Journal of Development Economics 105 (2013) 196–210

Contents lists available at ScienceDirect

Journal of Development Economics

journal homepage: www.elsevier.com/locate/devec

Keeping the doctor away: Experimental evidence on investment in preventative health products☆

Jennifer Meredith [a], Jonathan Robinson [b,*], Sarah Walker [c], Bruce Wydick [d]

[a] Department of Economics, University of Washington, United States
[b] Department of Economics, University of California, Santa Cruz and NBER, United States
[c] Department of Agricultural and Applied Economics, University of Wisconsin, United States
[d] Department of Economics, University of San Francisco, United States

ARTICLE INFO

Article history:
Received 1 February 2013
Received in revised form 7 August 2013
Accepted 8 August 2013

JEL classification:
O15
I14
I15

Keywords:
Health products
Health information
Field experiment
Multi-country

ABSTRACT

Household investment in preventative health products is low in developing countries even though benefits from these products are very high. What interventions most effectively stimulate demand? In this paper, we experimentally estimate demand curves for health products in Kenya, Guatemala, India, and Uganda and test whether (1) information about health risk, (2) cash liquidity, (3) peer effects, and (4) intra-household differences in preferences affect demand. We find households to be highly sensitive to price and that both liquidity and targeting women increase demand. We find no effect of providing information, although genuine learning occurred, and we find no evidence of peer effects, although subjects discussed the product purchase decision extensively.

1. Introduction

Over 10 million children in developing countries die each year, many by diseases which could be avoided by simple preventative health investments (Jones et al., 2003). Many studies have shown that investment in preventative health products yields enormous health benefits in developing countries.[1] Despite these benefits, investment in preventative health products is generally low among poor households and tends to fall off rapidly at even small positive prices (i.e., Ashraf et al., 2010; Cohen and Dupas, 2010; Dupas, 2009, 2013). Why does investment in preventative health remain low when benefits are high? In this paper, we present results from a novel set of field experiments designed to explore the relative importance of various factors that potentially influence the demand for preventative health products.

We consider four main factors which have been identified in other research as possible determinants of either the level or the elasticity of the demand curve for health products. First, households may lack health information: they may not be fully aware of the health risks they face, or of the role that a product can have in mitigating such risks. Indeed several studies reveal positive effects on health behavior from informing households about the benefits of certain types of sickness prevention. For example, Cairncross et al. (2005) and Luby et al. (2004, 2005) show large behavioral effects of intensive education campaigns on hygiene, while Jalan and Somanathan (2008) and Madajewicz et al. (2007) find that informing households about fecal and arsenic water contamination, respectively, influenced them to use alternative water sources and purification technology. Second, households may lack liquidity. This could be because they are credit constrained (i.e., Devoto et al., 2012; Tarozzi et al., 2013), because they lack a secure place to save money (i.e., Dupas and Robinson, 2013a), or because they do not

☆ We are grateful for research assistance from Elliott Collins, Felipe Dizon, Sarah Janzen, Jesse Meredith, Fidel Ndai, Jean-Paul Petraud, and Gonzalo Villaran. We thank Michelle Choi, Jishnu Das, Pascaline Dupas, Rob Jensen, Justin Marion, George Marios-Angeletos, Ted Miguel, two anonymous referees, and seminar participants at the 2011 Northeast Universities Development Consortium, the 2012 Midwest International Economic Development Conference, the MIT Maternal and Child Health Conference, the 2012 Pacific Development Conference, and UC Santa Cruz for helpful comments. We wish to thank the Jesuit Foundation at the University of San Francisco and UCSC for financial support for this project. We thank Innovations for Poverty Action (Kenya) for administrative support.

* Corresponding author at: Department of Economics, University of California, Santa Cruz, United States. Tel.: +1 8314595618.
E-mail addresses: jenmer8@uw.edu (J. Meredith), jmrtwo@ucsc.edu (J. Robinson), slwalker5@wisc.edu (S. Walker), wydick@usfca.edu (B. Wydick).

[1] A partial list of technologies with high returns includes chlorine for water (Arnold and Colford, 2007; Fewtrell et al., 2005), insecticide-treated bed nets (Lengeler, 2004), and iron supplementation (Bobonis et al., 2006; Thomas et al., 2006).

0304-3878/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jdeveco.2013.08.003

save as much as they planned to for behavioral reasons (i.e., Ashraf et al., 2006; Duflo et al., 2011). Peer effects may constitute a third influence, creating situations where multiple, Pareto-rankable equilibria may exist, and where sub-optimal levels of health product adoption are possible if there are few early adopters. Depending on the characteristics of the product, such peer effects may tend to increase investment (i.e., Dupas, 2013) or decrease it (i.e., Kremer and Miguel, 2007). Fourth, numerous studies have shown that there may be intra-household conflict in spending on health (particularly for children). For example, Duflo (2003) and Thomas (1990) provide evidence that women are more likely to invest in children's health than men, suggesting that targeting preventative health products at female household heads may be important.[2]

To test these different hypotheses, we perform a set of field experiments in four countries — three smaller studies in Guatemala, India, and Uganda, conducted in 2008, and a larger study in Kenya conducted in 2010. In each site, we follow recent papers to estimate experimental demand curves by providing households with coupons for randomly selected discounts that could be redeemed in exchange for a given health product.[3]

Our paper contributes to the existing literature in three significant ways. First, while there have been a number of studies of single factors that may affect health product demand in individual countries, our study in Kenya is among the first to simultaneously test multiple hypotheses to determine which factors have the greatest relative impact on demand. Second, because we carry out tests on three different kinds of preventative health products, we are better able to infer from our results as applying to health products more generally. Finally, our findings on the effect of information and price have an added degree of external validity since we test these factors in all four of our country sites, providing greater confidence that results are not highly context-dependent.

Our main experiment in Kenya was conducted among 999 households in 2010 and focused on a particular health technology which has not been examined in previous studies, but which could have potentially significant health impacts: rubber shoes for children. One important way shoes may improve health is by preventing hookworm infection, which is typically transmitted when a person's skin comes into contact with contaminated soil (usually through bare feet). While worms can be easily treated after infection (see Miguel and Kremer, 2004), initial infection can be avoided by wearing shoes.[4] Though the effect of deworming is an open question on a global scale, our main study takes place in a region in Kenya in which deworming has been shown to have important short- and long-term impacts (Baird et al., 2011; Miguel and Kremer, 2004), and substantial spillovers for young children (Ozier, 2011).[5] While we did not perform parasitological tests for worms, self-reported infection was quite high: Respondents reported that 23% of their children had worms in the past year. While much of this is due to poor sanitation, low shoe usage is also a major risk factor. In our sample, only 17% of children owned shoes and a smaller percentage wore them regularly. In this geographical context, preventing infection by wearing shoes is likely to have a substantial direct health effect, as well as a positive spillover effect on others.[6]

Our Kenya study carried out the following set of experimental treatments in conjunction with our basic price treatment. To measure the impact of information, we provided a randomly selected subset of households with an information script on the dangers of worm infection, transmission pathways, and on the importance of wearing shoes in hookworm prevention. To assess the role of liquidity constraints, we gave households a randomly determined amount of cash.[7] In order to test for peer effects, we geographically stratified the intensity of our low-price treatments to ascertain whether households surrounded by heavy adoption are more likely to purchase the shoes. We are also able to use random variation to examine whether information spilled over to the neighbors and other peers of treated households. To examine whether demand varied by parental gender, we randomly selected either the husband or wife (among married couples) for participation. This person was the one to receive the coupon, cash, and information script.

An important result from our set of experiments is that, despite the importance often given to information dissemination in health campaigns in developing countries, we find that information alone has no impact on the ultimate purchase decision. We show that while the informational script substantially increased knowledge about worms, this did not translate into increased demand. Our estimates are precise enough that we can rule out large effects, and the results are not specific to Kenya: we find no effect of information in Guatemala and Uganda, and some mixed evidence in India. These results suggest that information alone is unlikely to be a panacea for underinvestment in preventative health products. We also do not find any evidence that peer effects play a significant role in household purchases of the shoes.

By contrast, we find strong evidence that liquidity is important. Increasing the cash payment from zero to the mean payout in the experiment (35 Kenyan shillings, or US $0.47) increases redemption by approximately 8 percentage points. This is roughly equivalent to an 8 Kenyan shilling (Ksh) reduction in the price, or about 9.4% of the 85 Ksh retail price. This result implies that credit or liquidity constraints are an important limiting factor in health investment.

We also find that women are more likely to redeem their coupons (by about 9 percentage points). This corresponds to roughly a 9.5 shilling reduction in price, or 11% of the retail price. This result is closely related to earlier studies on intra-household investment such as that of Thomas (1990), who shows that the propensity to invest in children increases more strongly with female than male income, and Duflo (2003) who uses an exogenous change in pension eligibility in South Africa and finds similar results. However, our study is different because the experiment did not change relative incomes (and by extension, intra-household bargaining power). Instead, the experiment only varied which spouse received the coupon. This result suggests that the flow of information within the household may be limited. In this context, it appears that mothers value health investment in children more than fathers, and that there is intra-household conflict over the allocation of resources between health investment in children and other expenditures. Increasing investment in children appears to increase the mother's welfare, but may increase her husband's welfare by less, or even reduce it. Thus, if the husband receives the coupon, he may not choose to redeem it and withhold knowledge of it from his wife. This result is similar to Ashraf (2009), who finds evidence of intra-household communication barriers in a field experiment on savings in the Philippines.

While credit constraints and targeting women are therefore important, ultimately these effects are limited relative to the effect of price. About 78% of the variation in health-product purchase is explained through price variation alone, overshadowing liquidity and gender

[2] Dupas (2011) provides an excellent and more amplified review of these issues.

[3] See, for example, Ashraf et al. (2010), Cohen and Dupas (2010), Dupas (2009), and Kremer and Miguel (2007).

[4] Though there are no randomized controlled trials on the effect of shoe wearing that we are aware of, several non-experimental studies show that regular shoe usage is associated with reduced hookworm infection when controlling for other risk factors (Erosie et al., 2002; Phiri et al., 2000). This seems plausible given the transmission pathway for the disease.

[5] Recent work by Taylor-Robinson et al. (2012), suggests that the benefits of deworming campaigns may not be substantial. The authors synthesize 42 randomized control trials of deworming efforts and conclude that there is insufficient evidence of consistent benefit on nutrition, hemoglobin, school attendance or school performance. Nonetheless, worms are likely a major problem in this part of Kenya given these earlier studies.

[6] While preventing hookworm infection might be the most important health benefit of shoes, it is not the only one. Wearing shoes reduces foot injuries and the chance of infection from such injuries.

[7] The cash payment was very small relative to lifetime income. The average payout was 35 Ksh, relative to weekly income of 900 Ksh and asset ownership of around 23,000 Ksh (see Table 1). Thus, the payout had a negligible effect on household income and should only have affected cash-on-hand.