

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix. Derivation of Outcome Variables

Risk area #1: Partner Selection

Risk Area 1, Variable 1: Had sex with IDU in last 3 months

Variable 1 is based on the question: *“In the past 3 months, have you had sex with someone who injects or ever injected drugs?”*

This question was skipped if a subject reported 0 sexual partners in the last 3 months; these individuals were grouped with those who answered “no”. If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk Area 1, Variable 2: Had sex with MSM in last 3 months

Variable 2 is based on the question: *“In the past 3 months, have you had sex with a male who also has sex with other males?”*

This question was skipped if a subject reported 0 sexual partners in the last 3 months, or if s/he reported having never had sex with a male; these individuals were grouped with those who answered “no”. If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk Area 1, Variable 3: Had sex with an HIV+ partner in last 3 months

Variable 3 is based on the question: *“In the past 3 months, have you had sex with someone who you knew had HIV, or who you now know has HIV?”*

This question was skipped if a subject reported 0 sexual partners in the last 3 months; these individuals were grouped with those who answered “no”. If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Please note that this question asks about sex with an individual known to be HIV+. A previous question in the ACASI survey asks about sex during the last 3 months with someone the respondent “suspected” of having HIV; this data was not used in analysis.

Risk Area 1, Variable 4: Oldest sexual partner is >5 years older than subject

Risk Area 1, Variable 5: Oldest sexual partner is ≥25 years old

Variables 4 and 5 were derived to represent the role of the age of a subject’s oldest (or only) reported sexual partner, using the question: *“How old was this main/casual partner the last time you had sex together? (If you are not sure of the exact age, please tell me about how old you think your most recent main/casual partner was.)”* Subjects were asked to this question about their most recent main partner and their most recent casual partner, and could therefore only report the ages of up to two partners.

Variable 4 looks at the age difference between a subject and his/her oldest (or only) partner. Subjects were split into two categories: those whose oldest partner was more than 5 years older than the subject, and those whose partners were less than 5 years older. If a subject declined to report the age of at least one partner, s/he was excluded from this analysis.

Variable 5 looks at whether the oldest (or only) sexual partner of a subject is at least 25 years old. If a subject declined to report the age of at least one partner, s/he was excluded from this analysis.

Risk area #2: Number of Partners

Two variables were derived to examine a subject’s reported number of sexual partners over the preceding 3 months. Both are based on the question: *“In the past 3 months, how many sex partners have you had?”*

Risk Area 2, Variable 1: Subject had >5 sexual partners in the last 3 months

Variable 1 stratifies subjects into those who reported having more than five sexual partners in the last 3 months and those who reported five or fewer partners in the last three months.

If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk Area 2, Variable 2: Subject had ≤1 sexual partner in the last 3 months

Variable 2 draws the line between subjects who reported no more than one zero partners or only one partner in the last 3 months, and those who had more than one partner.

If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk area #3: Condom Use

Risk Area #3 concerns condom use with both main and casual sexual partners. Partner-specific data on condom use at last sex, as well as frequency of condom use, is available for the subject's most recent main partner and most recent casual partner. If a respondent did not have a main partner or did not have a casual partner, data on that partner is missing and the subject is not included in analysis of variables related to that partnership. The ACASI survey asks subjects to think of main partners as those with whom they have "an ongoing sexual relationship—like a spouse, lover, boyfriend or girlfriend." The survey defines a casual partner as "someone that you have sex with but do not consider this person to be a main partner to you. A casual partner is someone with whom you have sex occasionally on a casual basis."

Risk Area 3, Variable 1: Used condom at last sex with a main partner

Variable 1 is based on the question: "*The last time you had sex (oral, anal or vaginal) with this partner did you use a condom?*"

If a subject reported that s/he had "never" used a condom with this partner, this question was skipped in the ACASI; in deriving this variable, these "never used a condom with this partner" responses are grouped with those who answered that they had not used a condom at last sex with this partner.

If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk Area 3, Variable 2: Used condom at last sex with a casual partner

Variable 2 is based on the question: "*The last time you had sex (oral, anal or vaginal) with this partner did you use a condom?*"

If a subject reported that s/he had "never" used a condom with this partner, this question was skipped in the ACASI; in deriving this variable, these "never used a condom with this partner" responses are grouped with those who answered that they had not used a condom at last sex with this partner.

If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk Area 3, Variable 3: Used condom every time with main partner

Risk Area 3, Variable 4: Used condom half of the time, or less often, with main partner

Variables 3 and 4 are based on the question: "*How often do you use (or did you use) a condom when having sex (oral, anal or vaginal) with this partner?*"

This question is examined in two ways.

Variable 3 divides subjects into two groups: those who reported using a condom every time with his/her main partner, and those who reported less frequent condom use. If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Variable 4 stratifies subjects into those who reported using a condom half of the time, or less frequently, with his/her main partner and those who reported using a condom more frequently (i.e. most of the time, or every time). If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk Area 3, Variable 5: Used condom every time with casual partner

Risk Area 3, Variable 6: Used condom half of the time, or less often, with casual partner

Variables 5 and 6 are based on the question: "*How often do you use (or did you use) a condom when having sex (oral, anal or vaginal) with this partner?*"

This question is examined in two ways.

Variable 3 divides subjects into two groups: those who reported using a condom every time with his/her casual partner, and those who reported less frequent condom use. If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Variable 4 stratifies subjects into those who reported using a condom half of the time, or less frequently, with his/her casual partner and those who reported using a condom more frequently (i.e. most of the time, or every time). If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Section 5, Risk area #5: STIs

Risk Area 5, Variable 1: Diagnosed with STI within last year

Variable 1 is based on two questions: *“In your lifetime, have you ever had a sexually transmitted infection (STI), also known as a sexually transmitted disease (STD)?”* and *“When was the last time you were told you had a sexually transmitted infection?”*

If a subject reported that s/he had ever had an STI, and that the most recent diagnosis had occurred within the last year, the subject was coded as “Yes”. Subjects who reported having never had an STI, or whose most recent diagnosis was more than one year ago, were coded as “No.” If a subject declined to answer either question, s/he was excluded from analysis for this variable.

Risk Area 5, Variable 2: Sought care appropriately for STI within last year

Variable 2 is based on the question: *“In the past one year, have you gone to a clinic, a private doctor’s office, emergency room or any other type of health care facility to check or get treated for sexually transmitted infections?”*

The denominator for this analysis includes only those subjects who reported having been diagnosed with an STI within the last year (i.e. the subjects who comprise the numerator from the previous question). If a subject declined to answer this question, s/he was excluded from analysis for this variable.

Risk area #5: HIV Testing

Risk Area 5/ Variable 1: Tested for HIV within the last year

Two questions are used in the derivation of this outcome: *“Have you ever been tested for HIV?”* and *“When was the last time you were tested for HIV? If you are uncertain, take your best guess.”*

If a subject reported that s/he had ever been tested for HIV, and s/he had been tested within the last year, the subject was coded as “Yes”; subjects who reported having never been tested for HIV, or whose most recent test was more than one year ago, were coded as “No.” If a subject declined to answer either question, s/he was excluded from analysis for this variable.

eTable 1. Examples of Structural Change Objectives

Site	Structural Change Objectives	Related Risk Areas	Impact	Reasoning/Justification
Tampa	By April 2008, 3 agencies will include the Hillsborough County school system link on their websites in order to assist community members and/or their advocates in gaining access to school enrollment information for adult basic education, GED and vocational training classes.	<ul style="list-style-type: none"> • Partner Selection • Number of Partners • Condom Use • STI Co infection • HIV Testing 	Low (1 point)	Young women need education to ensure that they have the skills to get jobs with will lead economic stability. This is important to reduce risk related behaviors that may have been used to support themselves and their families. Having this information at multiple sites will make it easier for young women to obtain information on enrolling in adult basic education, GED and vocational training classes.
San Juan, PR	By the year 2008, a Beauty Parlor, located in Santurce area, of San Juan municipality will integrate a practice of HIV prevention for young people between the ages of 12 and 24 years.	<ul style="list-style-type: none"> • Partner Selection • Number of Partners • Condom Use • STI Co infection • HIV Testing 	Low (1 point)	Increasing the availability/accessibility of condoms would help to reduce the possibility of HIV/STI acquisition/transmission. Increasing the accessibility of the HIV/STD prevention services provides an opportunity to promote healthy behavior and awareness on risk behavior in the risk population. Making counseling and HIV testing more available and accessible would also provide an opportunity to identify seropositive individuals to reduce the possibility of HIV acquisition/transmission.
Washington, DC	By December 2009, DC Department of Mental Health will require its core service agencies to adhere to a list of specified LGBTQ cultural competency best practices.	<ul style="list-style-type: none"> • Partner Selection • Number of Partners 	High (2 points)	The DMH Core Service Agencies will create an LGBTQ youth friendly environment which will encourage this population to seek help and support. By receiving mental health support, youth can address mental health issues that are putting them at higher risk for contracting HIV/AIDS.
Baltimore	By January 2010 Gay and Lesbian Community Center of Baltimore (GLCCB) will have developed a youth drop in center	<ul style="list-style-type: none"> • Partner Selection • Number of Partners • Condom Use • STI Infection 	High (2 points)	This collaboration increases the safety of the community for sexual minority youth. It provides alternative social venues, opportunities to increase life skill and access to HIV testing in a friendly environment.

designated for
Sexual Minority
Youth in Baltimore
City.

- HIV Testing

eTable 2. Algorithm for Deriving Gender/Sexual Orientation Variable and Categories^a

Birth Gender	Current Gender	Sexual Orientation	Comment	Classification
Female	Female	Straight/Bisexual	(n=676)	W (n=759)
Female	Female	Gay	(n=47)	
Female	Female	Questioning/RF/DK	(n=18)	
Female	Male/Trans	...(any)...	(n=15)	
Female	Missing		(n=3)	
Male	Female/Trans	...(any)...	(n=57)	MSM (n=1401)
Male	Male/Missing	Gay/Bisexual	(n=1299)	
Male	Male/Missing	Questioning/RF/DK	Recruited at sites that targeted MSM (i.e. sites 2, 3, 8, 9, 11) (n=41)	
Male	Male/Missing	Questioning/RF/DK	Recruited at a site that did not specifically target MSM (6) AND ever had sex with a male (n=4)	
Male	Male	Straight	(n=221)	MSW (n=232)
Male	Male	Questioning/RF/DK	Recruited at a site that did not specifically target MSM (6) AND NEVER had sex with a male (n=11)	

W= Women

MSM= Men who have sex with men

MSW= Men who have sex with women

^aGender/sexual orientation

We created a derived variable for gender and sexual orientation that was ultimately condensed into three categories. In deriving these variables, we looked at several variables, including a subject's gender at birth, current gender identity, sexual orientation, history of sex with men, and the gender of the subject's most recent main and casual partners. We also took into consideration the stated target population of the sites from which subjects were recruited.

All subjects who reported a birth gender of "female" were grouped into a single category due to the small sample size of women who did not partner exclusively or primarily with men (models using a derived variable with multiple categories for females did not converge).

Among respondents who reported a birth gender of "male," we created two categories: men who have sex with men (MSM) and men who have sex with women (MSW). When possible we used self-reported sexual orientation to partition respondents; when this did not provide a straightforward indication, we looked at additional variables include whether respondents had ever had sex with a male, the gender of their main/casual partner(s), and whether they were recruited at a site that specifically targeted MSM. The following table displays the distribution of gender and orientation combinations that comprised each final category.

eTable 3. Results of Multivariable Modeling From the Connect To Protect Project, 2007 To 2010 (Full Models for Table 4)

eTable 3.1: Risk Area #1: Partner Characteristics

		OR	95% CI	P Value
Had sex with IDU in last 3 months N=2250				
SCO Score*	Δ ten units	1.22	0.88 - 1.67	.23
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	0.27	0.11 - 0.68	<.01
	Hispanic	0.52	0.22 - 1.22	.13
	Other	0.35	0.13 - 0.97	.04
Ever injected	No	1	---	
	Yes	36.43	18.01 - 73.71	<.01
	Not answered	1.65	0.82 - 3.33	.16
Ever had an STI	No	1	---	
	Yes	2.21	1.39 - 3.52	<.01
Had sex with MSM in last 3 months N=2279				
SCO Score	Δ ten units	0.95	0.80 - 1.14	.59
Gender/ Sexual Orientation	MSW	1	---	
	MSM	40.90	17.49 - 95.63	<.01
	Female	1.06	0.41 - 2.77	.90
Ever injected	No	1	---	
	Yes	10.36	2.55 - 42.21	<.01
	Not answered	0.55	0.37 - 0.82	<.01
Ever had an STI	No	1	---	
	Yes	2.71	1.97 - 3.73	<.01
Had sex with an HIV+ partner in last 3 months N=2263				
SCO Score	Δ ten units	1.05	0.83 - 1.33	.69
Gender/ Sexual Orientation	MSW	1	---	
	MSM	9.79	2.25 - 42.51	<.01
	Female	0.69	0.13 - 3.78	.67
Ever injected	No	1	---	
	Yes	8.36	4.01 - 17.44	<.01
	Not answered	1.00	0.55 - 1.84	1.00
Ever had an STI	No	1	---	
	Yes	4.94	3.44 - 7.08	<.01

eTable 3.1: Risk Area #1: Partner Characteristics (continued)

		OR	95% CI	P Value
Oldest sexual partner is >5 years older than respondent				
N=2139				
SCO Score	Δ ten units	0.91	0.78 - 1.07	.25
Age	Δ one year	1.07	1.03 - 1.12	<.01
Gender/ Sexual Orientation	MSW	1	---	
	MSM	2.95	1.75 - 4.96	<.01
	Female	2.49	1.50 - 4.15	<.01
Ever injected	No	1	---	
	Yes	2.06	1.11 - 3.81	.02
	Not answered	1.06	0.47 - 2.40	.90
Ever had an STI	No	1	---	
	Yes	1.66	1.32 - 2.10	<.01
		OR	95% CI	P Value
Oldest sexual partner is ≥25 years old				
N=2139				
SCO Score	Δ ten units	0.88	0.76 - 1.03	.11
Age	Δ one year	1.38	1.32 - 1.45	<.01
Gender/Sexual Orientation	MSW	1	---	
	MSM	2.51	1.58 - 3.99	<.01
	Female	2.65	1.73 - 4.05	<.01
Ever had an STI	No	1	---	
	Yes	1.77	1.41 - 2.22	<.01

* The odds ratio for the variable corresponding to SCO Score is expressed per 10 unit change (e.g., the odds of subjects reporting a risk factor from a site and time point with an SCO score of 17 versus subjects from a site and time point with an SCO score of 7).

eTable 3.2: Risk Area #2: Number of Partners

		OR	95% CI	P Value
Respondent had >5 sexual partners in the last 3 months				
N=2368				
SCO Score	Δ ten units	1.01	0.83 - 1.23	.91
Age	Δ one year	1.08	1.01 - 1.15	.03
Gender/ Sexual Orientation	MSW	1	---	
	MSM	1.94	1.01 - 3.71	.05
	Female	0.56	0.27 - 1.16	.12
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	0.42	0.23 - 0.75	<.01
	Hispanic	0.44	0.25 - 0.78	.01
	Other	0.59	0.31 - 1.12	.12
Ever injected	No	1	---	
	Yes	3.13	1.61 - 6.07	<.01
	Not answered	2.04	1.34 - 3.10	<.01
Ever had an STI	No	1	---	
	Yes	2.24	1.66 - 3.04	<.01
Respondent had ≤1 sexual partner in the last 3 months				
N=2368				
SCO Score	Δ ten units	0.97	0.85 - 1.12	.70
Gender/ Sexual Orientation	MSW	1	---	
	MSM	1.48	1.00 - 2.18	.05
	Female	2.62	1.87 - 3.68	<.01
Ever injected	No	1	---	
	Yes	0.45	0.22 - 0.90	.02
	Not answered	0.75	0.55 - 1.04	.08
Ever had an STI	No	1	---	
	Yes	0.46	0.37 - 0.56	<.01

eTable 3.3: Risk Area #3: Condom Use¹

		OR	95% CI	P Value
Used condom at last sex with a main partner				
N=1807				
SCO Score	Δ ten units	0.94	0.79 - 1.13	.52
Age	Δ one year	0.89	0.85 - 0.92	<.01
Gender/ Sexual Orientation	MSW	1	---	
	MSM	1.05	0.71 - 1.57	.80
	Female	0.42	0.29 - 0.61	<.01
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	1.66	0.93 - 2.95	.08
	Hispanic	0.95	0.54 - 1.67	.86
	Other	1.02	0.54 - 1.93	.95
Ever had an STI	No	1	---	
	Yes	0.66	0.52 - 0.85	<.01
Used condom at last sex with a casual partner				
N=1271				
SCO Score	Δ ten units	1.05	0.85 - 1.30	.63
Age	Δ one year	0.94	0.90 - 0.99	.02
Gender/ Sexual Orientation	MSW	1	---	
	MSM	0.77	0.47 - 1.27	.31
	Female	0.40	0.25 - 0.63	<.01
Ever had an STI	No	1	---	
	Yes	0.79	0.61 - 1.02	.07
Used condom every time with main partner				
N=1806				
SCO Score	Δ ten units	0.86	0.71 - 1.03	.12
Age	Δ one year	0.90	0.86 - 0.94	<.01
Gender/ Sexual Orientation	MSW	1	---	
	MSM	1.31	0.87 - 1.97	.20
	Female	0.51	0.34 - 0.75	<.01
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	2.05	1.10 - 3.74	.02
	Hispanic	1.09	0.60 - 1.98	.77
	Other	0.93	0.47 - 1.82	.83
Ever had an STI	No	1	---	
	Yes	0.59	0.45 - 0.76	<.01

eTable 3.3: Risk Area #3: Condom Use¹ (continued)

		OR	95% CI	P Value
Used condom half of the time, or less often, with main partner				
N=1806				
SCO Score	Δ ten units	1.15	0.95 - 1.39	.16
Age	Δ one year	1.11	1.07 - 1.16	<.01
Gender/ Sexual Orientation	MSW	1	---	
	MSM	0.83	0.54 - 1.28	.40
	Female	1.93	1.33 - 2.80	<.01
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	0.48	0.27 - 0.87	.02
	Hispanic	0.91	0.51 - 1.62	.74
	Other	0.93	0.49 - 1.76	.82
Ever had an STI	No	1	---	
	Yes	1.48	1.16 - 1.90	<.01
Used condom every time with casual partner				
N=1270				
SCO Score	Δ ten units	1.03	0.84 - 1.26	.78
Age	Δ one year	0.95	0.90 - 0.99	.02
Gender/ Sexual Orientation	MSW	1	---	
	MSM	0.75	0.47 - 1.19	.22
	Female	0.35	0.23 - 0.56	<.01
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	1.55	0.89 - 2.68	.12
	Hispanic	0.98	0.57 - 1.68	.94
	Other	0.95	0.53 - 1.73	.87
Ever had an STI	No	1	---	
	Yes	0.67	0.51 - 0.87	<.01
Used condom half of the time, or less often, with casual partner				
N=1270				
SCO Score	Δ ten units	0.91	0.60 - 1.39	.39
Gender/ Sexual Orientation	MSW	1	---	
	MSM	1.09	0.67 - 1.79	.72
	Female	2.46	1.56 - 3.87	<.01
Ever had an STI	No	1	---	
	Yes	1.28	0.98 - 1.67	.07

¹The denominator for questions concerning condom use with a main partner includes only those respondents who reported having a main partner. The denominator for questions concerning condom use with a casual partner includes only those respondents who reported having a casual partner.

eTable 3.4: Risk Area #4: STI Infection

		OR	95% CI	P Value
Diagnosed with STI within last year N=2384				
SCO Score	Δ ten units	1.09	0.86 - 1.38	.48
Age	Δ one year	1.05	0.99 - 1.12	.09
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	1.64	0.81 - 3.31	.17
	Hispanic	1.07	0.53 - 2.16	.86
	Other	1.20	0.56 - 2.16	.65
Sought care appropriately for STI within last year N=241				
SCO Score	Δ ten units	0.97	0.72 - 1.31	.84
Age	Δ one year	0.86	0.79 - 0.94	<.01
Gender/ Sexual Orientation	MSW	1	---	
	MSM	3.10	1.20 - 8.04	.02
	Female	3.06	1.12 - 8.32	.03

eTable 3.5: Risk Area #5: HIV Testing

		OR	95% CI	P Value
Tested for HIV within the last year N=2329				
SCO Score	Δ ten units	1.09	0.92 - 1.31	.37
Age	Δ one year	1.07	1.03 - 1.12	<.01
Gender/ Sexual Orientation	MSW	1	---	
	MSM	2.79	1.81 - 4.29	<.01
	Female	1.38	0.95 - 2.01	.09
Race/ethnicity	White non-Hispanic	1	---	
	Black non-Hispanic	1.61	0.94 - 2.75	.08
	Hispanic	1.01	0.60 - 1.69	.98
	Other	1.53	0.85 - 2.74	.16
Ever had an STI	No	1	---	
	Yes	1.45	1.14 - 1.84	<.01