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Measuring Program Success of Health Behavior and Other Interventions

Abstract: Program success as applied to public health activities can be measured through logic framework models that define any program's activities, expected outcomes, and intended effects. While multiple metrics exist in theory-based health interventions, all share a goal of developing appropriate activities and evaluating their successes, which can be determined through efficacy and effectiveness studies in some interventions. Measurements of a program's success, though evidence based in public health activities, should also be determined by the values of recipients of any intervention. The appropriate theory and sufficient resources are key components to any successful intervention program.

Introduction: As we examine different theory-based health interventions designed to improve breast cancer screening among African American women, the models under consideration all focus on metrics for success. Is the 5% percent increase in clinic patients getting mammograms over a year in our case a success or not? Who determines what success is, if as our case suggests, 100% adherence to screening recommendations is not realistic? Can the tools currently used adequately define success, particularly if there may never be the fiscal resources required to achieve every program objective of all health priorities? What's more, success itself can vary widely across different fields (see appendix 1 for examples). Lastly, health interventions, unlike outcomes in the marketplace that pick winners and losers, are driven by a desire to promote a health benefit for a greater social good that can be unpopular with the public and resisted by commercial forces who profit from those unhealthy behaviors, so quantifying success may not appear as clear as the popularity of an Apple consumer product in a specific market segment.

How Does Public Health Define Success? Public health interventions are evidence-based, using research findings about tested intervention strategies that have developed from rigorously controlled research studies. Successful interventions are ones that[1]:

- have wide applicable use to populations,
- can be adapted rapidly by practitioners,
- are low-cost and efficient to executive, and
- demonstrate efficacy by having a measurable impact.

For instance, the U.S. Department of Health and Human Service's initiative called the Guide to Community Preventive Services lays out a framework for determining population-based interventions based on evidence of their effectiveness, which can be seen in the

recommendations made by the U.S. Preventive Services Task Force that we have studied already.[2] In all cases, evidence is derived from observations and experiments. Farris et al., in their analysis of public health impacts, note that the effectiveness of health promotion programs also is driven by how well programs work in its local context.[1]

At the broadest level, any effective public health or promotion program that is designed to reduce a risk of disease or improve wellness requires a definition of success, but the theories used to effect change do not provide a precise formula for success, as that will vary for each intervention. The National Cancer Institute's Theory at a Glance guide to health behavior theory succinctly outlines more than a half-dozen theories such as diffusion of innovation and the health belief models and mentions success more than a dozen times without defining the term.[3] A survey of the U.S. Centers for Disease Control and Prevention (CDC) web site uncovered literally thousands of references to "success," without defining a theory for success. However, the CDC's Healthy Communities Program notes any program designed to change behavior requires application of a behavioral theory and a logic framework model in order to be successful. Failure to use a theoretical model from the beginning risks wasting resources and may fail to set accurate performance measurements.[4]

Elements of Successful Interventions: According to the PRECEDE-PROCEED model, a successful health intervention that achieves its desired outcomes will be driven by participation of the community the intervention most impacts.[5] From a social marketing perspective—a perspective embraced by public health for decades—it is the investment of time and resources during the scoping and development of any program that lay the successful groundwork for most interventions, and that outreach will make the difference between a successful intervention with quantifiable impacts and one which is ineffective.[6]

For instance, the first step in a CDC logic framework model for any intervention begins with a question of how program success is defined and if the group receiving an intervention defines success in the same manner as the CDC.[7] When using principles of community-based outreach for developing an intervention program, objectives defining the success or failure of a program will have been developed in a transparent manner to help determine what aspects of a program intervention are the most important. The logic framework model used can be considered the map to help all parties visualize the value judgments about any program successes or failures.[8] The CDC's model makes clear that an agreement upon conclusions, or the standards, must be reached

collaboratively. The values of participants also become the standards for judging if a program's interventions will be considered successful or not.[9]

Far from theoretical, community-based programs do work in boosting breast cancer screening. A 2009 study by Meersman et al. on the access to mammography screening in Los Angeles County by 127,000 women who were screened found that a community-based organization's outreach to Spanish-speaking women in 1999-2001 that was funded by the CDC and the State of California worked. The program, Every Women Counts, sought to increase breast and cervical cancer screening for low-income residents, and it included outreach to Latinas 50 and older, working with communities, a Mother's Day campaign, and reminder cards to patients to be screened and re-screened. Women 50-64 years old who were Spanish-speaking and low income were more likely to have been screened than those who were English proficient (OR=1.85). The authors conclude that social networks do promote the use of screening services.[10]

Other Measurements of Success: Success will not look the same with interventions for all health problems. James Prochaska and his colleagues developed the stages of change (transtheoretical) model after working on smoking interventions, identifying stages for a smoker to quit smoking successfully. The stages include pre-contemplation, contemplation, preparation, action, maintenance, and termination. Prochaska et al. note in a study of smokers and alcoholics, not even 20% of each group reached the point of no temptation, suggesting this level is not a reasonable marker for success but an ideal goal. They suggest in other behaviors, like weight loss or exercise, a practical goal for success would be lifetime maintenance, given the strong prevalence of relapsing.[11] Prochaska further notes that at least through the early 1990s, most of the smoking intervention materials were not successful because they were targeting only a small fraction of smokers ready for action, not the bulk of persons in the first three stages of change, suggesting failure defined many previous interventions.[12]

Though not a program, social marketing is a long-used public health technique that systematically applies the principles of marketing and other techniques to achieve specific, voluntary behavioral goals for a social good.[6] Problems targeted have ranged from sexually transmitted diseases to drug addiction. Success through this process occurs when marketers determine the needs and wants of their audience and satisfy them with communication, pricing, and competitive and available offerings.[13] Glanz et al. note that four health behavior theories contribute to marketing approaches: theory of planned behavior, social cognitive theory, the

parallel processing model, and the diffusion of innovations. In the context of our case, social marketing would involve targeting a campaign that is culturally sensitive to African American women in King County and that is driven by how ready the consumers are for specific messaging. In our case, 2005 qualitative survey data show African American women were skeptical of mammograms' safety and efficacy, and did not value early detection as beneficial to forestall negative outcomes, including death.[14]

Ensuring program success in a public health marketing intervention using social marketing involves the use of two type of evaluations, efficacy and effectiveness evaluations. Efficacy studies estimate maximum benefits, such as an intervention, in ideal circumstances and under a controlled environment, often using randomized controlled trials. Effectiveness studies, by contrast, are outcome studies without the same controls. In a social marketing context, they measure exposure of an intervention through individuals' recall.[15-17] In a social marketing context, efficacy studies are used to test an intervention campaign during their development to align health messages with the target audience, while effectiveness studies are used in program tracking and evaluation.[16] Non-experimental design, using pre- and post-testing is perhaps the most commonly used form of effectiveness testing with social marketing, to determine how well the intervention has moved the target population after it has been introduced. [16]

For example, a 2005 study on the of reducing pesticide risk among migrant farmworkers found that bilingual, sustained interventions to increase farmworkers' pesticide knowledge was successful ($P=.0001$) in 2 of 4 behavior outcomes, such as awareness of risk perception and safety behaviors.[18] A pre-test and post-test design was used as an effectiveness test to measure the program's success, which in this study relied on the transtheoretical model as its theoretical basis for developing the questionnaire to evaluate safety knowledge.[18] Success here required the correction application of theory and the right measurement tool, though costs considerations conspicuously were not described, making it unclear what limitations may prevent this program's adoption.

Success Theory Outside of Public Health: Taking a broad look at program success and failure in social sciences, Abraham Wandersman writes that many well-intentioned programs, from DARE to boot camps for juvenile offenders, start off with high hopes, but have no effect or even negative outcomes. He suggests that any major program has four keys and threats to success.[19] These include:

- **Theory**: The application of theory is crucial to understanding a problem and solving it. Theories set the stage for long-range results and specify how outcomes should be documented.
- **Implementation**: This is the set of activities designed to put into practice an activity or program.
- **Evaluation:** Evaluations collect, interpret, and communicate information about programs, with the goal of determining if a program should be continued, improved, or ended.
- **System Support**: All programs require a committed host (organization, political climate) and sufficient capacity to implement a program or strategy. This can involve leadership support, capacity support, and fiscal support.

Wandersman's model strongly emphasizes the inclusion of stakeholders in the design and implementation of each key element. However, others have noted that involvement of stakeholders, at an in-kind or volunteerism level, should not be viewed as substantive program support. Successful public health interventions require "substantial expenditures and, particularly, well organized institutional foundations and skilled personnel."[20]

Back to the Case and Questions: A year into the intervention program to encourage more African American women to undergo mammograms, we learn that programs aimed at this audience and health problem, likely measured by an effectiveness study, were not as significant as was desired. Predisposing, reinforcing, and enabling factors were identified in survey to the target audience. We do not know if the 5% uptick in the number of mammograms being given to clinic patients is viewed as a program success by the community targeted for the intervention, or if a large number of African American women who were engaged may be more aware of the issue and are at contemplation or preparation stages and moving toward action. Cost and budget considerations are, surprisingly, not mentioned. The upcoming luncheon between Price and Green at the First AME Church is a positive signal that their next program adjustment remains "consumer focused" on the audience, and thus a positive direction.

1. Even though public health programs are grounded strongly in evidence-based strategies, what can they learn from the private sector or other systems to improve program outcomes.
2. Logic framework models from the CDC and the PRECEDE-PROCEED model strongly emphasize community participation as a component for success, but do principal investigators who head up major studies with communities buy into these models? Have investigators' attitudes to these models ever been examined to see if there may be a disconnect between theory and practice.

Appendix 1: How Is Program Success Defined in Other Domains: Though this case is focusing on health behavior theory and interventions, a summary of how success is measured in three different areas provides models for comparison.

In a Military Context	In a Global Health Context	In a Business Context
In a major war involving U.S. personnel, Defense Secretary, Robert Gates pegged success in President Obama's Afghanistan strategy this way: "The key to our success is the continued expansion of the Afghan security forces. As the Afghans increase their capabilities, we can move in the more challenging parts of the country." Gates also identified other metrics: halt Taliban gains and reverse their momentum; build Afghan forces to take the lead against a weakened insurgency.[21] The end goal is the extraction of U.S. forces from the country with minimal political and security fallout, but not defeating the enemy.	In a global health context, the Global Polio Eradication Initiative, the most expensive health campaign ever in human history, and now into its 23rd year, defines program success as total eradication of the disease, despite polio's stubborn persistence in four countries where it remains endemic: India, Pakistan, Afghanistan, and Nigeria.[22] Success in absolute terms has not been reached. The program has proven controversial, and has cost more than $8 billion, but also has been credited for preventing 350,000 cases and a 99% reduction in cases.[23]	In the consumer electronics marketplace, Apple's success—as measured in share price and profits for shareholders and in consumer loyalty—is frequently held out as a winning model. With only 3% of the market share for computers, Apple's more expensive but limited number of products are consistently viewed as innovative, simple, and cool. Apple's success is credited to innovation, clever marketing across multiple platforms, brand loyalty, placement in multiple media, and showmanship for product rollouts.[24]

REFERENCES:

1. Farris RP, Will JC, Khavjou O, Finkelstein EA. Beyond effectiveness: evaluating the public health impact of the WISEWOMAN program. *Am J Public Health.* Vol 97. United States2007:641-647.
2. Briss PA, Zaza S, Pappaioanou M, et al. Developing an evidence-based Guide to Community Preventive Services--methods. The Task Force on Community Preventive Services. *Am J Prev Med.* Jan 2000;18(1 Suppl):35-43.
3. National Cancer Institute. *Theory at a glance, a guide for health promotion practice.* 2nd ed. Washington, D.C.: U.S. Department of Health and Human Services; 2005.
4. U.S. Centers for Disease Control and Prevention Health Communities Program. *Building our understanding: key concepts of evaluation: applying theory in the evaluation of communications campaigns.* 2009; http://www.cdc.gov/healthycommunitiesprogram/tools/pdf/apply_theory.pdf. Accessed May 1, 2011.
5. Green L, Kreuter M. *Health program planning: an educational and ecological approach.* Fourth ed. Boston: McGrall Hill; 2005.
6. National Social Marketing Centre. *Big pocket guide to social marketing.* 2007; 2nd edition; http://www.nsmcentre.org.uk/sites/default/files/NSMC_Big_Pocket_Guide_Aug_2007_2.pdf. Accessed May 1, 2011.
7. Chapel T. *Practical program evaluation—using CDC's evaluation framework.* 2007; http://www.cdc.gov/. Accessed May 1, 2011.
8. Ottoson JM, Green LW. Community outreach: from measuring the difference to making a difference with health information. *J Med Libr Assoc.* Oct 2005;93(4 Suppl):S49-56.
9. Framework for program evaluation in public health. *MMWR Recomm Rep.* Sep 17 1999;48(RR-11):1-40.
10. Meersman SC, Breen N, Pickle LW, Meissner HI, Simon P. Access to mammography screening in a large urban population: a multi-level analysis. *Cancer Causes Control.* Oct 2009;20(8):1469-1482.
11. Prochaska J, Redding C, Even K. The transtheoretical model and stages of change. In: Glanz K, Rimer B, Viswanath K, eds. *Health behavior and health education.* 4th ed. San Francisco: Jossey-Bass; 2004.
12. Prochaska JO, DiClemente CC, Velicer WF, Rossi JS. Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychol.* Sep 1993;12(5):399-405.
13. *Health behavior and health education.* Glanz K, Rimer B, Viswanath K, eds. 4th ed: Jossey-Bass; 2008.
14. Lewis FM, Phillips-Angeles E, Song L. *Taking care of yourself: factors influencing African American women's participation in breast cancer screening.* Seattle: Public Health-Seattle & King County; March 2005.
15. Bausewein C, Higginson IJ. Appropriate methods to assess the effectiveness and efficacy of treatments or interventions to control cancer pain. *J Palliat Med.* Jun 2004;7(3):423-430.

16. Dougherty A, Kates B, Mitchell-Jackson J. *How can we better evaluate the Success of Marketing Outreach Efforts?* 2008; http://www.opiniondynamics.com/resources/conferencePapersAndPresentations/Energy/How%20can%20we%20better%20evaluate%20the%20success%20of%20marketing%20outreach%20efforts_A%20Dougherty.pdf. Accessed May 1, 2011.
17. Evans WD, Uhrig J, Davis K, McCormack L. Efficacy methods to evaluate health communication and marketing campaigns. *J Health Commun.* Vol 14. England2009:315-330.
18. Vela Acosta MS, Chapman P, Bigelow PL, Kennedy C, Buchan RM. Measuring success in a pesticide risk reduction program among migrant farmworkers in Colorado. *Am J Ind Med.* Mar 2005;47(3):237-245.
19. Wandersman A. Four keys to success (theory, implementation, evaluation, and resource/system support): high hopes and challenges in participation. Am J Community Psychol. Mar 2009;43(1-2):3-21.
20. Goldberg M, Fishbein M, Middlestadt S. *Social marketing: theoretical and practical perspectives*. Mahwah: Laurence Earlbaum Associates, Inc.; 1997.
21. Daniel L. Success hinges on Afghan forces, Gates says. *American Forces Press Service.* Dec. 16, 2010. http://www.defense.gov/news/newsarticle.aspx?id=62133. Accessed April 30, 2011.
22. Roberts L. Polio eradication. Looking for a little luck. *Science.* Feb 6 2009;323(5915):702-705.
23. Global Polio Eradication Initiative strategic plan: 2010-2012. World Health Organization. Geneva: 2010; http://www.polioeradication.org/Portals/0/Document/StrategicPlan/StratPlan2010_2012_ENG.pdf. Accessed November 11, 2010.
24. Graham J. Apple buffs marketing savvy to a high shine. *USA Today.* March 9, 2007; http://www.usatoday.com.offcampus.lib.washington.edu/tech/techinvestor/industry/2007-03-08-apple-marketing_N.htm. Accessed April 30, 2011.

Key Reference:
This guidebook proved to be an exceptionally straightforward but detailed summary of social marketing, with clear language and well-conceived theoretical diagrams. National Social Marketing Centre. *Big pocket guide to social marketing*. 2007; 2nd edition; http://www.nsmcentre.org.uk/sites/default/files/NSMC_Big_Pocket_Guide_Aug_2007_2.pdf. Accessed May 1, 2011.