14.3 Power Analysis

Based on prior studies, we anticipate that the prevalence of unprotected vaginal or anal (UVA) intercourse will range from 30% to 40% (displayed in the table below as the true proportion). The table below gives the power to reliably rule out, or not mistakenly claim, an alternative proportion below and above the true proportion. The power calculations are based on a two-sided exact binomial test of a single proportion with significance level (alpha) = .05. As seen, we have substantial power to rule out alternative proportions in pooled and site-specific analyses.

True proportion UVA		0.30	0.30	0.35	0.35	0.40	0.40
Alternative proportion UVA		0.20	0.40	0.25	0.45	0.30	0.50
Power to reject alternative proportion in favor of true proportion							
African-American women (pooled across 2 sites)	N = 850	>.99	>.99	>.99	>.99	>.99	>.99
African-American women from North Carolina	N = 500	>.99	.99	.99	.99	.99	.99
African-American women from Alabama	N = 350	.99	.97	.98	.96	.97	.96
Hispanic women from Miami	N = 500	>.99	.99	.99	.99	.99	.99

The power to reliably detect true group differences in the prevalence of UVA by ethnic group and site (the two African-American sites) is given below. The power calculations are based on a two-sided Fisher's exact test of two independent groups with significance level (alpha) = .05. Under a range of potential true differences, we have substantial power to detect differences in UVA between African-American and Hispanic women, and between African-American women from North Carolina versus Alabama.

Group 1 proportion UVA		0.20	0.25	0.20	0.30	0.25	0.20
Group 2 proportion UVA		0.30	0.35	0.35	0.40	0.40	0.40
Power to detect differences between groups							
African-American (group 2) vs. Hispanic (group 1)	N=850, 500	.98	.96	>.99	.96	>.99	>.99
African-Americans from North Carolina (group 2) vs. African-Americans from Alabama (group 1)	N=500, 350	.90	.87	.99	.84	.99	>.99

The power to reliably detect group differences in the prevalence of UVA by stratification variables (median split) is given below. The power calculations are based on a two-sided Fisher's exact test of two independent groups with significant level (alpha) = .05. We

have substantial power to detect relatively small differences in UVA by stratification variables using the full sample of women (N=1350) and the pooled sample of African-American women ((N=850). Power to detect stratified differences in analyses of Hispanic women (N=500) remains strong if effect sizes are moderately larger, but marginal if effect sizes are smaller.

Proportion UVA among those below median on stratification variable (lower risk)		0.20	0.25	0.20	0.30	0.25	0.20
Proportion UVA among those above median on stratification variable (higher risk)		0.30	0.35	0.35	0.40	0.40	0.40
Power to detect differences in UVA between higher and lower risk groups							
All women (N=1350)	N=675, 675	.99	.98	>.99	.97	>.99	>.99
All African-American women (N=850)	N=425, 425	.91	.88	.99	.85	.99	>.99
Hispanic women (N=500)	N=250, 250	.70	.65	.96	.62	.94	.99