Online supplement for Respondent-Driven Sampling: An Overview in the Context of Human Trafficking

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In this document, we provide some additional comments and references.

1. Background

Even under a single definition, what gets counted as trafficking on a case-by-case basis depends on popular conceptions of trafficking, which are shaped by racism, sexism, colonialism, and other systemic injustices. Much of the anti-trafficking movement in the United States, and early legislation such as the Mann Act which continues to be used in prosecutions today, has roots in unfounded early-twentieth-century panic about "white slave traffic" (Allain, 2017). Black youth who trade sex for money or material needs are more likely than their white counterparts to be viewed as deviants or complicit agents rather than as victims (Showden and Majic, 2018).

Another difficulty with administrative data is that traffickers are often charged instead

with other easier offenses to prove (Barrick and Pfeffer, 2021).

For an overview of public health research priorities in US human trafficking research, see Rothman et al. (2017).

2.   Applying NSUM and RDS to trafficking

NSUM-based trafficking prevalence estimates have not yet been published to our knowledge, but several studies as part of the Prevalence Reduction Innovation Forum (PRIF) initiative are currently underway to directly compare NSUM and other estimation methods on the same target populations (University of Georgia Center on Human Trafficking Research and Outreach, 2023; Schroeder et al., 2022; Zhang, 2022). For reviews of NSUM, see McCormick (2021) and Laga et al. (2021).

In their scoping review of measurement strategies to learn about the prevalence and experience of human trafficking, Barrick and Pfeffer (2021) report that around 16% of the studies included in their review utilized RDS. Franchino-Olsen et al. (2022) conducted a scoping review on prevalence estimates for domestic minor sex trafficking and commercial sexual exploitation of children, and of the six studies included in the review, one used RDS. These examples demonstrate both that RDS is being used in human trafficking research and that the methodology is not yet standardized.

Gile and Handcock (2010) found that the seed-induced bias depends on the extent of homophily and the number of sampling waves. If there are substantial bottlenecks in the network then the recruitment process can get "stuck" in one pocket not explore the full extent of the graph; see Rohe (2019), for example.

RDS assumes that network connections are reciprocal, that person A is equally likely to refer person B as person B would be to refer person A (Volz and Heckathorn, 2008).

Goel and Salganik (2010) point out that violations of these assumptions can lead to substantial issues with statistical inference.

The question of how to measure the uncertainty in RDS estimators is also an area of current work; see for example Green et al. (2020); Rohe (2019); Baraff et al. (2016); Goel and Salganik (2010).

We note a few additional considerations in applying RDS to trafficking, as illustrated by other studies:

Unrepresentative seeds. Zhang et al. (2014) implemented RDS to estimate trafficking prevalence among unauthorized migrant laborers in San Diego. They worked with a community partner to build trust with the migrant community and recruit initial respondents, and they were able to exceed their estimated minimum sample size. However, the study was also limited by the combination of ethnic homophily and an ethnically homogeneous set of seeds. All their seeds were Mexican workers, and unauthorized Mexican migrants tended to connect among themselves rather than with other Spanish-speaking unauthorized migrants; as a result, the study had limited recruitment among non-Mexicans and was not representative of the undocumented migrant laborer community as a whole.

Non-reciprocal links. In a study of sex trafficking risk factors using data from a 2011 RDS survey of urban street-based Ohio sex workers, Chohaney (2016) found that the network violated the reciprocity assumption. Roughly one quarter of respondents described the person who referred them as a stranger, one quarter described them as neighbors or someone they "kind of know," and the remaining half described them as friends or family members.

Lack of visibility to other sex workers. While Carrillo et al. (2020) did not study trafficking but rather women who exchange sexual services for money or other goods, their study findings are relevant to implementing RDS in trafficking studies as well. One-third of the study participants recruited by previous waves of participants turned out to be ineligible or had not exchanged sex in the past year. One potential reason they identified is that women may have limited knowledge of whether specific other women they know are exchanging sex.

Misalignment between recruitment and eligibility criteria. Additionally in the study by Carrillo et al. (2020), recruiters were asked to recruit women who exchanged sex, not women who exchanged sex specifically within the last 12 months, which was the specific question that interviewers asked to assess group membership. This illustrates the importance of aligning the recruitment instructions with the study criteria, and yet asking participants to confirm more specific criteria when they recruit further participants may not be feasible if they require them to ask others more specific and sensitive questions.

3. Recent advances and future directions

RRDS relies on individuals knowing phone numbers (or saving contacts) of other members of the group of interest. Boudreau et al. (2023) implemented RRDS with workers in a large-scale industrial manufacturing setting during the peak of the COVID-19 pandemic. Telephone surveys were the only means to obtain critical information on the health and well-being of workers, as in-person activities were restricted. More research is needed to understand how effective this approach will be in the context of trafficking.

Specifically in the context of trafficking studies, there have also been efforts to combine RDS with traditional representative sampling methods, venue-based sampling, and multiple systems estimation to improve estimation and inference (Vincent and Thompson, 2017; Vincent, 2018). Zhang et al. (2019) leverage overlaps among RDS participants' social networks to improve population size estimation using mark-recapture methods. Vincent et al. (2021a) conduct both RDS and venue-based sampling, then use mark-recapture methodology to improve inference by combining the two samples. Vincent et al. (2021b) increase the number of initial seeds and reduce the necessary number of RDS waves.

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