

## Is patient satisfaction sensitive to changes in the quality of care? An exploitation of the Hawthorne effect<sup>☆</sup>

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### Abstract

We introduce a new instrument to evaluate the impact of behavior on outcomes when the behavior may be a function of unobserved variables that also affect outcomes. The instrument is introduced through a test of patient sensitivity to increases in the quality of care provided by doctors. We utilize the Hawthorne effect, in which the very presence of a research team causes doctors to provide measurably superior quality care for any type of patient to show that patients respond to this increased quality and are more likely to be very satisfied. Using the Hawthorne effect as an instrument allows us to examine the responsiveness of satisfaction to improvements in quality despite the fact that patient satisfaction is subjective and jointly produced with quality during the course of a consultation. © 2007 Elsevier B.V. All rights reserved.

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Health care quality is the subject of public regulation in many countries and extensive policy debates worldwide, suggesting that policy makers believe patients cannot, by themselves, ensure high quality care. Indeed, health care is a classic example of asymmetric information or hidden effort; because patients lack medical training, they cannot evaluate the complex activities of trained medical personnel (Arrow, 1963, 1986; Chalkley and Malcomson, 1998; Dranove and White, 1987; Gaynor, 1994; Glied and Remler, 2002; Mooney and Ryan, 1993). Nonetheless, authors commonly assume that patients know something about the quality of care available from different providers. The information patients have and how they came to possess it are rarely specified, but many theoretical analyses of health care markets assume that market discipline imposes some limits to doctor behavior (Chalkley and Tilley, 2005; Chalkley and Khalil, 2005; Ma and McGuire, 1997; Rochaix, 1989; Smith, 2005). In Tanzania, as in many developing countries, there is renewed attention to quality in health care, particularly technical quality in the public health sector. At the same time, the growing participation of private and nongovernmental health care providers greatly increases the choices available to consumers in the health care market. Even when there is no expectation that consumer demand could support the

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health care system and ensure a supply of high quality care, it is important to understand the responses of patients to changes in technical quality. When regulators or policy makers succeed in improving the quality of care provided by some doctors, do patients even notice and/or care? Positive demand responses to quality improvements may not drive reforms, but they can certainly reinforce them.

In this paper, we ask whether patients in a typical developing country setting can detect changes in the technical quality of care provided by their doctor. Although it is clear that patients in developing and developed countries are sensitive to prices, locations, and many observable characteristics of facilities and doctors, there is little empirical evidence that they are sensitive to this more important, but harder to observe, aspect of health care. Examining data collected in Arusha region of Tanzania, we find that patients can recognize quality care and that they value it. We compare patients' satisfaction with the quality of care they received to a research doctor's assessment of the actual quality of care provided to that patient and we show that a 1% increase in the doctor's adherence to medically prescribed protocol (hereafter simply adherence) *causes* a 0.40% increase in the probability that a patient will be very satisfied with the quality of care they received. In order to isolate the causal impact of quality on patient satisfaction, we take advantage of the Hawthorne effect, in which the quality of care temporarily increases when the research team arrives. In this research project, doctors significantly increased their adherence to protocol when a researcher began to observe them. These same doctors then slowly returned to normal levels of adherence while the researcher continued to observe them. The unanticipated arrival of the research team and the subsequent changes in quality are independent of patient, illness or doctor characteristics and therefore the arrival functions as an experimental change in the level of quality that can be linked to changes in patient satisfaction.

Identifying the link between patient satisfaction and quality requires exogenous variation in the quality of care provided by each doctor because satisfaction is sensitive to subjective expectations and both satisfaction and quality are simultaneously produced (de Ruyter and Wetzels, 1998; Jung et al., 1998; Meredith, 1996; Williams, 1998). Subjectivity is a problem because different people might rate the same services differently and even one person's satisfaction can be influenced by what they expected to happen. Thus, the differences in average satisfaction of patients at two different doctors may reflect differences in expectations not differences in actual quality. The simultaneous production of satisfaction and quality can also be a problem because the variation in the quality provided by a given doctor is usually a function of illness and patient characteristics that in turn influence patient satisfaction. For example, the fact that an illness is severe may increase the quality provided by the doctor while simultaneously increasing patient satisfaction. Further, demanding patients may induce more effort from doctors but also less likely to be satisfied no matter what happens. Thus, when we compare the changes in satisfaction and adherence for consultations at the same doctor we cannot normally differentiate changes in satisfaction caused by changes in quality from changes in satisfaction due to subjectivity, different expectations, or interactions between illness and patient characteristics and quality. However, by introducing the arrival of the research team as an experimental change, we can clearly see a change in quality that causes a change in satisfaction. This does not mean that satisfaction is no longer subjective, but the changes in satisfaction observed in this data can be linked to changes in quality, and therefore represent an objective aspect of patient satisfaction.

Existing studies of patient satisfaction have found that average levels of patient satisfaction are correlated with average levels of quality (Davies and Ware, 1988). On the other hand, studies that are more careful suggest that this correlation is spurious and that patient satisfaction is not sensitive to changes in quality (Chang et al., 2006; Das and Sohnesen, 2006; Erikson, 1986). The differences between these findings can be traced to the degree to which the authors control for unobserved patient and doctor characteristics across facilities. For example, Das and Sohnesen (2006) find that once they include doctor fixed effects, there is no correlation between satisfaction and quality. However, none of these studies uses an experiment or exogenous instrument for quality. There are some studies in developing countries that have tracked changes in patient satisfaction to changes in quality that result from outside interventions (Di Prete et al., 2000; Lundberg, 2007; Peters et al., 2004). However, because the changes in quality take place over a relatively long period, these authors cannot be sure that patients or patient expectations are not changing simultaneously. Lundberg (2007) shows that, while a bonus payment offered to randomly selected clinics in Uganda significantly increased the quality of care provided, the wealth of the average client also changed. This simultaneous change in patient mix and quality contaminates the experimental design of the study.

We argue that the Hawthorne effect represents an exogenous change within individual doctors' quality levels that is uncorrelated with observed or unobserved patient or illness characteristics. The arrival of the research team is an unanticipated event that induces short-term changes in quality without altering the types of patients and illnesses at a

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