

## A Supplementary Tables

Table A.1: Data informing prevalence, proportions diagnosed and prevalence of undiagnosed infection, by region and risk group

Source	Group	Parameter or function	Region	Data	
				$y$	$n$
<b>Prevalence</b>					
UA IDU	IDU <sub>f</sub>	$\pi_{\text{IDU}_f,r}$	IL	5	52
			OL	3	96
			REW	2	544
	IDU <sub>m</sub>	$\pi_{\text{IDU}_m,r}$	IL	14	201
			OL	0	159
			REW	7	1,236
UA PW	SSA <sub>f</sub>	$\pi_{\text{SSA}_f,r}$	IL	170	7,281
			OL	136	8,059
			REW	113	3,548
NSSA <sub>f</sub>	$\pi_{\text{NSSA}_f,r} = \frac{\sum_{g_f \in \{\text{LR}_f, \text{IDU}_f, \text{GUM}_f\}} \pi_{g_f,r} \rho_{g_f,r}}{\sum_{g_f \in \{\text{LR}_f, \text{IDU}_f, \text{GUM}_f\}} \rho_{g_f,r}}$		IL	83	38,406
			OL	75	53,862
			REW	33	124,247
ALL <sub>f</sub>	$\pi_{\text{ALL}_f,r} = \sum_{g_f} \pi_{g_f,r} \rho_{g_f,r}$		IL	31	5,487
			OL	17	1,495
			REW	181	179,262
<b>Proportion diagnosed</b>					
UA IDU	IDU <sub>f</sub>	$\delta_{\text{IDU}_f,r}$	IL	35	49
			OL	63	88
			REW	337	525
	IDU <sub>m</sub>	$\delta_{\text{IDU}_m,r}$	IL	125	187
			OL	95	150
			REW	701	1,189
<b>Prevalence of undiagnosed infection</b>					
UA GUM	GUM <sub>f</sub>	$u_{\text{GUM}_f,r} = \pi_{\text{GUM}_f,r} (1 - \delta_{\text{GUM}_f,r})$	IL	71	16,032
			OL	0	601
			REW	31	18,217
GUM <sub>m</sub>	GUM <sub>m</sub>	$u_{\text{GUM}_m,r} = \pi_{\text{GUM}_m,r} (1 - \delta_{\text{GUM}_m,r})$	IL	66	10,869
			OL	2	490
			REW	29	17,129
GMSM	GMSM	$u_{\text{GMSM},r} = \pi_{\text{GMSM},r} (1 - \delta_{\text{GMSM},r})$	IL	141	3,104
			OL	2	34
			REW	46	2,059

Table A.2: Data informing totals diagnosed and proportions of diagnosed individuals attributable to each risk group, by region

Source	Group	Parameter or function	Region	Data	
				<i>y</i>	<i>n</i>
<b>Total diagnosed</b>					
SOPHID	ALL <sub>f</sub>	$\mu_{f,r} = (1 - \nu) \sum_{g_f} \delta_{g_f,r} \pi_{g_f,r} \rho_{g_f,r} N_{f,r}$	IL	2,770.5	
			OL	2,444.5	
			REW	5,512.0	
	ALL <sub>m</sub>	$\mu_{m,r} = (1 - \nu) \sum_{g_m} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r} N_{m,r}$	IL	7,317.5	
			OL	2,541.0	
			REW	7,934.5	
<b>Proportion of diagnosed individuals attributable to each risk group</b>					
SOPHID	IDU <sub>f</sub>	$s_{IDU_f,r} = \frac{\delta_{IDU_f,r} \pi_{IDU_f,r} \rho_{IDU_f,r}}{\sum_{g_f} \delta_{g_f,r} \pi_{g_f,r} \rho_{g_f,r}}$	IL	94.0	2,736.0
			OL	22.0	2,424.5
			REW	115.0	5,470.0
	SSA <sub>f</sub>	$s_{SSA_f,r} = \frac{\delta_{SSA_f,r} \pi_{SSA_f,r} \rho_{SSA_f,r}}{\sum_{g_f \setminus IDU_f} \delta_{g_f,r} \pi_{g_f,r} \rho_{g_f,r}}$	IL	1,988.0	2,642.0
			OL	1,972.0	2,402.5
			REW	4,000.0	5,355.0
MSM		$s_{MSM,r} = \frac{\sum_{g_m \in \{GMSM, NGMSM, PMSM\}} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r}}{\sum_{g_m} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r}}$	IL	5,556.0	7,120.5
			OL	1,327.0	2,475.5
			REW	4,941.0	7,808.5
IDU <sub>m</sub>		$s_{IDU_m,r} = \frac{\delta_{IDU_m,r} \pi_{IDU_m,r} \rho_{IDU_m,r}}{\sum_{g_m \setminus MSM} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r}}$	IL	186.0	1,564.5
			OL	48.0	1,148.5
			REW	226.5	2,867.5
SSA <sub>m</sub>		$s_{SSA_m,r} = \frac{\delta_{SSA_m,r} \pi_{SSA_m,r} \rho_{SSA_m,r}}{\sum_{g_m \setminus \{MSM \cup IDU_m\}} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r}}$	IL	930.5	1,378.5
			OL	798.5	1,100.5
			REW	1,802.0	2,641.0

Table A.3: Data informing proportions of diagnosed individuals who are GUM attenders, by region and risk group. Data represent minimum bounds for these functions. “NSHET” refers to the group of non-SSA born non-IDU heterosexuals.

Source	Group	Parameter or function	Region	Data	
				$y$	$n$
<b>Proportion of diagnosed individuals who are GUM attenders</b>					
SOPHID	NSHET <sub>f</sub>	$p_{\text{NSHET}_f,r} = \frac{\delta_{\text{GUM}_f,r} \pi_{\text{GUM}_f,r} \rho_{\text{GUM}_f,r}}{\sum_{g_f \in \{\text{LR}_f, \text{GUM}_f\}} \delta_{g_f,r} \pi_{g_f,r} \rho_{g_f,r}}$	IL	209	521
			OL	119	316
			REW	307	1,007
	NSHET <sub>m</sub>	$p_{\text{NSHET}_m,r} = \frac{\delta_{\text{GUM}_m,r} \pi_{\text{GUM}_m,r} \rho_{\text{GUM}_m,r}}{\sum_{g_m \in \{\text{LR}_m, \text{GUM}_m\}} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r}}$	IL	141	383
			OL	96	214
			REW	224	657
MSM		$p_{\text{MSM},r} = \frac{\delta_{\text{GMSM},r} \pi_{\text{GMSM},r} \rho_{\text{GMSM},r}}{\sum_{g_m \in \{\text{GMSM}, \text{NGMSM}, \text{PMSM}\}} \delta_{g_m,r} \pi_{g_m,r} \rho_{g_m,r}}$	IL	1,869	4,927
			OL	404	1,050
			REW	1,270	4,137

Table A.4: Data informing proportions of pregnant women who are diagnosed, by year, time of diagnosis (before or during pregnancy), region and risk group

Region	Year	# diagnosed (NSHPC)				# positive (UA PW)		
		Before		During		SSA <sub>f</sub>	NSSA <sub>f</sub>	ALL <sub>f</sub>
		SSA <sub>f</sub>	NSSA <sub>f</sub>	SSA <sub>f</sub>	NSSA <sub>f</sub>	SSA <sub>f</sub>	NSSA <sub>f</sub>	ALL <sub>f</sub>
IL	1997	22	9	11	4	37	8	79
	1998	30	10	25	11	56	25	70
	1999	55	13	45	16	67	21	85
	2000	64	18	64	13	126	18	43
	2001	62	17	99	15	120	25	58
	2002	78	13	107	23	143	32	75
	2003	101	23	118	23	155	36	89
	2004	109	30	94	31	170	83	31
OL	1997	7	2	4	2	22	6	48
	1998	12	0	8	1	42	10	27
	1999	12	6	19	3	30	7	44
	2000	20	4	45	10	69	12	30
	2001	34	7	74	17	95	22	45
	2002	54	8	53	18	99	17	54
	2003	79	13	95	15	128	18	85
	2004	79	17	75	17	136	75	17
REW	1997	2	6	3	0	1	3	52
	1998	7	5	3	1	7	2	45
	1999	4	12	3	2	10	3	60
	2000	8	13	19	6	27	10	59
	2001	6	11	50	23	22	21	93
	2002	25	20	98	30	42	16	151
	2003	62	26	150	46	51	18	222
	2004	89	24	171	29	113	33	181