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Abstract

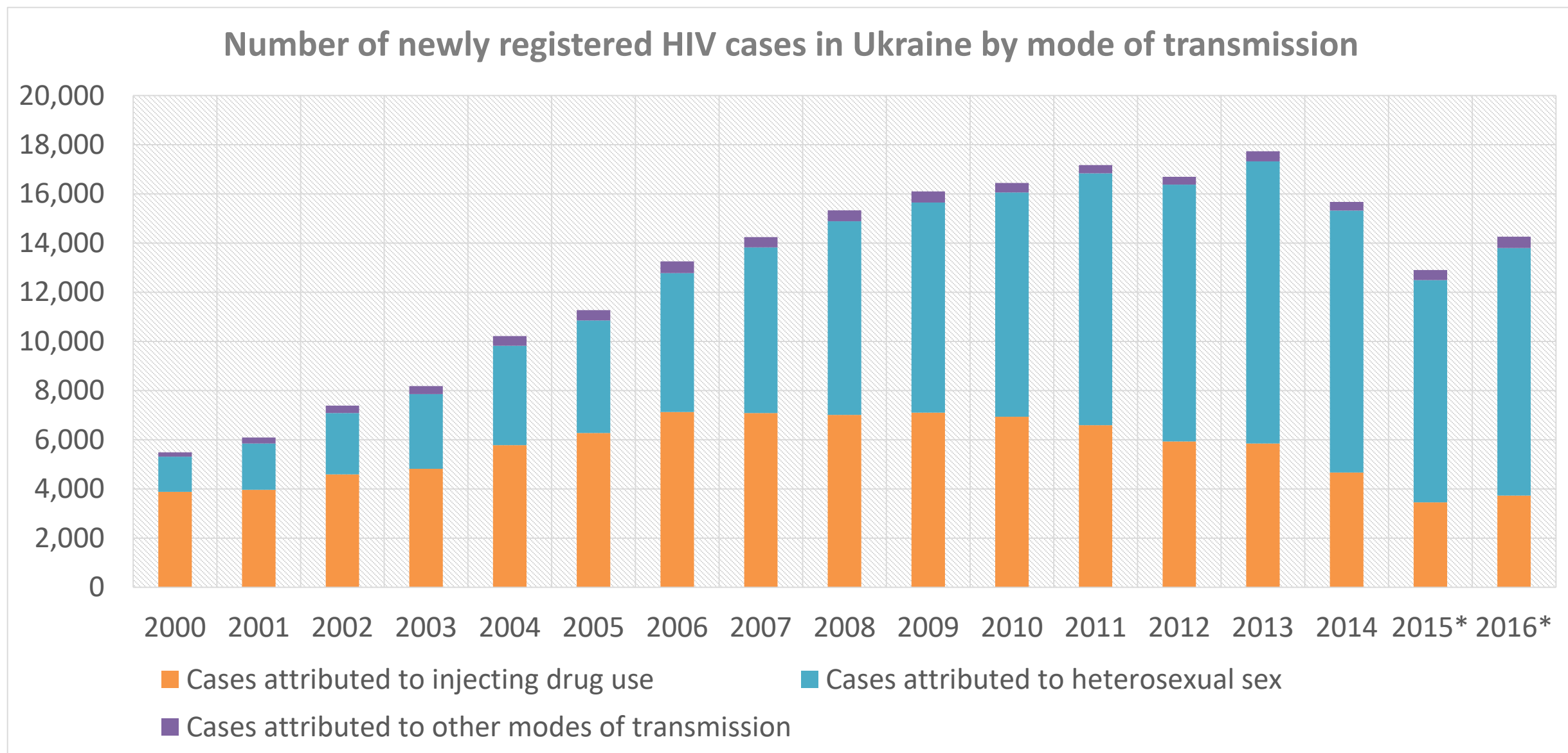
HIV prevention cascades were proposed to replicate the success of treatment cascades and reinvigorate the prevention programs through improved monitoring, planning and delivery. The latest concept includes four elements: 'priority population', 'motivation', 'access', and 'effective use'. We adapted the methodology to the PWID context and analyzed factors associated with achieving each stage of the continuum.

We analyzed 2017 bio-behavioral survey data collected in all 27 regions of Ukraine using respondent-driven sampling. Self-reported data on prevention service use and injection risk were used to construct the cascade. Socio-demographic and drug use variables were evaluated as potential correlates of cascade outcomes using chi-square test.

Of all participants who were HIV negative (N=7,792), 3,155 (42%) reported receiving at least one service (syringe, condom or HIV test), and 1,375 (18%) reported using all three services in past 12 months. The subsequent indicators were calculated using two approaches. In the sequential [SEQ] approach including only those from previous indicator, 1,349 (18% of total) reported using a clean syringe for last injection, 1306 (17%) used only clean syringes in 30 days, and 480 reported no injection-related risks (including container sharing and front-loading) in 30 days. In traditional [TR] calculation including all sample, 7,583 (97%) reported using clean syringe at last injection, 7,405 (95%) using only clean syringes in 30 days, and 2,882 (38%) reported no injection risk. In SEQ approach, the stimulant users had riskier behavior in last indicator (4.5% vs 6.8% in opioid users, p=0.038), whereas in TR cascade it was opposite (4.4% vs 39%, p<0.001). Similar discrepancy was found in comparison of last indicator between age groups <25 and >44 (3.8% vs 7.9 in SEQ, and 46% vs 39% in TR).

We faced methodological challenges in adapting the HIV prevention cascade framework to PWID context. Unlike in the treatment cascade, 'access to services' and 'effective use' are not always linked one to another, because PWID are frequently obtaining syringes from other sources. Application of linear cascade framework to the multifaceted HIV prevention programs may yield misleading results. To guide programmatic response, the traditional approach to analyze each indicator and their predictors separately may be more practical.

Background



Official case registration data show that the number of newly registered cases is declining since 2012, and the number of cases attributed to IDU is declining since 2008.

Methods

Data source: Integrated bio-behavioral surveillance

- Bi-annual anonymous surveys in three key populations (PWID, MSM, CSW)
- Nationally representative samples
- Respondent-driven sampling for PWID and MSM, time location sampling and RDS for CSW since 2007
- Behavioral and socio-demographic characteristics measured by a paper-based questionnaire

Cascade formulation

To ensure comparability with the existing frameworks, our primary analysis focused on the HIV-negative sub-population of PWID.

The second element of the cascade is generally conceptualized as awareness of HIV risk and are willingness to use the prevention services. The IBBS in Ukraine did not assess the perception of personal HIV risk, but did demonstrate almost universal knowledge of HIV modes of transmission among PWID. It is important to understand that all PWID are always motivated to use clean syringes and needles regardless of their perception of HIV risk or risk practices just because injection with a new needle is less painful. Therefore, we assumed that this cascade element is equal to the first one, and did not include it separately.

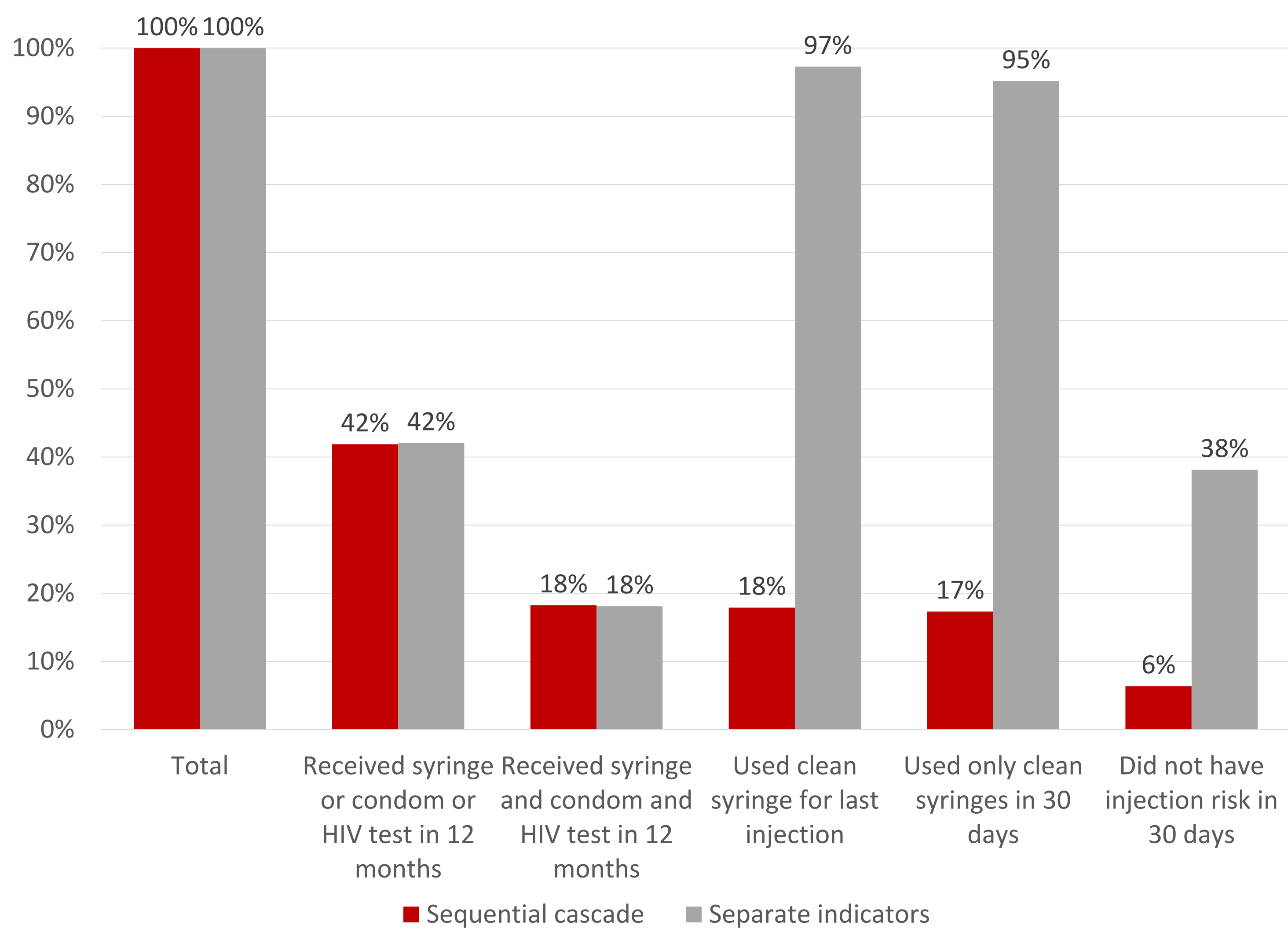
The next stage of the cascade should reflect the coverage of prevention services. The first coverage indicator counts the number of PWID who received either a syringe or a condom or a HIV test through the prevention programs in the past 12 months. Second, more robust indicator, counts those who received each of the services together. Since HIV testing is not needed for those aware of HIV-positive status, we created another variant of this indicator excluding HIV testing.

The final stage of the cascade we used the standard UNAIDS indicator on the use of a clean syringe and needle at last injection, followed by a more stringent indicator on using only clean syringes in the past 30 days, and then the absence of any injection risk in the past 30 days (defined as not using shared syringes/needles, other injection equipment or containers, pre-filled syringes, and back- or front-loading).

Analysis

- Chi-square for univariable analysis and multivariable logistic regression to assess predictors of each cascade indicator.

Results



Results: Sequential cascade

		Received syringe or condom or HIV test in 12 months				Received syringe and condom and HIV test in 12 months				Used clean syringe for last injection				Used only clean syringes in 30 days				Did not have injection risk in 30 days			
		Total ¹	N	%	p-value	N	%	p-value		N	%	p-value		N	%	p-value		N	%	p-value	
Sex	male	7535	3155	42%		1375	18%			1349	18%			1306	17%			480	6%		
	female	6360	2635	41%	.028*	1134	18%	0.236		1111	17%	.410a		1082	17%	.010*		400	6%	0.723	
Age	<=24	1175	520	44%		241	21%			238	20%			224	19%			80	7%		
	25-44	613	160	26%	.000*	56	9%	0.051		55	9%	.930a		52	8%	0.584		23	4%	0.264	
	>=45	6065	2587	43%		1142	19%			1121	18%			1086	18%			389	6%		
Injection duration	<=2 years	857	408	48%		177	21%			173	20%			168	20%			68	8%		
	>=3 years	689	165	24%	.000*	46	7%	.000*		46	7%	.339a,b		44	6%	.647b		13	2%	0.313	
	live with partner	6827	2982	44%		1326	19%			1300	19%			1259	18%			466	7%		
Family status	live alone	3123	1304	42%	.875b	550	18%	.068b		536	17%	.147a		524	17%	.105b		185	6%	.374a	
	live with partner	4412	1851	42%		825	19%			813	18%			782	18%			295	7%		
	<high school	1230	504	41%	0.704	215	17%	0.909		204	17%	.001*		192	16%	.014*		88	7%	.006*	
Education	high school	4688	1973	42%		867	18%			855	18%			836	18%			284	6%		
	>high school	1617	678	42%		293	18%			290	18%			278	17%			108	7%		
Monthly income	<120 USD	2216	987	45%	.004*	404	18%	0.130		396	18%	.868a,b		384	17%	.393b,c		162	7%	.008*	
	120-400 USD	4414	1820	41%		811	18%			796	18%			767	17%			274	6%		
	400-800 USD	733	280	38%		130	18%			127	17%			126	17%			39	5%		
Type of drugs injected in 30 days	>800 USD	172	68	40%		30	17%			30	17%			29	17%			5	3%		
	only opioids	4712	2065	44%	0.000	892	19%	0.032		876	19%	0.544		853	18%	0.152		320	7%	0.038	
	only stimulants	1057	287	27%		110	10%			109	10%			106	10%			48	5%		
	mix or other	1766	803	45%		373	21%			364	21%			347	20%			112	6%		

Multivariable analysis		Received syringe or condom or HIV test in 12 months			Received syringe and condom and HIV test in 12 months			Used clean syringe for last injection			Used only clean syringes in 30 days			Did not have injection risk in 30 days		
Sex	male	AOR	95% CI	sig.	AOR	95% CI	sig.	AOR	95% CI	sig.	AOR	95% CI	sig.	AOR	95% CI	sig.
		0.8	0.7-0.9	<0.001	0.9	0.7-1.0	0.129	0.6	0.2-2.0	0.395	2.2	1.1-4.3	0.020	0.9	0.6-1.2	0.377
age	female	ref.			ref.			ref.			ref.			ref.		
	<=24	ref.			ref.			ref.			ref.			ref.		
first experience <3 years	25-44	1.5	1.2-1.8	<0.001	1.2	0.8-1.7	0.308	1.1	0.1-8.5	0.925	1.6	0.5-5.5	0.439	1.3	0.8-2.3	0.317
	>=45	1.6	1.3-2.1	<0.001	1.1	0.8-1.7	0.504	0.8	0.1-7.4	0.800	1.7	0.4-7.5	0.475	1.1	0.6-2.0	0.792
	yes	0.5	0.4-5.6	<0.001	0.5	0.4-0.7	<0.001									
family status	no	ref.			ref.											
	live alone															
	live with partner															
education	<high school							0.2	0.1-0.7	0.013	0.7	0.3-1.5	0.318	0.8	0.5-1.2	0.016
	high school							0.8	0.2-2.8	0.699	1.8	0.9-3.8	0.112	1.3	1.0-1.7	0.097
	>high school							ref.			ref.			ref.		
income	<3000	1.2	0.9-1.7	0.196										0.3	0.1-0.8	0.016
	<10000	1.1	0.8-1.5	0.642										0.4	0.1-1.0	0.055
	<20000	1.0	0.7-1.4	0.879										0.5	0.2-1.3	0.141
	>=20000	ref.												ref.		
Drug choice	only opioids	ref.			ref.									ref.		
	only stimulants	0.5	0.4-0.6	<0.001	0.9	0.7-1.1	0.360							0.7	0.5-1.1	0.130
	mixed use or other	1.1	0.99-1.2	0.088	1.2	1.004-1.4	0.044							1.2	1.02-1.6	0.024

Results: Separate indicators

		Received syringe or condom or HIV test in 12 months				Received syringe and condom and HIV test in 12 months				Received syringe and condom and HIV test in 12 months				Used clean syringe for last injection				Used only clean syringes in 30 days				Did not have injection risk in 30 days			
		Total	N	%	p-value	N	%	p-value	N	%	p-value	N	%	p-value	N	%	p-value	N	%	p-value	N	%	p-value		
Total HIV negative		7792	3276	42%		2584	33%		1411	18%		7583	97%		7405	95%		2882	38%						
	Sex	6569	2727	42%	.028*	2154	33%	0.106	1162	18%	.026*	6387	97%	0.110	6278	96%	.000*	2437	38%	0.758					
Age	female	1223	549	45%		430	35%		249	20%		1196	98%		1127	92%		445	38%						
	<=24	640	165	26%	.000*	112	18%	.000*	56	9%	.000*	616	96%	0.154	607	95%	0.635	285	46%	.000*					
	25-44	6268	2688	43%		2132	34%		1173	19%		6110	97%		5959	95%		2260	37%						
Injection duration	>=45	884	423	48%		340	38%		182	21%		857	97%		839	96%		337	39%						
	<=2 years	712	170	24%	.000*	114	16%	.000*	47	7%	.000*	692	97%	0.398	676	94%	0.331	316	46%	.000*					
	>=3 years	7061	3098	44%		2464	35%		1361	19%		6873	97%		6711	95%		2558	37%						
Family status	live alone	3269	1371	42%	.875b	1058	32%	.204b	565	17%	.108b	3157	97%	.008*,b	3111	95%	.516b	1227	39%	.136b					
	live with partner	4523	1905	42%		1526	34%		846	19%		4426	98%		4294	95%		1655	37%						
Education	<high school	1260	517	41%	0.704	412	33%	0.915	219	17%	0.718	1211	96%	.036*	1177	94%	.008*	484	39%	0.682					
	high school	4878	2065	42%		1625	33%		895	18%		4762	98%		4646	95%		1778	38%						
	>high school	1654	694	42%		547	33%		297	18%		1610	97%		1582	96%		620	38%						
Monthly income	<120 USD	2325	1044	45%	.004*	807	35%	0.114	420	18%	0.995	2259	97%	0.697	2192	95%	0.500	908	41%	.000*					
	120-400 USD	4547	1877	41%		1498	33%		827	18%		4424	97%		4340	95%		1713	39%						
	400-800 USD	747	286	38%		227	30%		133	18%		732	98%		709	95%		214	29%						
Type of drugs injected in 30 days	>800 USD	173	69	40%		52	30%		31	18%		168	97%		164	94%		47	27%						
	only opioids	4914	2163	44%	.000*	1687	34%	.000*	919	19%	.000*	4796	98%	0.181	4721	96%	.000*	1862	39%	.000*					
	only stimulants	1079	296	27%		227	21%		113	10%		1047	97%		1018	95%		470	44%						
	mix or other	1799	817	45%		670	37%		379	21%		1740	97%		1666	93%		550	31%						