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METHODOLOGICAL CHALLENGES IN ESTIMATING THE SIZE OF KEY POPULATIONS USING INNOVATIVE METHOD: NETWORK-BASED CAPTURE-RECAPTURE

Background

- Network-based capture-recapture (NCRC) method proposed by Dombrowski was introduced among methamphetamine users in the USA in 2012.
- This method was first time applied in Georgia among Men who have Sex with Men (MSM) and later among People Who Inject Drugs (PWIDs). The abstract presents key methodological challenges emerged during fieldwork while using this innovative method.

Methods (1)

- Different population size estimation (PSE) methods - 7 for MSM (*Network Scale-up, Web- and mob- App Multipliers, Service Multiplier, Unique Object Multipliers, RDS-based Handcock, Wisdom of Crowd, NCRC*) and 3 for PWIDs (*Network Scale-up, Multiplier, NCRC*) - were used in these studies, including the NCRC.
- The innovation of the NCRC is that the respondent provides both capture and recapture data coded for subject anonymity in a single-session, which for our studies were 210 adult MSM and 2,037 PWIDs recruited in Georgia in 2014 and 2015, respectively.



Methods (2)

- For the capture phase the study participants reported their personal characteristics (approximate height, weight, hair color and ethnicity) and so called “telefunken codes” derived from the last four digits of their own mobile number.

An example for coding



	Descriptives	Codes	Descriptives	Codes	Descriptives	Codes
Phone number	*****3563	LHHL EEOE	*****1842	LHLL E000	*****4586	LHHH OE00
Height	168 cm	S	185 cm	T	176 cm	M
Weigh	108 kg	O	63 kg	T	78 kg	M
Hair color	Dark	D	Light	Light	Ginger	G
Nationality	Georgian	G	Russian	R	Armenian	A

Methods (3)

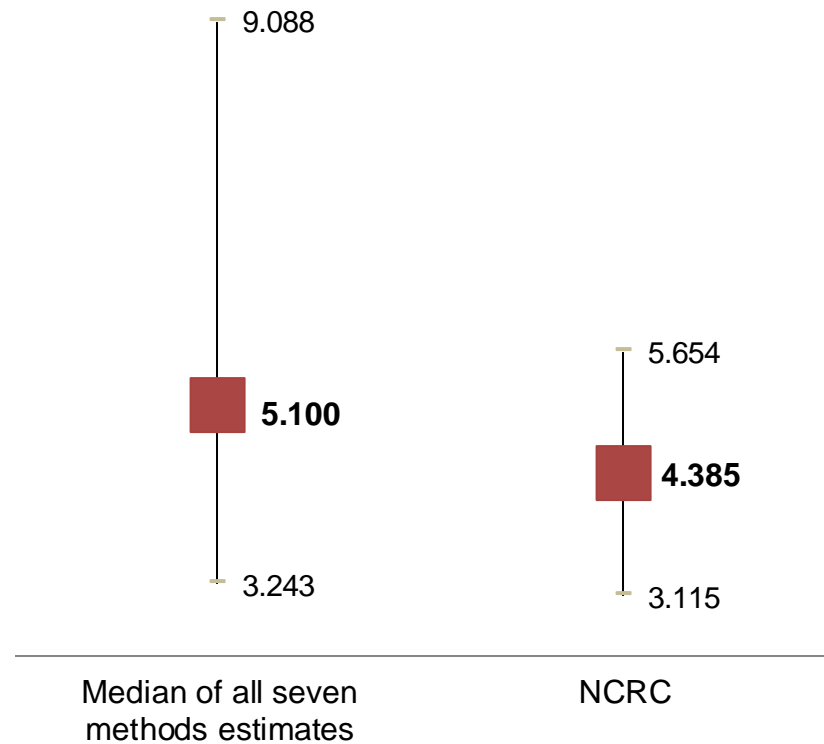
- As for the recapture, the respondents provided the similar characteristics appealing to their randomly selected five contacts from the mobile phone directories.
- PSE study among PWIDs was linked to bio-behavioral surveillance survey (BBS). Statistical analysis was performed using Lincoln-Peterson method



Results (1)

- The NCRC method provided MSM population size estimate that was in line with the estimates derived from other more established PSE methods (Fig 1).

Figure 1. MSM PSE in Tbilisi, 2014



Results (2)


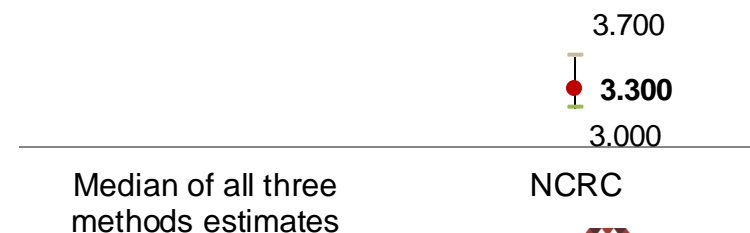
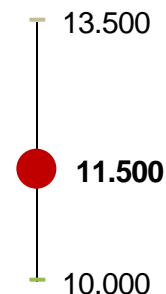
- While for PWIDs, this method yielded in underestimation compared to the median estimates of other PSE methods (Fig 2) 
- The inaccuracy of NCRC estimates among PWIDs was demonstrated by a higher false matches among this population compared to MSM. In addition, refusal rate was 3.2% among PWIDs, while zero refusals were recorded among MSM.

Figure 2. PSE of PWIDs in Tbilisi, 2015



Conclusion

- ❑ Failure of NCRC method among PWIDs could also be explained by the following:
 - Drug use is criminalized in Georgia.
 - Despite assurance of the confidentiality PWID were resistant to disclose personal characteristics of their peers, as well as giving information on the “telefunken codes”.
 - In addition the PSE questionnaire requires concentration on the task. This was difficult to achieve among PWIDs as the PSE questions were preceded by the BBS questionnaire, which required approximately 40-minutes to complete. In contrary, among MSM only PSE study was applied, that resulted in accurate estimates.
- The contextual factor coupled with the study design (combining BBS and PSE studies with improper sequencing of the study modules) affected the reliability of the NCRC method among PWID. At the same time NCRC provided valid estimates among MSM.
- **It is a simple, cheap and feasible method and recommended for application in PSE studies.**

