

SOUTH AFRICA

Last Updated: 2006-10-19

Level	Date	Location and sample descriptor	Sex	Age (years)	Sample size	Prevalence of xerophthalmia (%)							Serum / plasma retinol concentration (µmol/l)			Reference	Notes			
						Current XN	Previous XN	X1B	X2	X3A	X3B	XS	Prevalence (%)				Mean	SD	General	Line
													<0.35	<0.70	< 1.05					
LR	2005 P	Valley of a Thousand Hills: Infants: Total	B	0.50-1.07	194									16.1				5071	*	
		Infants by intervention group: Placebo	B	0.50-1.07	50										1.03					
		Infants by intervention group: Daily iron	B	0.50-1.07	49										1.03					
		Infants by intervention group: Daily multiple micronu	B	0.50-1.07	49										0.92					
		Infants by intervention group: Weekly multiple micro	B	0.50-1.07	46										0.98					
LR	2002 -2003	Valley of a Thousand Hills: Infants in control group	B	0.50-1.07	145									19.0				5518	*	
		Valley of a Thousand Hills: Infants in intervention gr	B	0.50-1.07	144										17.0					
L	1999 P	Ndunakazi: Infants/pre-SAC	B	0.33-2.07	115								0.0	37.3	0.77	0.22	2830	*		
L	1999	Ndunakaz: Pre-SAC	B	2.00-5.99	164								2.0	50.0			4191	*		
		Ndunakaz: Women	F	19.00-51.99	126								0.0	8.0						
L	1998	Joe Slovo settlement: Pre-SAC	B	0.00-5.99	150								2.7	16.7			1701	*	1	
		JB Mafora settlement: Pre-SAC	B	0.00-5.99	154								1.3	20.8					2	
S	1996 -1998	Northwest province: Women by area: Urban	F	15.00-75.99	570													5284	*	
		Northwest province: Women by area: Rural	F	15.00-75.99	440															
		Women by stratum: 1	F	15.00-75.99	300															
		Women by stratum: 2	F	15.00-75.99	147															
		Women by stratum: 3	F	15.00-75.99	176															
		Women by stratum: 4	F	15.00-75.99	292															
		Women by stratum: 5	F	15.00-75.99	106															
		Northwest province: Men by area: Urban	M	15.00-75.99	447															
		Northwest province: Men by area: Rural	M	15.00-75.99	314															
		Men by stratum: 1	M	15.00-75.99	196															
		Men by stratum: 2	M	15.00-75.99	117															
		Men by stratum: 3	M	15.00-75.99	135															
DR	1995	Vulamehlo Magisterial district: SAC	B	8.00-10.99	300								6.0	34.7	0.84	0.37	3422	*		
N	1994	National: Pre-SAC: Total	B	0.50-5.99	11430			0.80	0.70			0.10						48	*	13
		National: Pre-SAC: Total	B	2.00-5.99	NS	11.90														
		Pre-SAC by age	B	0.50-0.99	NS			0.20	0.40			0.30								
		Pre-SAC by age	B	1.00-1.99	NS			0.40	0.60			0.00								

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						Current XN	Previous XN	X1B	X2	X3A	X3B	XS	Prevalence (%)				Mean	SD	General	Line			
													<0.35	<0.70	< 1.05								
N	1994	Pre-SAC by age	B	2.00-2.99	NS	12.80		0.70	0.70									48		16			
		Pre-SAC by age	B	3.00-3.99	NS	11.80		0.70	0.90												17		
		Pre-SAC by age	B	4.00-4.99	NS	12.20		1.50	0.50													18	
		Pre-SAC by age	B	5.00-5.99	NS	10.60		1.30	1.20													19	
		Pre-SAC by area: Urban	B	0.50-5.99	4961	11.20		0.80	0.10														20
		Pre-SAC bu area: Rural	B	0.50-5.99	6469	12.40		0.80	1.10														21
		Pre-SAC by province: Eastern Cape	B	0.50-5.99	1577	16.80		0.50	2.70														22
		Pre-SAC by province: Eastern Transvaal	B	0.50-5.99	1299	7.40		3.40	1.30														23
		Pre-SAC by province: Free State	B	0.50-5.99	1453	22.10		1.80	0.80														24
		Pre-SAC by province: Gauteng	B	0.50-5.99	843	5.50		0.40	0.10														25
		Pre-SAC by province: KwaZulu-Natal	B	0.50-5.99	1306	4.70		0.20	0.00														26
		Pre-SAC by province: North West	B	0.50-5.99	1670	12.70		0.40	0.10														27
		Pre-SAC by province: Northern Cape	B	0.50-5.99	948	12.00		9.00	0.40														28
		Pre-SAC by province: Northern Province	B	0.50-5.99	1488	15.90		0.30	0.10														29
		Pre-SAC by province: Western Cape	B	0.50-5.99	846	13.50		0.50	0.00														30
		<i>National: Pre-SAC: Total</i>	<i>B</i>	<i>0.50-5.99</i>	<i>4283</i>									3.3	33.3		0.84						
		<i>Pre-SAC by age</i>	<i>B</i>	<i>0.50-0.99</i>	<i>204</i>									2.4	24.3		0.87						
		<i>Pre-SAC by age</i>	<i>B</i>	<i>1.00-1.99</i>	<i>620</i>									3.3	29.8		0.88						
		<i>Pre-SAC by age</i>	<i>B</i>	<i>2.00-2.99</i>	<i>766</i>									3.0	34.1		0.84						
		<i>Pre-SAC by age</i>	<i>B</i>	<i>3.00-3.99</i>	<i>917</i>									3.2	37.1		0.82						
		<i>Pre-SAC by age</i>	<i>B</i>	<i>4.00-4.99</i>	<i>914</i>									4.1	34.9		0.82						
		<i>Pre-SAC by age</i>	<i>B</i>	<i>5.00-5.99</i>	<i>776</i>									3.2	31.5		0.84						
		<i>Pre-SAC by area: Urban</i>	<i>B</i>	<i>0.50-5.99</i>	<i>2040</i>									2.0	25.1		0.92						
		<i>Pre-SAC by area: Rural</i>	<i>B</i>	<i>0.50-5.99</i>	<i>2168</i>									4.1	37.9		0.79						
		<i>Pre-SAC by province: Eastern Cape</i>	<i>B</i>	<i>0.50-5.99</i>	<i>473</i>									3.6	31.1		0.84						
		<i>Pre-SAC by province: Eastern Transvaal</i>	<i>B</i>	<i>0.50-5.99</i>	<i>460</i>									5.1	33.0		0.85						
		<i>Pre-SAC by province: Free State</i>	<i>B</i>	<i>0.50-5.99</i>	<i>626</i>									2.5	26.8		0.89						
		<i>Pre-SAC by province: Gauteng</i>	<i>B</i>	<i>0.50-5.99</i>	<i>312</i>									0.8	23.5		0.92						
		<i>Pre-SAC by province: KwaZulu-Natal</i>	<i>B</i>	<i>0.50-5.99</i>	<i>511</i>									2.6	38.0		0.82						
		<i>Pre-SAC by province: North West</i>	<i>B</i>	<i>0.50-5.99</i>	<i>442</i>									3.4	32.0		0.85						
<i>Pre-SAC by province: Northern Cape</i>	<i>B</i>	<i>0.50-5.99</i>	<i>497</i>									1.5	18.5		0.98								
<i>Pre-SAC by province: Northern Province</i>	<i>B</i>	<i>0.50-5.99</i>	<i>559</i>									5.5	43.5		0.75								
<i>Pre-SAC by province: Western Cape</i>	<i>B</i>	<i>0.50-5.99</i>	<i>403</i>									1.9	21.0		0.95								
L	1991	Durban Bester's Farm: Pre-SAC	B	3.00-6.99	169								5.3	44.4		0.73	0.26	219	*	31			
D	1987	Kentani and Willowvale districts: SAC	B	7.00-13.99	867													2073	*	32			

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						Current XN	Previous XN	X1B	X2	X3A	X3B	XS	Prevalence (%)			Mean		SD	General	Line
													<0.35	<0.70	< 1.05					
L	1970 -1971	<i>Katlehong township: Men</i>	<i>M</i>	<i>NS</i>	<i>239</i>								<i>7.4</i>	<i>22.6</i>		<i>1.17</i>	<i>0.59</i>	3033	*	33
		<i>Geluks location: Men</i>	<i>M</i>	<i>NS</i>	<i>204</i>								<i>0.0</i>	<i>1.5</i>		<i>1.88</i>	<i>0.77</i>			34
L	1965	<i>Pretoria: SAC</i>	<i>B</i>	<i>12.00-15.99</i>	<i>248</i>								<i>0.0</i>	<i>2.0</i>				3035a	*	
L	1964	<i>Pretoria: SAC by age</i>	<i>B</i>	<i>7.00-11.99</i>	<i>NS</i>								<i>1.3</i>	<i>10.1</i>				3035b	*	35
		<i>Pretoria: SAC by age</i>	<i>B</i>	<i>12.00-15.99</i>	<i>NS</i>								<i>0.6</i>	<i>15.5</i>			36			
		<i>Pretoria: SAC by age</i>	<i>B</i>	<i>7.00-11.99</i>	<i>NS</i>								<i>2.4</i>	<i>19.4</i>			37			
		<i>Pretoria: SAC by age</i>	<i>B</i>	<i>12.00-15.99</i>	<i>NS</i>								<i>0.0</i>	<i>9.4</i>			38			
L	1963	<i>Pretoria: SAC by age</i>	<i>B</i>	<i>7.00-11.99</i>	<i>NS</i>								<i>0.3</i>	<i>5.9</i>				3035c	*	39
		<i>Pretoria: SAC by age</i>	<i>B</i>	<i>12.00-15.99</i>	<i>NS</i>								<i>0.0</i>	<i>0.8</i>						
L	1962	<i>Pretoria: SAC</i>	<i>B</i>	<i>7.00-11.99</i>	<i>560</i>								<i>0.2</i>	<i>0.2</i>				3035d	*	

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Reference No: 5071

General notes: *Baseline data for facility-based (health posts in community-based health program) intervention trial to assess the efficacy of multiple micronutrient supplementation (daily or weekly). Survey conducted in the Valley of a Thousand Hills, KwaZulu-Natal province, a rural area. Infants excluded if premature, low birth weight, wasted, anemic (hemoglobin less than 80 g/L), or had fever >39 C on the day of the blood draw, so prevalence of low plasma retinol in infant population may be underestimated. Same survey reported in reference No. 5120.*

Reference No: 5518

General notes: *Baseline data for facility-based (community-based health program) intervention trial to assess the effect of fortified maize porridge on micronutrient status. Survey conducted in the Valley of a Thousand Hills, KwaZulu-Natal province, a rural area of low socioeconomic status. Infants excluded if birth weight less than 2500 g or hemoglobin less than 80 g/L. Study completed in 2 consecutive phases: Feb-Aug 2002 and Sep 2002-Mar 2003.*

Reference No: 2830

General notes: *Facility based study (community-based growth monitoring posts (called Isizinda)) in Ndunakazi, a mountainous area, KwaZulu-Natal province. Sample comprised of infants/pre-SAC. Serum retinol concentrations converted from µg/mL to µmol/L.*

Reference No: 4191

General notes: *Facility based study (community-based growth monitoring posts (called Isizinda)) in Ndunakazi, a mountainous area, KwaZulu-Natal province. Sample comprised of pre-SAC and caretakers (mothers and grandmothers). Serum retinol concentrations converted from µg/mL to µmol/L. Same survey reported in references No. 5157 and 5527.*

Reference No: 1701

General notes: *Sample comprised of pre-SAC randomly selected from Joe Slovo and JB Mafora (informal settlement areas) in Mangaung, near Bloemfontein. Baseline data before nutrition intervention programme. Plasma retinol concentrations converted from µg/dL to µmol/L.*

Note 1 PR >1.75 µmol/L: 1.3%

Note 2 PR >1.75 µmol/L: 0.0%

Reference No: 5284

General notes: *Subjects from 37 randomly selected sites, representing all health districts in the Northwest province. 5 strata represent levels of urbanization: 1) traditional African villages with tribal chief (small farmers, businessmen, self-employed or unemployed); 2) farmworkers on commercial farms; 3) residents in informal settlements, fringing towns or cities, unemployed or working in small business, informal sector or industry; 4) urban townships (work in informal or formal institutions, industries or small businesses); 5) urban, upper-class residential areas (professionals, government officials and self-employed businessmen). Serum retinol concentrations converted from µg/dL to µmol/L. Dissaggregated sample size data obtained from reference No. 5517.*

Note 3 Estimated mean: 1.56 µmol/L, standard error of the mean: 0.04 µmol/L

Note 4 Estimated mean: 1.54 µmol/L, standard error of the mean: 0.07 µmol/L

Note 5 Estimated mean: 1.52 µmol/L, standard error of the mean: 0.04 µmol/L

Note 6 Estimated mean: 1.59 µmol/L, standard error of the mean: 0.04 µmol/L

Note 7 Estimated mean: 1.57 µmol/L, standard error of the mean: 0.06 µmol/L

Note 8 Estimated mean: 1.62 µmol/L, standard error of the mean: 0.05 µmol/L

Note 9 Estimated mean: 1.61 µmol/L, standard error of the mean: 0.07 µmol/L

Note 10 Estimated mean: 1.73 µmol/L, standard error of the mean: 0.05 µmol/L

Note 11 Estimated mean: 1.66 µmol/L, standard error of the mean: 0.05 µmol/L

Note 12 Estimated mean: 1.86 µmol/L, standard error of the mean: 0.07 µmol/L

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Reference No: 3422

General notes: *Community-based survey of 11 schools randomly selected from 72 government run primary schools in the Vulamehlo Magisterial district of rural southern KwaZulu-Natal province. All grade 3 pupils selected within each school selected. Serum retinol concentrations converted from µg/dL to µmol/L. Same survey reported in reference No. 3547. Date of survey taken from reference No. 3547.*

Reference No: 48

General notes: *Multi-stage probability sample with disproportionate stratification by province. Local term for night blindness used. Summary data reported in reference No. 1762. Serum retinol concentrations converted from µg/mL to µmol/L.*

Note 13 Combined prevalence (X1A, X1B): 0.10%

Note 14 Combined prevalence (X1A, X1B): 0.00%

Note 15 Combined prevalence (X1A, X1B): 0.10%

Note 16 Combined prevalence (X1A, X1B): 0.10%

Note 17 Combined prevalence (X1A, X1B): 0.10%

Note 18 Combined prevalence (X1A, X1B): 0.10%

Note 19 Combined prevalence (X1A, X1B): 0.00%

Note 20 Combined prevalence (X1A, X1B): 0.10%

Note 21 Combined prevalence (X1A, X1B): 0.00%

Note 22 Combined prevalence (X1A, X1B): 0.10%

Note 23 Combined prevalence (X1A, X1B): 0.70%

Note 24 Combined prevalence (X1A, X1B): 0.00%

Note 25 Combined prevalence (X1A, X1B): 0.00%

Note 26 Combined prevalence (X1A, X1B): 0.00%

Note 27 Combined prevalence (X1A, X1B): 0.00%

Note 28 Combined prevalence (X1A, X1B): 0.00%

Note 29 Combined prevalence (X1A, X1B): 0.00%

Note 30 Combined prevalence (X1A, X1B): 0.00%

Reference No: 219

General notes: *Pre-SAC selected by stratified-random-sampling from Bester's Farm. An urban settlement with 11 units, within metropolitan Durban.*

Note 31 No clinical signs.

Reference No: 2073

General notes: *Sample comprised of randomly selected SAC from Kentani and Willowvale districts of Transkei.*

Note 32 Combined prevalence (X1A, X1B): 0.58%

Reference No: 3033

General notes: *Sample comprised of randomly selected adult Pedi men from the Cheifaincy of Paramount Cheifainess Mankopodi Thulare Sekhukhune at Mohlaletsi near Paradys in the Geluks location (rural), district of Lydenburg and adult Pedi men from Katilehang township in the Germiston area (urban). Serum retinol concentrations converted from µg/100mL to µmol/L.*

Note 33 Urban.

Note 34 Rural.

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Reference No: 3035a

General notes: *Sample comprised of SAC (white children) randomly selected from Pretoria. Serum retinol concentrations converted from $\mu\text{g}/100\text{ mL}$ to $\mu\text{mol}/\text{L}$.*

Reference No: 3035b

General notes: *Sample comprised of SAC (indian and coloured children) randomly selected from Pretoria. Serum retinol concentrations converted from $\mu\text{g}/100\text{ mL}$ to $\mu\text{mol}/\text{L}$.*

Note 35 Coloured children. Total sample size for coloured children aged 7.00-15.99 years: 450.

Note 36 Coloured children.

Note 37 Indian children. Total sample size for indian children aged 7.00-15.99 years: 407.

Note 38 Indian children.

Reference No: 3035c

General notes: *Sample comprised of SAC (bantú children) randomly selected from Pretoria. Serum retinol concentrations converted from $\mu\text{g}/100\text{mL}$ to $\mu\text{mol}/\text{L}$.*

Note 39 Total sample size for bantu children aged 7.00-15.99 years: 585.

Reference No: 3035d

General notes: *Sample comprised of SAC (white children) randomly selected from Pretoria. Serum retinol concentrations converted from $\mu\text{g}/100\text{ mL}$ to $\mu\text{mol}/\text{L}$.*

REFERENCES

SOUTH AFRICA

- Reference 48** South African Vitamin A Consultation Group (SAVACG). Children aged 6 to 71 months in South Africa, 1994: their anthropometric, vitamin A, iron and immunisation coverage status. Johannesburg, South African Vitamin A Consultative Group, 1995.
- Reference 219** Coutsooudis A, Mametjas D, Jinabhai CC, Coovadia HM. Vitamin A deficiency among children in a periurban South African settlement. *American Journal of Clinical Nutrition*, 1993, 57 :904-907.
- Reference 1701** Dannhauser A, Bester CJ, Joubert G, Badenhorst PN, Slabber M, Badenhorst AM, Du Toit E, Barnard HC, Botha P, Nogabe L. Nutritional status of preschool children in informal settlement areas near Bloemfontein, South Africa. *Public Health Nutrition*, 2000, 3 :303-312.
- Reference 2073** Hill JC, Maske R, Van Der Walt S, Coetzer P. Corneal disease in rural Transkei. *South African Medical Journal*, 1989, 75 :469-472.
- Reference 2830** Faber M, Benadé AJS. Nutritional status and dietary practices of 4-24-month-old children from a rural South African community. *Public Health Nutrition*, 1999, 2 :179-185.
- Reference 3033** Louw ME, Du Plessis JP, Laubscher NF. A biochemical evaluation of the nutrition status of rural and urban Pedi males. *South African Medical Journal*, 1972, 46 :1139-1142.
- Reference 3035** Du Plessis JP, de Lange DJ, Nesor ML. Biochemical evaluation of the nutrition status of urban primary school children: vitamin-A status. *South African Medical Journal*, 1966, 40 :1093-1097.
- Reference 3035** Du Plessis JP, de Lange DJ, Nesor ML. Biochemical evaluation of the nutrition status of urban primary school children: vitamin-A status. *South African Medical Journal*, 1966, 40 :1093-1097.
- Reference 3035** Du Plessis JP, de Lange DJ, Nesor ML. Biochemical evaluation of the nutrition status of urban primary school children: vitamin-A status. *South African Medical Journal*, 1966, 40 :1093-1097.
- Reference 3035** Du Plessis JP, de Lange DJ, Nesor ML. Biochemical evaluation of the nutrition status of urban primary school children: vitamin-A status. *South African Medical Journal*, 1966, 40 :1093-1097.
- Reference 3422** Jinabhai CC, Taylor M, Coutsooudis A, Coovadia HM, Tomkins AM, Sullivan KR. A health and nutritional profile of rural school children in KwaZulu-Natal, South Africa. *Annals of Tropical Paediatrics*, 2001, 21 :50-58.
- Reference 4191** Faber M, Jogessar VB, Benadé AJS. Nutritional status and dietary intakes of children aged 2-5 years and their caregivers in a rural South African community. *International Journal of Food Sciences and Nutrition*, 2001, 52 :401-411.
- Reference 5071** Smuts CM, Dhansay MA, Faber M, van Stuijvenberg ME, Swanevelder S, Gross R, Benade AJ. Efficacy of multiple micronutrient supplementation for improving anemia, micronutrient status, and growth in South african infants. *Journal of Nutrition*, 2005, 135 :653S-659S.
- Reference 5284** Kruger HS, Kruger A, Vorster HH, Jooste PL, Wolmarans P. Urbanization of africans in the north western province is associated with better micronutrient status: the transition and health during urbanization study in South Africa. *Nutrition Research*, 2005, 25 :365-375.
- Reference 5518** Faber M, Kvalsvig JD, Lombard CJ, Benade AJ. Effect of a fortified maize-meal porridge on anemia, micronutrient status, and motor development of infants. *American Journal of Clinical Nutrition*, 2005, 82 :1032-1039.

ADDITIONAL REFERENCES

SOUTH AFRICA

- Reference 1360 Oelofse A, Faber M, Benadé JG, Benade AJS, Kenoyer DG. The nutritional status of a rural community in KwaZulu-Natal, South Africa: the Ndunakazi project. *Central African Journal of Medicine*, 1999, 45 :14-19.
- Reference 1629 Department of Health, Directorate Nutrition. Vitamin A supplementation [draft policy document]. South Africa, 1997.
- Reference 1762 South African Vitamin A Consultative Group (SAVACG). Anthropometric, vitamin A, iron and immunisation coverage status in children aged 6-71 months in South Africa, 1994. *South African Medical Journal*, 1996, 86 :354-357.
- Reference 2068 Fairney A, Sloan MA, Patel KV, Coumbe A. Vitamin A and D status of black South African women and their babies. *Human Nutrition. Clinical Nutrition*, 1987, 41 :81-87.
- Reference 2884 Coutsoudis A, Adhikari M, Pillay K, Coovadia HM. Effect of vitamin A supplementation on morbidity of low birth-weight neonates. *South African Journal of Clinical Nutrition*, 2000, 13
- Reference 3031 Bluhm DP, Summers RS, Ellis JB. Severe vitamin A deficiency in black neonates in a tertiary referral hospital in South Africa. *Journal of Tropical Pediatrics*, 1998, 40 :116-118.
- Reference 3032 Lubbe AM. Nutritional status survey of Pretoria schoolchildren from four racial groups. *South African Medical Journal*, 1973, 47 :679-687.
- Reference 3034 Kuming BS, Politzer WM. Xerophthalmia and protein malnutrition in Bantu children. *British Journal of Ophthalmology*, 1967, 51 :649-666.
- Reference 3547 Jinabhai CC, Taylor M, Coutsoudis A, Coovadia HM, Tomkins AM, Sullivan KR. A randomized controlled trial of the effect of antihelminthic treatment and micronutrient fortification on health status and school performance of rural primary school children. *Annals of Tropical Paediatrics*, 2001, 21 :319-233.
- Reference 3764 Oelofse A, Van Raaij JMA, Benade AJS, Dhansay MA, Tolboom JJM, Hautvast JGAJ. The effect of a micronutrient-fortified complementary food on micronutrient status, growth and development of 6- to 12-month-old disadvantaged urban South African infants. *International Journal of Food Sciences and Nutrition*, 2003, 54 :399-407.
- Reference 4194 van Stuijvenberg ME, Dhansay MA, Lombard CJ, Faber M, Benade AJ. The effect of a biscuit with red palm oil as a source of beta-carotene on the vitamin A status of primary school children: a comparison with beta-carotene from a synthetic source in a randomised controlled trial. *European Journal of Clinical Nutrition*, 2001, 55 :657-662.
- Reference 4200 Faber M, Spinnler Benade AJ. Factors associated with low serum retinol levels in children aged 6-24 months in a rural South African community. *Public Health Nutrition*, 2000, 3 :395-402.
- Reference 4214 Hendricks MK, Fiedler JL. Food fortification--a feasible, cost-effective option in the fight against vitamin A deficiency in South Africa. *South African Medical Journal*, 2001, 91 :753-755.
- Reference 5074 Witten C, Jooste P, Sanders D, Chopra M. *Micronutrient Programs in South Africa*. Capetown, University of the Western Cape, School of Public Health,
- Reference 5157 Faber M, Phungula MA, Venter SL, Dhansay MA, Benade AJ. Home gardens focusing on the production of yellow and dark-green leafy vegetables increase the serum retinol concentrations of 2-5-y-old children in South Africa. *American Journal of Clinical Nutrition*, 2002 76 :1048-1054.
- Reference 5370 Witten C, Jooste P, Sanders D, Chopra M. Micronutrient programs in South Africa. Paper presented at a workshop on "Successful Micronutrient Programs" held at the International Union of Nutritional Sciences. Vienna, 2001.
- Reference 5517 Vorster HH, Venter CS, Wissing MP, Margetts BM. The nutrition and health transition in the North West Province of South Africa: a review of the THUSA (Transition and Health during Urbanisation of South Africans) study. *Public Health Nutrition*, 2005, 8 :480-490.

ADDITIONAL REFERENCES

SOUTH AFRICA

- Reference 5519 Nesamvuni AE, Vorster HH, Margetts BM, Kruger A. Fortification of maize meal improved the nutritional status of 1-3-year-old African children. *Public Health Nutrition*, 2005, 8 :461-467.
- Reference 5527 Faber M, Swanevelder S, Benade AJ. Is there an association between the nutritional status of the mother and that of her 2-year-old to 5-year-old child?. *International Journal of Food Sciences and Nutrition*, 2005, 56 :237-244.
- Reference 5824 Papatkakis PC, Rollins NC, Chantry CJ, Bennish ML, Brown KH. Micronutrient status during lactation in HIV-infected and HIV-uninfected South African women during the first 6 mo after delivery. *American Journal of Clinical Nutrition*, 2007, 85 :182-192.