

To: Transport & Health Policy Makers, & Practitioners
From: Professor Adrian Davis
Date: 17th May 2024
Subject: Essential Evidence 4 Scotland No.85 The importance
Representative Surveys

Top Line: Survey sampling methodology can be defined as the science of choosing a sample that provides an acceptable compromise between sample cost and sample representativeness. Local authorities and others pressured to consult the public should always seek representative samples for their surveys in order to have confidence in the findings.

When researchers want to study aspect of life among large population e.g. whole countries, cities and other large geographical areas it becomes necessary to reduce what is measured: one must measure a sample of the population, and one must measure only as much about that population as it can reasonably be expected that people will be willing to tell. The first thing that this reduced measurement leads to is the requirement that the data collected should be representative of the entire population.¹

In the detail, the goals of increasing the number of responses and reducing bias are very important goals for any survey. Increasing the sample size will generally increase the representativeness of the sample. However, increasing the sample size also increases the survey costs. A sample is representative if the mean of any characteristic of interest measured in the sample is statistically equal to the mean of that characteristic as it would be measured in the entire population.

Response rates are falling almost throughout the world in the early twenty-first century. Falling response rates bring with them the likelihood that the samples obtained from voluntary surveys are increasingly biased – i.e., that the people who respond to the survey are significantly different from those who do not respond, so that the behaviours to be measured in a survey are no longer representative of the population at large.² This is often a problem when national and local governments members and official believe that they should seek responses to an issue and where, typically, the majority of respondents to a consultation may be those who feel most passionate about an issue irrespective of the scientific validity of their claims.

Representativeness can generally be achieved when the probability that any element of the population has of being included in or excluded from the sample is known. Representativeness is achieved generally through the strict application of probability sampling. Probability sampling means that the probability of each element in the population being sampled is known, and this knowledge can be attained through the application of randomness in the choice process. Probability sample s have the important property of being measurable, which means that one can draw statistical inference s about the population from which they are drawn, based on measures of variability that are estimated from the sample data.

In many surveys of households and individuals, there may be a pre-notification contact, a recruitment contact, an interview contact, and a retrieval contact. In addition, there may be various reminder contacts that are also necessary. The actual contacts required will depend on the method by which the survey is being done. There is also the issue of incentivisation or not? Although there is much agreement in the literature that incentives will impact response rates, generally favourably, there is little in the literature that addresses the issue of the effect of incentives on nonresponse error, or on the distributions of characteristics of respondents. This includes UK studies since Stopher's book. However, when correctly designed, financial, and non-financial incentives can act as complements for achieving policy goals.³

¹ Stopher, P. 2012 Collecting, managing, and assessing data. Chapter 3: Basic issues in surveys, Cambridge: Cambridge University Press.

² Stopher, P. 2012 Ibid. Chapter 6: Methods for conducting surveys in human populations,

³ Kung, C., Johnston, D., Shields, M. 2018 Mental health and the response to financial incentives, *Journal of Health Economics*, 62: 84-8=94.