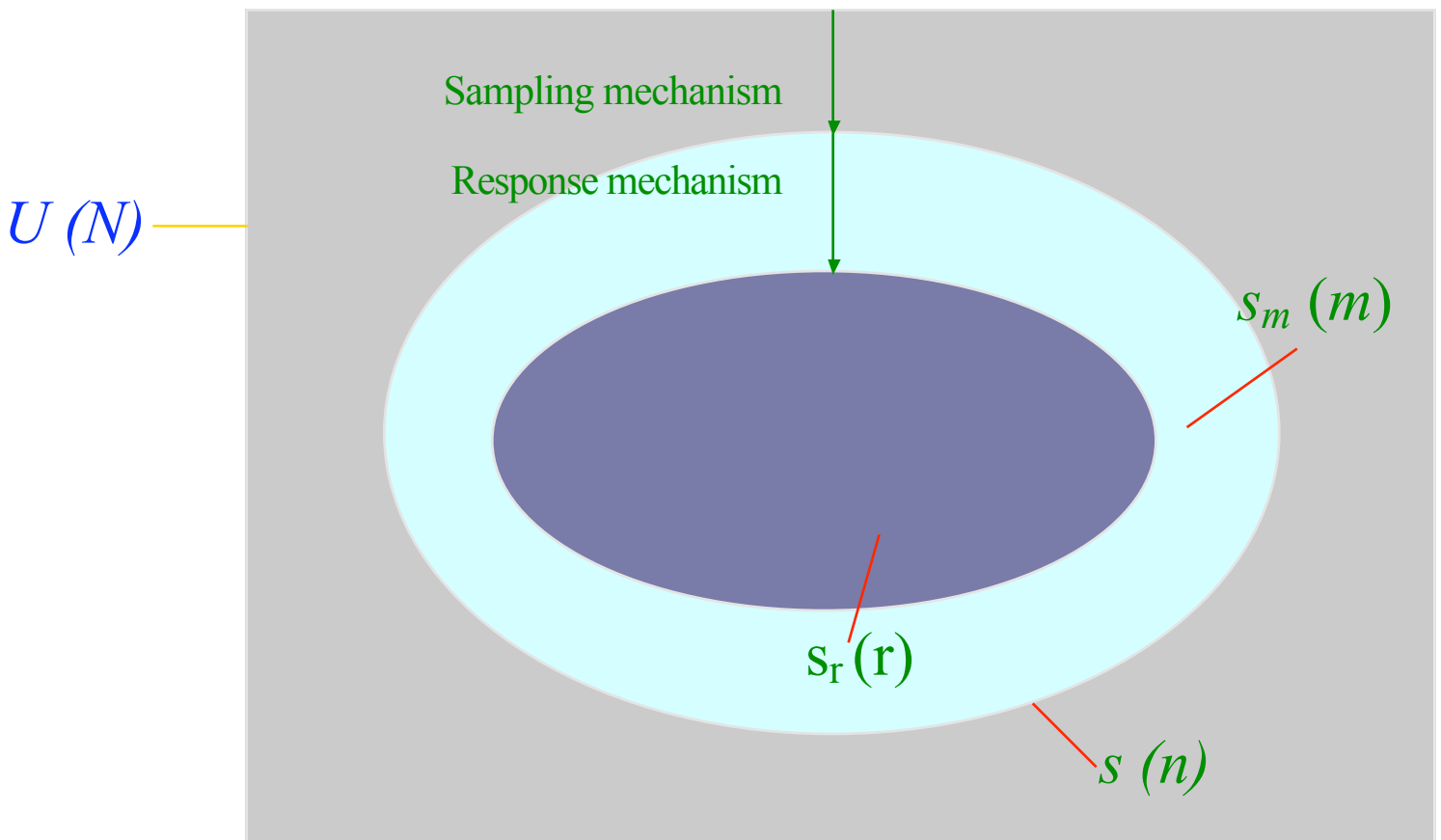


Exercise One: Assessing the response mechanism



Examine the data to assess whether the probability of response in HUI or General Health depends on any of the auxiliary variables (testing for MCAR).

Hint: you may have to use a logistic regression or χ^2 test

Background

In what follows, U denotes the target population, of size N , s denotes the sample of size n , and s_r denotes the sample of respondents for a given item. Let y denote the variable of interest, and \mathbf{x} denotes a vector of auxiliary variables that is assumed to be available for all units in the sample.

Survey statisticians generally consider three types of response mechanisms: missing completely at random (MCAR), missing at random (MAR) and not missing at random (NMAR). A MCAR response mechanism is one for which the probability of response $p_i = P(i \in s_r) = p \quad \forall i \in U$.

Informally speaking, a response mechanism is MAR if the probability of response depends on some auxiliary variables but not on the variable of interest; that is $p_i = P(i \in s_r) = p(\mathbf{x}_i)$. A

NMAR response mechanism is a mechanism where the probability of response depends on the

variable of interest and potentially on other variables that are not observed; in its simplest form,
 $p_i = P(i | s_i) = p(y_i)$.