographical site of the migrating lifestyle. The challenge in a situation of circular migration is to infer process over time and place from a single 'frame' of the 'moving picture'. Interpretation for the health status project and this article was aided by the preparatory social investigation[7] and selection of certain working concepts. The working concepts were selected to address process over time, and in a situation of circular migration this also means over place (see for example, the notion of the migrant household[14] and, related to this, the notion of the bedhold).[2]

Assessment of nutritional status addresses process. For this article the conventional combinations, weight-for-age, weight-for-height and height-for-age[15] based on the height and weight measurements that are used to assess nutritional status, refer to the following: weight-for-age and weight-for-height measure present state of nutrition;[15] they are indicators of nutritional status of the children in Cape Town at the time of the survey. On the basis of earlier findings,[5] it could be reasonably assumed that while in town these children eat more frequently and have a more varied diet than has been identified for a home-base migrant population.[11] Primary reliance was placed on weight-for-height as a measure of present nutritional status,[15] i.e. for this study the effects of current dietary intake at the time of the survey. A deficit in weight-for-age indicated undernutrition.[15] Undernutrition was determined as a value falling below the 3rd percentile.[16] However, weight-for-age does not distinguish between acute and chronic undernutrition.[15] Height-for-age is an indicator of past nutritional status,[15] with a value falling below the 3rd percentile being chronic undernutrition.[16] Height-for-age looked to the effects over time of circular migration between the more impoverished eastern Cape and Cape Town, where for the duration of the visit access to cash is more direct. Age was an additional indicator of change over time. Changes on the basis of age for all combinations also pointed to the cumulative effects of circular migration.

Place of birth, on the basis of the preparatory work carried out for health status survey,[7] is used in this article as an indicator of relative access to cash-wage income and, related to this, access to the urban workplace. Children born in Cape Town tended to be from the materially more advantaged households and had more direct access to the city.

It must be pointed out that a measure of duration of stay in town is difficult to determine in a situation of circular migration. The mobility of the migrant dependants in particular is irregular. Children may be born in Cape Town but they return to the eastern Cape within the first year of life. They continue to oscillate between the home-base and the city with their mothers until they reach school-going age. For their schooling they tend to remain on a more permanent basis at the home-base. In a given year mother and children start returning to the city after the male workers, i.e. towards the end of February. The survey of the nutritional status of the children was delayed until March on the advice of the Hostel Dwellers Association (HDA). In January and February we were told: 'The women and children are not back yet.'

The Zones, where the child health status study was carried out, is one of four hostel complexes in Langa. A zone is roughly the equivalent of a street and there are 10 zones at present available for hostel accommodation. The Zones was selected for the study because the poverty levels (overcrowding is at 2,7 persons per bed; unemployment is 32%, the highest for the Langa hostels[4]) and tuberculosis notification rates (2 667,9/100 000[4]) suggested that of the hostel children, the health status of the children here was most at risk. The usefulness of the Zones as a reference point for this migrant labour situation has been described.[6]

Subjects and methods

The nutritional assessment of the children of the Zones was carried out at the same time as an investigation of their immunisation status.[6] Permission to carry out both studies was obtained from the Western Cape HDA, a popular organisation representing the hostel dwellers.

The study aimed for a total sample of the children (0-5 years) of the Zones. This is the majority age group among hostel dwellers, $\leqslant 17$ years.[2,7] A physical count of the children by age, by room, and by zone was carried out before the survey. The response rate was 105%. The suggested reasons for this response rate have been described.[6]

Measurements of height and weight were carried out on 850 children, but were not performed when a child was particularly distressed by the procedure. This accounts for some of the missing frequencies (Table I). It will also be noted that there were children > 72 months in the sample. Since these children had recently (within a month before the survey) turned 6 years old, they were not excluded.

The survey was carried out zone by zone, rather than from a central location. Using a central location, which was not uniformly convenient, affected response in the earlier survey.[2] The zones were selected randomly. A conveniently situated 'room' in each zone, or section of the larger zones, was provided by the residents and set up for the interviews and taking of the height and weight measurements. The questionnaire used for the investigation of immunisation status provided the demographic details of the children — date of birth, sex, and place of birth. Dates of birth were taken from the 'Road-to-Health' cards, when available. Where the 'Road-to-Health' cards were not available date of birth could not be validated.

Heights and weights were determined using standard methods. For children aged > 2 years, height was measured with the children standing in the upright position. Crown-heel measurements, using a standard length measurer (loaned to the research team by the Child Health Unit, Red Cross War Memorial Children's Hospital), were taken for infants and toddlers. The use of crown-heel measurements was limited to infants and toddlers (0 - 2 years) because of the severe restrictions on working space inside hostels. Infants and toddlers were weighed and measured indoors and the older children outside.

Children were weighed in their underclothes, using bathroom scales (Salter). The scales were standardised by measuring a known weight on a scale and by calibrating the scales after every 10th child. Checks were carried out by taking duplicate measures regularly.

The research team comprised a nursing sister, a nurse/social anthropologist and 2 fieldworkers. Pre-survey training was carried out over 3 days. It included training in the taking of heights and weights and using the 'Road-to-Health' card to determine children in need of medical attention. Such children were referred to local health care centres.

Weight-for-age, height-for-age and weight-for-height were assessed in relation to standards set by the National Center for Health Statistics in the USA.[16] For the analysis of the data the χ^2 test with Yates' correction for 2×2 comparisons was used to compare proportions of children under the 3rd percentile for age and sex categories and place of birth. A significance level cut-off point of $P = 0,05$ was used. For the presentation of the data the recommended age groups (see Waterlow *et al.*,[15] column B) were used.

Results

The sample on which the calculations are based comprised 843 children (49,9% boys). For this group of children 5,7% were below the 3rd percentile of weight-for-age (6,9% of boys and 4,5% of girls); 25,4% were below the 3rd percentile of height-for-age (27,0% of boys and 23,9% of girls); 1,4% were below the 3rd percentile of weight-for-height (1,9% of boys and 1,0% of girls). There was no significant difference in proportions under the 3rd percentile of weight-for-age, height-for-age and weight-for-height between boys and girls (Table I).

There was a significant difference between age categories in the proportions of children (Table II) falling below the 3rd percentile of weight-for-age ($\chi^2 = 11,7$; df = 5; $P = 0,039$; range: 0,0% for 0 - 6 month olds - 10,0% for those > 72 months old). An increase in age was associated with an increase in proportion of children below the 3rd percentile. There was a significant association between age group and percentage of children below the 3rd percentile of height-for-age ($\chi^2 = 44,88$; df = 5; $P < 0,001$). The proportion of those < 12 months (0 - 6 months = 8,4%; 6 - 12 months = 10,7%) was markedly lower (Table II) than the group > 12 months (range 29,0 - 35,1%). The proportion of children falling below the 3rd percentile of weight-for-height (1,4%; range 0,0 - 3,6%) was not significantly different between age categories.

Of the 843 children surveyed in the Zones, 62,60% were born in Cape Town.[6] Of the children born outside Cape Town ('born other'), 82,8% were born in Transkei.[6] The proportion of children falling below the 3rd percentile of weight-for-age (Table III) was significantly higher for those born outside Cape Town (8,6%) than for those born in the city (3,8%) ($\chi^2 = 7,79$; df = 1; $P < 0,01$). The proportion of children below the 3rd percentile of height-for-age (Table III) was significantly higher for those born elsewhere (36,2%) than for those born in Cape Town (19,0%) ($\chi^2 = 29,45$; df = 1; $P < 0,001$). There was no significant difference between the proportions of children born in Cape Town and born elsewhere falling below the 3rd percentile of weight-for-height (Table III).

Discussion

The findings on acute undernutrition (5,7% below the 3rd percentile of weight-for-age) for these children, compare favourably with World Health Organisation indicators for monitoring progress in health status — 'nutritional status of children is adequate in that . . . at least 90% of children have a weight-for-age that corresponds to the standard reference values adopted by WHO'[17] and with recent local studies. In Soweto, although the study focused on older children, 25% of primary schoolchildren were found to be undernourished;[18] in Mamre 9% of crèche children and 10,2% of the school population;[19] in Khayelitsha, 10% of children under 5 years were below the 3rd percentile of weight-for-age irrespective of geographical location within this area.[20]

However, while the children of this study were not acutely undernourished, these findings showed up the long-term effects of poverty and the migrant lifestyle on nutritional status. Undernutrition increased significantly with age, with the effects of chronic undernutrition (height-for-age) being apparent after the age of 12 months. This is the age when weaning from breast-feeding begins. Movement patterns suggested that this was also the age when children who have been born in Cape Town return to the more impoverished home-base in Transkei/eastern Cape. The effects of the impoverished eastern Cape region on children born in Cape Town were borne out by the high post-neonatal infant mortality rate for the hostel dwellers.[3]

For the migrant children resident in the Zones in Cape Town at the time of the survey, 'place of birth' was used in a

TABLE I. NUTRITIONAL STATUS BY SEX

	Boys		Girls		Total	
	No.	%	No.	%	No.	%
Weight-for-age (percentile)						
> 50th	**189**	**44,9**	**233**	**55,2**	**422**	**50,1**
3rd-50th	**203**	**48,2**	**170**	**40,3**	**373**	**44,2**
< 3rd	**29**	**6,9**	**19**	**4,5**	**48**	**5,7**
Total*	**421**	**49,9**	**422**	**50,1**	**843**	**100,0**
Height-for-age (percentile)						
> 50th	**102**	**24,3**	**125**	**29,9**	**227**	**27,1**
3rd-50th	**204**	**48,7**	**193**	**46,2**	**397**	**47,4**
< 3rd	**113**	**27,0**	**100**	**32,9**	**213**	**25,4**
Total†	**419**	**50,1**	**418**	**49,9**	**837**	**100,0**
Weight-for-height (percentile)						
> 50th	**296**	**70,8**	**303**	**72,7**	**599**	**71,7**
3rd-50th	**114**	**27,3**	**110**	**26,4**	**224**	**26,8**
< 3rd	**8**	**1,9**	**4**	**1,0**	**12**	**1,4**
Total‡	**418**	**50,1**	**417**	**49,9**	**835**	**100,0**

* 7 frequencies missing — 6 with no age; 1 with no weight.
† 13 frequencies missing — 6 with no age; 7 with no height.
‡ 15 frequencies missing — 6 with no age; 1 with no weight, 7 with no height, 1 where data did not allow for percentile calculation.

TABLE II. NUTRITIONAL STATUS BY AGE

	<3rd percentile		3rd - 50th percentile		>50th percentile		Total	
	No.	%	No.	%	No.	%	No.	%
Weight-for-age (mo.)								
0 - 5,99	0	0,0	35	29,4	84	70,6	119	14,1
6 - 11,99	4	3,6	44	39,3	64	57,1	112	13,3
12 - 23,99	11	6,4	82	48,0	78	45,6	171	20,3
24 - 47,99	15	6,6	103	45,4	109	48,0	227	26,9
48 - 71,99	16	8,2	99	51,0	79	40,7	194	23,0
>72	2	10,0	10	50,0	8	40,0	20	2,4
Total*	48	5,7	373	44,2	422	50,1	843	100,0
Height-for-age (mo.)								
0 - 5,99	10	8,4	52	43,7	57	47,9	119	14,2
6 - 11,99	12	10,7	43	38,4	57	50,9	112	13,4
12 - 23,99	60	35,1	76	44,4	35	20,5	171	20,4
24 - 47,99	64	29,0	109	49,3	48	21,7	221	26,4
48 - 71,99	60	30,9	104	53,6	30	15,5	194	23,2
>72	7	35,0	13	65,0	0	0,0	20	2,4
Total†	213	25,4	397	47,4	227	27,1	837	100,0
Weight-for-height (age in mo.)								
0 - 5,99	3	2,7	39	34,5	71	62,8	113	13,6
6 - 11,99	4	3,6	48	42,9	60	53,6	112	13,5
12 - 23,99	1	0,6	52	30,8	116	68,6	169	20,4
24 - 47,99	3	1,4	43	19,5	175	79,2	221	26,7
48 - 71,99	1	0,5	37	19,1	156	80,4	194	32,4
>72	0	0,0	3	15,0	17	85,0	20	2,4
Total‡	12	1,4	222	26,8	595	71,8	829	100,0

*† Missing frequencies as listed for Table I.
‡ Missing frequencies as listed for Table 1 + 6 where data did not allow for percentile calculation.

TABLE III. NUTRITIONAL STATUS BY PLACE OF BIRTH

	Place of birth					
	Cape Town		Other		Total	
	No.	%	No.	%	No.	%
Weight-for-age						
>50th percentile	287	54,5	134	42,8	421	50,1
3rd - 50th percentile	220	41,7	152	48,6	372	44,3
<3rd percentile	20	3,8	27	8,6	47	5,6
Total*	527	62,7	313	37,3	840	100,0
Height-for-age						
>50th percentile	162	30,9	65	21,0	227	27,2
3rd - 50th percentile	263	50,1	132	42,7	395	47,4
<3rd percentile	100	19,0	112	36,2	212	25,4
Total*	525	62,9	309	37,1	834	100,0
Weight-for-height						
>50th percentile	354	67,8	244	78,7	598	71,9
3rd - 50th percentile	159	30,5	63	20,3	222	26,7
<3rd percentile	9	1,7	3	1,0	12	1,4
Total*	522	67,7	310	37,3	832	100,0

* Missing frequencies as listed for Table I + 3 with birthplace unknown.

relative sense. Based on earlier findings, relative to children born elsewhere, those born in Cape Town tended to be from the materially more advantaged households with a more direct access to town and cash-wage income. Findings on place of birth suggested that while undernutrition (weight-for-age) increased for all children by age, undernutrition was even higher for children not born in Cape Town. The picture was similar for chronic undernutrition (height-for-age). Chronic undernutrition increased with age for all children. For children not born in Cape Town, chronic undernutrition was significantly higher.

Current nutritional status (weight-for-height) was similar for children born in Cape Town and those born elsewhere. Overall, few children of this sample fell below the 3rd percentile of weight-for-height. Since the social situation of this study was one of circular migration, findings on the current nutritional status (weight-for-height) could not be attributed to the positive effects of urbanisation as a linear process. Weight-for-height findings seen in relation to height-for-age findings suggested that weight-for-height findings were more a function of the fact that the children were stunted but put on weight when in town.

Nutritional status findings suggested that for these migrant children, direct access to the cash-wage income of working parents during a visit to town where shopping is convenient and a variety of foodstuffs are more readily available, has a temporary positive effect on nutritional status. However, visits to town were not sufficient to offset the negative cumulative effect of the migrant lifestyle. Deficits in weight-for-age increased with age, as did deficits in height-for-age.

This study, and the hostel project as a whole, attempted to address the finer geographical stratification in the collection of health care information. The findings indicated that, in addition to geographical stratification, mobility and movement patterns — in other words social process — provided a useful dimension to the understanding and interpretation of the interrelationship between health status and social conditions.

It is reasonable to assume that the nutritional status of other Cape Town hostel children is similar to the children of the Zones. However, the nutritional status of hostel migrant children is probably much better than that of the children of the home-base who do not have access to town and cash-wage incomes.

The incremental negative effects of circular migration and differential access to cash-wage incomes on nutritional status are cause for concern. Chronic undernutrition has severe consequences for the intellectual and physical development of these children and the problems are not easily accessible to medical intervention. Health education for these mothers is inappropriate. The findings on weight-for-age and current nutritional status by place of birth show that with sufficient cash income, despite the poverty of the hostel environment, children could be adequately nourished. The chronic undernutrition is a social problem and requires a social solution.

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REFERENCES

1. World Health Organisation. Nutrition: global surveillance through anthropometric measurement. *Wkly Epidemiol Rec* 1987; **62**: 37-38.
2. Ramphele MA, Heap M. Health status of hostel dwellers: Part I. Introduction, methodology and response rates. *S Afr Med J* 1991; **79:** 697-701 (this issue).
3. Ramphele MA, Heap M. Health status of hostel dwellers: Part II. Infant mortality and prevalence of diabetes, hypertension and syphilis among adults. *S Afr Med J* 1991; **79:** 702-705 (this issue).
4. Ramphele MA, Heap M. Health status of hostel dwellers: Part V. Tuberculosis notifications. *S Afr Med J* 1991; **79:** 714-716 (this issue).
5. Ramphele MA, Heap M. Health status of hostel dwellers: Part VI. Tobacco smoking, alcohol consumption and diet. *S Afr Med J* 1991; **79:** 717-720 (this issue).
6. Ramphele MA, Heap M, Trollip DK. Health status of hostel dwellers: Part IV. Immunisation of children. *S Afr Med J* 1991; **79:** 710-713 (this issue).
7. Segar J. Living in anonymity — life in the hostels of Cape Town. Paper presented at the Annual Conference of the Association of Anthropologists of Southern Africa, Rhodes University, Grahamstown, 7 - 10 September 1988.
8. Mabin A. Limits of urban transition in understanding South African urbanisation. Paper presented to a seminar at Department of Community Health, University of the Witwatersrand, 24 November 1989.
9. Spiegel AD. Migrant labour remittances, the developmental cycle and rural differentiation in Lesotho community. Dissertation for the degree M.A., University of Cape Town, 1979.
10. Murray CG. *Families Divided*. Cambridge: Cambridge University Press, 1981.
11. Heap M. Health and disease in south-eastern Lesotho: a social anthropological perspective of two villages. Centre for African Studies, University of Cape Town Communications, No. 16, 1989.
12. Ramphele M. The dynamics of gender politics in the hostels of Cape Town: another legacy of the South African migrant labour system. *J S Afr Studies* 1989; **75**: 393-414.
13. Prothero RM. Disease and mobility: a neglected area in epidemiology. *Int J Epidemiol* 1977; **6**: 259-267.
14. Murray CG. Keeping house in Lesotho: a study of the impact of oscillating migration. Dissertation submitted for the degree Ph.D., Cambridge University, 1976: 54.
15. Waterlow JC, Buzina R, Keller W, Lane JM, Nichaman MZ, Tanner JM. The presentation and use of height and weight data for comparing the nutritional status of groups of children under the age of 10 years. *Bull WHO* 1977; **55**: 489-498.
16. World Health Organisation. *Developing Indicators for Monitoring the Progress Towards Health for All by the Year 2000* (Health for All Series No. 8). Geneva: WHO, 1981.
17. *World Health Statistics Annual*. Geneva: WHO, 1987: viii.
18. Wagstaff LA, De Vries G, Mkhabise C. Whither school health services for lower primary schoolchildren in Soweto? *S Afr Med J* 1988; **73**: 117-119.
19. Jacobs M, Joubert G, Hoffman M. Anthropometric assessment of children in Mamre. *S Afr Med J* 1989; **74**: 341-343.
20. Yach D, Coetzee N, Hugo-Hamman CT, Fisher SA, Kibel MA. Identifying children at risk in an urban environment. *S Afr J Epidemiol Infect Dis* 1990; **5**: 6-8.