



PREVALENCE REDUCTION INNOVATION FORUM



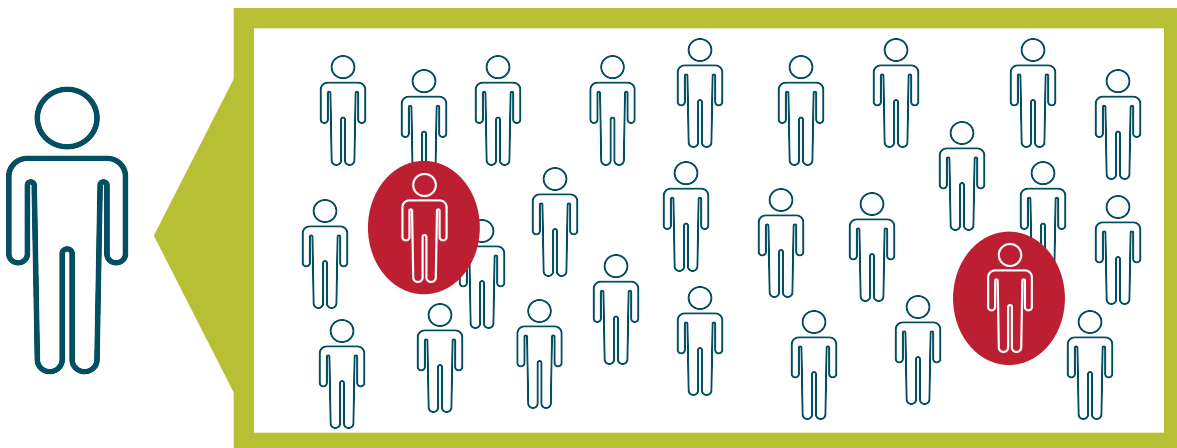
NETWORK SCALE-UP METHOD

The network scale-up model (NSUM) is a methodology specifically developed to estimate prevalence rates of hard-to-reach populations based on an individual's social network. A participant reports the number of people in their network and then identifies how many in that network are also members of the target population (e.g. trafficking victim).

Participants are also asked how many people in their network ascribe to other common subgroups with readily available data (e.g. number of primary school teachers) to allow for the estimation of the average network size of that respondent.

Clearly defined and operational designations of what it constitutes to be in one's social network are crucial for NSUM estimates. If the definition of being "known" by someone is too broad more bias is introduced into the estimate, but if the definition is too narrow it can affect the precision of the estimate.

Researchers can base a study's social network definition on population-specific characteristics and the particular goals of the study. Participants' reported numbers of target population members in their social network are extrapolated to the general population, or population segment, using secondary data (e.g. Census reports) and statistical methods.



ASSUMPTIONS

- Social ties are formed completely at random.
- Respondents are perfectly aware of the characteristics of their social network.
- Respondents are able to provide accurate answers to questions about their personal networks.
- An individual's network of known people is generally representative of the population in which they reside.

PAST NSUM EXAMPLES

Wang et al. (2015) randomly selected **4017 households** from a large Chinese city's districts and surveyed on household person randomly from all eligible persons in each household. The "known people" definition included **people they had met in person, known by sight or name, had contact within the last 2 years via phone calls or email, and had lived in the same region for at least 6 months.**

Jing et al. (2018) failed to get adequate responses from a household survey and shifted to **workplace surveys**. They randomly selected **174 workplaces** from 20 sectors for a total of **8031 respondents**. The "known people" definition included **people they know and who know them by name or by sight, live in the same region, and whom the respondent had contact with in the past 12 months.**

PREVIOUS USES

Individuals at Risk for HIV

Feehan et al. (2016); Raftery, McCormick, & Baraff (2015); Salganik et al. (2010); Wang et al. (2015)

Individuals Engaged in Commercial Sex

Jing et al. (2018)

PROS

- Can be implemented in communities that lack data collection infrastructure, such as developing countries.
- Draws information from general community members and does not rely on direct contact with hard-to-reach population members.
- Can estimate the size of multiple populations in a single survey.

CONS

- Requires large, population-representative samples.
- Need to mitigate associated biases.

A NOTE ABOUT DATA REGISTRIES

There are at least 3 primary sources of bias within NSUM:

Transmission Bias

This occurs when a respondent fails to recognize that they know something about their friends and acquaintances or the relevant information was never communicated to them. Since many hard-to-reach population characteristics are also associated with social stigma, participants might not have accurate information about people in their networks. For example, stigmatizing information such as having HIV is unlikely to be transmitted in normal conversation. The main correction in the data collection stage is to ask known population questions that are more likely to be communicated or observable (e.g. occupation, education status, children, etc.). The collected data can also be corrected by calculating adjustment factors based on included questions on the respondents' perception of community members' knowledge about the respondent. For example, asking questions such as "What percentage of your social network clearly know your highest level of education?" can illuminate a respondent's knowledge of their network and how that translates to the general population

Barrier Bias

This describes the various physical and social barriers that can prevent knowing people in various populations based on someone's context and characteristics (e.g. living in a rural area, part of a homogeneous religious group, etc.). It occurs from the non-random mixing of people in a society which violates the assumption of random social ties. To counteract this bias, researchers can use representative random samples.

Recall Bias

This occurs when a respondent doesn't accurately recall the number of people that they know in sub-populations when asked by researchers. Each subgroup that respondents are asked about should only constitute ~5% of the population as specific characteristics are easier to recall than ubiquitous categories. For example, someone might have trouble recalling how many women are in their social network since it would be a large percentage, but they could recall a defined less-common segment of their social network such as primary teachers.



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