Location, Location, Location: Residence, Wealth, And The Quality Of Medical Care In Delhi, India

Quality of care varied by neighborhood but not necessarily by patients' income level.

by Jishnu Das and Jeffrey Hammer

ABSTRACT: There are seventy medical care providers within walking distance of every household in Delhi. However, inequalities in health outcomes persist among the rich and poor, which might reflect differences in the quality of available care. This paper shows that providers visited by the poor were indeed less knowledgeable than those visited by the rich. There is strong evidence of inequalities in access, with lower competence among private- and public-sector providers in poor neighborhoods, but no evidence of inequalities in choices. Practical policy options include targeted information to patients on provider competence and improving the allocation of public doctors across poor and rich neighborhoods. [*Health Affairs* 26, no. 3 (2007): w338–w351 (published online 27 March 2007; 10.1377/hlthaff.26.3.w338)]

India spends 6 percent of its gross domestic product (GDP) on health—three times the amount spent by Indonesia or Philippines and twice the amount spent by China.[1] Surveys show that 60 percent of health spending is for primary care; of this, households contribute more than 80 percent.[2] It is usually assumed that a large proportion of spending devoted to acute illnesses reflects the prevalence of morbidities with high case-fatality ratios (such as tuberculosis) or diseases leading to permanent disability (such as leprosy).

The problem of health care is often assumed to be low availability; increasing availability is thought to reduce the delays in seeking care and therefore the cost of treating illnesses. This point of view is not unique to India. The influential 1978 Alma-Ata Declaration, for instance, identified better health outcomes with increased availability of primary care:

Jishnu Das (jdas1@worldbank.org) is an economist with the Human Development and Public Services Group, Development Research Group, at the World Bank in Washington, D.C. Jeffrey Hammer is a lead economist with the World Bank's Social Development Sector in South Asia.

DOI 10.1377/hlthaff.26.3.w338

> Primary health care relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community.[3]

Consistent with this declaration, India adopted policies to improve the availability of health care. First, a front-line tier of health workers was trained to create a referral system (registered medical practitioners, or RMPs). Second, providers practicing traditional medicine were mainstreamed to provide cheap and efficient health care for the poor. These strategies increased the availability of medical services, especially in urban areas. Data from this study show that there are more than seventy medical care providers within a fifteen-minute walk of the average household in Delhi, regardless of income. Furthermore, the poor use medical services more than the rich, not just because the poor tend to fall sick more often. Conditioning on the report of an illness, the poor go to the doctor 40 percent of the time, and the rich, 30 percent of the time.[4]

More health services used by the poor, however, do not translate into better health outcomes. According to data from the National Family Health Survey (1999), 70 of every 1,000 infants born in the lowest income deciles in Delhi die; among the rich, infant mortality is negligible.[5] Similar disparities exist for nearly all measured health outcomes in the city. Many explanations can account for this difference, such as better nutrition, education, or hygiene, but one might well be health care: Greater availability does not imply better health outcomes, because the quality of care is poor, and more so for the poor than for the rich.

This study measures the competence of providers—the frontier of care that patients actually receive—in seven neighborhoods of Delhi.[6] The purpose is to see to what extent the knowledge of providers constrains quality and to what extent the competence of providers visited differs between poor and rich people. The paper is organized as follows: We briefly discuss some features of the Indian medical system in urban areas; outline our method of measuring the competence of practitioners and of choosing our sample of doctors and their patients; describe our statistical approach and present its results; and speculate on policy implications.

The Study Setting

Our study was based in Delhi, the richest state in India, with an average per capita income of Rs. 24,450 ($532 in 1994–95 U.S. dollars)—more than double that in the rest of the country. The public health system in India (urban as well as rural) consists of hospitals and first-responder primary health centers (PHCs) within the context of a much larger number of private providers. Providers in the public sector all hold a bachelor of medicine and bachelor of surgery (MB BS) degree (equivalent to a doctor of medicine, or MD, degree in the United States) and work at either public dispensaries, PHCs, or hospitals. In contrast, a wide array of qualifications exist in the private sector, with training periods ranging from six

months to six years. These can be separated into three broad groups: those with an MB BS degree, those with formal training in alternative medicine (Ayurvedas, homeopaths, Unani, and integrated systems doctors with degrees other than the MB BS degree), and those with little or no formal training (RMPs).[7]

Although a public-sector provider with an MB BS degree is likely to be more qualified than his or her average private-sector counterpart, households in India overwhelmingly favor seeking care in the private sector. It accounts for 82 percent of all visits nationwide; for our urban sample, 75 percent.[8] With no medical insurance apart from that implicit in the provision of government health care, this implies that families incur high out-of-pocket spending: The World Health Organization, for instance, estimates that of total spending on health care in the country in 2000, 82 percent was out-of-pocket spending on primary and inpatient care.[9]

Health policy moved to center stage following the recently elected government's promise of a Common Minimum Program to ensure high-quality education and health for all. One hotly debated topic is the relative quality of providers in the private and public sectors. One side of the debate holds that private-sector providers are mostly "quacks" with little training and medical competence; the other side notes that anyone able to afford a private doctor will do so, since the care is much better. As discussed below, both sides have an element of truth to them.

The Vignettes And Sample

■ **The vignettes.** To assess providers' clinical competence, medical vignettes were designed in consultation with doctors for five diseases that commonly occur in Delhi.[10] The vignettes were as follows: Case 1: a child with diarrhea; Case 2: a man with viral pharyngitis; Case 3: a man with pulmonary tuberculosis; Case 4: a young girl with depression; and Case 5: a pregnant woman with pre-eclampsia. The cases were chosen to elicit a different set of "ideal" responses for any primary care physician who has been assured of full compliance on the part of the patient. Thus, diarrhea and viral pharyngitis should be treated in a primary care context without referral. Tuberculosis should be treated under the government's program but may be treated in a primary care context, given the assumption of perfect follow-up. Depression can be either treated or referred, while pre-eclampsia should be immediately referred to a hospital. In line with our expectations, 80 percent of the providers with whom we consulted felt that they saw the first two almost every day; only 25 percent said that they saw tuberculosis every day; and only 15 percent and 8 percent saw depression and pre-eclampsia, respectively.

For the vignettes, the interview team consisted of two people. One played the role of the patient (for the child with diarrhea, the mother), and the other recorded the interaction and provided additional information that the patient might not know but should be determined by the provider, such as the results of tests or examinations. The "patient" began by presenting basic symptoms, and the provider proceeded with the consultation. The recorder kept track of questions the pro-

vider asked regarding the history of the case, the examinations performed, the tests prescribed (answered by either the "patient" or the recorder), and the treatment given. The vignettes were then graded by comparing the questions asked by each provider with a checklist of questions compiled by experts for the case.

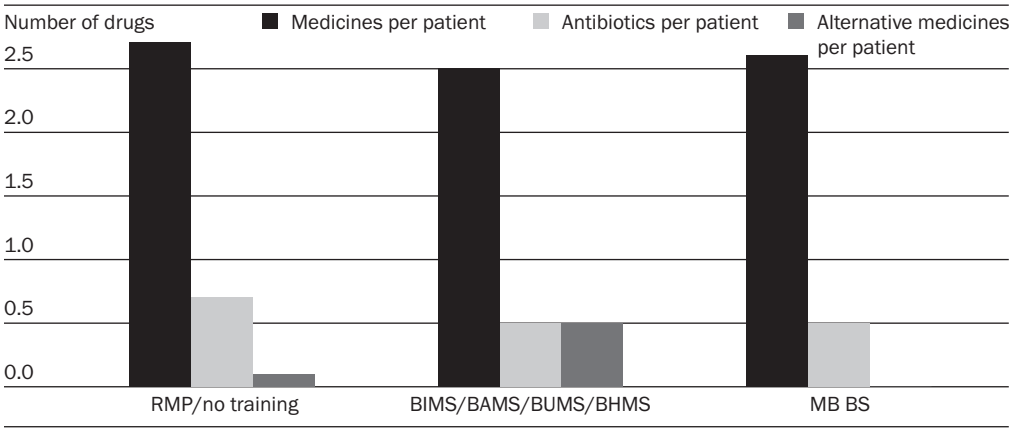
Finally, treatments were evaluated by two independent panels of expert physicians in South Asia and the United States. Most important was the identification of treatments that could be harmful to the patient, either in the short or the long term. Such treatments might include the use of antibiotics in viral illnesses or anticholinergics in the case of viral diarrhea, although the experts were left to form their own judgments in every case. The kappa measure of agreement on what constituted harmful treatment was high: more than 90 percent within the South Asian and U.S. doctor teams, and more than 80 percent across the two teams.

An interesting challenge to the construction of vignettes was framing them so that providers from different traditions—Ayurvedic, Unani, homeopathic—could be accommodated within the same methodology. For this, we took two steps. First, we pretested the vignettes with practitioners from these traditions and anticipated answers to potential questions from different types of providers, which were then standardized. For example, if the question, "What did the mother eat the night before the baby developed diarrhea?" were to be asked by an Ayurveda, the standardized answer was, "Lentils and rice," which we were assured had no particular implication for the baby's condition. Second, we excluded providers who used only nonallopathic medicines for treating the presented illness. As it turned out, empirically, both of these concerns were minor. Not very many questions based on alternative medical systems were asked, and except for one case, all providers used allopathic medicines in their treatments (Exhibit 1). Thus, while Ayurvedas, for example, were slightly more likely than others to prescribe Ayurvedic medicines, they also prescribed as many antibiotics as anyone else, even though they are not entitled to make these recommendations as per a Supreme Court decision in 1998 (*Dr. Chand vs. State of Punjab*).

■ **The sample.** A total of 1,600 people (300 households) were followed in seven localities in Delhi over two years, 2003–04.[11] The localities were chosen purposively to represent different income groups; within localities, households were randomly sampled. The final sample of households was similar to representative Delhi samples in both the National Family Health Survey and the National Sample Survey, although sampled households tended to be slightly richer. There was only a 4 percent rate of refusal to participate in the survey, which indicates that sample-selection bias was minimal. Over these two years, household surveys involved thirty-five weekly surveys followed by eight monthly surveys. The team asked, among other things, about morbidity in the household, the use of medical care providers (by name, for subsequent matching of households and providers), and medication practices.

The universe for the sample of providers consisted of those who had ever been

EXHIBIT 1
Practitioners' Qualifications And Patients' Use Of Drugs, In Delhi, India, 2003–04



SOURCE: Information derived from the authors' own analysis.
NOTES: Exhibit shows the types of medicines given to patients by different types of providers in 4,119 observed interactions between doctors and patients. For instance, registered medical practitioners (RMPs) prescribe or dispense an average of 2.7 different medicines in an interaction, 0.7 of which are antibiotics and 0.1 are alternative medicines (Ayurvedic and homeopathic remedies). RMPs/providers with no training have minimal medical training; degrees in integrated, Ayurvedic, Unani, or homeopathic medicine (BIMS/BAMS/BUMS/BHMS) indicate training in alternative (Indian) medicine; and bachelor of medicine and bachelor of surgery (MB BS) degrees are (roughly) equivalent to a doctor of medicine (MD) degree in the United States.

visited by households in the survey and those who were practicing within a fifteen-minute walking radius of any household in the sample. Every provider in this "census" was given a short questionnaire asking about training, education, and tenure. The sample was chosen by drawing twenty to twenty-five from each locality from the set of providers visited and an additional ten from among those who were in the study universe but had never been visited.[12] The census of providers contained information on 542 providers in the seven localities. Thus, there were close to eighty providers for each locality in the full census; on average, seventy were within a fifteen-minute walking radius of households in the locality.

Vignettes were completed for 85 percent (205 providers) of the original sample; the direction of bias resulting from noncompletion was hard to determine, since refusal to participate could indicate low competence if such providers were worried about the results of the study or high competence if the opportunity cost of time exceeded the incentive to participate.

The "average" medical care provider in the sample was a forty-four-year-old male practicing in his current practice for either 10.0 years in the public sector or 13.5 years in the private sector.[13] The majority of private-sector providers did not hold MB BS degrees, and close to one-quarter had minimal medical training. All public-sector providers in the sample held the required MB BS degree.

Households were matched to the providers they visited, which allowed us to estimate the average competence of the providers (from the vignette score) whom each household visited. Over the thirty-five-week survey period, households reported 4,892 visits to 658 providers. Of these, provider competence was measured

through vignettes for 3,123 visits (64 percent). In addition, for 307 visits we could predict competence on the basis of neighborhood and provider qualifications, age, and tenure. Close to 70 percent of all visits during the survey period could therefore be matched to the competence of the provider visited.

■ **Analytical methods.** The results were based on three steps: constructing the competence score, relating the score to neighborhood/provider characteristics, and relating household attributes to provider competence. We used multivariate regressions to decompose variation in competence into variation across and within neighborhoods, controlling for patients' and providers' traits.

The competence score is the normalized sum over all "correct questions asked" in the history and examination sections, expressed in standard deviations from the mean provider in the sample.[14] The competence index is related to various provider attributes (age, tenure, sex, origin, whether public or private, and qualifications) as well as to the income of the locality where the provider practiced. Income is the average per capita spending of a sample of forty households in each locality, derived from one module of the household survey. From the matched household-provider data, each household was assigned the average competence of all providers visited during the survey period.

Study Findings

■ **Levels of competence.** Using the actual proportion of relevant questions and the probability of nonharmful treatment for providers at different levels of competence as benchmarking criteria, even the most competent providers performed poorly (Exhibit 2). The vignettes were designed so that a competent provider would

EXHIBIT 2
Percentage Of Questions Asked And Probability Of Nonharmful Treatment, By Provider Competence, In Delhi, India, 2003–04

		Vignette health condition				
Quintile of competence	Competence index	Diarrhea	Viral pharyngitis	Tuberculosis	Depression	Pre-eclampsia
Least competent	−1.18	6% (16%)	8% (23%)	9% (45%)	6% (52%)	5% (36%)
2d quintile of competence	−0.58	12 (27)	18 (45)	16 (84)	13 (34)	10 (59)
Average competence	−0.15	19 (25)	25 (36)	23 (58)	17 (44)	13 (61)
4th quintile of competence	0.47	21 (33)	28 (68)	34 (90)	21 (78)	23 (60)
Most competent	1.57	33 (46)	43 (61)	48 (83)	31 (56)	35 (68)
All providers	0.00	18 (29)	24 (46)	26 (72)	17 (53)	17 (57)

SOURCE: Information derived from the authors' own analysis.

NOTES: The exhibit shows the percentage of questions asked and the probability of nonharmful treatment by providers at different levels of competence. The column "Competence index" shows the actual level of competence as standard deviations from the mean; the remaining columns show the percentage of questions asked and the probability of nonharmful treatment in parentheses. For instance, the average competence among the bottom quintile of providers was 1.18 standard deviations below the mean. These providers asked 6 percent of the relevant questions in the diarrhea vignette, and the probability of nonharmful treatment for diarrhea was 16 percent.

ask 90 percent or more of the questions included. Although the difference between the lowest and highest quintiles of competence was 2.6 standard deviations of the competence index, the percentage of appropriate questions asked increased only from 7 percent to 38 percent: The most competent providers in the sample asked fewer than half of the relevant questions. Providers did slightly better with cases of viral pharyngitis and tuberculosis and did worst with cases of depression and pre-eclampsia. For the average provider, who asked only 19.6 questions, or 20 percent of the essential questions over the five cases, it was impossible to have determined, for example, that a child's diarrhea was, in fact, relatively harmless or that a woman with pre-eclampsia needed immediate attention.

Exhibit 2 also examines the treatment implications for the vignette cases. Numbers in parentheses show the percentage of doctors graded as giving a treatment that was "not harmful" for the patient. Again, harmful treatment in the case of diarrhea implies using antibiotics or anticholinergics, or both; for tuberculosis, failure to either refer or start the patient on multidrug therapy; and for pre-eclampsia, failure to refer the patient to hospital for immediate follow-up.

Although there was some variation across illnesses, only 65 percent of treatments given by providers in the highest quintile of competence were graded as "nonharmful" by the raters; among the lowest quintile, this dropped to 30 percent. Competence levels must be between 0.6 and 1.3 standard deviations above the mean for providers to have a better-than-even chance of not harming the patient (the notable exception is the case of tuberculosis, where providers who were 1.34 standard deviations below achieved this level as well). Looked at in another way, the average provider's treatment was harmful 50–75 percent of the time for four of our five cases (all but tuberculosis).

■ **Correlates of competence.** Exhibit 3 examines the relative competence of public- and private-sector providers, disaggregated by their qualifications and by the income of the neighborhoods they practiced in. Several features are noteworthy. First, private-sector providers belonged to two very different groups: The competence of private providers without an MB BS degree was much lower than that of providers with that degree. Interestingly, a further separation of providers without MB BS degrees showed similar levels of competence among those with a recognized degree in Ayurveda or homeopathy (BAMS/BHMS) and those with minimal or no training (RMP/others).

Second, the notion that public-sector providers performed "below" those in the private sector was reinforced by comparisons of the competence of public doctors to that of MB BS private doctors. The opposite was also reinforced by comparing the competence of public doctors to that of only their private counterparts without MB BS degrees. These two comparisons balanced out, so that on average, public-sector providers were just slightly better than private-sector providers, and the difference was not statistically significant.

Third, the poor clearly had access to worse providers than the rich; moving

EXHIBIT 3
Distribution Of Competence, By Area Income, Providers' Qualifications, And Institution, In Delhi, India, 2003–04

		Private-sector providers				Public-sector providers		
Income of neighborhood	All providers	RMP/ other	BAMS/ BHMS	MB BS	All	PHCs	Hospitals	All
All areas	0.01 [1.00]	−0.66 [0.51]	−0.37 [0.90]	0.58 [0.98]	−0.03 [1.02]	0.02 [0.87]	0.29 [0.98]	0.16 [0.93]
Low income	−0.30 [0.88]	−0.64 [0.52]	−0.50 [0.91]	0.41 [0.78]	−0.31 [0.87]	−0.64 [0.55]	0.23 [1.14]	−0.21 [0.97]
Middle income	−0.11 [0.80]	−0.89 [0.36]	−0.23 [0.73]	0.07 [0.66]	−0.26 [0.72]	0.38 [0.90]	0.16 [0.88]	0.28 [0.87]
High income	0.52 [1.12]	−0.28 [0.65]	−0.21 [1.17]	0.91 [1.09]	0.58 [1.18]	0.16 [0.77]	0.40 [1.03]	0.32 [0.93]

SOURCE: Information derived from the authors' own analysis.

NOTES: This exhibit shows average competence and its standard deviation (in brackets) by neighborhood, qualification, and institutional affiliation. It shows that average competence is much lower in low-income than in high-income areas, in both the private and public sectors. Even within qualification categories, the less competent go to lower-income areas. Thus, among only doctors with the bachelor of medicine and bachelor of surgery (MB BS) degree, the average competence of a private-sector MB BS in a low-income area was 0.5 standard deviation less in a low- than in a high-income area. Among public-sector providers, this difference was close to 0.55 standard deviation. RMP is registered medical practitioner. BAMS is bachelor of Ayurvedic medicine and surgery. BHMS is bachelor of homeopathic medicine and surgery. PHC is primary health center.

from low- to middle-income areas increased average competence by 0.5 standard deviation, and from low- to high-income areas, by more than 1 standard deviation. This average difference was driven by a number of factors. Providers with less training were located in poor areas: The proportion of MB BS providers more than doubled when one moved from poor to rich neighborhoods. In addition, within every qualification, less competent providers were located in poor areas. Thus, MB BS providers were 0.5 standard deviation less competent when located in poor rather than rich areas; results were similar for those without that degree.

One option for poor people would be to use government health facilities, where, theoretically, providers are assigned independent of competence. Unfortunately, public-sector doctors in poor areas were also much less competent than those in rich neighborhoods. Although this was particularly true for public providers in PHCs, where the difference in competence across rich and poor neighborhoods was almost 0.8 standard deviation, it also held for hospitals, where public providers' competence level was much higher than in PHCs on average but still varied to the disadvantage of poor neighborhoods. In fact, private-sector providers in rich areas who lacked an MB BS degree were more competent than public-sector providers in the PHCs of poor areas who had that degree.

■ **Inequalities in access: regression analysis.** Little changed with multivariate analysis. Exhibit 4 shows the results from the ordinary least squares (OLS) regression. Column 1 uses only the institutional affiliation of the provider; column 2 adds in the income of the area that the provider is in; and column 3 adds the pro-

EXHIBIT 4
Multivariate Analysis Of Correlates Of Provider Competence In Delhi, India, 2003–04

	Specification 1	Specification 2	Specification 3
Public-sector doctor	0.046 [0.20]	0.082 [0.36]	−0.379 [1.64]
General hospital	0.270 [0.88]	0.130 [0.45]	0.110 [0.41]
Percent of poor households in neighborhood		−0.010 [4.34]***	−0.006 [2.84]***
Percent of middle-income households in neighborhood		−0.011 [3.29]***	−0.006 [2.04]**
MB BS degree			0.962 [4.86]***
BAMS/other alternative degree			0.293 [1.51]
Sex			−0.053 [0.31]
Age			−0.009 [1.24]
Tenure in locality			−0.015 [1.44]
Constant	−0.031 [0.39]	0.602 [4.10]***	0.547 [1.68]***
N	203	203	190
R^2	0.01	0.13	0.29

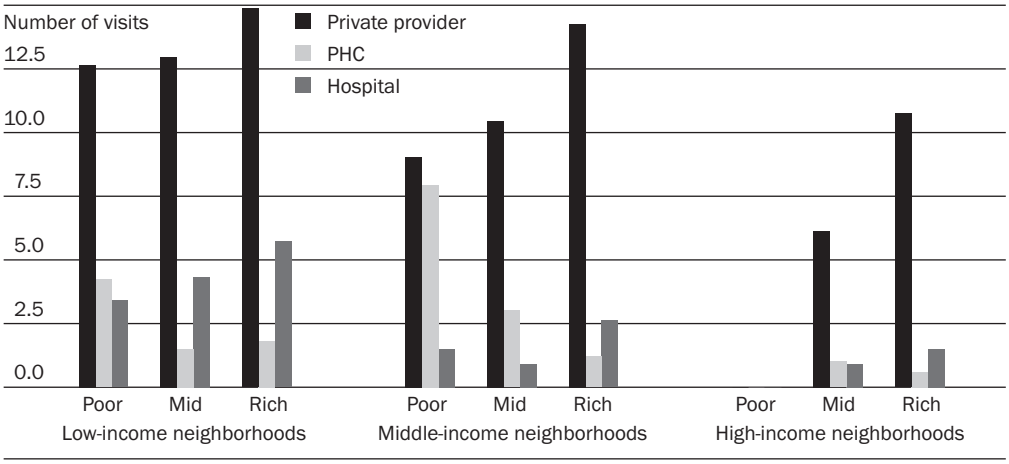
SOURCE: Information derived from the authors' own analysis.
NOTES: Exhibit shows the correlates of competence for providers in the sample. Absolute value of *t* statistics in brackets. The regression also includes additional controls for the origin of the provider, which is not significant. MB BS is bachelor of medicine and bachelor of surgery. BAMS is bachelor of Ayurvedic medicine and surgery.
$^{**}p < 0.05$ $^{***}p < 0.01$

vider's attributes. As in the bivariate correlations, there was no significant difference in competence between providers in the private and public sectors. Within the private sector, the most important correlate of competence was whether or not the provider held an MB BS degree. A provider with this degree was 0.8 standard deviation more competent than one without. Note that there was no significant difference between those with alternative degrees recognized by the government and those with no training at all.

The correlation between poverty and competence remained. From column 3, the coefficient implies a decrease of 0.67 standard deviation in competence moving from the richest to the poorest neighborhoods and a decline of 0.28 standard deviation for a one-standard-deviation increase in the percentage of poor households for the sample. Finally, younger providers in the sample were more competent (column 3), which suggests that "learning by doing" is offset by newer techniques in training later cohorts.

■ **Inequalities in choices.** Even within neighborhoods, however, there was considerable variation in provider competence (Exhibit 4). Did households' specific choices attenuate or exacerbate the differences across neighborhoods? Exhibit 5 shows the choices that households made among private and public providers, the latter separated into PHCs and hospitals. Three things stand out. First, all income groups and neighborhoods overwhelmingly favored the private over the public sector: 70 percent of all visits were to private-sector providers, and the remaining 30 percent were evenly divided between PHCs and hospitals. Second, people in low-

EXHIBIT 5
Provider Visits, By Neighborhood And Household Income, In Delhi, India, 2003–04



SOURCE: Information derived from the authors' own analysis.
NOTES: Exhibit shows how visits to medical care providers over the thirty-five weeks of the survey were distributed across private- and public-sector doctors (the latter separated into primary health centers, or PHCs, and hospitals). Visits are disaggregated by the income of the neighborhood that the household is in and the income of the household itself (poor, mid, and rich).

income neighborhoods visited providers more frequently than did those in high-income neighborhoods. The higher use in low-income neighborhoods implies that for the full sample, poor households reported twenty visits during the thirty-five weeks of observation, compared with fifteen visits reported by the rich. Third, visits to public facilities by the poor were primarily to PHCs, and among the rich, to hospitals; given the large differences in competence between these two types of public facilities, this has direct implications for the quality of care received.

The poor visited providers whose competence score was, on average, 0.84 standard deviation lower than those visited by the rich (−0.38 vs. 0.42). We decomposed this variation into differences by locality and by household income.[15] There were relatively large differences across localities and smaller differences between rich and poor households living in the same area. The competence of providers visited by middle-income households in poor localities was −0.33; households at similar income levels in rich localities visited providers who were 0.6 standard deviation better. Rich households in poor localities visited providers 0.16 standard deviation below the mean and, in rich localities, 0.74 standard deviation above the mean.

These overall comparisons mask some variations across public and private providers. Rich and poor households in the same neighborhood visited private providers with similar levels of competence. Rich households, however, visited more-competent public providers than did the poor, a finding consistent with the greater use of hospitals among the rich and the differences in competence between PHCs and hospitals.

■ **Inequalities in choices: regression analysis.** The multivariate analysis con-

firmed these patters: A one-standard-deviation increase in (log) per capita income led to a 0.88-standard-deviation increase in the competence of providers that the household visited (Exhibit 6, column 1), and this remained unchanged once we included additional household-level controls (Exhibit 6, column 2).

The difference is entirely due to differences across rich and poor neighborhoods: Introducing neighborhood income (Exhibit 6, column 3) reduced the coefficient on household income to 0.06 (±0.34 at 95 percent confidence interval), or 0.08 in standard deviations of (log) income. The pattern was repeated for visits to private providers in columns 4 and 5, which compare the coefficient on household income in specifications with and without neighborhood incomes as explanatory variables. For public providers, the pattern was weaker. Column 6 shows that increasing (log) per capita income by one standard deviation led to a 0.66-standard-deviation increase in the competence of providers visited; introducing neighborhood effects led to an attenuation in the coefficient, but not by much (column 7). We discuss the policy implications below.

Discussion And Policy Implications

■ **Study limitations.** The study measured only one dimension of the quality of care—clinical competence—which reflects the best potential care a patient could

EXHIBIT 6
Average Competence Of Providers That Households Visit, In Delhi, India, 2003–04

	(1) All doctors	(2) All doctors	(3) All doctors	(4) Private doctors	(5) Private doctors	(6) Public doctors	(7) Public doctors
Household income	0.639 [0.076]***	0.600 [0.103]***	0.062 [0.171]	0.779 [0.118]***	0.212 [0.188]	0.482 [0.125]***	0.381 [0.235]
Middle-income area			−0.017 [0.086]		−0.007 [0.097]		0.108 [0.108]
High-income area			0.914 [0.192]***		0.976 [0.223]***		0.273 [0.256]
Average age in household		0.005 [0.005]	0.007 [0.005]	0.001 [0.006]	0.004 [0.005]	0.000 [0.006]	−0.001 [0.006]
Education of household head		0.003 [0.084]	0.014 [0.076]	−0.052 [0.099]	−0.045 [0.086]	0.085 [0.092]	0.047 [0.094]
Household head is first-generation migrant		0.026 [0.078]	−0.029 [0.068]	0.010 [0.092]	−0.079 [0.077]	−0.066 [0.088]	−0.084 [0.088]
Constant	−5.144 [0.595]***	−4.968 [0.707]***	−0.959 [1.225]	−6.372 [0.821]***	−2.084 [1.366]	−3.621 [0.910]***	−2.844 [1.719]
N	264	261	261	236	236	148	148
R^2	0.23	0.25	0.44	0.21	0.45	0.16	0.22

SOURCE: Information derived from the authors' own analysis.

NOTES: Exhibit correlates household and neighborhood characteristics to the average competence of providers visited by the household over the thirty-five weeks of the survey. Household income is computed on the basis of a consumption-expenditure module administered to every household in the survey. Neighborhoods are divided into middle- and high-income areas depending on the average income of the locality. Standard errors are in brackets.

***$p < 0.01$

"Anecdotal evidence suggests that public doctors in hospitals behave poorly with patients from low-income households."

receive. The actual quality of care received could be very different, depending on the effort exerted by the doctor. In another paper based on observations of doctor-patient interactions, published elsewhere, we show that effort is much lower in public clinics and argue that this is attributable to paying public doctors with fixed salaries. We also argue that private doctors respond to market conditions, which leads to overmedication since patients believe that more medication is better. The quality of actual care received is very different from what can be gauged through clinical competence alone.[16]

Our measure of competence could be flawed if providers' behavior in the vignettes was contaminated by their behavior in practice. There is evidence that public and private providers do not behave the same even at the same level of competence. It is possible that providers started thinking about the way they practice and that the vignettes measured both clinical competence and some dimensions of clinical experience. For example, private providers might believe that more proactive treatments are appropriate than do public providers, and this might have affected our measure of competence.

■ **Policy implications.** Practical policy advice under these circumstances is difficult to sort out. Simply improving practitioner training will not work. First, training less-than-fully-qualified practitioners to the level of MB BS doctors is costly and not sufficient to assure a high degree of competence: MB BS doctors practicing in public clinics and dispensaries also gave poor medical advice. Further, the difference in competence between those with alternative degrees that take five and a half years (BAMS and BHMS) and those with six-month training was insignificant.

A second problem with training is that what doctors know and what they do might be quite different. The incentives faced in the public and private sectors led to very different behavior between doctors at the same level of competence. Private providers were prone to do "too much," in overprescribing drugs (a serious problem in India), while public doctors clearly did "too little," in time spent with patients. Incentives rather than training determined what providers did.[17]

One option would be to provide better information to consumers. In this research as well as related analysis of behavior in practice, a distinction between public and private practitioners is that public providers are more likely to refer a patient to a more specialized provider when that is the appropriate action or, alternatively, to do nothing.[18] When the right thing to do is to probe, diagnose, and treat at the primary care level, the private sector is better. Thus, if the patient has a self-limiting problem or only needs a referral, it is best to go to a public-sector provider; when the illness can be treated at the primary care level, it is better to go to a private-sector provider. On the other hand, the private sector is more likely to

overmedicate self-limiting diseases. In interviews, providers said that they felt pressured to prescribe because they feared that otherwise they would lose customers and income. This could be one reason that Ayurvedic and Unani providers gave just as many antibiotics as allopathic practitioners did. The bias toward overmedication needs to be countered.

Unfortunately, patients typically do not know whether they have an illness that requires treatment at the primary level. Better information on how to recognize self-limiting illnesses versus those that require a more active response would help them sort themselves into the most appropriate treatment settings. Some optimism is warranted, because there are precedents that people do respond to specific information aimed at particular practices.[19]

The allocation of more-competent public doctors to clinics in poorer neighborhoods could improve matters via the "spillover effect" in which differences between rich and poor within neighborhoods and levels of facilities are small. One of the fundamental premises on which the public system of curative health care is based is that of ensuring equity: The public sector should balance out inequalities arising from the location choices of the private sector. Our data showed that this was not the case, both in the location patterns of public providers and, consequently, in the choices that households made. A priori, one would have expected greater sorting among private rather than public providers: If the poor could (and did) choose the same private providers as the rich, what prevented them from choosing better providers in the free public sector? Anecdotal evidence suggests that public doctors in hospitals behave poorly with patients from low-income households. Ensuring equity in the public sector through geographical allocation and better treatment patterns would help, but how this can be achieved, given current social disparities and enforcement of personnel policies in India, is a big problem.

Finally, if the problems with improving curative health care prove insurmountable, an alternative is to focus on "public goods" such as sanitation, which are direct competitors for spending on curative care. In urban areas, public investments in sewage, drainage, clean water, vector or pest control, campaign-style immunization drives, and other direct attacks on communicable diseases can certainly help the relatively poor. In this case, an ounce of prevention might be worth a pound of cure.

The material presented here draws from a larger project on provider quality and health-seeking behavior carried out in collaboration with the Institute for Socio-Economic Research on Development and Democracy, Delhi. The authors thank Sarah Barber, Paul Gertler, Kenneth Leonard, and Shanta Devarajan for their comments and encouragement. The survey of practitioners and households was conducted by the Institute of Socio-Economic Research on Development and Democracy. Vignettes were designed in consultation with Tejvir Singh Khurana, and expert teams led by Zahida Khwaja and Jonathon Ellen graded the doctors' treatments. The findings, interpretations, and conclusions expressed in this paper are those of the authors and do not necessarily represent the views of the World Bank, its executive directors, or the governments they represent.

NOTES

1. World Bank, *World Development Report: Investing in Health* (Washington: World Bank, 1993).
2. National Sample Survey, *Registration System Bulletin* 32, no. 2 (Delhi: National Sample Survey, 2001); and A. Shariff, *India Human Development Report* (Delhi: National Council of Applied Economic Research and Oxford University Press, 1999).
3. World Health Organization, *The Alma-Ata Declaration* (Geneva: WHO, 1980), 3.
4. J. Das and C. Sánchez-Páramo, "Short but Not Sweet: New Evidence on Short Duration Morbidities from India," Policy Research Working Paper no. 2971 (Washington: World Bank, 2003).
5. Authors' calculations based on data from the National Family Health Survey (1999) for Delhi. Among households in the richest decile, there were no reported infant deaths in the NFHS (1999). The infant mortality rate for the poor is just above the national rate of 68 per 1,000 births.
6. J. Das and P.J. Gertler, "Variations in Practice Quality in Five Low-Income Countries: A Conceptual Overview," *Health Affairs* 26, no. 3 (2007): w296–w309 (published online 27 March 2007; 10.1377/hlthaff.26.3.w296).
7. Training for providers (other than those with an MB BS degree) draws on different traditions in Indian medicine and includes bachelor of Ayurvedic medicine and surgery (BAMS), bachelor of integrated medicine and surgery (BIMS), and bachelor of Unani medicine and surgery (BUMS). Further down the order are the registered medical practitioners (RMPs) or paramedics with some rudimentary training; given the limited regulatory powers of government authorities, there are also providers with no formal training.
8. A. Mahal et al., "The Poor and Health Service Use in India" (Washington: World Bank, 2001).
9. WHO, *The World Health Report 2000—Health Systems: Improving Performance* (Geneva: WHO, 2000).
10. The use of vignettes as a measure of quality has increased in the United States during the past decade. See J.W. Peabody et al., "Comparison of Vignettes, Standardized Patients, and Chart Abstraction: A Prospective Validation Study of Three Methods for Measuring Quality," *Journal of the American Medical Association* 283, no. 13 (2000): 1715–1722. A technical scoring algorithm and discussion of the vignettes is presented in J. Das and J. Hammer, "Which Doctor: Combining Vignettes and Item Response to Measure Provider Competence," *Journal of Development Economics* 78, no. 2 (2005): 348–383.
11. The sample is discussed in Das and Sánchez-Páramo, "Short but Not Sweet."
12. The first set was drawn via probability proportional to visits (size), and the second was drawn randomly with equal weights (the scheme for the first set explains the variation across localities—some neighborhoods had fewer total providers visited during the survey period).
13. A table describing these findings is available in an online technical appendix, at http://content.healthaffairs.org/cgi/content/full/26/3/w338/DC2.
14. Das and Hammer, "Which Doctor," uses a different scoring technique derived from Item Response Theory with somewhat different results than presented here. For comparability with other country studies from Indonesia and Tanzania in this collection of *Health Affairs* papers, we used the standardized raw score formulation.
15. A graphic describing these findings is available in an online technical appendix, as in Note 13.
16. J. Das and J. Hammer, "Money for Nothing: The Dire Straits of Medical Practice in India," *Journal of Development Economics* 83, no. 1 (2007): 1–36. Similar results are reported for the Netherlands by J.J. Rethans et al., "Does Competence of General Practitioners Predict Their Performance? Comparison between Examination Setting and Actual Practice," *British Medical Journal* 303, no. 6814 (1991): 1377–1380; and for Tanzania by K.L. Leonard and M.C. Masatu, "Comparing Vignettes and Direct Clinical Observation in a Developing Country Context" (Unpublished paper, University of Maryland, 2003).
17. Das and Hammer, "Money for Nothing."
18. Ibid.
19. J. Jalan and E. Somanathan, "Being Informed Matters: Experimental Evidence on the Demand for Environmental Quality," ISI Discussion Paper no. 04-08 (New Delhi: Indian Statistical Institute, 2004).