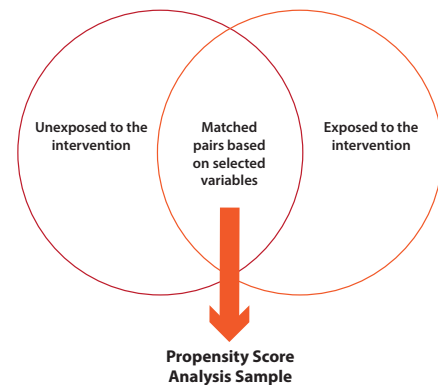


WHAT IS PROPENSITY SCORE MATCHING?

Propensity Score Matching (PSM) is a statistical technique that allows researchers to more accurately measure social and behavior change communication (SBCC) program impact and to make a strong case for causal attribution. It helps researchers determine whether the program was actually responsible for the changes in knowledge, attitudes and behaviors that occurred.

Impact evaluation of SBCC programs requires comparison between what happened as a result of a program and what would have happened in the absence of the program (a counterfactual). Randomized control trial designs (RCTs) accomplish this by randomly assigning some people to get a treatment and others to not get the treatment, and comparing the results between the two groups. In large-scale SBCC programs, such as entertainment-education programs that use mass media to reach a national audience, it can be impossible or undesirable to prevent some people from receiving the messages simply in order to create a counterfactual condition for the purposes of evaluation. Unfortunately for program evaluators, people who hear or see program messages may be different from those who are not exposed (those that do not hear or see the program messages). Those people that are exposed to messages may be more affluent, better educated, more motivated or otherwise predisposed to participate in the program and respond to it. PSM provides a way to take those differences and predispositions – individuals' propensity for exposure – into consideration and to control for them when calculating program impact.



The PSM technique requires survey data. If a sample of survey respondents is drawn in a way that is representative of the intended SBCC audience, then the PSM analysis can be used to estimate the actual number of people in the population who changed as a result of the program. The survey data used for PSM should contain measures of things that make a person more likely to be exposed to the program, such as age, gender, language preference, household income, place of residence, prior behavior, access to media and other demographic and lifestyle factors. Multiple regression analysis is used to identify which of these characteristics is most strongly related to program exposure. PSM then matches people in the survey sample who have the same characteristics that make them more or less likely to be exposed to the intervention. It then compares the extent of behavior change among similar people who were exposed (the treatment group) and those not exposed (the matched comparison group).

PSM gives us confidence that the only difference between the matched persons is the one we want to examine: exposure to a specific SBCC intervention. This allows researchers to evaluate behavior change while controlling for the variables that predispose some people to be exposed and to change. This way, without assigning some people to receive the program and denying it to others, researchers can be certain that the predisposing variables are not the reason that an individual responded positively to an SBCC program – rather, it was the program itself that had an effect on the individual's behavior.

WHEN SHOULD PROPENSITY SCORE MATCHING BE USED?

Impact studies are sometimes criticized for not controlling for a person's response bias (their propensity for exposure or behavior change) to an intervention. Randomized control trials, however, are not possible in large-scale media-based campaigns that aim to reach all members of a target population. Propensity score matching approximates the conditions of a randomized control trial design by creating matched groups with statistically equal likelihood of exposure to an intervention. With this technique, researchers are able to create intervention and matched comparison groups where the only difference between them is exposure to the intervention. Use of the propensity score approach increases the

accuracy of impact measurement because it controls for unaccounted factors that might bias a person to respond favorably to a communication program.

WHAT SHOULD IMPLEMENTERS KNOW?

Propensity score matching produces strong evidence of a causal relationship between an SBCC intervention and behavior change in large population-based observational studies. It is a statistically sound technique that can be used when randomized control trials are either not ethical or possible. However, PSM analysis can only account for the variables that have been observed and measured by a particular survey. If there are other variables affecting the relationship between the intervention and behavior change not measured or not identified in the survey data, then PSM will not be able to account for them.

South Africa's *Scrutinize* Campaign Uses Propensity Score Index to Measure Impact

The *Scrutinize* campaign was developed in South Africa in 2009, as a joint effort between Johns Hopkins Health and Education South Africa (JHHESA), Levi Strauss's *Red for Life* campaign, USAID, PEPFAR and other partners. It aired eight animated advertisements (animerts) on national TV channels and in over 300 clinic waiting rooms, with the aim of increasing awareness of risk behaviors related to HIV infection.

A national evaluation of the campaign using propensity score matching found that being able to correctly recall the risks associated with multiple sexual partners from the animerts resulted in a 3.2 percentage point decrease in the likelihood of having multiple sexual partners. Because the survey sample was representative of the population of young adults targeted by the program, PSM could be used to estimate the actual number of people in the population who changed as a result of *Scrutinize*.

Fifteen variables were used to create the propensity score index: age, sex, marital status, level of education, household wealth, poverty classification, employment status, frequency of television viewing, frequency of radio listening, frequency of reading newspapers, frequency of reading magazines, frequency of internet use, type of settlement (urban, peri-urban, tribal, farming), race and province. Of the 10.8 million sexually active South Africans aged 16-32 in the year of the survey, 32% (3.5 million people) could correctly recall the animert regarding multiple sexual partners. Based on this estimate, propensity score matching enabled the evaluators to estimate that 3.2% of that population, or over 111,000 people, avoided multiple sexual partners as a direct result of exposure to the *Scrutinize* campaign.



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