An Unhealthy Public-Private Tension: Pharmacy Ownership, Prescribing, and Spending in The Philippines

Physicians who are linked to pharmacies do not prescribe more-costly medicines, but they do persuade patients to use those pharmacies.

by Chris D. James, John Peabody, Orville Solon, Stella Quimbo, and Kara Hanson

ABSTRACT: Physicians’ links with pharmacies may create perverse financial incentives to overprescribe, prescribe products with higher profit margins, and direct patients to their pharmacy. Interviews with pharmacy customers in the Philippines show that those who use pharmacies linked to public-sector physicians had 5.4 greater odds of having a prescription from such physicians and spent 49.3 percent more than customers using other pharmacies. For customers purchasing brand-name medicines, switching to generics would reduce drug spending by 58 percent. Controlling out-of-pocket spending on drugs requires policies to control financial links between doctors and pharmacies, as well as tighter regulation of nongeneric prescribing. [Health Affairs 28, no. 4 (2009): 1022–1033; 10.1377/hlthaff.28.4.1022]

Public-sector doctors in low- and middle-income countries are often poorly paid. Consequently, many undertake additional work or invest in the private sector; some even leave the public sector altogether. One common strategy is for doctors to have financial links to pharmacies, diagnostic clinics, and other private health facilities. Such linkages potentially create a perverse financial incentive for physicians to overprescribe, prescribe products with higher profit margins, and convince patients to use their pharmacy.

A doctor’s incentive to obtain a share in a private pharmacy, and the perverse incentives that can emerge from this, are more marked when patients pay directly...
for drugs themselves or when drugs are retrospectively reimbursed by insurers on a fee-for-service basis (as compared with prospective drug payment). In such circumstances, financial gain is directly linked to prescribing strategies.

Whether or not doctors actually act on these incentives depends on the relative weight they place on personal financial gain and a patient’s well-being, assuming that these two objectives are not aligned. That is, their clinical behavior depends on how “perfect” an agent the doctor is for the patient.3

To evaluate whether public-sector doctors are affected by these personal financial incentives, we interviewed pharmacy customers in the Philippines after they had purchased medicines from a pharmacy. Customers were asked whether they had a prescription and, if so, from whom and how much they spent. Data on the price and availability of selected essential medicines were also collected from pharmacies and public district hospitals. Accordingly, this paper addresses three related research questions: (1) Do physicians having financial links with a private pharmacy influence patients to purchase medicines from their pharmacy? (2) Do patients with prescriptions from pharmacy-linked physicians spend more in pharmacies than patients with prescriptions from other physicians? (3) Would patients with prescriptions from a pharmacy-linked public-sector physician spend less on medicines if generics were fully available within public district hospitals?

Although our study refers only to the Philippines, the problem of physicians’ linkage with pharmacies is potentially important in many low- and middle-income countries, particularly where public-sector salaries are low and regulation is lax.

Study Data And Methods

Study context. A network of public-sector health facilities offers integrated health care services in the Philippines. There are also many private providers, particularly in the larger urban areas. Public facilities are predominantly financed by local government units (LGUs). However, this is not sufficient to cover their operating costs, so shortfalls are financed through contributions from the Philippine Health Insurance Corporation (PHIC) and user charges. The PHIC, the publicly sponsored national health insurance company, does not yet provide universal coverage. Benefits are capped and limited mainly to inpatient care, so copayments for the insured can be high, particularly for those with protracted or serious illnesses.

The pharmaceutical retail market in the Philippines is dominated by commercial pharmacies, which account for 85 percent of drugs sold.4 Patients can also purchase medicines in hospital pharmacies, but availability is limited, particularly in government hospitals. Patients with PHIC membership, however, can later claim reimbursement for prescribed medicines purchased in pharmacies up to a prespecified ceiling if the medications and supplies were not available in public hospitals.
Our study was connected to the Philippine Child Health Experiment, known locally as QIDS. QIDS is an ongoing study exploring the impact of two policy interventions: expanded insurance coverage for children; and performance-based payments for hospitals and physicians. It was undertaken in thirty randomly selected districts in the Visayan Island group and the northern tip of Mindanao. QIDS provided us with detailed information on these districts’ hospital facilities, including the physicians working there; and anecdotal information on public physicians’ potential linkages with private pharmacies.

**Pharmacy sample frame.** Seven districts were purposively selected from among the thirty QIDS study districts. Selection was based on there being at least one pharmacy linked to a public hospital physician; all intervention arms of the QIDS study were represented.

The inclusion criteria for pharmacies in these seven districts were as follows: (1) pharmacies must be owned by or have direct familial links (parent, sibling, or offspring) to a public hospital physician; (2) pharmacies must be owned by or have direct familial links to a private clinic physician; or (3) pharmacies must be located next to a hospital (on the same street and within two minutes’ walk). We also included controls of two or more randomly selected independent pharmacies per site, with ideally at least one of these next to the hospital and at least one farther away (that is, five to thirty minutes’ walk away). An independent pharmacy is defined as a pharmacy that is neither owned by nor has direct familial links with a public or private physician.

Screening interviews were administered with the pharmacy owner or chief pharmacist, or both, establishing who owned each pharmacy. Interviews were undertaken for all pharmacies within each district’s main commercial center. Of the forty-six screened pharmacies, all but seven were eligible for our study. Of those seven, three refused to be interviewed (all independently owned), and four were closed throughout the study period (two independently owned; two with familial links to public hospital physicians).

**Collection of patient data.** Data collection took place during March–May 2007. We interviewed patient respondents immediately after they had purchased medicines from one of the study’s pharmacies. Respondents were asked if they received a prescription and, if so, from whom and what they bought; they were also asked about their socioeconomic status and the illness for which the medicines were purchased. Some 40–60 percent of customers purchasing medications were interviewed per pharmacy, with a minimum time frame of one day per pharmacy. Interviewing was sequential and done by local research assistants trained by the lead author. Interviews were administered in the local dialect, encompassed fourteen questions, and took about ten minutes to complete. All interviewees were adults, although approximately a quarter of them were purchasing medicines for children.

**Model specification.** Three models were specified, each addressing one of the paper’s three research questions. These are summarized below, with further details...
given in an online technical appendix. (1) Do physicians who own or have financial links with a private pharmacy influence patients to purchase medicines from their pharmacy? The approach was to model the probability that a patient (the pharmacy customer or the person for whom the customer was buying the medicines) received a prescription from a public hospital physician. This used a logistic model, with the main variable of interest indicating whether a pharmacy is linked to a physician. Various control variables at both the pharmacy and pharmacy customer levels were included. Reasons given for why a customer chose to use a physician-linked pharmacy were also analyzed.

(2) Do patients with prescriptions from pharmacy-linked physicians spend more in pharmacies than patients with prescriptions from other physicians? This analyzed pharmacy spending, using a semi-logarithmic ordinary-least-squares (OLS) specification. It focused on the subsample of customers with prescriptions from a public hospital, comparing the spending of customers with a prescription from a pharmacy-linked public physician to the spending of those with a prescription from other public-sector physicians. The data collected did not distinguish between patients with prescriptions for inpatient or outpatient use.

(3) Would patients with prescriptions from a pharmacy-linked public physician spend less on medicines if generic versions were fully available in public district hospitals? This involved analyzing the subsample of people with a prescription from a pharmacy-linked public hospital physician. These people’s observed drug spending in pharmacies was compared with what they could have spent on the same medicines if generic versions were fully available in public district hospitals. Quantities of medicines purchased in a hospital were assumed to be the same as observed quantities purchased in pharmacies.

Study Results

Descriptive statistics. Of the thirty-nine pharmacies, six were owned by public physicians, three were owned by private physicians, and thirty were independently owned. Eleven pharmacies were located on the same street as the hospital; the remaining twenty-eight were five to fifteen minutes’ walk away.

Just under half of the sample had a prescription (compared with over-the-counter, or OTC, purchases). Further, 32 percent had a prescription from a public hospital physician—17 percent from a pharmacy-linked public physician and 15 percent from other public physicians. More than 60 percent of the sample reported household incomes that were in the bottom quintile of the national income distribution (Exhibit 1). Asset ownership was positively associated with reported household income.

Probability of receiving a prescription from public hospital physicians. Pharmacy customers using a pharmacy linked with a public-sector physician were 5.4 times more likely to receive a prescription from such a physician than were customers using pharmacies not owned by such a physician (Exhibit 2). Further, those
using pharmacies located in the immediate vicinity of the town's public hospital, rather than other pharmacies, had 6.2 higher odds of having their prescription come from a public-sector physician. Customers with PHIC insurance and planning to submit a claim for their purchase had 1.8 greater odds of having a prescription from a public-sector physician. There was also noticeable variability in results across districts.

Customers’ reasons for using a particular pharmacy. To better understand physicians’ ability to influence a patient’s drug-purchasing behavior, we analyzed
the reasons customers gave for using physician-linked pharmacies (Exhibit 3). Among the customers with a prescription from a pharmacy-linked public-sector physician and using that physician's pharmacy, 61 percent cited the influence of a health professional as the main reason. The respective figure for customers with prescriptions from other public-sector physicians was 26 percent. This difference was statistically significant (chi-square $= 5.29, p < 0.025$).

**Determinants of pharmacy spending.** A first analysis showed that customers using a public physician–linked pharmacy spent 49.3 percent more than those using other pharmacies (Exhibit 4). However, it also showed that those with a prescription from a pharmacy-linked public-sector physician spent 37.4 percent less than those with prescriptions from other public-sector physicians. Patients who used pharmacies located in the immediate vicinity of a town's public hospital spent 63 percent more than those who used other pharmacies (Exhibit 4). There was also variability in results across districts.

A second analysis, comparing four customer subgroups, showed that customers with prescriptions from pharmacy-linked public-sector physicians spent less than those with prescriptions from other public-sector physicians only if they used pharmacies not owned by physicians who were linked to a pharmacy. These subgroups were (1) customers with prescriptions from pharmacy-linked public-sector physicians and using their pharmacies; (2) customers with prescriptions

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**EXHIBIT 2**

**Odds Of A Patient’s Receiving A Prescription From A Public Hospital Physician In The Philippines, 2007**

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>SE</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy linked to public physician</td>
<td>5.427</td>
<td>2.17</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Pharmacy located next to hospital</td>
<td>6.152</td>
<td>2.20</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>District</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abuyog</td>
<td>3.319</td>
<td>1.32</td>
<td>0.0020</td>
</tr>
<tr>
<td>Bais</td>
<td>2.034</td>
<td>0.83</td>
<td>0.0810</td>
</tr>
<tr>
<td>Guihulngan</td>
<td>28.703</td>
<td>14.24</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Palompon</td>
<td>6.172</td>
<td>2.31</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Oras</td>
<td>10.036</td>
<td>3.69</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Taft</td>
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<td></td>
<td></td>
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<tr>
<td>Household assets index</td>
<td>0.502</td>
<td>0.26</td>
<td>0.1880</td>
</tr>
<tr>
<td>PHIC member and planning to claim</td>
<td>1.796</td>
<td>0.52</td>
<td>0.0430</td>
</tr>
<tr>
<td>Patient’s age (years)</td>
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<td></td>
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<tr>
<td>40–59</td>
<td>0.632</td>
<td>0.15</td>
<td>0.0520</td>
</tr>
</tbody>
</table>

**SOURCE:** Authors’ analysis of survey data.

**NOTES:** PHIC is Philippine Health Insurance Corporation. OR is odds ratio. SE is standard error. Bayawan is the reference district for geographic odds; case-mix proxies also included. Age 60+ is the reference group for the age variables. Data clustering at the pharmacy level were adjusted for. Several variables (age ≤5, ages 6–17, ages 18–39, and female) were excluded from the final model on the basis of the Akaike Information Criterion (AIC). Statistics based on model 1: n = 1322. Likelihood ratio = 619, Prob > LR = 0.00. Pseudo $R^2 = 0.37$; AIC x n = 1,085.
from pharmacy-linked public-sector physicians but using other pharmacies (re-
gression reference group); (3) customers with prescriptions from other (non-
pharmacy-owning) public-sector physicians and using pharmacies linked to
public-sector physicians; and (4) customers with prescriptions from other public-
sector physicians and using other pharmacies (Exhibit 4).

Extent of potential savings if customers purchased generics. Extrapolat-
ing these results to all pharmacy customers with a prescription from a pharmacy-
linked public hospital physician shows that noticeable savings could be generated.
For the 88 percent of these customers who purchased brand-name medicines,
spending could be reduced by 58 percent, on average (median), saving US$4.60 per
prescription (their average expenditure was US$7.70) if they purchased generic
medicines (Exhibit 5). For the 20 percent of these customers purchasing both
brand-name and generic medicines, their spending would be reduced by 49 percent,
on average (median), saving US$3.10 per prescription (their average expenditure
was US$6.40). This assumes that price differences between generic and brand-
name versions for other medicines are the same as for medicines analyzed in the sim-
ulation subsample.

Discussion

This study investigated whether doctors respond to the incentives created by fi-
nancial links with pharmacies, and it evaluated the financial implications of that
behavior. We found that pharmacy-linked physicians in the Philippines appear to
persuade patients to use their pharmacy in preference to other pharmacies. After
other factors were controlled for, results demonstrated that customers using pub-
lic-sector physician–linked pharmacies had 5.4 greater odds of having a prescription from a public-sector hospital physician and spent 49 percent more than those using other pharmacies.

In determining expenditures, the type of pharmacy a customer purchased medicines from was more important than who prescribed the medicine. Doctors who owned pharmacies did not prescribe more-costly medicines than other hospital physicians. However, physicians’ linkage with private pharmacies remains a concern because of the finding that pharmacy-linked public-sector physicians persuade patients to use their pharmacies. Further, for customers purchasing brand-name medicines, switching to generics would reduce pharmaceutical spending to an average of 42 percent of their actual spending. This finding implies that there are potentially significant savings for both people paying out of pocket and third-party payers.

**Consistency with other studies.** Our results are consistent with those of other studies that have analyzed financial links between doctors and health facili-
ties. In the United States, physicians linked to private facilities consistently had different referral behavior, resulting in policy regulations—the Stark laws—that severely limited self-referrals. Many studies showed how utilization and profits of U.S. facilities providing ancillary and outpatient services were higher if these facilities had financial links with physicians. In Taiwan, researchers analyzing outpatient clinics found that the probability of prescription and drug spending per visit were, respectively, 17–34 percent and 12–36 percent less among visits to clinics without “on-site” pharmacists (pharmacists hired by physicians to dispense the drugs they prescribe). Later studies found that pharmacies linked with physicians accounted for a large and growing proportion of prescriptions in Taiwan.

Other studies evaluated the prescribing practices of dispensing doctors. In South Korea, prescriptions for antibiotics and injections fell following the separation of drug prescribing and dispensing in 2000. However, these were offset by physicians’ demands for compensatory higher medical fees and an increase in prescriptions of high-price drugs. In Zimbabwe, dispensing doctors prescribed more medicines than nondispensing doctors, and dispensing with a prescription lowered the quality of care. In the United Kingdom, practices that also dispensed drugs prescribed more items per patient (and fewer of them generically) than nondispensing practices.

**Study limitations.** Still, our study has some important limitations. First, data were not collected from patients who bought medicines in the hospital pharmacy, nor from patients who bought none of the medicines they were prescribed. None-
“Improving the availability of generic medicines in public hospitals could produce sizable savings for patients and third-party payers.”

Nevertheless, other data from the QIDS study showed that for 98.7 percent of inpatient cases younger than age six, the parent/caregiver had to obtain additional prescribed medicines outside of the hospital, so bias from this source is unlikely. Second, districts and pharmacies were selected purposively; however, the participation rate among both pharmacies and pharmacy customers was high, and there is no a priori reason to think that the results are driven by the sampling frame. Third, some physicians with links to pharmacies might not have been not identified, because of informal links between pharmacies and physicians that were not captured in the screening interview. This would mean that certain pharmacies classified as “independent” actually had physician links. This form of misclassification would tend to underestimate the actual differences between pharmacy ownership types. Fourth, although results illustrated that pharmacy-linked public-sector physicians were able to persuade patients to use their pharmacy, the research only began to explore how they were able to do this. Qualitative research methods might have captured this more effectively. Further, we did not analyze a physician’s decision to obtain pharmacy ownership stakes and consequently if (and if so, how) pharmacy-linked physicians differ from other physicians. Finally, the analysis could not analyze the linkage between physicians owning private pharmacies and the number of prescriptions they wrote. Pharmacy-linked physicians face a stronger financial incentive to overprescribe. Although our analysis showed that health spending was higher in public-sector physician-linked pharmacies, it cannot show if this is explained by more prescriptions or more expensive medicines being prescribed; thus, it is not possible to disentangle price and quantity effects. Potential overprescribing also implies that the cost savings in our analysis would have been underestimated.

**Potential policy responses.** Our findings suggest a range of policy responses to physicians’ ownership of private pharmacies. At the one extreme, banning physicians from owning pharmacies would remove the perverse financial incentives associated with pharmacy ownership. However, such a policy is likely to be difficult to enforce, and physicians might still maintain financial links with pharmacies without actually owning them, particularly if the underlying issue of low physician salaries is not addressed. Experiences from South Korea and Taiwan suggest that such a policy cannot succeed in isolation.16

Another policy option is to improve the availability of generic medicines in public hospitals. This could produce sizable savings for patients and third-party payers and could also offer revenue opportunities for hospitals. Further, it would pressure outside pharmacies to carry generic medicines and to offer medications at competitive prices. However, as this study indicates, there would also need to be adequate monitoring of prescribing practices, because there is no guarantee
that pharmacy-linked public-sector physicians would not continue to try and persuade patients to use their pharmacies. Policymakers might also focus on ensuring that private pharmacies stock generic versions of essential medicines (already the law). However, if pharmacy customers regularly demanded generics, private for-profit pharmacies would more readily supply them.

This implies a more general problem with generics: customers might perceive them to be of inferior quality to brand-name medicines, or physicians might recommend brand-name products, or both. Indeed, anecdotal evidence from this study suggests that prescriptions often exclude the medicine’s generic name, even though this is in conflict with Philippine law (Republic Act no. 6675). Thus, for generics to be more widely used, there needs to be better monitoring of physicians’ prescribing, and, more generally, any concerns about the quality of generics needs to be assuaged. PHIC could regulate physicians’ prescribing practices, given its experience in evaluating physician claims, and because it has the incentive of significant cost savings to do so. However, for this to cover a large proportion of prescriptions, PHIC reimbursement would need to be expanded to cover outpatient prescription medicines.

Finally, policymakers must recognize that public physicians’ salaries are typically low, relative to what they could earn elsewhere. Physicians’ ownership of private pharmacies and the associated perverse financial incentives that emerge are likely to be driven by the need to cope with low public-sector wages.

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NOTES


6. The Technical Appendix is available online at http://content.healthaffairs.org/cgi/content/full/28/4/1022/DC1.


8. Manchikanti and McMahon, “Physician Refer Thyself.”


