

The Quality of Medical Advice in Low-Income Countries

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In 1978, an International Conference on Primary Health Care was held at Alma Ata in what was then the USSR and is now Kazakhstan. The resulting Alma Ata Declaration called “for urgent action by all governments, all health and development workers, and the world community to protect and promote the health of all the people of the world” (World Health Organization, 1978). While “action” was understood to mean a wide variety of interventions including safe water, sanitation, nutrition, and pest control, primary health care was also emphasized, and it eventually captured a larger proportion of health budgets than purely preventive services.

Since then, increased investment in health care infrastructure in many low-income countries around the world means that urban and rural households have improved access to health facilities and doctors. While the availability of health care remains an issue in certain areas, like some countries in sub-Saharan Africa, for a large majority of households in low-income countries, problems of access are no longer the first-order concerns that they were 30 years ago. However, whether or not this past gain in health infrastructure led to improved health, it is clear that in low-income countries today, access to health care facilities and personnel often do not translate into health. Two case studies help us understand why.

Ms. Sundar is a typical patient who lives in urban Delhi. There are over 70 private-sector medical care providers within a 15-minute walk from her house (and

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virtually any household in her city). She chooses the private clinic run by Dr. SM and his wife. Above the clinic, a prominent sign says “Ms. MM, Gold Medalist, MBBS,” suggesting that the clinic is staffed by a highly proficient doctor (an MBBS is the basic degree for a medical doctor as in the British system). As it turns out, Ms. MM is rarely at the clinic. We were told that she sometimes comes at 4 a.m. to avoid the long lines that form if people know she is there. We later discovered that she has “franchised” her name to a number of different clinics.

Therefore, Ms. Sundar sees Dr. SM and his wife, both of whom were trained in traditional Ayurvedic medicine **through a six-month long-distance course**. The doctor and his wife sit at a small table surrounded, on one side, by a large number of bottles full of pills, and on the other, by patients, who sit on a bench that extends into the street. Ms. Sundar sits at the end of this bench. Dr. SM and his wife are the most popular medical care providers in the neighborhood, with more than 200 patients every day. The doctor spends an **average of 3.5 minutes with each patient**, asks 3.2 questions, and performs an average of 2.5 examinations. Following the diagnosis, the doctor takes two or three different pills, crushes them using a mortar and pestle, and makes small paper packets from the resulting powder, which he gives to Ms. Sundar and asks her to take for two or three days. These medicines **usually include one antibiotic and one analgesic and anti-inflammatory drug**. Dr. SM tells us that he constantly faces unrealistic patient expectations, both because of the **high volume of patients** and their demands for treatments that even Dr. SM knows are inappropriate. Dr. SM and his wife seem highly motivated to provide care to their patients, and even with a very crowded consultation room, they spend more time with their patients than a public-sector doctor would. However, they are not bound by their knowledge of health care to deliver only those treatments they know to be appropriate; instead, as with the crushed pills in the paper packets, they deliver a type of health care that will result in larger numbers of patients willing to pay more for their services. Indeed, **overmedication in India is a widespread (for instance, Greenhalgh, 1987; Phadke, 1998)**. Note: this is consumer-driven demand, not the “supplier-induced demand” of practitioners exploiting asymmetric information to talk people into unnecessary treatment.

In rural Tanzania, Ms. M brings her nine-month-old to the local health clinic, carrying the child on her back. When she enters, Dr. K (an Assistant Medical Officer with O-level education¹ and four years of medical training) asks her what the problem is. Still standing in front of his desk, she replies that her daughter has a fever. Dr. K fills a prescription for malaria based on this statement, even though he cannot see the child, much less observe her condition. The consultation and medicine are both free and Ms. M leaves the facility with the prescribed medicine. During the exit interview, a nurse on our team notes that the child is suffering from severe **pneumonia**. The health facility has the medicine to treat both malaria and pneumonia. Dr. K is trained in the diagnosis and treatment for these diseases and

¹ O-level education refers to the old British system of education and is roughly equivalent to completing junior high school in the United States.

saw only 25 patients that day. Yet, but for the intervention of the nurse on our research team, the child would have died. Indeed, a survey in rural Tanzania found that 79 percent of children who die of malaria sought care at modern health facilities (de Savigny et al., 2004).

Taking these two cases as a starting point, this paper documents the quality of medical advice in low-income countries. We begin with an overview of the evidence that in many low-income countries, the problem of access to health care has improved, at least if measured by facilities, doctor visits, and access to drugs. We then introduce a rapidly developing literature on measuring the quality of health care in low-income countries. Two broad approaches have been used. In the “vignette” approach, a medical provider may be presented with hypothetical cases, and their responses may be compared to a checklist of essential procedures. The other approach is direct observation of doctors.

These two tools that measure process quality—medical vignettes and direct observation of the doctor–patient interaction—have proved quite informative. For example, doctors in Tanzania complete less than a quarter of the essential checklist for patients with classic symptoms of malaria, a disease that kills 63,000–96,000 Tanzanians each year. A public-sector doctor in India asks one (and only one) question in the average interaction: “What’s wrong with you?” In Paraguay, the amount of time a doctor spends with a patient has nothing to do with the severity of the patient’s illness. We present systematic evidence in this paper to show that these isolated facts represent common patterns. We interpret the vignettes as a measure of what health care providers know, while direct observation shows what they actually do.

By looking at what doctors know and what they do, we are able to show four things: First, the quality of care in low-income countries as measured by what doctors know is very low. Second, the problem of low competence is compounded due to low effort—doctors provide lower standards of care for their patients than they know how to provide. Third, the poor are particularly disadvantaged, both because they have access only to doctors with low levels of competence and because less-competent doctors put in less effort. Fourth, oft-tried measures such as training doctors are unlikely to work because doctors often exert very little effort; for example, three years of medical school in Tanzania result in only a 1 percentage point increase in the probability of a correct diagnosis.

Our evidence on health care quality in low-income countries is drawn primarily from studies in four countries: Tanzania, India, Indonesia, and Paraguay. Table 1 summarizes the methods used and the samples in these four countries. These results for these four countries must obviously be viewed as preliminary, and in the conclusion of the paper, we will outline some of the theoretical and empirical questions yet to be investigated. However, the available evidence strongly suggests that if the enormous burden that poor health imposes on most of the world’s poor is to be reduced through medical care, it will be critical to look beyond the presence (or absence) of physical components of health care like proximity to facilities and to examine the behavior of health care providers. An alternative

Table 1

Survey Instruments Used in the Four Countries

<i>Country</i>	<i>Methodology</i>	<i>Observations</i>	<i>Sample</i>	<i>Year of survey</i>
Tanzania, Arusha region	Vignettes and direct observation	111 doctors, 1178 provider–patient interactions	Rural/urban doctors practicing in Western-style health facilities	2002–03
India	Vignettes and direct observation	215 providers, 4108 provider–patient interactions	Delhi-based public and private providers spanning a wide range of treatment styles	2002–03
Paraguay	Direct observation and exit surveys	286 providers, 2200 provider–patient interactions	Public providers practicing “Western” forms of medicine sampled from 4 “departments” in the country.	2004
Indonesia	Vignettes	992 Facilities	Providers practicing “Western” forms of medicine sampled from the entire country.	1993 Indonesia Family Life Survey

Notes: Kenneth Leonard was the principal investigator on the Tanzanian survey; Jishnu Das and Jeffrey Hammer on the Indian survey; Jishnu Das and Daniel Dulitzky on the Paraguay survey. The Indonesian results are drawn from the Indonesia Family Life Survey, data for which were provided by Sarah Barber.

interpretation is that the public sector may have serious, systematic, problems ensuring quality in publicly supplied medical care and that major improvements in true public goods and nonmedical control of infectious disease are needed before turning to policies that are hard to implement.

Improved Access to Health Care in Low-Income Countries

The expansion of the physical health care infrastructure has improved the extent to which people in low-income countries can meet with a health care provider. Data from the Tanzanian Demographic and Health Surveys for 2004 showed that 68 percent of urban and 58 percent of rural citizens reported taking their child to a health facility when the child showed signs of acute respiratory infection (viral or bacterial colds and coughs). In India, for the same period, 78 percent of urban and 60 percent of rural residents reported having done so (2005–2006 National Family Health Survey (NFHS-3) data). In Indonesia, the overall rate is 62 percent, and in Paraguay in 1990 the rate was 53 percent. Although, there is no precise comparison in the United States, data from the National Medical Expenditure Survey (1988) show that 52 percent of children seek care at a health facility when they are sick with pharyngitis (throat infection); among the uninsured, the rate is 32 percent. The rough comparability of the

numbers from low-income countries to U.S. data, together with the fact that the rural health facility usage rates are within 80 percent of the urban rates, suggest that most residents of low-income countries do have access to health care when they need it.

Detailed surveys on health care utilization in low-income countries also often show many contacts with health care providers. People in rural Rajasthan—a low-income and low-density state in India—visit a doctor about six times a year (Banerjee, Deaton, and Duflo, 2004). In urban India, individuals visited doctors about five times a year (Das and Sánchez-Páramo, 2003). This usage of health facilities in India—both in a relatively rich urban sample and a relatively poor rural sample—is higher than the U.S. average of 3.15 visits per person per year (National Ambulatory Medical Care Survey advance data available at <http://www.cdc.gov/nchs/data/ad/ad374.pdf>). Because medicines that typically require prescriptions in the United States, such as antibiotics, are usually sold over-the-counter in India, it is likely that under similar prescription regimes, the differences in care seeking would be even higher. Other low-income countries have similar results. Across countries ranging from Burkina Faso (whose Gross National Income or GNI per capita was \$230 in 1998) to Thailand (GNI per capita \$2,740 in 1998), health care utilization is high among the population in general and among the poorest quintile in particular (Makinen et al., 2000).

That patients in low-income countries have access to health care facilities is encouraging. However, whether the higher usage of health facilities translates into better health is a matter of debate. In many countries, the level of expertise of medical care providers is low. In China, the use of barefoot doctors was widely advocated and used—although ironically, this program was abandoned in China just as the rest of the world began to emulate it. In India, the government provides valid licenses to a wide range of health care practitioners: from “real” doctors with a MBBS to a “Practicing Medical Physician” or PMP, whose only qualification is that the person has practiced medicine at some time. In addition, India’s government has brought a large number of semi-trained medical care providers into the medical practice and has “regularized” the use of alternative methods of treatment. African countries trained new cadres of clinicians who required very little formal medical education. In Tanzania, with four medical doctors for every 100,000 people, much care in the rural areas is provided by clinical officers (who have four years of secondary schooling and two additional years of medical training) and clinical assistants (who have only elementary education and three years of medical training).

Health outcomes in these countries are still very poor compared to the United States *despite* very high and frequent use of the health care system by the population. One possibility is that poverty and the overall health environment make good medical care insufficient for good health. A second possibility is that the expansion of the health care system has led to a situation where the poor have access to doctors, but the quality of the medical care is so poor that even common illnesses are not diagnosed and treated correctly. Almost certainly, both factors play a role.

To ascertain how important each might be, an important first step is to measure and document the quality of medical advice and its correlates in these countries.

Competence: What Do We Learn From Testing Doctors?

Traditionally, health care quality in low-income countries has been measured either by the condition of infrastructure or by the presence or absence of certain drugs—measures known in the literature as “structural quality.” While structural quality is clearly not a direct measure of the quality of medical advice, it might be thought that it could serve as a proxy. This line of reasoning runs into two problems. First, in a number of countries, there is little variation in basic measures of health infrastructure. In Paraguay and Indonesia, for instance, more than 95 percent of all health care facilities have running water, regular electricity, and telephone connections, and just less than 90 percent have refrigeration facilities (which are important for maintaining vaccination cold-chains). Second, even when there is variation in structural quality, as there would be for the availability of medicines, in both Indonesia and Tanzania there is little or no correlation with the quality of medical advice that is actually dispensed in these facilities (Barber, Gertler, and Harimurti, 2007a).

An alternative approach to measuring the quality of medical care is to test doctors using vignettes. A vignette is a hypothetical case in which the interviewer acts as a patient and provides a very brief description of symptoms. In addition, the doctor is told that the patient will comply with the provider’s instructions, medications, and tests, and will follow-up by returning to the doctor if necessary. The doctor is then invited to proceed exactly as he or she would under normal circumstances, asking questions about the history of the illness and performing necessary examinations. The “patient” provides standardized predetermined answers to the questions and examination procedures. Usually, a second interviewer is present to provide answers to questions that the “patients” may not know and to provide continuity to the process—for example, if the results of a blood-test are called for, the second interviewer responds. The recorder also notes the treatment described.

An Example of a Vignette

In one vignette, used in India, Indonesia, and Tanzania, a mother brings an infant to the provider. She tells the provider that her child has been suffering from diarrhea for the last two days and she does not know what to do. The recorder notes such things as whether the doctor asked about the nature of the stool (to distinguish viral diarrhea from dysentery) and checked the child for symptoms of severe dehydration, such as dryness of the tear-ducts or depression in the skull fontanel (the soft spots in the skull of an infant). The underlying condition reflected in the answers given is that the “patient’s” diarrhea does not arise from an infection and

that the child is not severely dehydrated; therefore oral rehydration therapy is the only required action.

The questions and examinations that a clinician uses are compared to a list of questions and examinations compiled by experts (India) or drawn from national protocol (Tanzania). Thus, for each clinician evaluated and for each illness presented in a vignette, data are collected on whether the clinician provided each of the items on the reference list; the diagnosis given; and the treatment suggested. In this manner, each doctor is tested for up to six different illnesses. The performance of each clinician on the list of items is then used to create an index of overall competence. In addition, the diagnoses and treatments offered can be evaluated for correctness, either by comparison with a protocol or by using a team of medical experts.

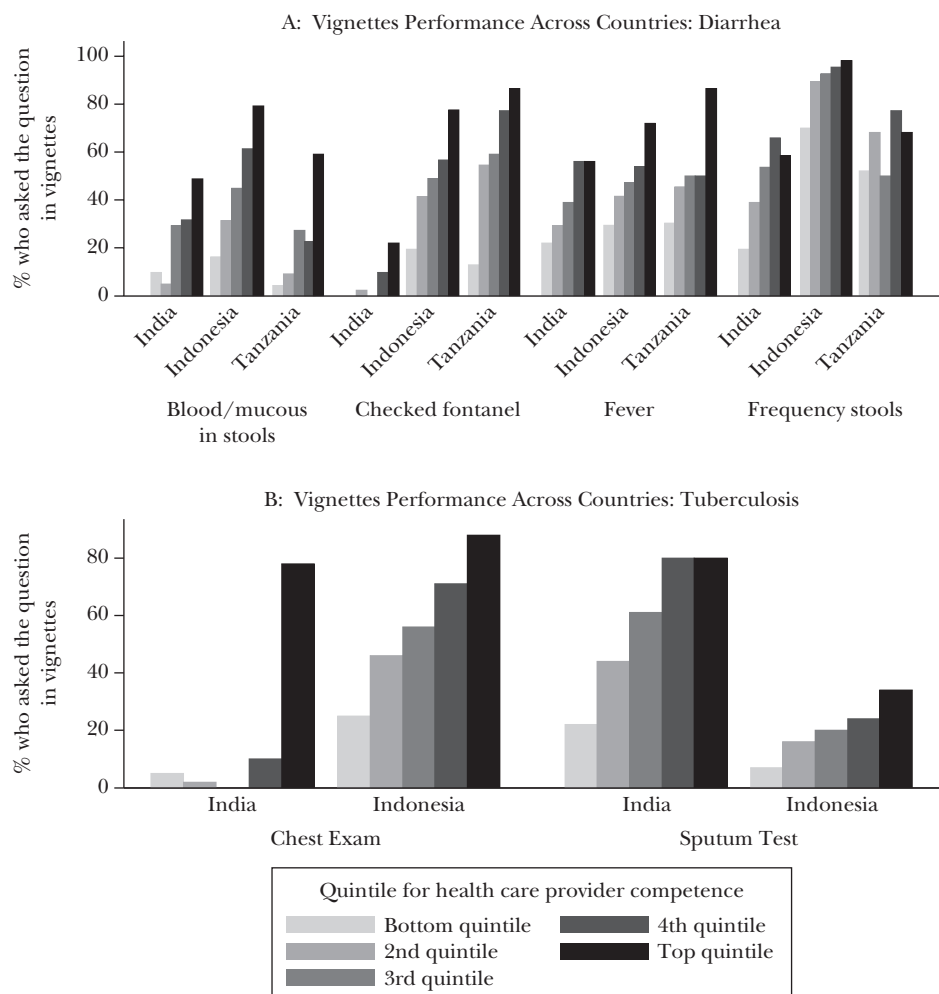
Vignettes: Results and Validity

Figure 1 presents a snapshot of vignette responses in India, Indonesia, and Tanzania. Although the vignettes were independently designed in these countries, all three administered a vignette on childhood diarrhea. In the top panels, comparisons of whether certain diagnosis questions were asked in the vignettes on diarrhea are shown in the top panel. The projects in India and Indonesia also administered a vignette on tuberculosis, and the results for some diagnosis questions on tuberculosis are shown in the bottom panel. The percentage of clinicians who asked each question is shown by quintiles of their competence index (more on this below), derived from their performance on all items across all vignettes administered.

The most noteworthy result is that basic essential procedures for common diseases were not being used by health care providers. In India, where close to 500,000 children die every year of diarrhea, only 25 percent of providers in the richest state, Delhi, asked about blood/mucous in the stool, 49 percent ask whether the child has a fever, and 7 percent checked for a depression in the skull fontanel. These essential questions and examinations allow the provider to differentiate viral from bacterial causes and to assess the degree of dehydration—thus, whether the child needs immediate hospitalization. In Tanzania, these numbers are only slightly better, and even in Indonesia, except for asking about the frequency of stools, there is still less than a 50 percent chance that any of the other essential procedures would be carried out.

The results also show that the probability of asking an essential question or completing an essential examination increases with competence, sometimes dramatically so. Across the different questions, moving from the lowest to the highest quintile of competence increases the probability of completing an essential procedure by 40–70 percentage points. Competence derived from the vignettes is strongly associated with greater knowledge of essential procedures. Also noteworthy is that in India, the probability of completing essential procedures does *not* vary much across the bottom two quintiles—because the vignettes were “too difficult” for doctors in the bottom part of the distribution (Das and Hammer, 2005).

Figure 1

Performance Variation across Countries

Note: The figure compares common questions for diarrhea and tuberculosis vignettes administered in India, Indonesia, and Tanzania. The percentage of care providers who asked each relevant question is disaggregated by their quintiles of competence and plotted on the vertical axis. We show four common questions in the diarrhea vignette and two in the tuberculosis vignette; the two tuberculosis questions were shared only across India and Indonesia. The competence index is based on the item-response estimate described in the text.

A side-by-side examination of the diarrhea and tuberculosis panels illustrates why it will be hard to make cross-country comparisons. Ideally, relative rankings of competence would not vary across different illnesses and procedures, and this is indeed what we see in any comparison within each of the three countries. However, it seems that in comparing India and Indonesia, doctors who are relatively more competent in one illness may be relatively less competent in another. For example,

providers in India look much worse than their Indonesian counterparts for diarrhea, where the difference in the probability of completing an essential procedure between the two countries is close to 40 percentage points. For tuberculosis, the difference is again close to 40 percentage points in favor of Indonesia for whether the providers complete a chest examination, but Indian providers are far more likely to ask the patients for a sputum examination—a recommended and critical procedure, without which a diagnosis of tuberculosis cannot be confirmed. Doctors in India come across looking more or less competent depending upon which procedure we are looking at, which may reflect differences in the disease burden or the medical training across these two countries.

Constructing and Validating the Competence Index

Item Response Theory, a tool of psychometrics, is a method for combining answers from a number of questions into a composite index of competence. The method begins with the assumption that there is a single measure of competence being approximated by the questions, and then solves for optimal weights for each question, so that the composite index explains as much of the overall pattern of correct answers as possible. These weights allow for a competence measure that provides the greatest possible information about the differences between clinicians and simultaneously allows us to verify that the index of competence explains behavior.²

One source of validation for the competence index is the fact that doctors with a high value of the index are much less likely to suggest harmful treatment (India) and much more likely to suggest the correct diagnosis and treatment (Tanzania). As an indicator of how poor overall competence is, a doctor in India has to be above mean competence in the sample to have a better than even chance of not harming the patient.

A second indication of the importance of this index is that, in Tanzania and India, after controlling for a doctor's score on the vignette, no other characteristics of the doctor are significantly correlated with the probability of giving the correct diagnosis, which in turn suggests that the scores derived on the vignette provide a useful summary of knowledge and/or capacity (Das and Hammer, 2005; Leonard, Masatu, and Vialou, 2007).

What Correlates with Competence?

The competence index derived from Item Response Analysis can be compared with characteristics of the provider such as experience, training, and institutional

² The critical assumption for constructing the competence index is unidimensionality. That is, a single dimension (presumably) knowledge explains all performance on the vignettes. While clearly not true across countries, within countries this is validated both by looking at the drop-off of eigenvalues from a factor model and by specifically testing whether other attributes of the doctor remain significant after including competence as an explanatory variable for performance on the vignettes (Das and Hammer, 2005; Leonard, Masatu, and Vialou, 2007).

affiliation and the characteristics of the area in which the provider practices. These correlations are explored in Das and Hammer (2007), Leonard and Masatu (2007b), and Barber and Gertler (2007) and provide a number of interesting insights.

Take for instance, the perennial question of whether doctors in the public or private sector are better. A typical assumption is that the private sector provides higher quality at a higher price. Yet this is clearly not true for the measures of competence based on vignettes—in all three countries, the public sector is on average as good as the private sector. This seeming equivalence arises for a number of different reasons. In Indonesia, many private-sector doctors are employed by the public sector but also work in private clinics—so it is not surprising that their levels of competence are similar. In India, within the public sector there is a distinct difference between doctors staffing prestigious hospitals and those in primary health clinics. In the private sector, fully trained doctors are slightly better than those in the public hospital (but not by much) and, indeed, are likely to be the same people at different stages in their careers. In contrast, the various less-than-fully trained practitioners in the private sector are, on average, less knowledgeable than their public counterparts in primary health clinics (but not by as much as one might think). The overall result is that the public and private sectors look very similar in their competence; at the same time, the distribution shows a long tail of poorly trained doctors in India's private sector who, by law, cannot practice in public clinics.

Or consider the relationship between training, experience, and competence. As expected, training is highly correlated with competence. However, these data show no relationship between experience and competence, suggesting either that “learning on the job” is not important or that the better training received by a more recent cohort offsets the advantages of experience for older cohorts.

The relationship between poverty in the area that the doctor practices and the competence of that doctor stands out. In India, Indonesia, and Tanzania, doctors in poorer areas are less competent than those in richer areas. While this is expected from private-sector location decisions, since willingness to pay plausibly increases with income, part of the rationale for public-sector provision of health care was to enhance equity by offsetting the adverse effects of private-sector location decisions. Clearly, this is not happening. Rich people get reasonable care either from public clinics or from highly qualified private physicians. Poor people get care from providers with very deficient competence wherever they go—public clinics or private.

This insight implies that “access to care” can be very different from “access to quality care,” and the difference can loom larger for the poor. In the Arusha region of Tanzania for instance, most of the rural population lives within five kilometers of a functioning health facility. However, many of these facilities are staffed by doctors with such low levels of competence that patients are likely to be misdiagnosed and receive the wrong treatment. Low-competence doctors are more common in the rural areas; consequently, an average rural resident has to travel further

to reach a competent provider than an urban one. Thus, the picture of access derived from distance to the nearest health facility is very different from that derived from distance to the nearest competent provider (Klemick, Leonard, and Masatu, 2007).

Vignettes offer intriguing insights into the training, orientation, and knowledge of medical providers in low-income countries. However, what providers say they would do in a hypothetical or role-playing situation and what they actually do when confronted with a patient can be very different, and we turn to this next.

What Do We Learn From Watching Doctors?

Direct observations of health care providers have been made in three countries: India, Paraguay, and Tanzania. We first describe differences in methods across the countries and then draw some lessons from the three studies, including lessons based on analysis of the linkages between what doctors recommend on the vignettes and what they actually do in practice.

How Observation Was Done

Slightly different methods were used for direct observation of clinical practice. In India and Paraguay, interviewers with no medical training sat for a day with each of the doctors to whom vignettes were presented. The interviewer recorded details of every interaction, including the time spent, the questions asked, the examinations performed, the treatment dispensed, and the price charged. The time spent, questions asked, and examinations performed were then aggregated into a single “effort-index” using principal components analysis, which again weights the individual questions so that those questions more closely correlated with a single overall measure receive higher weights. In addition, for two common ailments (diarrhea and cough without fever), which had also been included in the vignettes, the interviewers noted whether the provider asked specific questions that were deemed essential by the team of experts. This approach allowed a direct comparison between what health care providers knew (and what we knew they knew) and what they did.

In Paraguay, direct observation was supplemented with exit surveys of patients as they left the clinic. Interviewers conducting the exit surveys completed a short module on the patient’s sociodemographic details, their health status (measured through self-reported health status and activities of daily living), their satisfaction with the interaction, and a measure of their wealth using the possession of durable goods. These patient details were then matched to the details from the interaction to see how responsive public-sector doctors are to patient characteristics.

In Tanzania, the researcher (who was also a doctor) checked off a list of expected items, including questions about medical history and physical examination procedures. The research team in Tanzania designed instruments to compare the effort provided in doctor–patient consultation for three common conditions to

nationally designed protocols for those conditions. Thus, if a patient has a cough, fever, or diarrhea, there are a series of history-taking and physical examination procedures that are clearly useful; doctors who provided more of these items were deemed to provide higher-quality care. In addition, doctors who were observed consulting patients with any of these three conditions could be compared to other doctors in the sample, even if their case-mix was otherwise very different. Thus, the percentage of items provided from among those required by protocol was used as a process quality measure and compared across doctors within the sample to examine the determinants of variation in process quality.

One concern with measuring doctor effort through direct observation is that the doctor may work harder in the presence of the research team. The “Hawthorne effect,” as the effect of observation on performance is called, is well documented in health care studies.³ Leonard and Masatu (2006) gather data on process quality using exit surveys that ask specific questions about the doctors’ activities just before the research team arrived; they compare this data with data gathered when the doctors realize that they are being observed. When the research team arrives at a facility, process quality increases by 20 percent on average. However, for the average doctor, this increase in quality is temporary. Within ten to 15 consultations (1 to 1½ hours), the doctor returns to levels of quality exhibited before the research team arrived. Although the reasons for this rise and subsequent fall in quality are not fully understood, it seems likely that doctors put in more effort when they know they are being watched, especially if the observers are their own peers (recall that the observers used in Tanzania were doctors). Despite this reaction to being studied, it appears that process quality measures can be reliably inferred if the research team is willing to wait for quality to return to normal levels. To the extent that Hawthorne effects also bias the measurements of effort upwards, the “true” quality of care is worse than that documented here.

Variation across Countries

Table 2 shows the average time that a doctor spends with every patient, the number of questions asked, and the number of examination procedures actually used. Clinical style varies substantially between countries. Far and away the most time and effort appear to be given by practitioners in Paraguay. The average time spent with patients in Paraguay is similar to that in many high-income rich countries. At over eight minutes per visit, Paraguay ranks higher than Germany and Spain, though lower than the United Kingdom or Belgium.

In contrast, consider Delhi. In the average interaction, the doctor sees the patient for 3.8 minutes, asks 3.2 questions, and performs just over one examination procedure. These measures are low by any standard. In Tanzania, doctors exert

³ The Hawthorne effect is named after a study of the Hawthorne Works, an industrial plant located outside Chicago, from 1924 to 1932. The study was originally intended to determine the optimal lighting for the plant. However, the researchers found that workers increased their effort when lighting went either up or down—as long as someone was paying attention to them.

Table 2
International Comparisons of Effort

Country/Effort category	Time spent	Questions asked of patient	Number of physical exams	(Total number of medicines given)
<i>Dehli</i>				
Doctors who exert low effort	1.9	1.36	0.97	2.13
Doctors who exert medium effort	3.36	2.94	1.0	2.72
Doctors who exert high effort	6.15	5.32	1.37	3.05
All doctors	3.80	3.20	1.09	2.63
<i>Paraguay</i>				
Doctors who exert low effort	5.79	5.33	1.38	1.36
Doctors who exert medium effort	7.90	7.50	2.93	1.55
Doctors who exert high effort	11.34	11.91	3.64	1.65
All doctors	8.33	8.23	2.65	1.52
<i>Tanzania</i>				
Doctors who exert low effort (25 th Percentile)	3	2	0	N/A
All doctors	6.32	3.96	1.51	N/A
<i>Germany</i>	7.6	N/A	N/A	N/A
<i>Spain</i>	7.8	N/A	N/A	N/A
<i>Belgium</i>	15.0	N/A	N/A	N/A
<i>United Kingdom</i>	9.4	N/A	N/A	N/A

Notes: We divide doctors by terciles of effort in India and Paraguay, and the 25th percentile versus all doctors for Tanzania. The data are based on the following sources: India—Das and Hammer (2007); Paraguay—Das and Sohnesen (2007); Tanzania—based on calculations by Kenneth Leonard; International Comparisons—Hogelzeir et al. (1993) and Deveugele, Derese, Brink-Muinen, Bensing, and De Maeseneer (2003).

more effort in consultations—approximately 6.3 minutes on average. Looking across a wider range of countries in the bottom panel of the table, while the time spent with the patient varies dramatically across countries, this variation is only loosely associated with the country's per capita national income.

Variation across Doctors

Large variations of time and effort given to patients in different countries can be decomposed into variations between doctors—say, due to general differences in the style of practice of a particular practitioner—and that part that is attributable to variations in time spent by any particular doctor across patients. For India and Paraguay, the variance can be divided about 50/50 between inter-provider and intra-provider variation. In Tanzania, there is also substantial variation in the clinical habits between doctors. Twenty-eight percent of doctors spend three minutes, ask two questions, and perform no physical examination with the average patient. This result is frightening, particularly since in all cases where we observed doctors, they were the first point of contact with the medical system for the patient—the numbers from United Kingdom and Spain for instance, represent the time spent with the doctor *after* a nurse or assistant has taken basic health measurements for the patient.

We do not have nearly enough information to explain variation between doctors. Only about 40 percent of the variation in India, for example, is explicable with observable characteristics. For instance, in both India and Tanzania, the doctor's age, gender, and experience are not related to effort. The tenure of the doctor in his or her current position is inversely related to the amount of time devoted to each patient. This may be a problem, but it may also reflect greater familiarity with the patient base.

What *do* jump out of the data are systematic differences in effort due to institutional affiliations. Variations in India are instructive. In the private sector and in public hospitals, the amount of time spent is fairly low relative to other countries. In the public clinics, however, the situation is disastrous. In these clinics, representing about one-third of the visits that we observed, the average number of questions asked was one (and that one was often asked rudely). The average time spent was less than two minutes and the average number of examinations was 0.8, or less than one examination for every patient seen. That is, if a person claims to have a fever, in most cases the doctor will not feel or otherwise take the temperature of the patient.

In Tanzania, the split between those who work for the public sector and those who work for nongovernmental organizations makes up most of the difference. The latter put in much more effort than the former. In Paraguay we do not observe private-sector doctors, but do find a clear difference in effort across doctors with permanent or temporary contracts that can be tied to career concerns and wage incentives.

In all three countries, incentives may be driving these patterns. In India, public primary health care physicians are paid by salary and are not monitored. India's public primary health care physicians are usually of much higher social and economic status than are their patients, which influences their attitudes towards the patients and results in a low likelihood that complaints about their behavior will be reported, or acted upon if reported. As a result absenteeism is high; care is lackadaisical and often rude. On the other hand, India's public hospital-based physicians put in much greater effort per patient relative to public primary health care physicians—in fact, the best of them look a lot like their private counterparts. We speculate that such workers are better monitored. Also, while it is still virtually impossible to fire a public doctor, jobs at the urban hospitals we visited are coveted, and the doctors there may be on a career track that makes them sensitive to the evaluations of their senior supervisors.

Using data from Tanzania, Leonard, Masatu, and Vialou (2007), we develop an index of incentives that measures the degree to which authority over decision making is decentralized. Facilities that have a high index value are those in which the chief of post has the authority to hire and fire, choose the qualifications of his staff, set prices, and decide how funds will be used. In contrast, a facility with a low index value is one in which all of these decisions are made in the capital without the input of the staff. In Tanzania, as incentives increase, so does effort among doctors in the facility.

The story in Paraguay is a bit more complicated. In general, men do less work than do women, and the higher-paid practitioners work less. However, there is a distinct split between how the genders react to incentives. Doctors can hold either permanent contracts or temporary contracts and, in some cases, hold both types of contracts in different institutions. A sample of doctors who held both types of contracts were observed, and the results show that men put in more effort in their permanent positions and women in their temporary positions. One explanation for this gender difference is that salaries in the Paraguayan health system are negotiated, with strong evidence of discrimination against women. Most male doctors expected their temporary contracts to be renewed, irrespective of job performance, and their increases in salaries to come from negotiations based on their permanent positions. Women felt that salary increases were hard to negotiate and also feared losing their temporary jobs if they did not perform well.

Although these patterns can be plausibly tied to the structure of incentives within the public system, there are several alternate hypotheses. First, public doctors may see many more patients. Second, the presence of observers may have differential effects on public and private providers. This shows up either in reluctance to accept “under-the-table” payments in the public sector or through differential Hawthorne effects for public and private-sector doctors. Third, some have suggested that doctors, because they are underpaid, work about as long as their salary would justify. Fourth, doctors may select into public or private practices depending on their intrinsic motivation and/or cost of effort.

As to workload, the results in India continue to hold after controlling for patient load. While the doctor’s heavier patient load in the public sector is negatively correlated with effort, the difference between the public and private sector in effort remains large and significant with additional controls for the average number of patients the doctor sees in his or her practice. Further, the cases seen in both public and private sectors are identical in terms of their disease profile. If anything, judging by the extra number of days people wait to go to a public clinic, the severity of disease seen in the public clinics is likely to be greater than in private clinics, and so should warrant more time and attention rather than less. Similarly, in Tanzania, the effort provided by rural doctors, who also have lower caseloads, is much lower than that provided by urban doctors with higher caseloads.

There are differences in the Hawthorne effect for public and private providers, but these differences accentuate the magnitude of the effort-gap between the two sectors. Leonard and Masatu (2007a) show that this effect is strongest for doctors who normally face the lowest incentives to provide quality.

Our studies offer no information about bribery of health care providers, since we did not observe any—this outcome could have been induced by our observations. However, if under-the-table payments are important, it would suggest that doctors are responding to price incentives—when you pay them more for a specific service, they work more.

Do public-sector doctors put in less effort because they are paid too little? While complicated, there are some indications in each of the countries that raise

doubt about the extent of this problem. In India, income can be estimated controlling for quality of the practitioner on the basis of vignettes, and it turns out that public primary health care doctors are not likely to make more in the private sector; we predict they would make much less. In Tanzania, effort is unrelated to remuneration; and in Paraguay, doctors who are paid more work less.

Less effort in the public sector is almost surely partly due to selection on the cost of effort. This finding underscores the impact of incentives, not only on what doctors do in their chosen profession, but also on how they choose between the two sectors to begin with. If you wish to work less, you may very well choose to stay in the public sector. Ultimately, we cannot disentangle these two effects with the existing data.

Explaining Variation for Individual Doctors

In Paraguay, there is almost no correlation between variation in doctor effort and the characteristics of the patients that doctor sees (Das and Sohnesen, 2007). On the positive side, this finding implies that doctors in Paraguay do not discriminate by the background of the patient; on the negative side, it implies that doctors did not expend greater effort or spend more time on those who were sicker. In India, private doctors expend less effort on their younger patients and on their repeat patients; in the public sector, the differences are statistically and qualitatively smaller. Overall, only about one-third of the variation observed within doctors is explicable with easily observed characteristics of the patients.

What Do We Learn From Both Testing and Watching Doctors?

Testing and watching doctors suggests that the variation in quality of medical advice arises from 1) variation in competence, defined as what doctors know; 2) variation in effort, defined as how hard doctors work; and 3) implicitly, the link between the two. The connection between competence and effort could go in either direction. For example, greater competence could mean less time needs to be spent in making a correct diagnosis and offering a correct treatment. Conversely, a knowledgeable doctor may take more time in being more thorough.

The data suggest two patterns. First, greater competence is associated with higher effort. For instance, in India we divided doctors into four categories: with and without an MBBS, and private versus public hospital-based (or clinic-based) doctors. In all four categories, the more competent the provider, the more effort exerted. Indeed, the increased effort from greater competence looks similar between the groups, however, the deficient effort in public clinics still stands out. The finding that effort and competence are positively correlated is confirmed in the data from Tanzania as well (Leonard and Masatu, 2005).

Second, despite the positive correlation between effort and competence, there is a large and significant gap between what doctors know they should do (as

measured by testing doctors) and **what they actually do** (as measured by watching doctors). In both India and Tanzania, for patients reporting fever, cough, or diarrhea, observers were asked to note whether the doctor asked certain questions and performed certain examinations that had been included in the vignettes as essential tasks. Since these cases had also been covered under the vignettes, we can directly compare what doctors said they would do and what they actually did when faced with a similar patient. How **large is the gap between knowledge and practice?**

For the data from India, we considered the percentage of essential tasks completed in the vignettes concerning diarrhea and “cough without fever” and in direct observation of patients reporting these conditions for three types of doctors—private doctors with an MBBS degree; private doctors without an MBBS degree (recall that doctors with an MBBS degree are more competent); and public doctors, all of whom have an MBBS degree. There are several noteworthy features of the comparison. First, private doctors without an MBBS complete just over 20 percent of all essential tasks, but they are doing pretty much all they know to do—the constraint on their performance is competence. Second, private doctors with an MBBS knew 40 percent of the essential tasks, but in actual practice were completing only 25 percent of them. The constraint on their performance is effort. Third, the gap between competence and practice among public-sector doctors is even higher—these doctors knew to complete 30 percent of essential tasks, but actually completed only 8 percent. Here, the constraint on performance is clearly effort.

In Tanzania, similar analysis tells a slightly different story. Consider the essential tasks that were both asked about in vignettes and noted in doctor–patient interactions. Doctors in the public and nongovernment organization sector both completed 50 percent of these essential tasks in the vignettes. However, whereas doctors in the nongovernment organization sector completed 44 percent of these tasks when observed with their regular patients, doctors in the public sector completed only 36 percent of the same tasks. The items that correspond across the vignette and the direct observation checklist are not the same for Tanzania as they are for India, and therefore the higher percentage of tasks completed should not be interpreted as higher quality (Leonard and Masatu, 2005). However, the numbers illustrate the fact that there are no differences in competence between the public and nongovernment organization sectors in Tanzania, but that there are significant differences in effort.

Two implications of these results seem worth emphasizing. First, the poor in these countries receive low-quality medical advice both because the medical providers located close to them are less competent and because less competent doctors exert less effort. One of the ostensible rationales for a public-sector presence in health was precisely to ameliorate the detrimental effects of profit-maximizing behavior among private-sector providers. Yet the association between competence and local poverty is identical for doctors in the public and private sectors. Worse, effort in the public sector is so low that it is often better to go to an untrained provider in the private sector than a trained doctor in the public sector, because the

greater effort of the untrained private-sector provider makes up for the lower level of competence.

In low-income African countries, one option may be the nongovernment organization sector. The nongovernment organization sector in Tanzania, as in many other African countries, is an institution handed down from earlier missionary efforts and plays a significant role in education and health. In Tanzania, the nongovernment organization sector is staffed with Tanzanians who graduate from the same medical schools as doctors in the public sector (as reflected in their similar levels of competence), but the data suggest that some features of their organizational structure encourages these doctors to exert more effort (Leonard, 2002). Nongovernment organizations are more expensive than their public counterparts, but they are located in poor areas, and Leonard and Masatu (2007b) suggest that they may do a better job of serving the rural population of Tanzania.

A second implication is that the link between knowledge and practice provides stark evidence that “training doctors”—a perennial favorite among multilateral institutions and donors—is not going to help much. The effect of training on the quality of medical care can be divided into two parts: 1) the effect of training on the knowledge (as measured by the probability of completing essential tasks in vignettes) and 2) how knowledge affects effort (as measured by the probability of completing essential tasks in practice). Both these effects are small.

In Tanzania, for example, doctors are much less likely to get the correct diagnosis in practice than their competence would suggest. In these data, a one-standard-deviation change in competence corresponds approximately to moving from a clinical assistant (with four years of secondary schooling and two years of medical training) to a medical officer (with six years of secondary schooling and five years of university-level medical training). These five years of additional training on average correspond to a 5 percentage point increase in the probability that the doctor would correctly diagnose the illness. When measured by actual behavior, however, the difference between a clinical officer and a medical officer for practice quality is about 1 percentage point. Based on these estimates, two additional years of school and three additional years of medical school buys an increase of only 1 percentage point in the quality of medical care actually delivered. Moreover, training doctors in *poor* areas also raises the question of where they will locate after they are trained. If the better-trained doctors follow the typical location patterns, it is unlikely that they will remain in the poorer areas.

Research Agenda and Concluding Thoughts

Some of the patterns that we have found in India, Indonesia, Paraguay, and Tanzania are strong enough that we feel comfortable presenting them as likely to be universal. In particular, the **competence of doctors** in low-income countries is low, the **quality of care provided to patients is even lower** than would be suggested

by a doctor's competence, and the poor have access to worse-quality care than the rich, whether from the public or the private sector. However, these facts and their interrelationships require further exploration. Several different research agendas are suggested by these results.

First, research is required to **establish the link between the quality of medical advice** measured using these tools and **health outcomes**. A few studies suggest that both competence and effort are positively correlated with health outcomes, but clearly further work is required. For example, using a decline in health care provider quality as measured by vignettes in Indonesia between 1993 and 1997 (caused by a funding freeze), Barber and Gertler (2005) demonstrate a link between competence and children's heights and weights. Similarly, Barber and Gertler (2007) show in Mexico that the birthweight of children increased in villages with conditional cash transfer programs, whereby mothers were given cash if they completed a certain number of doctor visits. What is of particular interest in their study is that the improvement in birthweight had little to do with greater doctor visits—in fact, these barely changed as a consequence of the program. Using data on the percentage of essential tasks completed in maternal check-ups, the authors argue that community meetings “empowered” women to demand better care from their doctors and that consequently there was a large increase in effort and hence the quality of care delivered. Similar results are documented by Bjorkman, Reinika, and Svenson (2006). In a randomized study on the effect of citizen report cards on health care outcomes, the authors document an improvement in child health, which they attribute to greater effort among providers.

A second issue is how to deal with sorting effects, which can arise in a variety of ways. For example, our measure of effort is based on observations of patients who choose to visit the doctor observed. But if those with **high incomes visit more competent providers**, more **competent doctors may provide more effort because they are being paid more and not because they are more competent**. Das and Hammer (2007) use the presence of multiple doctor clinics with random sorting between doctors to show that the correlation between competence and effort was identical in the entire sample and in this more specialized setting. In Leonard (2008), the Hawthorne effect is used as an instrument for quality; that is, they exploit the fact that patients who received their consultations immediately after the research team arrived, received better consultations for reasons that are uncorrelated with patient characteristics. This method does not expose the determinants of case mix but allows the researcher to link effort to outcomes (patient satisfaction, in this case) despite case mix variation. Another possible way to control for case mix is to collect more patient data through detailed exit surveys, so that it becomes possible to adjust for a wide array of patient characteristics. Yet another approach, which has been used to study the quality of health care in high-income countries but not in low-income countries, is to use fake patients with standardized symptoms, which is another way of holding patient characteristics constant. The ethical, feasibility, and estimation issues associated with these alternative approaches are yet to be resolved.

A third issue is to understand the structure of market equilibrium, recognizing that the location choices of doctors are endogenous. On average, less competent providers are in poorer areas, but considerable variation exists. Why do we find competent providers in poor localities when, a short distance away, their competitors are making more money? What is the process in the public sector whereby less competent providers are assigned to poorer areas? Some of these answers must be related to the demand for health care as a function of quality. Do high-income people see better doctors because they are more educated consumers and better judges of quality, or do better doctors choose to locate where markets are more lucrative? In recent work, households were asked to rank the same set of doctors that vignettes were administered to in India. Preliminary results suggest that the overall correlation between household's ranks and vignettes performance is fairly high, although there is substantial variation across localities. Furthermore, prices do reflect competence, although the relationship disappears once observable characteristics of the doctors (qualifications and the neighborhood the practice is located in) are included (Das, Do, and Hammer, 2007). These results are a start, but further work is required to understand the market equilibrium that simultaneously explains location and pricing as a function of competence.

The research agenda on **quality of medical care** in low-income countries contributes to our understanding in three ways. First, it highlights that **standard measures of health care quality in low-income countries, based on physical infrastructure and sometimes on availability of certain drugs,** are sorely inadequate. The quality of medical advice cannot be “proxied for” by measures of physical infrastructure. Second, it emphasizes that measuring the quality of medical advice using vignettes and direct observation *is* feasible, if somewhat more difficult. Yet, this is clearly the relevant dimension along which variations—within and across countries—matter. We have shown the quality of care to be extremely low and have demonstrated how this arises from a **combination of low competence and low effort.** Third, the agenda also highlights issues that arise once the quality of medical advice is accurately measured. The question of how market equilibrium is arrived at in settings with **public and private providers of differing quality is** of particular interest; further research along these dimensions could help us understand the **structure of market failures in the delivery of health care in low-income countries.**

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References

- Banerjee, Abhijit, Angus Deaton, and Esther Duflo.** 2004. "Wealth, Health and Health Services in Rural Rajasthan." *American Economic Review*, Papers and Proceedings, 94(2): 326–30.
- Barber, Sarah, and Paul J. Gertler.** 2005. "Child Health and the Quality of Medical Care in Indonesia." http://faculty.haas.berkeley.edu/gertler/working_papers/02.28.02_childheight.pdf.
- Barber, Sarah, and Paul G. Gertler.** 2007. "Empowering Women: How Mexico's Opportunidades Improved Prenatal Care Quality and Birth Outcomes." Draft version. World Bank, Washington, D.C.
- Barber, Sarah L., Paul J. Gertler, and Pandu Harimurti.** 2007a. "Differences in Access to High-Quality Outpatient Care In Indonesia." *Health Affairs*, 26(3): w352–w356.
- Barber, Sarah L., Paul J. Gertler, and Pandu Harimurti.** 2007b. "The Contribution of Human Resources for Health to the Quality of Care in Indonesia." *Health Affairs*, 26(3): w367–w379.
- Bjorkman, Martina, Ritva Reinnika, and Jakob Svenson.** 2006. "Local Accountability." Seminar Paper 749, Institute for International Economic Studies, Stockholm University.
- Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F. Halsey Rogers.** 2006. "Missing in Action: Teachers and Health Workers in Developing Countries." *Journal of Economic Perspectives*, 20(1): 91–116.
- Das, Jishnu, Do Quy-Toan, and Jeffrey Hammer.** 2007. "Prices and Crisis: Doctor Competence, Prices and Patient Perceptions in Delhi, India." Draft version. World Bank, Washington D.C.
- Das, Jishnu, and Jeffrey Hammer.** 2005. "Which Doctor? Combining Vignettes and Item-Response to Measure Doctor Quality." *Journal of Development Economics*, 78(2): 348–83.
- Das, Jishnu, and Jeffrey Hammer.** 2007. "Money for Nothing: The Dire Straits of Medical Practice in Delhi, India." *Journal of Development Economics*, 83(1): 1–36.
- Das, Jishnu, and Carolina Sánchez-Páramo.** 2003. "Short but Not Sweet: New Evidence on Short Duration Morbidities from India." Policy Research Working Paper 2971. World Bank, Development Research Group, Washington, D.C.
- Das, Jishnu, and Thomas Pave Sohnesen.** 2007. "Variations in Doctor Effort: Evidence from Paraguay." *Health Affairs*, 26(3), w310–w323.
- de Savigny, Don, et al.** 2004. "Care-Seeking Patterns for Fatal Malaria in Tanzania." *Malaria Journal*, July 28, 3(27).
- Deveugele, Myriam Anselm Derese, Atie van den Brink-Muinen, Jozien Bensing, and Jan De Maeseneer.** 2002. "Consultation Length in General Practice: Cross Sectional Study in Six European Countries." *British Medical Journal*, August 31, 325(7362): 472.
- Fisher, E. S., D. E. Wennberg, T. A. Stukel, and D. J. Gottlieb.** 2004. "Variations in the Longitudinal Efficiency of Academic Medical Centers." *Health Affairs*, Supplemental Web Exclusive: VAR19-32.
- Greenlagh, Trisha.** 1987. "Drug Prescription and Self-medication in India: An Exploratory Survey." *Social Science and Medicine*, 25(3): 307–18.
- Hogerzeil, H., D. Bimo, D. G. Ross-Degnan, R. O. Laing, D. Orofi-Adjei, B. Santoso, and A. K. Chowdhury.** 1993. "Field Tests for Rational Drug Use in Twelve Developing Countries." *Lancet*, 342(8884): 1408–10.
- Kerr, Eve A., Elizabeth A. McGlynn, John Adams, Joan Keesey, and Steven M. Asch.** 2004. "Profiling the Quality of Care in Twelve Communities: Results from the CQI Study." *Health Affairs*, 23(3): 247–56.
- Klemick, Heather, Kenneth L. Leonard, and Melkiory C. Masatu.** 2007. "Doctor Quality, Roads and Patient Access to Health Care in Rural Tanzania." <http://faculty.arec.umd.edu/kleonard/papers/healthandinfrastructure.pdf>.
- Leonard, Kenneth L.** 2002. "When States and Markets Fail: Asymmetric Information and the Role of NGOs in African Health Care." *International Review of Law and Economics*, 22(1): 61–80.
- Leonard, Kenneth L., and Melkiory C. Masatu.** 2005. "The Use of Direct Clinician Observation and Vignettes for Health Services Quality Evaluation in Developing Countries." *Social Science and Medicine*, 61(9): 1944–51.
- Leonard, Kenneth L., and Melkiory C. Masatu.** 2006. "Outpatient Process Quality Evaluation and the Hawthorne Effect." *Social Science and Medicine*, 63(9): 2330–40.
- Leonard, Kenneth L., and Melkiory C. Masatu.** 2007a. "Using the Hawthorne Effect to Examine the Gap between Medical Ability and Practice." <http://faculty.arec.umd.edu/kleonard/papers/whydo2.pdf>.
- Leonard, Kenneth L., and Melkiory C. Masatu.** 2007b. "Variation in the Quality of Care Accessible to Rural Communities in Tanzania." *Health Affairs*, 26(3): w380–w392.

Leonard, Kenneth L., Melkiory C. Masatu, and Alex Vialou. 2007. "Getting Doctors to Do Their Best: The Roles of Ability and Motivation in Health Care." *Journal of Human Resources*, 42(3): 682–700.

Leonard, Kenneth L. 2008. "Is Patient Satisfaction Sensitive to Changes in the Quality of Care? An Exploitation of the Hawthorne Effect." *Journal of Health Economics*, 27: 444–459.

Makinen, M. et al. 2000. "Inequalities in Health Care Use and Expenditures: Empirical Data from Eight Developing Countries and

Countries in Transition." *Bulletin of the World Health Organization*, 78(1): 55–65.

Phadke, Anant. 1998. *Drug Supply and Use: Toward a Rational Policy in India*. New Delhi: Sage Publications.

Stoddard, Jeffrey J., Robert F. St. Peter, and Paul W. Newacheck. 1994. Health Insurance Status and Ambulatory Care for Children. *New England Journal of Medicine*, 330(20): 1421–5.

World Health Organization. 1978. *The Alma-Ata Declaration*. Geneva: World Health Organization.

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18. Patrick Opiyo Owili, Miriam Adoyo Muga, Bomar Rojas Mendez, Bradley Chen. 2017. Quality of maternity care and its determinants along the continuum in Kenya: A structural equation modeling analysis. *PLOS ONE* **12**:5, e0177756. [[Crossref](#)]
19. Achyuta Adhvaryu, Anant Nyshadham. 2017. Health, Enterprise, and Labor Complementarity in the Household. *Journal of Development Economics* **126**, 91-111. [[Crossref](#)]
20. Johanna Hanefeld, Timothy Powell-Jackson, Dina Balabanova. 2017. Understanding and measuring quality of care: dealing with complexity. *Bulletin of the World Health Organization* **95**:5, 368-374. [[Crossref](#)]
21. Manoj Mohanan, Soledad Giardili, Veena Das, Tracy L Rabin, Sunil S Raj, Jeremy I Schwartz, Aparna Seth, Jeremy D Goldhaber-Fiebert, Grant Miller, Marcos Vera-Hernández. 2017. Evaluation of a social franchising and telemedicine programme and the care provided for childhood diarrhoea and pneumonia, Bihar, India. *Bulletin of the World Health Organization* **95**:5, 343-352E. [[Crossref](#)]
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24. Ryoko Sato. 2017. Learning from a Bitter Past? The Behavioral Effect of a Child's Death on Mothers. *Journal of African Economies* 1-22. [[Crossref](#)]
25. Muhammad Ayaz Mustufa, Munir Ahmed Sheikh, Ijaz-ul-Haque Taseer, Syed Jamal Raza, Muhammad Sohail Arshad, Tasleem Akhter, Ghazala Mohyuddin Arain, Sultana Habibullah, Sohail Safdar, Rukhsana Firdous, Muhammad Adnan. 2017. Trajectory of cause of death among brought dead neonates in tertiary care public facilities of Pakistan: A multicenter study. *World Journal of Pediatrics* **13**:1, 57-62. [[Crossref](#)]
26. Simon Lange, Stephan Klasen. 2017. How the New International Goal for Child Mortality is Unfair to Sub-Saharan Africa (Again). *World Development* **90**, 128-146. [[Crossref](#)]
27. Iqbal Dhaliwal, Rema Hanna. 2017. The devil is in the details: The successes and limitations of bureaucratic reform in India. *Journal of Development Economics* **124**, 1-21. [[Crossref](#)]
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30. Simon Lange, Sebastian Vollmer. 2017. The effect of economic development on population health: a review of the empirical evidence. *British Medical Bulletin* **121**:1, 47-60. [[Crossref](#)]
31. Asaf Bitton, Hannah L. Ratcliffe, Jeremy H. Veillard, Daniel H. Kress, Shannon Barkley, Meredith Kimball, Federica Secci, Ethan Wong, Lopa Basu, Chelsea Taylor, Jaime Bayona, Hong Wang, Gina Lagomarsino, Lisa R. Hirschhorn. 2016. Primary Health Care as a Foundation for Strengthening Health Systems in Low- and Middle-Income Countries. *Journal of General Internal Medicine* **94**. . [[Crossref](#)]
32. Ankur Kalra, Nathan Glusenkamp, Karen Anderson, Ram N. Kalra, Prafulla G. Kerkar, Ganesh Kumar, Thomas M. Maddox, William J. Oetgen, Salim S. Virani. 2016. American College of Cardiology (ACC)'s PINNACLE India Quality Improvement Program (PIQIP)—Inception, progress and future direction: A report from the PIQIP Investigators. *Indian Heart Journal* **68**, S1-S4. [[Crossref](#)]
33. Wanda Jaskiewicz, Christophe Lemiére, David Phillips, Joanne Spetz, Eric Keuffel. Measuring and Analyzing Salaries and Incentives 215-242. [[Crossref](#)]
34. Pieter Serneels, Tomas Lievens, Damas Butera. Health Worker Labor Supply, Absenteeism, and Job Choice 85-134. [[Crossref](#)]

35. Rosemary Morgan, Tim Ensor, Hugh Waters. 2016. Performance of private sector health care: implications for universal health coverage. *The Lancet* **388**:10044, 606-612. [[Crossref](#)]
36. Elizabeth Lee, Supriya Madhavan, Sebastian Bauhoff. 2016. Levels and variations in the quality of facility-based antenatal care in Kenya: evidence from the 2010 service provision assessment. *Health Policy and Planning* **31**:6, 777-784. [[Crossref](#)]
37. Sebastian Bauhoff, Olesya Tkacheva, Lila Rabinovich, Olena Bogdan. 2016. Developing citizen report cards for primary care: evidence from qualitative research in rural Tajikistan. *Health Policy and Planning* **31**:2, 259-266. [[Crossref](#)]
38. Kelly F. Austin, Cristina DeScisciolo, Lene Samuelsen. 2016. The Failures of Privatization: A Comparative Investigation of Tuberculosis Rates and the Structure of Healthcare in Less-Developed Nations, 1995–2010. *World Development* **78**, 450-460. [[Crossref](#)]
39. Susan Godlonton, Edward N. Okeke. 2016. Does a ban on informal health providers save lives? Evidence from Malawi. *Journal of Development Economics* **118**, 112-132. [[Crossref](#)]
40. Glyn Alcock, Sushmita Das, Neena Shah More, Ketaki Hate, Sharda More, Shanti Pantvaidya, David Osrin, Tanja AJ Houweling. 2015. Examining inequalities in uptake of maternal health care and choice of provider in underserved urban areas of Mumbai, India: a mixed methods study. *BMC Pregnancy and Childbirth* **15**:1. . [[Crossref](#)]
41. Lindsay Mangham-Jefferies, Kara Hanson, Wilfred Mbacham, Obinna Onwujekwe, Virginia Wiseman. 2015. Mind the gap: knowledge and practice of providers treating uncomplicated malaria at public and mission health facilities, pharmacies and drug stores in Cameroon and Nigeria. *Health Policy and Planning* **30**:9, 1129-1141. [[Crossref](#)]
42. Giovanni Battista Migliori, Giovanni Sotgiu. 2015. Assessing tuberculosis management: what really happens to patients?. *The Lancet Infectious Diseases* **15**:11, 1249-1251. [[Crossref](#)]
43. Jishnu Das, Ada Kwan, Benjamin Daniels, Srinath Satyanarayana, Ramnath Subbaraman, Sofi Bergkvist, Ranendra K Das, Veena Das, Madhukar Pai. 2015. Use of standardised patients to assess quality of tuberculosis care: a pilot, cross-sectional study. *The Lancet Infectious Diseases* **15**:11, 1305-1313. [[Crossref](#)]
44. Debasis Barik, Amit Thorat. 2015. Issues of Unequal Access to Public Health in India. *Frontiers in Public Health* **3**. . [[Crossref](#)]
45. Harounan Kazianga, Seni Kouanda, Laetitia N. Ouedraogo, Elisa Rothenbuhler, Mead Over, Damien de Walque. HIV/AIDS Services Delivery, Overall Quality of Care, and Satisfaction in Burkina Faso: Are Some Patients Privileged? 121-138. [[Crossref](#)]
46. Timothy Powell-Jackson, Sumit Mazumdar, Anne Mills. 2015. Financial incentives in health: New evidence from India's Janani Suraksha Yojana. *Journal of Health Economics* **43**, 154-169. [[Crossref](#)]
47. Achyuta Adhvaryu, Anant Nyshadham. 2015. Return to Treatment in the Formal Health Care Sector: Evidence from Tanzania. *American Economic Journal: Economic Policy* **7**:3, 29-57. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
48. Alok Bhargava. 2015. Diet Quality, Child Health, and Food Policies in Developing Countries. *The World Bank Research Observer* **30**:2, 247-276. [[Crossref](#)]
49. Jagdish Chaturvedi, Andrew Logan, Girish Narayan, Shakuntala Kuttappa. 2015. A structured process for unmet clinical need analysis for medical device innovation in India: early experiences. *BMJ Innovations* **1**:3, 81-87. [[Crossref](#)]
50. Sean Sylvia, Yaojiang Shi, Hao Xue, Xin Tian, Huan Wang, Qingmei Liu, Alexis Medina, Scott Rozelle. 2015. Survey using incognito standardized patients shows poor quality care in China's rural clinics. *Health Policy and Planning* **30**:3, 322-333. [[Crossref](#)]
51. James Hudspeth, Christine L. Curry, Zadok Sacks, Claude Surena. 2015. Continuing Professional Development in Low-Resource Settings: Haiti as Example. *Annals of Global Health* **81**:2, 255-259. [[Crossref](#)]

52. Richard Miller, Nirisha Chalapati. 2015. Utilizing lean tools to improve value and reduce outpatient wait times in an Indian hospital. *Leadership in Health Services* 28:1, 57-69. [[Crossref](#)]
53. Jessica Cohen, Pascaline Dupas, Simone Schaner. 2015. Price Subsidies, Diagnostic Tests, and Targeting of Malaria Treatment: Evidence from a Randomized Controlled Trial. *American Economic Review* 105:2, 609-645. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
54. Maia Sieverding, Christina Briegleb, Dominic Montagu. 2015. User experiences with clinical social franchising: qualitative insights from providers and clients in Ghana and Kenya. *BMC Health Services Research* 15:1, 49. [[Crossref](#)]
55. . Health 146-158. [[Crossref](#)]
56. Victor Chimhutu, Ida Lindkvist, Siri Lange. 2014. When incentives work too well: locally implemented pay for performance (P4P) and adverse sanctions towards home birth in Tanzania - a qualitative study. *BMC Health Services Research* 14:1. . [[Crossref](#)]
57. Jishnu Das, Jeffrey Hammer. 2014. Quality of Primary Care in Low-Income Countries: Facts and Economics. *Annual Review of Economics* 6:1, 525-553. [[Crossref](#)]
58. B. Frandsen, J. B. Rebitzer. 2014. Structuring Incentives within Accountable Care Organizations. *Journal of Law, Economics, and Organization* . [[Crossref](#)]
59. Kjell Hausken, Mthuli Ncube. 2014. Political Economy of Service Delivery: Monitoring Versus Contestation. *The Developing Economies* 52:1, 68-84. [[Crossref](#)]
60. P. Serneels. Internal Geographical Imbalances: The Role of Human Resources Quality and Quantity 91-102. [[Crossref](#)]
61. Lindsay Mangham-Jefferies, Kara Hanson, Wilfred Mbacham, Obinna Onwujekwe, Virginia Wiseman. 2014. What determines providers' stated preference for the treatment of uncomplicated malaria?. *Social Science & Medicine* . [[Crossref](#)]
62. K. L. Leonard. 2014. Active patients in rural African health care: implications for research and policy. *Health Policy and Planning* 29:1, 85-95. [[Crossref](#)]
63. Szymon Jarosławski, Gayatri Saberwal. 2013. Case studies of innovative medical device companies from India: barriers and enablers to development. *BMC Health Services Research* 13:1. . [[Crossref](#)]
64. Sharmistha Self. 2013. Does son preference pay-off for the ailing and elderly in rural India?. *International Journal of Social Economics* 40:12, 1077-1093. [[Crossref](#)]
65. M. D. Chinn, B. Eichengreen, H. Ito. 2013. A forensic analysis of global imbalances. *Oxford Economic Papers* . [[Crossref](#)]
66. T. Bold, J. Svensson. 2013. Policies and Institutions for Effective Service Delivery: The Need of a Microeconomic and Micropolitical Approach. *Journal of African Economies* 22:suppl 2, ii16-ii38. [[Crossref](#)]
67. David K. Leonard, Gerald Bloom, Kara Hanson, Juan O'Farrell, Neil Spicer. 2013. Institutional Solutions to the Asymmetric Information Problem in Health and Development Services for the Poor. *World Development* 48, 71-87. [[Crossref](#)]
68. Richard Grabowski, Sharmistha Self. 2013. Mother's autonomy: impact on the quality of children's healthcare in India. *Applied Economics* 45:14, 1903-1913. [[Crossref](#)]
69. Kimberly Singer Babiarz, Hongmei Yi, Renfu Luo. 2013. Meeting the Health-care Needs of the Rural Elderly: The Unique Role of Village Doctors. *China & World Economy* 21:3, 44-60. [[Crossref](#)]
70. Markus Goldstein,, Joshua Graff Zivin,, James Habyarimana,, Cristian Pop-Eleches,, Harsha Thirumurthy. 2013. The Effect of Absenteeism and Clinic Protocol on Health Outcomes: The Case of Mother-to-Child Transmission of HIV in Kenya. *American Economic Journal: Applied Economics* 5:2, 58-85. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
71. Ulrika Baker, Göran Tomson, Mathias Somé, Bocar Kouyaté, John Williams, Rose Mpembeni, Siriël Massawe, Antje Blank, Lars L Gustafsson, Jaran Eriksen. 2012. 'How to know what you need to

do': a cross-country comparison of maternal health guidelines in Burkina Faso, Ghana and Tanzania. *Implementation Science* 7:1. . [[Crossref](#)]

72. Ujwala Bapat, Glyn Alcock, Neena Shah More, Sushmita Das, Wasundhara Joshi, David Osrin. 2012. Stillbirths and newborn deaths in slum settlements in Mumbai, India: a prospective verbal autopsy study. *BMC Pregnancy and Childbirth* 12:1. . [[Crossref](#)]
73. Ida Lindkvist. 2012. INFORMAL PAYMENTS AND HEALTH WORKER EFFORT: A QUANTITATIVE STUDY FROM TANZANIA. *Health Economics* n/a-n/a. [[Crossref](#)]
74. William D Savedoff, David de Ferranti, Amy L Smith, Victoria Fan. 2012. Political and economic aspects of the transition to universal health coverage. *The Lancet* 380:9845, 924-932. [[Crossref](#)]
75. Gesine Meyer-Rath, Mead Over. 2012. HIV Treatment as Prevention: Modelling the Cost of Antiretroviral Treatment—State of the Art and Future Directions. *PLoS Medicine* 9:7, e1001247. [[Crossref](#)]
76. Szymon Jarosławski, Madhukar Pai. 2012. Why are inaccurate tuberculosis serological tests widely used in the Indian private healthcare sector? A root-cause analysis. *Journal of Epidemiology and Global Health* 2:1, 39-50. [[Crossref](#)]
77. Nicholas E. Burger, Daniel Kopf, Connor P. Spreng, Joanne Yoong, Neeraj Sood. 2012. Healthy Firms: Constraints to Growth among Private Health Sector Facilities in Ghana and Kenya. *PLoS ONE* 7:2, e27885. [[Crossref](#)]
78. Kathleen Beegle, Kristen Himelein, Martin Ravallion. 2012. Frame-of-reference bias in subjective welfare. *Journal of Economic Behavior & Organization* 81:2, 556-570. [[Crossref](#)]
79. Ruchi Puri, Stephen Rulisa, Shahrzad Joharifard, Jeffrey Wilkinson, Patrick Kyamanywa, Nathan Thielman. 2012. Knowledge, attitudes, and practices in safe motherhood care among obstetric providers in Bugesera, Rwanda. *International Journal of Gynecology & Obstetrics* 116:2, 124-127. [[Crossref](#)]
80. Tin Aung, Dominic Montagu, Karen Schlein, Thin Myat Khine, Willi McFarland. 2012. Validation of a New Method for Testing Provider Clinical Quality in Rural Settings in Low- and Middle-Income Countries: The Observed Simulated Patient. *PLoS ONE* 7:1, e30196. [[Crossref](#)]
81. Nils Songstad, Ida Lindkvist, Karen Moland, Victor Chimhutu, Astrid Blystad. 2012. Assessing performance enhancing tools: experiences with the open performance review and appraisal system (OPRAS) and expectations towards payment for performance (P4P) in the public health sector in Tanzania. *Globalization and Health* 8:1, 33. [[Crossref](#)]
82. Daniel Terry, Mohammed Ali, Quynh Lê. 2011. Asian migrants' lived experience and acculturation to Western health care in rural Tasmania. *Australian Journal of Rural Health* 19:6, 318-323. [[Crossref](#)]
83. Pascaline Dupas. 2011. Health Behavior in Developing Countries. *Annual Review of Economics* 3:1, 425-449. [[Crossref](#)]
84. C. D. James, K. Hanson, O. Solon, C. J. M. Whitty, J. Peabody. 2011. Do doctors under-provide, over-provide or do both? Exploring the quality of medical treatment in the Philippines. *International Journal for Quality in Health Care* . [[Crossref](#)]
85. Sima Berendes, Peter Heywood, Sandy Oliver, Paul Garner. 2011. Quality of Private and Public Ambulatory Health Care in Low and Middle Income Countries: Systematic Review of Comparative Studies. *PLoS Medicine* 8:4, e1000433. [[Crossref](#)]
86. Jishnu Das. 2011. The Quality of Medical Care in Low-Income Countries: From Providers to Markets. *PLoS Medicine* 8:4, e1000432. [[Crossref](#)]
87. J. Onishi, S. Gupta, D. H. Peters. 2011. Comparative analysis of exit interviews and direct clinical observations in Pediatric Ambulatory Care Services in Afghanistan. *International Journal for Quality in Health Care* 23:1, 76-82. [[Crossref](#)]
88. Kenneth L. Leonard, Melkiory C. Masatu. 2010. Professionalism and the know-do gap: exploring intrinsic motivation among health workers in Tanzania. *Health Economics* 19:12, 1461-1477. [[Crossref](#)]

89. Emmanuel Byamukama, Paul Courtright. 2010. Knowledge, skills, and productivity in primary eye care among health workers in Tanzania: need for reassessment of expectations?. *International Health* 2:4, 247-252. [[Crossref](#)]
90. Kenneth L. Leonard, Melkiory C. Masatu. 2010. Using the Hawthorne effect to examine the gap between a doctor's best possible practice and actual performance. *Journal of Development Economics* 93:2, 226-234. [[Crossref](#)]
91. Joanne Yoong, Nicholas Burger, Connor Spreng, Neeraj Sood. 2010. Private Sector Participation and Health System Performance in Sub-Saharan Africa. *PLoS ONE* 5:10, e13243. [[Crossref](#)]
92. Ottar Mæstad, Gaute Torsvik, Arild Aakvik. 2010. Overworked? On the relationship between workload and health worker performance. *Journal of Health Economics* 29:5, 686-698. [[Crossref](#)]
93. Neena Shah More, Glyn Alcock, Sushmita Das, Ujwala Bapat, Wasundhara Joshi, David Osrin. 2010. Spoilt for choice? Cross-sectional study of care-seeking for health problems during pregnancy in Mumbai slums. *Global Public Health* 1-14. [[Crossref](#)]
94. Dean Karlan, Jonathan Morduch. Access to Finance 4703-4784. [[Crossref](#)]
95. Heather Klemick, Kenneth L. Leonard, Melkiory C. Masatu. 2009. Defining Access to Health Care: Evidence on the Importance of Quality and Distance in Rural Tanzania. *American Journal of Agricultural Economics* 91:2, 347-358. [[Crossref](#)]