

**Impact of HIV infection on Survival among Women with Stage I-III Breast Cancer:  
Results from the South African Breast Cancer and HIV Outcomes Study.**

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## Supplementary table 1

Treatment of women with breast cancer in the SABCHO cohort by stage and HIV status

	Stage I & II Breast cancer				Stage III Breast cancer			
	HIV negative	HIV Positive	Total	P value	HIV negative	HIV Positive	Total	P value
Row %	N=961 (%)	N=229 (%)	N=1190 (%)		N=907 (%)	N=270 (%)	N=1177 (%)	
<b>Surgical treatment</b>								
No	100 (10.4)	32 (14.0)	132 (11.1)	0.122	334 (36.8)	105 (38.9)	439 (37.3)	0.538
Yes	861 (89.6)	197 (86.0)	1058 (88.9)		573 (63.2)	165 (61.1)	738 (62.7)	
<b>Chemotherapy treatment</b>								
No	341 (35.5)	55 (24.0)	396 (33.3)	<b>0.001</b>	181 (20.2)	33 (12.2)	214 (18.2)	<b>0.004</b>
Yes	620 (64.5)	174 (76.0)	794 (66.7)		726 (80.0)	237 (87.8)	963 (81.8)	
<b>Radiation therapy</b>								
No	504 (52.4)	127 (55.5)	631 (53.0)	0.412	389 (42.9)	121 (44.8)	510 (43.3)	0.575
Yes	457 (47.6)	102 (44.5)	559 (47.0)		518 (57.1)	149 (55.2)	667 (56.7)	
<b>Treatment received</b>								
Surgery, no chemotherapy	261 (27.2)	36 (15.7)	297 (25.0)	<b>&lt;0.001</b>	42 (4.6)	4 (1.5)	46 (3.9)	<b>0.006</b>
Surgery + chemotherapy	600 (62.4)	161 (70.3)	761 (63.9)		531 (58.5)	161 (59.6)	692 (58.8)	
Chemotherapy, no surgery	20 (2.1)	13 (5.7)	33 (2.8)		195 (21.5)	76 (28.1)	271 (23.0)	
No surgery or chemotherapy	80 (8.3)	19 (8.3)	99 (8.3)		(15.3)139	29 (10.7)	168 (14.3)	
<b>Endocrine therapy (ER+/PR+ patients only, N=866)</b>								
No	97 (12.2)	32 (17.6)	129 (13.2)	0.052	155 (23.3)	49 (24.5)	204 (23.6)	0.720
Yes	699 (87.8)	150 (82.4)	849 (86.8)		511 (76.7)	151 (75.5)	662 (76.4)	

## Supplementary table 2

**Univariate mortality hazard ratios and confidence intervals for risk factors in women with stages I - III breast cancer in the SABCHO cohort.**

	Alive		Died		HR (95% CI)	P-value
<b>Patient status (%)</b>	<b>1639</b>	<b>69.2%</b>	<b>728</b>	<b>30.8%</b>		
<b>HIV</b>						
Negative	1,330	81.1%	538	73.9%	1.00	<b>&lt;0.001</b>
Positive	309	18.9%	190	26.1%	1.45 (1.23-1.72)	
<b>Age at diagnosis in years</b>						
<40	217	13.4%	109	15.0%	1.00	<b>0.001</b>
40-49	408	24.9%	160	22.0%	0.79 (0.62-1.00)	
50-59	402	24.6%	155	21.3%	0.82 (0.64-1.04)	
60-69	362	21.8%	137	18.8%	0.76 (0.58-0.76)	
≥70	250	15.3%	167	22.9%	1.18 (0.92-1.50)	
<b>Ethnicity</b>						
Others	385	23.5%	137	18.8%	1.00	<b>&lt;0.001</b>
Black	1,254	76.5%	591	81.2%	1.44 (1.20-1.74)	
<b>Highest level of education</b>						
Primary education and below	412	25.3%	247	34.6%	1.00	<b>&lt;0.001</b>
Secondary education and above	1,219	74.7%	466	65.4%	0.69 (0.59-0.81)	
<b>Wealth index</b>						
1	312	19.0%	159	21.8%	1.38 (1.09-1.75)	<b>0.009</b>
2	322	19.6%	155	21.3%	1.35 (1.07-1.71)	
3	311	19.0%	163	22.4%	1.46 (1.15-1.84)	
4	351	21.4%	126	17.3%	1.08 (0.84-1.38)	
5 (wealthiest)	343	20.9%	125	17.2%	1.00	
<b>Body mass index (BMI)</b>						
<25	257	16.4%	154	22.5%	1.00	<b>0.010</b>
25-29.9	440	28.1%	155	22.6%	0.70 (0.56-0.87)	
≥30	871	55.5%	376	54.9%	0.82 (0.67-0.99)	
<b>Diabetes</b>						
No	1,428	87.2%	611	84.5%	1.00	0.075
Yes	209	12.8%	112	15.5%	1.17 (0.96-1.43)	
<b>Hypertension</b>						
No	970	59.3%	413	57.1%	1.00	0.332
Yes	667	40.7%	310	42.9%	1.05 (0.90-1.21)	
<b>Cerebrovascular disease</b>						
No	1,549	94.6%	664	91.8%	1.00	<b>0.010</b>
Yes	88	5.4%	59	8.2%	1.44 (1.10-1.89)	
<b><sup>a</sup> ECOG PS</b>						
0 & 1	1,579	96.5%	643	88.7%	1.00	<b>&lt;0.001</b>
2-4	57	3.5%	82	11.3%	2.81 (2.23-3.54)	
<b>Hospitals</b>						
Durban	275	16.8%	124	17.0%	1.00	0.332
CHBAH	648	39.5%	276	37.9%	1.14 (0.93-1.41)	
CMJAH	419	25.6%	185	25.4%	1.16 (0.93-1.46)	

Greys	273	16.7%	118	16.2%	1.00 (0.78-1.29)	
Ngwelezana	24	1.5%	25	3.4%	1.47 (0.96-2.27)	
<b>Stage at diagnosis</b>						
I & II	976	59.5%	214	29.4%	1.00	<b>&lt;0.001</b>
III	663	40.5%	514	70.6%	3.04 (2.59-3.56)	
<b>Histological diagnosis</b>						
Invasive ductal	1,574	96.0%	691	94.9%	1.00	0.217
Other histological type	65	4.0%	37	5.1%	1.12 (0.81-1.56)	
<b>Grade at diagnosis</b>						
1 & 2	959	67.4%	313	51.6%	1.00	<b>&lt;0.001</b>
3	464	32.6%	294	48.4%	1.79 (1.53-2.10)	
<b>ER/PR status</b>						
Positive	1,326	80.9%	518	71.2%	1.00	<b>&lt;0.001</b>
Negative	313	19.1%	210	28.8%	1.66 (1.41-1.95)	
<b>HER2 status</b>						
Negative	1,271	77.5%	538	73.9%	1.00	0.060
Positive	368	22.5%	190	26.1%	1.20 (1.02-1.42)	
<b>Breast cancer subtype</b>						
<sup>b</sup> ER+/PR+; HER2-	1,049	64.0%	385	52.9%	1.00	<b>&lt;0.001</b>
ER+/PR+; HER2+	277	16.9%	133	18.3%	1.27 (1.05-1.55)	
ER-/PR-; HER2+	91	5.6%	57	7.8%	1.68 (1.27-2.22)	
ER-/PR-; HER2-	222	13.5%	153	21.0%	1.79 (1.48-2.15)	
<b>KI67</b>						
<20	537	33.9%	174	25.1%	1.00	<b>&lt;0.001</b>
≥20	1,047	66.1%	520	74.9%	1.49 (1.25-1.77)	
<b>Radiation therapy</b>						
No	715	43.6%	426	58.5%	1.00	<b>&lt;0.001</b>
Yes	924	56.4%	302	41.5%	0.48 (0.41-0.56)	
<b>Treatment received</b>						
Surgery + chemotherapy	1,119	68.3%	334	45.9%	1.00	<b>&lt;0.001</b>
Surgery, no chemotherapy	282	17.2%	61	8.4%	0.80 (0.61-1.05)	
Chemotherapy, no surgery	115	7.0%	189	26.0%	4.93 (4.11-5.91)	
No surgery or chemotherapy	123	7.5%	144	19.8%	4.20 (3.45-5.11)	

Abbreviations: <sup>a</sup> ECOG (Eastern Cooperative Oncology Group) PS (Performance status), <sup>b</sup> ER/PR (Oestrogen receptor/progesterone), HER2 (Human Epidermal Growth Factor Receptor 2), Missing data: Highest level of education (n=23), BMI (n=114), Diabetes (n=7), hypertension (n=7), cerebrovascular disease (n=7), ECOG (n=6), Grade (n=337), Ki67 (n=89)

### Supplementary table 3

#### Multivariate Cox Proportional Hazard Ratio Model of Risk Factors for Mortality in Women with Stages I-III Breast Cancer who received surgery and some form of systemic therapy

	Hazard ratio (95% CI)	P-value
<b>HIV</b>		
Negative	1.00 (Reference)	
Positive	1.41 (1.07-1.85)	<b>0.016</b>
<b>Age at diagnosis in years</b>		
<40	1.00 (Reference)	
40-49	1.10 (0.78-1.56)	0.589
50-59	0.94 (0.64-1.36)	0.730
60-69	0.72 (0.48-1.09)	0.122
≥70	1.43 (0.93-2.19)	0.101
<b>Ethnicity</b>		
Others	1.00 (Reference)	
Black	1.21 (0.92-1.59)	0.180
<b>Highest level of education</b>		
Primary education and below	1.00 (Reference)	
Secondary education and above	0.66 (0.51-0.84)	<b>0.001</b>
<b>Body mass index (BMI)</b>		
<25	1.00 (Reference)	
25-29.9	0.73 (0.53-1.01)	0.062
≥30	0.95 (0.72-1.26)	0.716
<b><sup>a</sup> ECOG</b>		
0 & 1	1.00 (Reference)	
2-4	2.42 (1.52-3.83)	<b>&lt;0.001</b>
<b>Stage at diagnosis</b>		
I & II	1.00 (Reference)	
III	2.18 (1.74-2.72)	<b>&lt;0.001</b>
<b>Breast cancer subtype</b>		
<sup>b</sup> ER+/PR+/HER2-	1.00 (Reference)	
ER+/PR+/HER2+	1.14 (0.85-1.52)	0.380
ER-/PR-/HER2+	1.53 (1.01-2.33)	<b>0.046</b>
ER-/PR-/HER2-	1.54 (1.17-2.03)	<b>0.002</b>
<b>KI67</b>		
<20	1.00 (Reference)	
≥20	1.31 (1.02-1.68)	<b>0.002</b>
<b>Treatment received</b>		
Surgery + chemotherapy	1.00 (Reference)	
Surgery, no chemotherapy	0.97 (0.69-1.37)	0.878

Abbreviations: <sup>a</sup> ECOG (Eastern Cooperative Oncology Group), <sup>b</sup> ER/PR (Oestrogen receptor/Progesterone receptor), HER2 (Human Epidermal Growth Factor Receptor 2).

## Supplementary table 4

### Multivariate Cox Proportional Hazard Ratio Model of Risk Factors for Mortality in WLWH with Stages I-III Breast Cancer Enrolled in the SABCHO cohort

	Died, N=190 (row %)	Hazard ratio (95% CI)	P-value
<b>Age at diagnosis in years</b>			
<40	51 (39.8)	1.00 (Reference)	
40-49	70 (33.5)	0.76 (0.50-1.15)	0.195
50-59	53 (45.7)	1.00 (0.60-1.66)	0.997
60-69	11 (30.6)	0.83 (0.39-1.78)	0.631
≥70	5 (50.0)	1.55 (0.48-5.02)	0.468
<b>Highest level of education</b>			
Primary education and below	46 (45.5)	1.00 (Reference)	
Secondary education and above	141 (35.9)	0.72 (0.48-1.10)	0.135
<b>Body mass index (BMI)</b>			
<25	62 (47.3)	1.00 (Reference)	
25-29.9	44 (31.9)	0.69 (0.44-1.09)	0.113
≥30	71 (34.0)	0.87 (0.59-1.28)	0.473
<b><sup>a</sup> ECOG PS</b>			
0 & 1	181 (37.4)	1.00 (Reference)	
2-4	8 (57.1)	1.93 (0.81-4.59)	0.138
<b>Stage at diagnosis</b>			
I & II	56 (24.5)	1.00 (Reference)	
III	134 (49.6)	2.24 (1.53-3.28)	<b>&lt;0.001</b>
<b>Breast cancer subtype</b>			
<b><sup>b</sup> ER+/PR+/HER2-</b>	84 (31.0)	1.00 (Reference)	
ER+/PR+/HER2+	49 (44.1)	1.49 (0.99-2.25)	0.057
ER-/PR-/HER2+	15 (48.4)	1.39 (0.72-2.25)	0.328
ER-/PR-/HER2-	42 (48.8)	2.14 (1.37-3.36)	<b>0.001</b>
<b>KI67</b>			
<20	36 (27.7)	1.00 (Reference)	
≥20	145 (41.8)	1.57 (1.03-2.38)	<b>0.036</b>
<b>Treatment received</b>			
Surgery + chemotherapy	93 (28.9)	1.00 (Reference)	
Surgery, no chemotherapy	5 (12.5)	0.98 (0.37-2.56)	0.960
Chemotherapy, no surgery	61 (68.5)	3.72 (2.53-5.46)	<b>&lt;0.001</b>
No surgery or chemotherapy	31 (64.6)	6.96 (3.97-12.19)	<b>&lt;0.001</b>
<b>ART use</b>			
HIV+, on ART	141 (36.1)	1.00 (Reference)	
HIV+, not on ART	47 (46.1)	0.90 (0.57-1.42)	0.649
<b>HIV viral load (copies/mL)</b>			
HIV+, VL < 50	112 (35.7)	1.00 (Reference)	
HIV+, VL ≥ 50	70 (42.7)	1.06 (0.73-1.56)	0.751
<b>CD4 count (cells/mL)</b>			
HIV+, CD4 ≥ 200	163 (37.8)	1.00 (Reference)	
HIV+, CD4 < 200	18 (42.9)	0.91 (0.52-1.62)	0.756

Abbreviations: <sup>a</sup> ECOG (Eastern Cooperative Oncology Group) PS (Performance status), <sup>b</sup> ER/PR (Oestrogen receptor/Progesterone receptor), HER2 (Human Epidermal Growth Factor Receptor 2), ART (Antiretroviral therapy), VL (Viral load). We tested for interactions

between HIV and each of the above covariates, and none was statistically significant. Missing data: Highest level of education (n=23), BMI (n=114), ECOG (n=6), Ki67 (n=89), ART use (n=2), HIV viral load (n=8), CD4 count (n=9).