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Subsidies for Health Products

Pascaline Dupas*

Adoption of health products could lessen the burden of infectious disease in developing countries. In a series of studies using experimental data from Kenya, my colleagues and I have explored the role of subsidies in both short- and long-run adoption of such products, and studied how subsidies might be targeted.

Full Subsidies Increase Adoption in Both the Short and Long Run

Three studies examine the role of subsidies in the adoption of preventative health technologies. Subsidies for such products can be justified in two ways: first, because the diseases they prevent are often infectious, these technologies generate public health benefits. Second, people may be more likely to know the health effectiveness of a product if they or others around them have had an opportunity to try it out cheaply in the past.

For subsidies to successfully generate such health and learning effects, households need to make effective use of the products they receive at a highly subsidized price. However, they may not do so for two reasons. First, households that are unwilling to pay a high monetary price for a product also may be unwilling to pay the non-monetary costs associated with daily use of the product, or may not actually need the product at all. In other words, indiscriminate subsidies may undermine the screening or allocative effect of prices. Second, subsidies could reduce the potential for psychological effects associated with paying for a product, such as a “sunk cost” effect in which people, having paid for a product, feel compelled to use it.

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In a first study, Jessica Cohen and I use a two-stage randomized design to estimate the distinct roles of the screening and psychological sunk-cost effects in the use of long-lasting anti-malarial bed nets in rural Kenya.¹ These nets cost \$7, and they prevent bites from malaria-carrying mosquitoes while sleeping. We randomize the price at which prenatal clinics offered nets to pregnant women, who are particularly vulnerable to malaria. The clinics charged either nothing (free distribution), or 15, 30, or 60 U.S. cents. A random subset of women who had purchased a net for either 30 or 60 cents subsequently received a surprise rebate. We find that the rate at which pregnant women used the net (measured through home observation visits two months later) was relatively high (60 percent) and was completely independent of the price they paid for the net, either initially or after the surprise rebate. In other words, there is no evidence of either a screening or sunk-cost effect of prices in that context. On the other hand, our take-up results show that demand is very sensitive to price: the likelihood that pregnant women acquired a net fell from 99 to 39 percent when price increased from zero to 60 cents. Thus the effect of the subsidy on coverage, and hence its potential for public health outcomes, decreases very rapidly as the subsidy level declines.

In a second study conducted on a sample of households with school-aged children, also in Kenya, I find that demand becomes slightly less price sensitive if subsidies are in the form of vouchers that households have three months to redeem at local retail shops. Overall price remains the primary driver of demand, with the purchase rate dropping from 73 percent when the price is \$0.60 to around 33 percent when the price reaches \$1.50 (still an 80 percent subsidy) and to 6 percent when the price reaches \$3.50 (corresponding to a 50 per-

cent subsidy). Various marketing strategies (for example, making the morbidity burden or treatment costs salient, targeting mothers, or eliciting verbal commitments to invest in the product) fail to change the slope of the demand curve.² Here again, the price paid does not matter for usage. In fact, home observation visits show that the usage of bed nets acquired through a subsidized voucher was extremely high, rising from 60 percent at a three-month follow-up to over 90 percent after one year, and thus across all price groups, including recipients of fully subsidized net.

The results observed for bed nets do not appear highly specific. Nava Ashraf, James Berry, and Jesse Shapiro study the use of water purification products in Zambia; their two-stage design preceded the one I use with Cohen, and they find no evidence of use-inducing sunk-cost effects. However, they do find some evidence of a screening effect of prices.³ Jennifer Meredith, Jonathan Robinson, Sarah Walker, and Bruce Wydick work with three products in four countries—rubber shoes to prevent worm infections, soap, and vitamins in Kenya, Uganda, Guatemala, and India—and find that demand is very sensitive to price in all contexts. Neither health information nor gender targeting helps increase demand at higher prices, but people use the products no matter the price they paid.⁴

Given these results, and the fact that mass distribution is cheaper than setting up a partial subsidy scheme through vouchers, full subsidies appear necessary if one wants to see adoption of bed nets to reach the coverage levels targeted by the international community. But how long can subsidies be in place? Can a once-off subsidy be enough to trigger learning and to generate sustained adoption? Or is there a risk that people are unwilling to pay for a product they once received for free? This could hap-

pen if people, when they see a product being introduced for free, come to feel entitled to receive this product for free (that is, they would “anchor” around the subsidized price). To gauge the relative importance of these effects, I look at the long-run effects of temporary subsidies on adoption of these products.⁵ That study had two phases: in phase 1, taking data from study 2 described above, households were randomly assigned a price for a bed net, ranging from zero to \$3.80. In phase 2 a year later, all households faced the same price of \$2.30. By comparing the take-up rate of the second, uniformly-priced bed net across phase-1 price groups, I can test whether being exposed to a large or full subsidy in Phase 1 (which, as discussed above, considerably increases adoption in Phase 1) reduces or enhances willingness to pay for the bed net a year later. I find that it enhances it, suggesting the presence of a positive learning effect which dominates any potential anchoring effect. Interestingly, the learning effect trickles down to others in the community: households facing a positive price in the first year are more likely to purchase a bed net when the density of households around them who received a free or highly subsidized bed net is greater. Once bed net ownership is widespread, though, the transmission risk starts to decrease and the returns to private investments decrease: accordingly, those who have more subsidized neighbors in year one are less likely to invest in year two.

When Prices regain their Allocative Role: Medical Treatment

The studies discussed above find that price was not a good targeting mechanism to allocate malaria prevention tools (bed nets), and in fact that higher prices prevent positive spillovers on disease transmission associated with large bed net coverage. But in a study with Cohen and Simone Schaner using experimental data from the same region of Kenya, we find that price can be (to some extent)

used as a targeting mechanism to allocate malaria treatment.⁶ Targeting of malaria treatment is very important because of the negative spillovers that overuse of such treatments generates: it can delay or preclude proper treatment for the true cause of illness, waste scarce resources for malaria control, and may contribute to drug resistance among malaria parasites, making treatment of malaria harder in the long-run.

Price can be effective at targeting treatment when it's not effective at targeting prevention, because demand for treatment appears much less price-sensitive (especially among the poor) than demand for prevention. What's more, conditional on experiencing malaria-type symptoms, adults are much less likely to be malaria-positive than children. As with most treatments, though, the price per anti-malarial dose for adults (who need to take more pills) is higher than the price for children. Consequently, at a given price per pill, children (the key target for the subsidy) are on a flatter portion of the demand curve.

In addition to furthering our understanding of how price can be used to target health products in the developing world, a fourth study makes two contributions: 1) it highlights the trade-off inherent to subsidies for medications in environments with weak health system governance (which prevents conditioning the subsidy on a formal diagnostic); and 2) it points out that bundling subsidies for medications with subsidies for diagnostic tests has the potential to improve welfare impacts.

When Price is not an Effective Allocating Tool, what Allocation Mechanism can be used?

Two studies with Debopam Bhattacharya concern the question of how to efficiently allocate subsidized products. When budgets are such that only a small fraction of a target population can receive a given subsidy, but returns to the subsidy are heterogeneous across households (for example, some

households can afford the product without the subsidy but others cannot), the eligibility rule used to decide who will receive the subsidy can have an important effect on the overall benefit arising from the subsidy program. We first consider the problem of allocating a fixed amount of treatment resources to a target population with the aim of maximizing the mean population outcome, and the dual problem of estimating the minimum cost of achieving a given mean outcome in the population by efficient targeting of the treatment.⁷ We set-up an econometric framework for studying this problem and apply it to the design of welfare-maximizing allocation of subsidies for bed nets. Using the same data as in study 2 described above, we estimate that a government that can afford to distribute bed net subsidies to only 50 percent of its target population can, if using an allocation rule based on multiple covariates, increase bed net coverage by 17 to 20 percentage points relative to random allocation.

Bhattacharya, Shin Kanaya, and I then develop a method for estimating the predicted aggregate effect of a given subsidy-targeting rule, taking into account the spillover effects that one household's subsidization has on neighboring households' outcomes; and for estimating the error incurred in prediction due to ignoring the spillovers.⁸ A key requirement of the method we propose is the availability of data to estimate the magnitude and shape of spillovers. In our application, we (here again) exploit data from one of the experimental Kenya studies discussed above, in which a subsidy for anti-malarial bed nets was assigned randomly across households. We show that ignoring treatment externalities in the estimation of aggregate policy impacts can yield large bias and, importantly, that the sign of this bias cannot be inferred solely from the sign of the externality. For example, when individual bed net use is increasing in neighborhood subsidy rates, as in our application, intuitive reasoning might suggest that ignoring this externality would lead to underestimation of the aggregate impact of

a targeted bed net subsidy program. However, this intuition is flawed and the correct answer depends on whether the average neighborhood subsidy rate under the proposed subsidy program would be higher or lower than the average neighborhood subsidy rate observed in the data used to estimate the parameters of interest.

¹ J. Cohen and P. Dupas, "Free Distribution or Cost Sharing? Evidence from a Randomized Malaria Experiment," NBER Working Paper No. 14406, October 2008, and Quarterly Journal of Economics, 125 (1), (February 2010), pp.1–45.

² P. Dupas, "What matters (and what does not) in households' decisions to invest

in malaria prevention?" and American Economic Review P&P, 99(2), (May 2009), pp. 224–30.

³ N. Ashraf, J. Berry, and J. Shapiro. "Can Higher Prices Stimulate Product Use? Evidence from a Field Experiment in Zambia," NBER Working Paper No. 13247, July 2007, and American Economic Review 100(5) (December 2010) pp. 2383–413.

⁴ J. Meredith, J. Robinson, S. Walker, and B. Wydick. "Keeping the Doctor Away: Experimental Evidence on Investment in Preventive Health Products," forthcoming in Journal of Development Economics.

⁵ P. Dupas, "Short-run Subsidies and Long-run Adoption of New Health Products: Evidence from a Field Experiment," NBER Working Paper No.

16298, August 2010.

⁶ J. Cohen, P. Dupas, and S. Schaner, "Price Subsidies, Diagnostic Tests, and Targeting of Malaria Treatment: Evidence from a Randomized Controlled Trial," NBER Working Paper No.17943, March 2012.

⁷ D. Bhattacharya and P. Dupas, "Inferring Welfare Maximizing Treatment Assignment under Budget Constraints," NBER Working Paper No. 14447, October 2008, and Journal of Econometrics, 167(1), (March 2012), pp. 168–96.

⁸ D. Bhattacharya, P. Dupas, and S. Kanaya, "Estimating the Impact of Means-tested Subsidies under Treatment Externalities with Application to Anti-Malarial Bednets," NBER Working Paper No. 18833, February 2013.

Ideology in the News Media

Matthew Gentzkow* and Jesse M. Shapiro**

In many traditional models of politics, such as the pioneering work of Anthony Downs, voters lack private incentives to become informed.¹The news media therefore play a crucial role in any democracy, amortizing the costs of gathering and filtering news across many citizens, lowering the costs of acquiring political information, and strengthening private incentives to become informed.

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Democracy might function poorly without the news media, but the special role of the media in providing information relevant to voting and other political decisions also endows it with significant power to shape how events are perceived. Anecdotal evidence suggests that the news media do, indeed, exercise significant discretion in how they present events. Consider, for example, the following three reports on a December 2, 2003 battle in the Iraqi city of Samarra:²

Fox News: "In one of the deadliest reported firefights in Iraq since the fall of Saddam Hussein's regime, U.S. forces killed at least 54 Iraqis and captured eight others while fending off simultaneous convoy ambushes."

New York Times: "American commanders vowed Monday that the killing of as many as 54 insurgents in this cen-

tral Iraqi town would serve as a lesson to those fighting the United States, but Iraqis disputed the death toll and said anger against America would only rise."

Al Jazeera: "The U.S. military has vowed to continue aggressive tactics after saying it killed 54 Iraqis following an ambush, but commanders admitted they had no proof to back up their claims. The only corpses at Samarra's hospital were those of civilians, including two elderly Iranian visitors and a child."

These accounts are based on the same facts. But through selective omission, choice of words, and varying credibility ascribed to the primary source, they convey very different impressions of what transpired.

What drives the variation we see in how a given event is presented by different news outlets? Does the diversity of perspectives reflected in the quotes