

Research in Action:
Using Positive Deviance to Improve Quality of Health Care

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Abstract

Background. Despite decades of efforts to improve quality of health care, we continue to have only average performance in many aspects of care. Furthermore, despite enormous national investment in biomedical research, less than 1% of this is directed at research on improving the delivery system, and when innovations in clinical care are discovered, widespread implementation of these improvements is often delayed and incomplete. In this paper, we describe a new approach, a “positive deviance” approach to identifying and promoting effective strategies to improve health care quality.

Methods. We synthesize existing literature from other areas on the use of positive deviance to propose its benefits for health services research.

Results. The positive deviance approach, as adapted for use in quality improvement and health services research, comprises five steps: 1) identify top performing organizations demonstrating exceptionally high performance in the process under inquiry, 2) study top performing organizations qualitatively to generate insights about how the positive deviants have achieved exceptional performance, 3) generate hypotheses about top performance, 4) test these hypotheses statistically in large, representative samples of organizations, and 5) work in partnership with key organizations to spread the adoption of effective strategies to improve care. We describe its use in both global public health issues and its recent application to improving cardiovascular inpatient care nationally.

Discussion. The approach offers several benefits that help bridge research and practice and foster implementation of findings. Contextual factors that can affect “what works” are incorporated into research, findings are grounded in real-life experience, and the community of adopters is fostered by their involvement in early steps in the research. Although there are also limitations to this approach, the

methodology holds much promise for improving the implementation of innovative and high quality practices.

Conclusion. The formal analysis of organizations that demonstrate positive deviance provides a unique opportunity to explore, characterize, and disseminate key insights for improving quality. The approach exemplifies important bridges between research and practice and can be used to foster research that has widespread practical benefit for health care organizations and their patients.

Quality of Health Care

Despite decades of efforts to improve quality of health care, we continue to have only average performance in many aspects of care. Patients often do not receive guideline-based processes of care [1-3], and risk-adjusted outcomes vary substantially across hospitals [4] and regions [5, 6], suggesting potential for improvements. Furthermore, despite enormous national investment in biomedical research, less than 1% of this is directed at research on improving the delivery system,[7] and when innovations in clinical care are discovered, the diffusion of these improvements into practice is often delayed and incomplete [8-11].

We describe a new approach to quality of care research that identifies innovative solutions from “positive deviants” in health care, those organizations that achieve exceptional outcomes (e.g., survival rates, medication use, door-to-balloon times). The central premise of a positive deviance approach [12, 13] is that solutions to problems that face a community can often be found within that community, and that certain members possess wisdom that can be generalized to improve the performance of the larger community.

The power of a positive deviance approach to improve health outcomes has been shown in complex problems globally including pregnancy outcomes [14], condom use,[15] and childhood nutrition [12, 16, 17]. In a dramatic application of positive deviance in Vietnam, childhood malnutrition was reduced by 75% [12]. Researchers identified a set of women as “positive deviants” because their children were thriving despite high rates of childhood wasting and stunting in their rural villages. The women were including in their cooking pots tiny shrimps and crabs, found in large numbers in rice paddies but not normally used because fish were generally thought to be inappropriate for young children [17]. The subsequent randomized controlled trial of this practice showed significant improvements in health outcomes of children fed in this way [12, 16, 18]. This method of food

preparation was then disseminated and sustained years after the original studies [19]. The “best practice” had been based on proven, successful practices within the community, rather than theoretical concepts of good nutrition.

How can we use this potentially powerful approach to improve and sustain quality of health care in the United States? In this paper, we describe key steps and methods for using a positive deviance approach to identify and promote effective strategies to improve health care quality. We describe how the approach has been used to reduce door-to-balloon times for patients with acute myocardial infarction in order to illustrate its potential in for health care quality improvement.

Five Steps in “Positive Deviance” Approach

The positive deviance approach, here described as applied to health care organizations, comprises five steps: 1) identify top performing organizations that are known as the “positive deviants” demonstrating exceptionally high performance in the process under inquiry (e.g., surgical outcomes, wait times, proper discharge medication use), 2) study high performing organizations qualitatively to generate insights about how the positive deviants have achieved exceptional performance, 3) generate hypotheses about top performance, 4) test these hypotheses statistically in large, representative samples of organizations, and 5) work in partnership with key organizations to disseminate the findings and spread the adoption of effective strategies to improve care.

The positive deviance approach has several benefits. The study of positive deviance can elevate care within the bounds of current capabilities and resources, leveraging the natural variation in health care quality across organizations. In addition, findings are generated from real-life experiences rather than experimental conditions, enhancing the credibility and applicability of the research. Last, the approach recognizes that features of the organizational environment and implementation process, such as the presence of physician champions or the type of

hospital culture, can influence performance in quality of care. These contextual issues related to implementation are typically held constant in the carefully monitored protocols of controlled trials; however, these features can be central to organizational performance. A positive deviance approach explores, rather than controls away, such implementation features as potential predictors of top performance.

Application of Mixed Methods to this Approach

Our approach to uncovering and understanding positive deviance requires systematic integration of qualitative and quantitative research methods in a mixed methods study design [20]. In the first steps, qualitative methods are used to select the initial sample, to conduct in-depth organizational analyses, and to generate hypotheses. In subsequent steps, quantitative methods are used to develop large-scale sampling and perform hypothesis testing to make statistical inferences.

Qualitative components. The first step in our approach requires purposeful sampling [21] with the goal of identifying cases (in our example, hospitals) that vary markedly in the outcome of interest (e.g., performance in the selected quality measure). Hospitals are classified according to performance, and cases representing a range of performance are selected using well-established sampling strategies for qualitative studies [21]. The sample size is determined by theoretical saturation [22]; that is, organizations are added to the sample until no new concepts related to the outcome of interest emerge with successive site visits and interviews. The second and third steps of this approach involve comprehensive data collection through site visits and in-depth, open-ended interviews [21, 23] and qualitative, comparative analysis [21, 24] to identify potential causal mechanisms associated with a given outcome or to generate hypotheses about strategies that appear to distinguish higher and lower performing organizations. The qualitative analysis enables researchers to look beyond identified variables that are statistically linked to

performance to understand how and why a given intervention has a specific impact. These hypotheses may pertain to specific strategies employed by the organization to improve quality as well as contextual features of the organization that impact implementation and success of the strategies. Such exploratory, formative research is helpful for uncovering patterns and illuminating unanticipated and novel influences on quality of care.

Quantitative components. In the next phase, quantitative measures of the concepts hypothesized as associated with performance are developed based on the findings from the preliminary qualitative phase. Such measures are most often obtained through surveys, using well-established [25-27] methods for questionnaire development and testing to foster valid and reliable measurement. Quantitative methods are then used to generate a representative sample and field the survey. This phase of the approach may also be accomplished with interventional studies or with secondary data to demonstrate statistical links between the outcome of interest (e.g., performance measures) and hypothesized predictors of performance. In observational methods, hierarchical generalized linear modeling should be used if the outcomes are measured at the patient level (e.g., receipt of a recommended, presence of post-surgical infection) and the strategies are measured at the organizational level (e.g., presence of various strategies within hospitals, communities, practices) to effectively test hypotheses about associations between organizational features and patient outcomes.

Translating Research into Action

Perhaps most challenging for researchers and practitioners is the integration of research and practice. Researchers lament the limited adoption rates of best practices identified through research, and practitioners lament that the research is experimentally-based and hence not applicable to their daily practices. The fifth step in the positive deviance approach seeks to address the chasm between research and

practice through rigorous, deliberate, and targeted dissemination of findings, undertaken in partnership with the anticipated users of the findings.

Previous literature [28-30] has identified critical variables in the speed of diffusion: the perceived relative advantage of the new practices and the communication mechanisms through which new practices are disseminated. New practices will diffuse more quickly if they are perceived as valuable relative to the status quo and if information about them is provided by a trusted and credible source.

How does our positive deviance approach facilitate diffusion? First, the relative advantage of research findings is straightforward to many health care organizations, which face continued pressures to improve quality of care. Evidence about "what works," particularly in a health care market of public reporting and pay for performance, has great value to organizations seeking to achieve higher performance. Second, given the grounded (non-experimental) approach to this research, practitioners are likely to recognize the applicability of the findings to their own experiences in organizations no matter how diverse. The inclusion of contextual features can also enhance the perceived usefulness of the findings as strategies often require interdepartmental collaboration and team processes, key aspects of context. Contextual elements such as these are often central to achieve and sustain larger organizational changes [29]. Last, because the health care organizations participate closely in the research, and because the findings reflect their knowledge and experience, sites are often strongly motivated and receptive to implementing findings. Such inclusion of stakeholders in producing relevant evidence for health care improvement has been shown to be successful in large-scale organizational changes [29, 31].

Effective communication mechanisms rely on sources viewed as trustworthy and credible, and typically require partnerships including the research team, national

provider organizations and government agencies. Dissemination strategies might include national campaigns such as the D2B Alliance sponsored by the American College of Cardiology and other health care organizations [32] or Get with the Guidelines sponsored by the American Heart Association [33]. Additionally, national quality improvement collaboratives such as those sponsored by the Institute for Healthcare Improvement provide examples from positive deviance research that can promote widespread, evidence-based performance improvement efforts.

Closing the Knowledge-Action Gap

The gap between what we know and what we do is well-documented [34]. This gap is particularly pertinent in health care organizations as the research literature on best medical practices is robust; however, findings are often not implemented reliably. Naturally occurring positive deviance can be leveraged to both identify best practices and to understand how these best practices can be effectively implemented in health care organizations.

Recent efforts to improve care for patients with ST-segment elevation myocardial infarction by reducing door-to-balloon time illustrate the positive deviance approach to conducting research and translating findings into action. Early research in this area identified top performing hospitals in the country in terms of door-to-balloon time, i.e., organizations showing positive deviance. These hospitals were studied in-depth using qualitative methods to generate hypotheses about organizational strategies and contextual factors that might reduce door-to-balloon time [35, 36]. Based on these hypotheses, a closed-ended survey was designed and fielded with a national sample of hospitals to generate statistical evidence about key strategies associated with lower door-to-balloon times [37]. This evidence then formed the foundation for the D2B Alliance [32], a national collaborative of more than 1,000 hospitals, sponsored by the American College of Cardiology and 38 partner organizations and agencies. The D2B Alliance recommendations were

streamlined to include those strategies that were feasible with relatively limited investment, while other costly strategies supported by good evidence of their effectiveness were not recommended due to the required investment (e.g., full-time attending cardiologists always on site). Contemporary data [38] are now demonstrating substantial reduction in door-to-balloon times nationally, and what was once positive deviance in the earlier studies is now standard, recommended practice.

Despite its many benefits, there are limitations to this approach to determining and disseminating key strategies to elevate quality of care nationally. First, both the qualitative and the subsequent quantitative survey research depend on self-reported information and hence may be biased. Skills in in-depth interviewing [21, 23] can enhance the validity of the qualitative findings, and state-of-the-art survey design techniques [25-27] can minimize bias from self-reported data, although as in all survey research, limitations of self-reported data are important to recognize. Second, the focus on individual organizations might result in local, idiosyncratic solutions that do not generalize beyond those few organizations. At the same time, the quantitative survey-based findings may miss breakthrough strategies, which are limited in number and hence lack statistical power to detect.

This methodology, nevertheless, holds much promise for improving practice. The positive deviance approach, which examines individual cases in depth and also seeks large-scale statistical evidence and widespread diffusion of generally successful strategies, can illuminate innovations in how care is best delivered. Quality improvement efforts will benefit from the broad dissemination of the wisdom of those who excel. The formal analysis of positive deviance can accelerate progress toward better care and provide immediate and sustainable benefits for patients.

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Competing Interests

The authors declare that they have no competing interests.

Authors' contributions

EHB is the lead author and the corresponding author of the paper. LAC and HMK co-wrote the paper and have approved of the final draft of the manuscript.

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