

# Prevalence and correlates of nutrition support services in HIV care and treatment programs across 9 sub-Saharan African countries

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## BACKGROUND

HIV-infected individuals are at increased risk of developing nutritional deficiencies that can worsen clinical outcomes. International guidelines recommend provision of nutritional support services to HIV-infected individuals, including those receiving antiretroviral therapy (ART). However, little is known about the extent and types of nutritional support services provided in HIV care and treatment programs in sub-Saharan Africa.

## METHODS

- We describe the prevalence and independent correlates of nutritional support services in HIV care and treatment clinics in nine sub-Saharan African countries, and describe changes in availability of these services over time
- The study population included 338 HIV care and treatment clinics across 9 sub-Saharan African countries (Kenya, Tanzania, Ethiopia, Rwanda, Mozambique, South Africa, Nigeria, Lesotho and Cote d'Ivoire) that were receiving direct support via PEPFAR from the International Center for AIDS Care and Treatment Programs (ICAP) in June 2008
- A structured program and facility characteristics survey, which captured information on the availability of nutritional support services, was administered at three time points during January 2007-July 2008
- Four bivariate analyses were conducted in order to determine the prevalence and correlates of various types of nutritional services available
- Univariate and multivariate logistic regression analyses were performed to determine independent predictors of availability of each nutrition service
- For clinics that had completed three surveys, we evaluated changes in availability of nutrition support services over the 18 month period

## RESULTS

Across 338 HIV care and treatment clinics, 303 (90%) provided some form of nutritional support service (Table 1).

Table 1 describes the enrollment, clinic characteristics and location, and prevalence of nutritional support services in 338 HIV care and treatment programs in sub-Saharan Africa. As of July 2008, these clinics had enrolled 118,527 individuals on ART [including 10,105 (9%) children and 108,422 (91%) adults]. Of all HIV care and treatment clinics, 303 (90%) provided some form of nutritional support service, including 165 (54%) in rural areas, and 139 (46%) at primary care clinics. Of these 21(7%) had nutritionist onsite and 282 (93%) provided anthropometric evaluation (mainly weight for height). The prevalence of each service varied substantially by country.

In bivariate analysis (Table 2), all nutrition support services were associated with provision of anthropometric evaluation (p<0.001). In addition:

- Provision of nutritional counseling was more likely in secondary/tertiary clinics compared to primary clinics (p=0.029)

**Table 2: Bivariate Analysis of Sites Providing Nutritional Counseling, Micronutrient Support, Treatment of Severe Malnutrition and Food Rations to people living with HIV/AIDS in PEPFAR-support ART Sites in nine sub-Saharan African Countries**

ART Site Characteristics	Provision of Nutritional Counseling		P-value	Provision of Micronutrient Support		P-value	Treatment of Severe Malnutrition		P-value	Distribution of Food Rations		P-value
	No (n=40)	Yes (n=238)		No (n=144)	Yes (n=194)		No (n=220)	Yes (n=189)		No (n=243)	Yes (n=99)	
Age of Program < 2 years	23 (11.1%)	104 (43.7%)	0.758	73 (44.5%)	114 (46.6%)	0.442	153 (71.4%)	44 (21.2%)	<0.001	17 (6.2%)	37 (14.7%)	<0.001
Number of people on ART < 200	1 (2.5%)	10 (4.2%)	0.269	4 (2.5%)	6 (2.6%)	0.418	7 (2.5%)	4 (2.1%)	0.996	7 (2.5%)	6 (2.3%)	0.932
Location (% Rural vs Urban)	23 (11.1%)	104 (43.7%)	0.216	73 (44.5%)	97 (49.5%)	0.197	73 (32.7%)	44 (22.7%)	0.177	17 (6.2%)	41 (16.1%)	0.099
Type of Site (% Primary vs Secondary)	23 (11.1%)	104 (43.7%)	0.029	73 (44.5%)	97 (49.5%)	0.036	104 (47.3%)	44 (22.7%)	0.776	17 (6.2%)	52 (20.2%)	0.108
Presence of Nutritionist (% Yes vs No)	43 (12.6%)	27 (11.3%)	0.412	71 (41.2%)	96 (48.7%)	0.176	22 (9.6%)	17 (8.5%)	0.912	20 (7.1%)	17 (6.7%)	0.293
Anthropometric Evaluation (% Yes vs No)	31 (62.5%)	173 (72.4%)	<0.001	45 (33.3%)	111 (56.7%)	<0.001	50 (22.3%)	29 (15%)	<0.001	13 (4.9%)	11 (4.3%)	<0.001

**Table 3: Multivariate Analysis of Sites Providing Nutritional Counseling, Micronutrient Support, Treatment of Severe Malnutrition and Food Rations to people living with HIV/AIDS in PEPFAR-support ART Sites in nine sub-Saharan African Countries**

ART Site Characteristics	Provision of Nutritional Counseling		Provision of Micronutrient Support		Treatment of Severe Malnutrition		Distribution of Food Rations	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age of Program > 2 yrs vs < 2 yrs	1.02	1.02	1.01	1.01	1.56	1.57	1.42	1.43
Number of people on ART < 200 vs > 200	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01
Location (% Rural vs Urban)	1.42	1.42	1.01	1.01	1.01	1.01	1.01	1.01
Type of Site (% Primary vs Secondary)	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01
Presence of Nutritionist (% Yes vs No)	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01
Anthropometric Evaluation (% Yes vs No)	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01

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**Table 1: Enrollment, clinic characteristics and location, and prevalence of nutritional support services in 338 HIV care and treatment programs in sub-Saharan Africa**

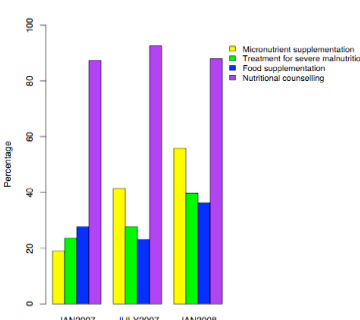
Patients enrolled in all 338 clinics, n	HIV care and treatment clinics			P-value
	Total	Urban	Rural	
<b>ART care</b>				
All patients	118,527	109,093	13,472	<0.001
Children <15 years	10,105	9,120	985	
Adults	108,422	99,973	12,487	
<b>Characteristics of 303 clinics providing nutrition support services, n (%)</b>				
Total	303 (100)	165 (54)	138 (46)	<0.001
<b>Clinic type</b>				
Primary	139 (46)	42 (24)	67 (71)	
Secondary	162 (50)	114 (69)	38 (28)	
Tertiary	1 (4)	1 (7)	0	
<b>Presence of nutritionist</b>	21 (7)	13 (8)	8 (6)	0.683
<b>Presence of anthropometric evaluation</b>	282 (93)	162 (57)	118 (42)	<0.001
<b>Country</b>				
Cote d'Ivoire	8 (3)	7 (4)	1 (0.7)	
Ethiopia	42 (14)	37 (22)	4 (3)	
Kenya	61 (19)	17 (10)	43 (29)	
Lesotho	23 (8)	3 (2)	17 (13)	
Mozambique	30 (12)	23 (15)	11 (8)	
Nigeria	28 (9)	23 (12)	4 (3)	
Rwanda	31 (10)	4 (2)	27 (20)	
South Africa	39 (12)	20 (12)	19 (14)	
Tanzania	44 (15)	22 (13)	15 (11)	
<b>Type of nutritional support services available in 303 clinics, % (range)</b>				
<b>Provision of nutritional counseling</b>				
Nutritional counseling for adults	15 (76-100)	63 (71-90)	69 (91-100)	0.855
Infant feeding counseling for mothers	11 (81-100)	61 (66-90)	62 (80-100)	0.319
<b>Provision of micronutrient supplementation</b>				
Multivitamin & mineral supplementation	23 (0-97)	21 (0-98)	20 (0-73)	0.870
Vitamin A over 12 weeks	62 (2-80)	42 (3-86)	64 (0-100)	<0.001
Vitamin A supplementation for postpartum women	41 (0-77)	27 (0-66)	58 (0-100)	<0.001
Vitamin A given to other adults or adolescent children	19 (0-58)	11 (0-30)	29 (0-94)	<0.001
Iron supplementation	47 (0-88)	35 (0-86)	37 (0-100)	0.001
<b>Treatment of severe malnutrition</b>				
Nutrition "treatment" for severely malnourished adults	23 (0-72)	21 (0-75)	26 (0-100)	0.301
Nutrition "treatment" for severely malnourished infants and children <5 years	32 (0-62)	30 (0-76)	37 (0-94)	0.269
<b>Distribution of food rations</b>				
Formula feeding and weaning foods for infants	22 (0-75)	16 (0-71)	29 (0-78)	0.007
Food rations for adults to promote ART adherence	18 (0-57)	10 (0-26)	29 (0-68)	<0.001
Food rations for adults to promote household food security	43 (1-71)	63 (24)	67 (0-81)	0.022
Food rations for children <5 yrs to promote ART adherence	13 (0-77)	7 (0-75)	21 (0-78)	<0.001
Food rations for children <5 yrs to promote household food security	7 (0-21)	8 (0-27)	7 (0-31)	0.816

- Micronutrient supplementation was more commonly available at rural compared to urban clinics (p<0.001)
- Treatment for severe malnutrition was more commonly available at clinics providing ART >2 years (p<0.001), and at clinics that had initiated more than >260 people ART (p=0.096), and those with a nutritionist on staff (p=0.012)
- Food rations were more commonly available at clinics providing ART for at least 2 years (p<0.001)

In multivariate analysis (Table 3), types of nutritional support services were independently associated with varying clinic characteristics

In our time trend analysis (Figure 1) nutrition services that expanded most rapidly included micronutrient supplementation (p<0.001) and treatment for severe malnutrition (p=0.001).

**Figure 1: Expansion of nutritional support services in HIV treatment and care clinics, across 9 sub-Saharan African countries, from January 2007 to January 2008**



## CONCLUSIONS

Availability of specific nutritional support services varies by country, geographic context, and clinic/program characteristics. Nutritional counseling is widely available in our sample of public sector HIV care and treatment clinics throughout the sub-Saharan African region. Evidence-based strategies should be taken to accelerate the expansion of micronutrient supplementation. Ongoing monitoring of the rollout of nutrition services in the context of HIV scale-up is essential to further guide operations and policy. Subsequent analyses should seek to understand patient-level access to, and quality of, these services.