Population Size Estimation within a Biobehavioral Survey among People who Inject Drugs and Men who Have Sex with Men in the Survey Cities of the Kyrgyz Republic, 2021

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BACKGROUND

- The Kyrgyz Republic (KR) is a country with an HIV epidemic concentrated among key populations (KP).
- Population size estimates (PSE) are critical for calculating burden estimates, health risk, and to inform program planning. Updated and high-quality PSE are lacking for KPs.
- Accurate KP PSE are necessary to design and evaluate programs and policies designed prevent new HIV infections and monitor the dynamics of the epidemic.
- Incorporating empirical PSE methods within biobehavioral surveys may offer an efficient opportunity to generate valid PSE for select populations.

METHODS

- We conducted a biobehavioral survey (BBS) using respondent-driven sampling (RDS) in 2021 among people who inject drugs (PWID) and men who have sex with men (MSM) **(Figure 1).**

LIMITATIONS

- The overall sample size was low and not nationally representative.
- PSE were dependent on data quality collected in each site (e.g., self-report, program records) may have influenced the accuracy of the estimates.
- Self-reported network sizes may have influenced results.
- The social network-based approach to recruitment may fail to produce a representative sample of the population if certain groups of people (e.g., high income KP) have loose or nonexistent social ties to the rest of the population, affecting their probability of being sampled.

CONCLUSIONS

- 2021 BBS in KR provided a cost-effective and timely opportunity to complete a range of empirical, probability-based PSEs.
- These updated estimates generally fell within the globally recognized ranges.
- The triangulation of survey and programmatic data over time along with use of synthesis models could help refine PSE and support optimal allocation of limited resources and improve target-setting and program monitoring.
- 2021 BBS in KR was implemented in select locations rather than a national sample; this requires extrapolation to generate a national PSE.

There is no 'gold-standard' for size estimation as each methodology has its strengths and weaknesses.

Using multiple method outputs to synthesize one single output provides empirical population size estimates that can be used by program implementers and policy makers to more effectively and efficiently allocate resources for response.

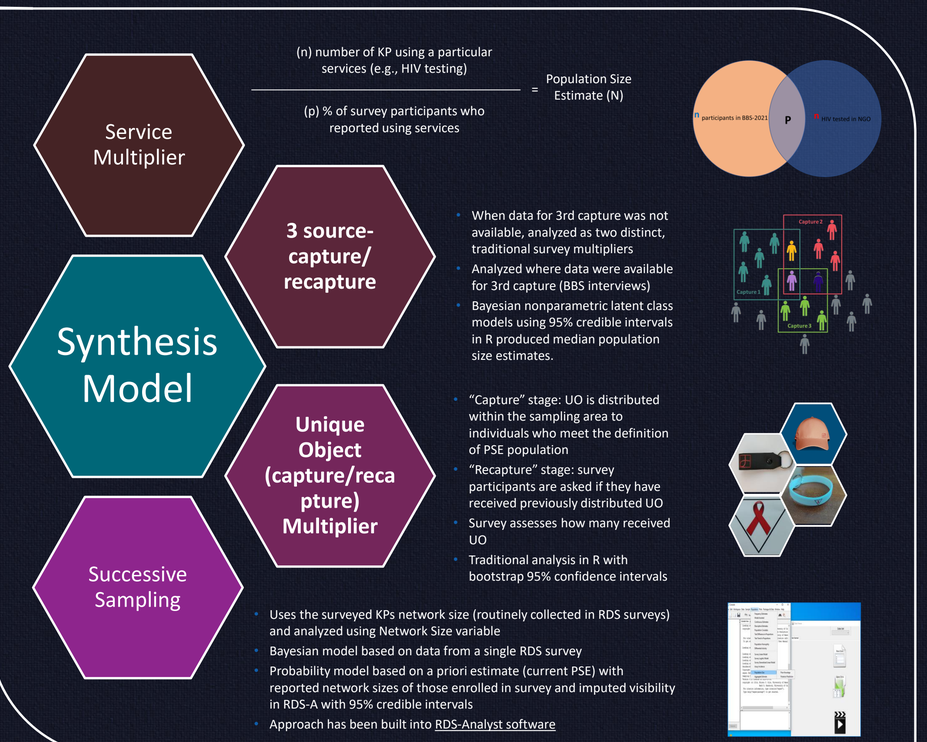

Table 1: Multiple Empirical PSE Methods

BBS Pop.	Site	Service Multiplier			3 Source capture/recapture			Unique Object Multiplier 1			Unique Object Multiplier 2			Successive Sampling PSE		
		PSE	LB	UB	PSE	LB	UB	PSE	LB	UB	PSE	LB	UB	PSE	LB	UB
MSM	Bishkek	12,665	11,336	14,604	-	1,373	4,444	-	-	-	-	-	-	2,287	1,697	2,502
	Osh	490	337	950	-	NA	NA	97	64	147	48	32	85	617	486	660
PWID	Bishkek	15,617	12,035	21,521	-	1,827	16,728	-	-	-	-	-	-	2,438	1,900	2,639
	Kara-Balta	12,229	4,584	26,781	-	NA	NA	51	39	115	38	27	60	117	61	488
	Kara-Suu	2,616	2,192	3,306	-	NA	NA	194	179	213	190	169	214	1,241	407	2,312
	Osh	6,005	5,009	7,490	-	1,378	15,960	-	-	-	-	-	-	1,006	290	1,926
	Sokuluk	7,580	4,683	16,892	-	881	6,590	-	-	-	-	-	-	641	181	1,264
	Tokmok	3,699	2.807	5,228		393	612	-	-	-	-	-	-	246	175	697

Table 2: PSE Synthesis Model Outputs

BBS Pop.	Site	Synthesis Estimate			% of Population		
		Median	Lower	Upper	%	Lower	Upper
MSM	Bishkek	6,126	5,185	7,183	2.0	1.7	2.4
	Osh	863	749	993	1.0	0.8	1.1
PWID	Bishkek	4,068	3,312	4,937	1.4	1.1	1.6
	Kara-Balta	113	80	153	1.1	0.7	1.4
	Kara-Suu	380	323	440	0.3	0.3	0.3
	Osh	1,147	897	1,467	1.3	1.0	1.6
	Sokuluk	711	540	932	1.3	1.0	1.6
	Tokmok	219	169	286	1.3	1.0	1.6
	Bishkek	6,126	5,185	7,183	2.0	1.7	2.4

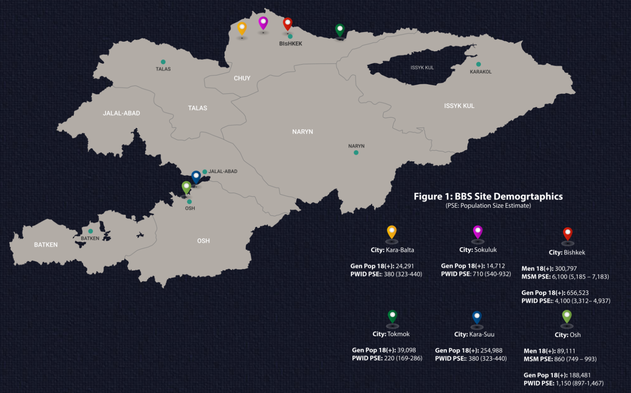

Figure 1: BBS Site Demogrtaphics
(PSE: Population Size Estimate)