CENTER FOR STUDIES IN DEMOGRAPHY & ECOLOGY
UNIVERSITY of WASHINGTON

November 3, 2023

Dear Implementation Board of King County Regional Homelessness Authority,

We are writing to endorse the use of "Respondent Driven Sampling" methods to obtain a high-quality estimate of the unsheltered total and demographic percentages of people experiencing homelessness for the 2024 Point in Time (PIT) count. This replaces the classic visual one-night PIT count and the accompanying demographic survey collected after the one-night count.

There has long been a critique of the Middle-of-The-Night hunting expedition with flashlights and clipboards that has characterized previous point-in-time counts. Even the U.S. General Accounting Office acknowledges it results in a significant undercount of the unsheltered population.[1] Advocates and academics have called for more modern and sophisticated methods for improving the count to create momentum for more appropriate budget allocations and services.[2]

Modern statistical methods using sampling procedures provide among the highest quality estimates for population totals and percentages. In this case, the number of people experiencing homelessness who are living unsheltered on a given night or the percentage of those who identify as male. Survey sampling as a way to understand human populations has a long and well-established history.[3]

The idea of using statistical methods, rather than a simple census, is to estimate the total number of a population or demographic percentages by sampling (selecting a portion) of the population. Usually, when estimating the size or characteristics of a population, we'd have a "sampling frame." For example, a household address list or landline phone number list, from which we'd select a sample of people to interview from the list. The Respondent Driven Sampling method circumvents the problem that we don't have such a list of unsheltered people. Instead, by using the theory of social network connections, we can obtain statistically unbiased[4] [5] estimates. Respondent-driven sampling (RDS) is a relatively modern method that emerged in the early 2000s to respond to the challenges of studying hidden or hard-to-reach populations, for example, people experiencing homelessness. It was developed by Douglas Heckathorn (Professor at Cornell University), a sociologist, and has since gained popularity in fields such as public health and other social sciences.

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[1] Office of Government Accountability, *Homelessness: better HUD oversight of data collection could improve estimates of homeless population*. July 14, 2020.
Almquist, Zack W., et al. "Network Sampling Methods for Estimating Social Networks, Population Percentages and Totals of People Experiencing Unsheltered Homelessness." arXiv preprint arXiv:2309.03875 (2023). https://arxiv.org/abs/2309.03875

[2] Tsai, J., and Alarc´on, J. (2022), "The Annual Homeless Point-in-Time Count: Limitations and Two Different Solutions," American Journal of Public Health, 112(4), 633–637.

[3] Gile, Krista J., Lisa G. Johnston, and Matthew J. Salganik. "Diagnostics for respondent-driven sampling." Journal of the Royal Statistical Society Series A: Statistics in Society 178.1 (2015): 241-269.

[4] Statistical unbiasedness is a measure of the accuracy of a given measurement of interest, such as the total number of people living unsheltered on a given night.

[5] Baraff, A., McCormick, T. H., and Raftery, A. E. (2016). Estimating Uncertainty in Respondent-Driven Sampling Using a Tree Bootstrap Method. Proceedings of the National Academy of Sciences (USA), 113: 14668-14673.

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RDS evolved from earlier "snowball sampling" techniques (where people we interview refer us to additional people to contact), but introduced a structured and statistically rigorous approach to account for biases in recruitment. Over the years, it has been used to study various marginalized groups, including individuals with HIV/AIDS, injection drug users, and sex workers, providing valuable insights into these populations while addressing issues of sample representativeness and ethical concerns. One strong feature of the methods from an ethical viewpoint is that surveyors don't go out and find people; instead, they wait for people notified of the opportunity to be interviewed to come to them.

Several major organizations have employed RDS as a valuable tool for research and data collection. One notable example is the U.S. Centers for Disease Control and Prevention (CDC), which has utilized RDS to study high-risk populations in the context of HIV and other sexually transmitted diseases. Additionally, the World Health Organization (WHO) has incorporated RDS into its global surveillance efforts for diseases like HIV/AIDS and hepatitis. Other organizations, such as UNAIDS and various universities and research institutions worldwide, have also adopted RDS to investigate hard-to-reach populations, making it a recognized and widely used method in public health and social research. Another strength of the method, making it superior to the flashlights-and-clipboards method, is that it allows us to gather information about people beyond just counting their bodies. Notice this replaces the need for a separate follow-up demographic and needs assessment survey, commonly done to augment the one-night visual census PIT count.

The University's Institutional Review Board (IRB) is the authorizing compliance office for ensuring that any university research conducted on human subjects is ethical. The IRB's support for RDS reflects a dedication to ethical research encompassing diverse perspectives, ultimately promoting more comprehensive and socially responsible academic and public investigations.

Respondent-driven sampling, endorsed by the CDC and the WHO, has gone through many simulation and empirical evaluations in the top statistics, sociology, and public health journals.[6] Further, it has been employed by the Benoiff Homelessness and Housing Initiative at the University of California, San Francisco (UCSF) to conduct a statewide representative study of people experiencing homelessness in 2021 and 2022 -- the most extensive representative study of homelessness in the United States since the mid-1990s with a total of 3,200 administered surveys.[7] The RDS approach we employ has been vetted by the very best scientists through the peer review, evaluation review, and grant review processes.

In 2022, the King County Regional Homelessness Authority, in conjunction with the University of Washington, employed RDS methods to estimate the totals and demographic percentages of unsheltered people experiencing homelessness. Our numbers reflected a growth in unsheltered population by 38% over the previous (2020) point in time count. This work followed best practices and statistical development within the field.[8] [9] [10] This work has been written up as a white paper[11]. This paper is currently under peer review at the journal *Demography* for consideration for publication, where it will receive the highest level of scientific scrutiny. Peer review is the gold standard for ensuring scientific rigor in publications.[12] In 2023, the University of Washington, with KCRHA

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[6] Johnston, Lisa G., and Keith Sabin. "Sampling hard-to-reach populations with respondent driven sampling." *Methodological innovations online* 5.2 (2010): 38-48.

[7] https://homelessness.ucsf.edu/sites/default/files/2023-06/CASPEH_Report_62023.pdf

[8] Johnston, Lisa G., and Keith Sabin. "Sampling hard-to-reach populations with respondent driven sampling." *Methodological innovations online* 5.2 (2010): 38-48.

[9] Gile, Krista J., Lisa G. Johnston, and Matthew J. Salganik. "Diagnostics for respondent-driven sampling." Journal of the Royal Statistical Society Series A: Statistics in Society 178.1 (2015): 241-269.

[10] The RDS strategy and method employed by the KCRHA and the UW team is based on the NSF grant,"CAREER: Measuring and Modeling the Multi-Modal Networks and Demographics of People Experiencing Homelessness", PI'd by Dr. Almquist, which went through NSF peer review panel before funding.

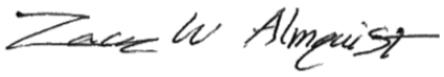
[11] Almquist, Zack W., et al. "Network Sampling Methods for Estimating Social Networks, Population Percentages and Totals of People Experiencing Unsheltered Homelessness." arXiv preprint arXiv:2309.03875 (2023). https://arxiv.org/abs/2309.03875

[12] Peer review is the gold standard for research and design. Peer review is a critical process in scientific research where experts in a field evaluate the quality and validity of a study before it's published. It helps ensure the accuracy and reliability of research findings by identifying potential flaws, biases, or errors. Peer review is an essential step in maintaining the credibility and integrity of the scientific community. Respondent-driven sampling as both sampling strategy and estimation method has gone through extensive peer review through grants and published research and is well accepted in the academic community.

approval, conducted a follow-up study to estimate the totals and demographic percentages of unsheltered people experiencing homelessness in King County with full IRB approval. Results of the 2023 RDS study are currently being tallied and written up for public and peer review to further improve practical implementation and statistical analysis to limit statistical bias (accuracy) and error (precision).

The proposed 2024 RDS for the unsheltered PIT is on track for a full IRB review at the University of Washington. It is based on the methods proposed in Dr. Almquist's National Science Foundation Grant, which went through NSF peer review. Given the long history of RDS and this being the third iteration of the method employed in King County, we believe this to be a sound method for obtaining a high-quality estimate of the unsheltered total and demographic percentages of people experiencing homelessness for the 2024 PIT count.

Sincerely,



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Short Biography of Signatories

Zack W. Almquist received his PhD in Sociology from the University of California, Irvine and also holds MS in Statistics from Northwestern University and BS in Mathematics from the University of Oregon. Dr. Almquist is an Associate Professor in Sociology with an adjunct appointment in the Department of Statistics. Before coming to the University of Washington, he held a Research Scientist position at Facebook (now Meta). From 2013-2018, he held a joint appointment as an Assistant Professor in the Departments of Statistics and Sociology at the University of Minnesota. He is an expert in social networks and survey methods.

Amy Hagopian received her PhD and MHA from the UW School of Public Health. She is currently a Professor Emeritus in the departments of Health Systems and Population Health and Global Health. Dr Hagopian was the Director of Community-Oriented Public Health Practice and has published extensively on research with people experiencing homelessness in King County, such as "McCarty C, Marchand M, **Hagopian** A. Tracking and memorializing homeless deaths in Seattle with WHEEL Women in Black. In *Loss and Trauma*, 12 August 2021."

Steven M. Goodreau received his PhD in Anthropology from The Pennsylvania State University. He is a Professor in Anthropology with an adjunct appointment in the Department of Epidemiology. Dr Goodreau is a core member of the STATNET team, which develops software for statistical models of social networks and has published extensively in network methods and respondent-driven sampling.

Tyler H. McCormick received his PhD in Statistics from Columbia University. He is a professor in the Departments of Statistics and Sociology at the University of Washington. He is a fellow of the American Statistical Association and recipient of the NIH Director's New Innovator Award. Dr McCormick has published extensively on the use of respondent-driven sampling methods.

Sara Curran received her PhD in Sociology from the University of North Carolina at Chapel Hill. She is a Professor of Sociology and a Professor in the Department of International Studies at the Henry M. Jackson School of International Studies at the University of Washington. Dr. Curran has been the director of the Center for Studies in Demography and Ecology (CSDE) since 2015. CSDE is supported by a center grant from the NICHD and is the preeminent center for Demography in the State of Washington and among the top places for demographic methods in the United States. Dr Curran has published extensively in the field of Demography.

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