The Impact of Health Insurance Schemes for the Informal Sector in Low- and Middle-Income Countries: A Systematic Review

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This paper summarizes the literature on the impact of state subsidized or social health insurance schemes that have been offered, mostly on a voluntary basis, to the informal sector in low- and middle-income countries. A substantial number of papers provide estimations of average treatment on the treated effect for insured persons. We summarize papers that correct for the problem of self-selection into insurance and papers that estimate the average intention to treat effect. Summarizing the literature was difficult because of the lack of (1) uniformity in the use of meaningful definitions of outcomes that indicate welfare improvements and (2) clarity in the consideration of selection issues. We find the uptake of insurance schemes, in many cases, to be less than expected. In general, we find no strong evidence of an impact on utilization, protection from financial risk, and health status. However, a few insurance schemes afford significant protection from high levels of out-of-pocket expenditures. In these cases, however, the impact on the poor is weaker. More information is needed to understand the reasons for low enrollment and to explain the limited impact of health insurance among the insured.
 JEL codes: I10, I15

Introduction

In a seminal study, Townsend (1994) showed that in rural India, a health crisis in a household induced significant declines in the level of household consumption that were more severe than those associated with other financial crises. Townsend examined households' ability to "smooth consumption," to maintain a stable consumption level over a period of time. The inability to smooth consumption over time because of a health crisis has been found in other developing countries, partly as a result of the inability to afford appropriate and effective care to ensure the recovery of health and partly as a result of the reduced labor supply (Gertler and Gruber 2002; Deaton 1997). Recent accounting methods indicate that for as many as 1.3 billion people in low- and middle-income countries, financial constraints are a major barrier to access to health care (Xu et al. 2003; Preker et al. 2004).

Among the solutions proposed within various low- and middle-income countries to reduce costs to households at the point of care are the establishment or extension of national or social health insurance (SHI) in which service providers are paid from a designated government fund, which is partially funded through taxes. These SHIs are primarily intended for those employed outside of the formal sector. The WHO (2010) and the World Bank (Hsiao and Shaw 2007) have endorsed the restriction of out-of-pocket (OOP) expenditures for health care at the time of use through the prepayment of insurance as an important step toward averting the financial hardship associated with paying for health care. The impact of insurance, even when properly implemented, is not clear from the outset in low- and middle-income countries. Awareness of and trust in public programs, distance to health care facilities and institutional rigidities within the health care system can play major roles in limiting insurance enrollment and its related effects (Wagstaff 2007; Basinga et al. 2010).

We conduct a systematic review of the literature on the extent to which insurance schemes enhance access to care and offer protection from financial risk to households in the informal sector. We also report on how these schemes may improve health. Previous reviews of the impact of health insurance in low- and middle-income countries for the poor include studies by Ekman (2004) and Lagarde and Palmer (2009). Both of these reviews focused on community-level insurance. The latter examined the impact of removing user fees. Ekman (2004) focused on community-based health insurance in low-income countries and concluded that community-based health insurance provides some financial protection by reducing OOP spending. Several countries have gone beyond community risk sharing, and many new insurance schemes have been introduced since 2004. In parallel, there is a growing interest in evaluating the impact of SHI programs in low- and middle-income countries (Wagstaff 2009). Thus, a new review of the

impact of health insurance for people in the informal sector could inform policy on the extent to which insurance provides greater access to necessary care, reduces the financial burden of care, and improves health.

The paper is organized as follows. In Section 2, we explain the review methodology of the current study. Section 3 describes methodologies that should be used to assess the impact of health insurance when it is offered on a voluntary basis. In Section 4, we describe the schemes found in the literature. Section 5 examines enrollment into health insurance schemes and its related impact. Section 6 concludes the paper.

Methodology

The methodology aims to critically examine the evidence on whether health insurance schemes, once implemented, (1) are adopted, (2) provide greater access, (3) provide financial protection, and (4) improve health status among the intended beneficiaries. The last three points describe welfare impact. We summarize the methodology by defining the types of insurance that are of interest.

Types of Insurance

If universal health care coverage is to be financed through prepayment for insurance, health insurance should have the following characteristics: (1) compulsory contributions to the risk pool (otherwise, the rich and healthy will opt out); (2) large numbers of people in the risk pool because pools with a small number of people cannot spread risk sufficiently and are too small to handle large health costs; and (3) pooled funds that are generally subsidized from government revenue (WHO 2010) due to the large numbers of poor people. The standard SHI schemes in developed countries mandate enrollment for people who are fully employed by imposing a mixture of tax on the employer and direct payment of insurance premiums. This effort is accompanied by requiring enrollment from people who are self-employed or unemployed, with varying degrees of revenue funding and cross-subsidies (OECD 2004).

SHI has also been mandated for formal sector workers in a number of developing countries. To achieve universal health care coverage, an institutional structure that emphasizes payment to providers for services delivered has been offered to those beyond the formal workforce in Vietnam, Nigeria, Tanzania, Ghana, India, and China over the last 15 years. Although schemes for the poor may share the same administrative structure as SHI for the formal sector, the former usually offer a reduced package or restrictions on providers. Alternatively, we find free-standing schemes (separate from SHI) that offer financial protection to the poor

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through subsidized, usually voluntary household enrollment into a defined bene-fits arrangement (Wagstaff 2009). Insurance is offered at premiums that are con-siderably below the actuarially fair price. Given that most employment in low- and middle-income countries is informal, governments manage compulsory insur-ance in the formal sector with limited avenues to cross-subsidize the informal sector. Thus, health insurance is tax financed, although funding for it may be ring-fenced.

Starting from a point of low utilization by the formal sector, both free care and prepayment of financing for care are implemented to encourage use for illness or to increase contact with health workers to facilitate better delivery of preventive care. From the perspective of the user, prepayment insurance schemes, whether highly subsidized or zero-entry fee, should be understood differently than free care. First, even if the entry fee is small, some households may not be able to afford the fee. For example, Sparrow, Suryahadi, and Widayanti (2008) report that in Indonesia, it may be costly to provide photos of household members for in-surance cards. Second, at the point of care, there may be copayments to limit friv-olous care-seeking behavior because of the extremely low marginal cost of seeking care if zero copayments prevail. Reimbursement mechanisms may play a role; many families have little cash, are credit constrained (Pitt and Khandkar 1998) and cannot take on the financial burden at the point of care when reim-bursement is often delayed (Shi et al. 2010).

From a governmental perspective, insurance allows a separation between the provision and the funding of care. Despite a public sector that offers care largely free of cost to recipients, the insurance system can take advantage of the plural-ism in the supply of medical care that prevails in most low- and middle-income countries. The use of the private sector through government financing of health insurance would reduce the administrative burden within the allocation and sub-vention processes, the incidence of side payments and, perhaps, corruption.

When insurance is offered free, it often involves prescribed care and care givers. Some of these may be offered at the national level and some at the community level. Some community-level insurance with subsidized entry fees may have limited risk pooling because a specific community may be small. Most insurance that we examined only offered a set of well-defined interventions; thus, limited risk pooling at the community level may yield the same coverage as nationally sponsored insurance in terms of illness. Nationally sponsored insurance may allow for wider access to providers.

We examine studies of schemes that meet all of the following criteria:

(1) Schemes that seek to offer financial protection for people facing health shocks to cover health care costs; these schemes involve some tax financing

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(2) Schemes that include a component in which poorer households can or must enroll through some formal mechanism at a rate much lower than the actuarial cost of the package or even free of charge; in return, these households receive a defined package of health care benefits

(3) Schemes that are offered in one of two ways:
  (a) Nationally managed and considered an extension of existing SHI
  (b) Managed at the community level (limiting the risk-pooling population), either through a local government or nongovernmental organization (usually with government sponsorship), often called community-based health insurance

Defining the Impact of Insurance

We presume that the impact evaluation of a project should provide two essential pieces of information to policy makers: (1) Is the program implementable? (2) Once implemented, does the program achieve a set of desirable outcomes? In the case of a health insurance program, if the adoption of a program is high, then the program *at least* approached proper implementation. Furthermore, policy makers are interested in the impact on those adopting the insurance, the average treatment on the treated, or the average impact on those who actually adopted the program. Insurance may affect those who do not adopt it by, for example, affecting the price of health care, which would be part of the total impact of the insurance program. Morduch (2006) reports that if richer individuals adopt a social program disproportionately at zero private cost, the program can be considered a large income transfer that may affect the prices of all goods within a relevant economy. The impact on prices is smaller when the poor adopt social goods because the adoption may not replace previous large expenditures. This type of general equilibrium impact has been largely ignored, probably because of the stable unit treatment value assumption where only those intended to be affected by the program become the subject of evaluation (see Imbens and Wooldridge 2009), which focuses on the intended target of a program.

The intention to treat effect can also be measured as the impact of insurance on individuals offered the insurance, regardless of whether it was adopted. An intention to treat measure would not approximate the impact of health insurance for those who adopt insurance if insurance uptake is not at a very high level, a common situation in most of the studies.

We report on three outcomes: (1) utilization of health care, (2) financial protection, and (3) health status. Willingness to pay for health insurance schemes, obtained ex post once the benefits have been realized, can be used to measure welfare impact. Ex ante willingness to pay for insurance is likely to be positive (Gustafsson-Wright, Asfaw and van der Gaag 2009). However, recipients of health services may

not always be able to accurately assess benefits. Furthermore, the severity of income constraints for the poor may not elicit well-considered responses.

Inclusion Criteria

The studies on which we report must measure or report impact through a comparator, using either a contemporaneous control or a constructed control from data containing similar information collected over a similar time period. Inclusion criteria are as follows:

(1) Randomized controlled trials
(2) Quasi-randomized controlled trials in which methods of allocating are not random but create a matched control group through either:
    (a) a propensity score matching method or
    (b) a regression discontinuity design
(3) Controlled before-and-after studies or difference-in-differences; the pre- and postintervention periods for study and control groups should be the same, and the choice of the control site should be similar in terms of socioeconomic characteristics and/or should have no major differences in the baseline
(4) Regression studies that consider the probability of selection into treatment through the instrumental variable method
(5) Qualitative studies focused on exploring the impact of health insurance and meeting a checklist

However, no qualitative studies that explored the impact of insurance were found.

Search Method

A number of electronic databases[1] were searched using keywords related to health insurance, health care, and low- and middle-income countries. This search yielded 4756 references, including numerous duplicates and studies detailing general health issues in low- and middle-income countries. We filtered by titles and abstracts to reduce the number of relevant studies to 64. Of these, 35 were related to the impact of SHI on low- and middle-income countries. Inclusion criteria were met in 24 studies. Further examination found that five studies used poor identification strategies when measured against the standard methods recommended for impact evaluation studies (Imbens and Wooldridge 2009).

Summarizing the Results

It is difficult—and, more important, misleading—to aggregate the outcome measures that we found into some form of meta-analysis. This difficulty arises for three

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reasons: (1) many of the outcome measures are different (for example, the time intervals varied); (2) the insurance schemes were different, as outlined in table 2; and (3) the estimations of the impact depended on the functional form or the estimation method and the unit of measure, such as the period in which data were measured.

The unit of measure can shape the results, especially with regard to health expenditures (Das, Hammer, Sánchez-Paramo 2011). It can also dictate different estimation methods. For example, OOP expenditures as a share of income can be modeled through probit, whereas OOP expenditures may be modeled using linear estimation methods. In addition, when magnitudes are reported, they should be understood within the context of the study; magnitudes have limited generalisability outside of a study, even for the same insurance scheme within the same region. Thus, only trends are reported.

Identification Issues

Although low enrollment fees should have attracted universal adoption, in most cases, enrollment rates were low. Low enrollment may induce selection effects, and selection into insurance may ultimately affect the outcome. One way that selection may affect outcome is through adverse selection: ill individuals select themselves into insurance at premium levels, which individuals in good health find the premium too costly given their expectation of their health care needs (Rothschild and Stiglitz 1976).[2] The pool of the insured may be sicker than the pool of the uninsured. The expectation of becoming healthy influences the adoption of insurance, which can be an efficient way to obtain care. In contrast to the possibility of adverse selection, given the low costs of entry for most insurance, it may simply be that better-informed individuals enroll. Better-informed individuals may also be more educated, may have larger incomes, and may be healthier than those who do not adopt insurance.

Thus, if one examines the average impact of insurance on those who adopt insurance (i.e., average treatment on the treated), then a simple comparison of insured and noninsured individuals does not yield appropriate results. The comparison is flawed because the noninsured group may not have had an opportunity to enroll, and this group includes those who would adopt insurance if offered as well as those who would not adopt insurance. The insured and noninsured groups may differ with regard to the factors that may affect outcomes. In light of the possibility of selection into insurance, the threat to validity is high. As a result, the impact may differ significantly when no adjustment is made for this type of selection, especially if average treatment on the treated is reported (Imbens and Wooldridge 2009).[3] Inclusion criteria have focused on studies with counterfactuals, we now discuss identification issues applied to the inclusion criteria. We briefly describe

statistical procedures to obtain average treatment on the treated in the present context. As indicated, 19 studies properly addressed identification issues.

Randomized Studies

Even if insurance is offered through random means when uptake is low, it cannot be assumed that people who adopt insurance are similar to those who do not. An adjustment is needed even in this randomized setting. The most standard approach is to determine the local average treatment effect. If the stable unit treatment value assumption holds, as the instrument, mainly the assignment to treatment, is exogenous, then the local average treatment effect estimates the impact of those who comply with the offer but would not be treated otherwise (Angrist and Pischke, 2009). Thornton used the instrumental variable approach, although different approaches have also been used.[4]

Matching

If insurance uptake occurs in a nonexperimental setting, a popular method known as propensity score matching can be used. Impact is measured by comparing the outcomes of insured individuals with the outcomes of nonparticipants. This measurement derives weights for the outcomes for nonparticipants according to the degree of similarities between the two groups as judged through observed factors, which are reduced to a single metric (Rosenbaum and Rubin 1983): the propensity to be enrolled in a program. Wagstaff et al. (2009) emphasize that unobservable heterogeneity may be stronger between those who adopt insurance and those who refuse insurance when both groups are offered insurance than between those who have never been offered insurance and those who adopt insurance when offered. In this case, the matching method should use comparators chosen from those who have never been offered insurance.

Instrumental Variable Approach

A number of authors have used instrumental variable methods to determine that individuals who adopt insurance are not easily comparable to those without insurance. Insurance status is dependent on a variable that affects only entry into insurance, not any of the outcomes that may be affected by insurance. For studies that use the instrumental variable method, participating in insurance can be considered a problem of endogeneity or of selecting into insurance. Wagstaff and Lindelow (2008) and Sosa-Rubi, Galarraga and Harris (2009a) model selection into insurance as a problem of endogeneity; individuals anticipate the impact of insurance, and this expectation of the impact shapes the uptake of insurance.

These studies use instrumental variable methods to correct endogeneity. Instrumental variable methods can correct policy endogeneity (Dow and Schmeer 2003) by including policy with the expectation of certain types of results.

Regression Discontinuity Design

When programs are targeted to a group at a measurable threshold income, the regression discontinuity design approach compares health care-related outcomes for those who are eligible at the margin with those who are just above eligibility. Individuals who do not qualify for enrollment in insurance because they are marginally on the other side of eligibility constitute the control group. The impact of regression discontinuity design yields an intention to treat estimation; some individuals who are eligible may not actually have insurance although they intended to receive it.

Finally, a study by Wagstaff (2010) subtracts two previous difference-in-differences outcome measures from two later difference-in-differences measures (using available data for three periods) and regresses this variable with similar differences in the independent variables and insurance status.

Several studies model the insurance effect through multiple observations of individuals in the sample and individual heterogeneity over time. This model is usually performed by inputting factors for a specific individual effect with the underlying assumption that any correlation between the error term and the insurance status arises from the correlation between time-variant unobservable factors (perhaps such as health) and insurance status. However, the time-invariance assumption is unlikely to hold because health conditions indeed fluctuate to influence insurance uptake.[5]

Description of the Studies

Table 1 provides descriptions of the health insurance schemes from the 19 studies in addition to the corresponding data and methodologies. No study attempted to link the various outcomes of interest to any specific insurance features. However, it is instructive to note which types of schemes were evaluated. Reports of the impact of health insurance are from Burkina Faso (one study) Costa Rica (one study), Georgia (one study), Ghana (one study), India (one study) Nicaragua (one study), Colombia (two studies), Mexico (three studies), Vietnam (four studies), and China (four studies). Three studies, from Burkina Faso, China, and India, reported on community-based health insurance with government support.

Not all studies reported enrollment. Studies on impact evaluations obtained results through (1) a randomized trial (three studies); (2) propensity score matching (nine studies); (3) instrumental variable estimation, to consider either

Table 1. Description of the Studies

	Study country, and year of launch	(1) Name of the scheme (2) National or regional	Health insurance[1] (1) Benefit package (2) Target beneficiaries (3) Premium (4) Cost-sharing arrangements (5) Enrollment rate	Data	Methodology	Funding source
1	Aggarwal (2010); Karnataka, India; 2003	(1) The Yeshasvini Health Insurance Programme (2) Regional (state level) scheme	(1) Covers surgical procedures of high-cost, low-probability, highly catastrophic medical events and free out-patient department care (2) Rural farmers of cooperative societies and informal sector workers (3) Premium INR 120 (USD 2.4) per person (4) No copayment (5) 3.0 million in 2008−09	Survey of 4109 households; block matching to the insured; cross-sectional; sample includes households that have never been offered insurance	Propensity score matching; clear selection equation and balancing results; not clear if the presence of zero expenditure is taken into account	Bill and Melinda Gates Foundation through the Global Development Network
2	Bauhoff et al. (2011); Georgia; 2006	(1) The Medical Insurance Programme for the Poor (2) National	(1) Most emergency outpatient care and set of planned and emergency inpatient care (2) Poor, 20 percent of Georgian population (3) Fully funded through the general government budget (4) No copayments (5) Low enrollment	Survey of 3500 households	Intention to treat estimation regression discontinuity design where enrollment is not very high; estimations for OOP expenditures is presented through generalized linear model with log link to account for those who undertook zero expenditure	Georgia Health and Social Project Implementation Center
3	Dow and Schmeer (2003); Costa Rica; 1970s	(1) National health insurance (2) National	(1) Primary and secondary health care (2) Lower socioeconomic groups (3) 73 percent of children by 1984 (4) **Not reported** (5) **Not reported**	Vital statistics registries, Census data; a panel for 88 to 97 regional data	Fixed-effect model of health outcomes on a region for infant mortality rates using Cox binary transformation for infant mortality rates as the dependent variable for the region	National Institute of Child Health and Human Development Grants

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Table 1. *Continued*

	Study country, and year of launch	(1) Name of the scheme (2) National or regional	Health insurance[1] (1) Benefit package (2) Target beneficiaries (3) Premium (4) Cost-sharing arrangements (5) Enrollment rate	Data	Methodology	Funding source
4	Gnawali et al. (2009); Senegal; 2004 to 2006	(1) Community-based health insurance (2) Regional	(1) Consultation, essential and generic drugs, laboratory tests, limited inpatient hospital stays (2) People in the informal sector, including the poor (3) XAF 1500 per adult and XAF 500 per child per annum in a household (USD 1 = XAF 655) (4) No copayment (5) 5.2 percent in 2004, 6.3 percent in 2005, and 5.2 percent in 2006	Cluster randomized with 33 clusters, involving 4936 households; step-wedge design; complete information is found for 1309 households; not clear where the uninsured came from	Propensity score matching model to account for very low uptake; no balancing table, but selection model is present	The German Research Foundation
5	Mensah et al. (2010); Ghana; 2003	(1) National Health Insurance Scheme (2) National	(1) Specified package of general out-patient services, in-patient services, oral health, eye care (2) General population, including peoplein the informal sector (3) Sliding scale: free for core poor, between USD 8 and USD 52 (4) **Not reported** (5) 55 percent of the total national population by August 2007	Survey by researcher; 393 insured women and 1689 uninsured women, randomized samples from regions; control group matched in the area; reports on only 565 women who were pregnant; small sample	Used propensity score matching; presents clear selection equation and covariate balance tables; results from different matching methods that are generally consistent	Global Development Network and the Bill and Melinda Gates Foundation

6	Thornton and Field (2010); Nicaragua; 2007	(1) Nicaraguan Social Security Institute's health insurance programme (Seguro Facultativo de Salud): (2) National (study experiment on increasing enrollment)	(1) Preventive, diagnostic, maternity, and curative health services (2) Informal sector (3) USD 15 per month (4) No copayment at the time of service (5) 20 percent of the sample (in the experiment)	Insurance offered at randomly selected market booth; uses a pre-experiment baseline, 2610 households; loss to follow up 7 percent	Local average treatment effect; selection into the insurance is modeled as an ordinary least squares with the insurance offer as the instrumental variable; the outcome measure is differences-in-difference; results for those who enrolled given the enrollment procedure; no accounting for zero OOP expenditure	The United States Agency for International Development's Private Sector Partnerships-One project and the Global Development Network
7	Trujillo et al. (2005); Colombia; 1993	(1) Subsidized health insurance program; (2) National	(1) Basic health care services (2) Low-income families (3) Government funded (4) A coinsurance rate that varies between 5 percent and 30 percent according to the individual's income (5) **Not reported**	1997 Colombia Living Standards Survey; 5559 insured through social health insurance system and 16,732 uninsured; may not have been insurance	Propensity score matching, selection equation presented (no balancing results) and instrumental variable estimation are compared	The University of Central Florida
8	Miller et al. (2009); Colombia; 1993	(1) Régimen Subsidiado (Subsidised Regime), National Health Insurance (2) National	(1) Primary care, inpatient care (2) Poor (3) Fully funded through the general government budget (4) Low level of coinsurance (5) **Not reported**	Colombian household surveys (the Encuestas de Calidad de Vida and the Demographic and Health Surveys); nearly 4300 families eligible and marginally ineligible	Intention to treat estimation of constructed eligibility from a survey; uses regression discontinuity design; the analysis also uses an instrumental variable of constructed value for eligibility on actual enrollment; no accounting for zero expenditure	The Economic and Social Research Council; UK Inter-American Development Bank; National Institute of Child Health and Human Development and the Stanford Center on Demography and Economics of Health and Aging
9	King et al. (2009); Mexico; 2005	(1) Mexican *Seguro Popular de Salud* (Universal Health Insurance program-SP) (2) National (study experiment on increasing enrollment)	(1) A package to treat the diseases responsible for approximately 95 percent of the burden (2) People in the informal sector (3) Fully government funded (sliding scale by income, free for the poor) (4) **Not reported** (5) Approximately 3.5 million families	Negotiated 74 paired clusters to participate with one from a pair randomly assigned to intense insurance uptake campaign before national enrollment; survey in 50 pairs; 32,515 households	Presents intention to treat estimations and the effect on experimental compliers of average causal effect; the outcome measured is ifferences-in-difference; the complier results should be understood as specific to the study; no accounting for OOP expenditure of zero	National Institute of Public Health of Mexico; the Mexican Ministry of Health; the National Institutes of Aging and the National Science Foundation; United States

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Table 1. *Continued*

Study country, and year of launch	(1) Name of the scheme (2) National or regional	Health insurance[1] (1) Benefit package (2) Target beneficiaries (3) Premium (4) Cost-sharing arrangements (5) Enrollment rate	Data	Methodology	Funding source
10 Sosa-Rubi et al. (2009a) Mexico; 2005	See King et al. (2009)		National Health and Nutrition Survey 2006; Sample of 3890 women who delivered between 2001 and 2006; no one with employer insurance or private insurance was included; complete data for all women	Innovative multinomial probit that takes into account endogenous enrollment through instrumenting by time of the introduction of SP, assuming there is no problem of policy endogeneity.	The Health Ministry of Mexico (SSA)
11 Sosa-Rubi et al. (2009b) Mexico; 2005	See King et al. (2009)		National Health and Nutrition Survey 2006; 1491 adults with diabetes were chosen; no pregnant women or women with access to social security services; complete data for all adults (see Sosa-Rubi, 2009a)	Propensity score matching for those with and without SP insurance; presentation of bias reduction and selection equation	The Health Ministry of Mexico (SSA)
12 Wagstaff (2007); Vietnam; 2003	(1) Health care fund for the poor (2) National	(1) Covered inpatient and outpatient care only at public providers until 2005; some preventive care (2) All poor households and selected other groups (3) Fully subsidized (4) No copayment (5) As of 2006, the program covered approximately 60 percent of those eligible, accounting for approximately 23 percent of the population	Vietnam Household Living Standards Survey 2004	Propensity score matching method on single-period data; selection equation and balancing is well presented; not clear whether those in the control group were offered insurance; results dependent on propensity score matching weights chosen; no accounting for zero expenditure	Not reported

13	Axelson et al. (2009); Vietnam; 2003	(1) Health care fund for the poor (2) National	(1–4) See Wagstaff (2007) (5) Study reported 18 percent enrollment for 2002	Vietnam Household Living Standards Survey data 2002 (preprogram) and 2004 (postprogram); cross-sectional 10,232 and 4112 panel	Uses both single-period and differences-in-difference outcome measures; uses survey data as in Wagstaff (2007); selection equation and balancing results are presented from propensity score matching; no accounting for zero expenditure	Not reported
14	Wagstaff (2010); Vietnam; 2003	The same as Wagstaff (2007)	(1–5) See Wagstaff (2007)	The panel 2002, 2004, and 2006 Vietnam Household Living Standards Survey Multipurpose household survey; 1689 households in all three waves	Triple difference is the outcome variable; the triple difference is regressed on covariates; no accounting for zero expenditure	Not reported
15	Jowett et al. (2004); Vietnam; 1992, discontinued, not currently in place	(1) Voluntary health insurance program (2) National	(1) **Not reported** (2) Self-employed individuals, farmers, schoolchildren (3) Fully subsidized (4) A copayment of 20 percent with exceptions (5) 9.7 percent of target group	Data were collected through a household survey designed specifically to evaluate the impact of the scheme; analysis from 2631 households	Two-stage multinomial logit model to examine the type of facility used; instrumental variable for selection into insurance is used; appropriateness of instrumental variable tested; no theory given for unusual instrumental variable	United Kingdom's Department for International Development
16	Wagstaff and Lindelow (2008); China; 1996 onward	(1) Multiple health insurance schemes: Labour Insurance Scheme and Government Insurance Scheme (2) National	(1) **Not reported** (2) General population (3) Not free (4) **Not reported** (5) 90 percent of the population covered in 1970, but decreased to 20 percent for rural population and 40 percent for urban population from 1980 onward; increased to 90 percent of urban workers by 2003	Three surveys: (1) China Health and Nutrition Survey in 1991, 1993, 1997, and 2000; (2) Gansu Survey of Children and Families in 2000 and 2003; (3) World Bank Health VIII project baseline survey in 1998; total sample was 18,200 adults	Instrumental variable is used to take account of selection with probit for catastrophic measure and then panel data are used; fixed effect is only used for logit with no instrumental variable because these are OOP expenditures, a **generalized linear** model with instrumental variable is used to consider zero expenditure by some	The Spencer Foundation Small and Major Grants Programme; Fogarty International Center at the National Institutes for Health; World Bank Research Committee

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Table 1. *Continued*

Study country, and year of launch	(1) Name of the scheme (2) National or regional	Health insurance[1] (1) Benefit package (2) Target beneficiaries (3) Premium (4) Cost-sharing arrangements (5) Enrollment rate	Data	Methodology	Funding source
17 Wagstaff et al. (2009); China; 2003	(1) NCMS (2) National	(1) Heterogeneity in the benefit package across counties and coverage modes; all counties cover inpatient care, some cover outpatient (2) Rural population (3) The minimum premium requirement was a CNY 10 (per person) beneficiary contribution from households, supplemented by government subsidy (4) Deductibles, ceilings, and coinsurance rates (5) **Not reported**	Two data sets: (1) The 2003 round of the National Health Service Survey of the Ministry of Health; follow up in 2005; (2) Routine Health Facility Survey from the Ministry of Health administrative data; total households > 8000	Use propensity score matching to match the insured with those who have never been insured; show balancing results but no selection equation; subgroup analyses are presented by regressing individual treatment effect (weighted through propensity score) on income groups; most likely estimation of cost is for those receiving medical care.	The World Bank and the United Kingdom's Department for International Development
18 Lei and Lin (2009); China; 2003	(1) NCMS (2) National	(1–4) See Wagstaff et al. (2009) (5) For NMS, 85.7 percent of the rural population were covered in 2008	Longitudinal sample drawn from the China Health and Nutrition Survey for 2000, 2004, and 2006; different analyses use different panel and thus have different data sizes; differences-in-difference is only for a panel of 3225 individuals	Differences-in-difference using propensity score matching along with instrumental variable estimations and fixed-effect panel are used on panel data; balancing results are presented with no selection equations; not clear if OOP expenditures includes zero expenditures	Not reported
19 Wang et al. (2009); China; 2003 to 2006	(1) Rural Mutual Health Care in China; a social experiment (2) Regional and community-based in rural area (China's western provinces)	(1) Both outpatient services and hospital services (2) Villagers, including farmers (3) Annual premium of at least CNY 10 (4) No copayment (5) 1173 households	The Rural Mutual Health Care experiment adopted a pre-post treatment-control study design of those not offered insurance; panel of 1665 insured and 1745 uninsured individuals	Propensity score matching models with varied matching and subgroup analyses are presented, as is balancing after matching	Not reported

[1]No entry indicates not reported in the study.

endogeneity at the individual level or regional program placement (four studies); (4) the use of a regression discontinuity design on eligibility to obtain intention to treat (two studies); and (5) double difference-in-differences from three periods with regression (one study).

The data used in these studies ranged from program-designated data sets to routinely collected available data at the national level gathered to measure a range of indicators of wellbeing.

Findings

We first report enrollment, and then, we report intention to treat or average treatment on the treated estimations of whether insurance is likely to have resulted in welfare improvement. Table 2 summarizes the outcomes.

Enrollment and Its Determinants

The enrollment rate partially reflects whether a health insurance program can be implemented. Our review did not conduct a systematic search to identify studies that report enrollment. For three papers (Gnawali et al. 2009; King et al. 2009; Thornton and Field 2010), the evaluation was conducted for programs that were designed to enhance enrollment. The activities did not enhance enrollment.

Enrollment rates varied. For the Vietnam Health Care Fund for the Poor (VHCFP), introduced in 2003, which includes free enrollment and no copayment with specified access to care, country-wide enrollment reached 60 percent by 2006 (Wagstaff 2010). The New Cooperative Medical Scheme (NCMS) in China showed regional variations of 48 to 99 percent (Wagstaff 2009). By 2007 (i.e., within the first four years), national enrollment in Ghana was at 55 percent (Mensah, Oppong and Schmidt 2010). Bauhoff, Hotchkiss and Smith (2010) report low enrollment in Georgia in a collected sample.

The enrollment patterns and determinants of enrollment in health insurance schemes are similar to those observed for enrollment into insurance schemes to provide protection from adverse shocks in general (Gine and Yang 2007). We summarize the factors affecting enrollment from studies that reported determinants:[6]

(1) No clear demographic patterns emerge; in some cases, positive enrollment factors include female-headed households and elderly headed households, family size, and composition

(2) Positive effect of education (except in Colombia; Miller, Pinto and Vera-Hernandez, 2009)

Table 2. Summary of Findings[†,‡]

Utilization	Financial Protection	Health Status
1. Aggarwal (2010) India (Yeshasvini Community-based Health Insurance)		
Those with health insurance decided to use health facility in greater numbers and with greater frequency; increase from outpatient service usage, including outpatient surgery; no higher usage in frequency of hospitalization; less usage of government services	Overall, medical expenses were actually higher for the insured, with the poor experiencing no change; for hospitalization, expenditures are significantly lower for the insured; also reported is the incidence of burrowing for hospital care, which is smaller for the insured	**n.a.**
2. Bauhoff et al. (2011) Georgia (Targeted Scheme for the Poor)		
No impact on utilization from intention to treat estimations	No robust evidence of lower expenditures among insured outpatients' expenditures, except for the elderly; lower expenditure among insured for inpatient care	**n.a.**
3. Dow and Schmeer (2003) Cost Rica (National Insurance Expansion)		
n.a.	**n.a.**	No impact on decline in community infant mortality rates from increased proportion of population insured over time
4. Gnawali et al. (2009) Burkina Faso (Community-based Health Insurance)		
Overall, there is a significant positive impact on health care utilization; more outpatient visits, but no significant impact on inpatient care utilization; the higher outpatient utilization is only significant among the richest group	**n.a.**	**n.a.**
5. Mensah et al. (2010) Ghana (National Health Insurance Scheme)		
The insured women who are enrolled are more likely to give birth in hospitals and to receive higher levels of prenatal care, preventive health check ups, and attention from trained health professionals	**n.a.**	Three types of health status are reported, two of which (infant death and birth complications) are significant under specific matching weights; the difference in infant death is likely to suffer from small sample size

6. Thornton and Field (2010) Nicaragua

Local average treatment effect measure; no significant effect on overall health care utilization; fairly substantial substitution away from use of public and private facilities to health care facilities covered by insurance; social security hospitals	Local average treatment effect measure; overall decline in OOP expenditures decreased by a smaller amount than the actual premium for the insured; no significant result for OOP spending for the insured reported; the sample is too small to note effect in catastrophic spending	

7. Miller et al. (2009) Colombia (Targeted Scheme for the Poor)

Intention to treat estimations; substantial higher use of traditionally underutilized preventive services for those with health insurance	Intention to treat estimations; no significant effect on average outpatient expenditures; lowers inpatient expenditures and lowers incidence of high-end expenditures among the insured	**n.a.**

8. Trujillo et al. (2005) Colombia (Targeted Scheme for the Poor)

Greatly increased medical care utilization among the country's poor, including children, women, and the elderly	**n.a.**	**n.a.**

9. King et al. (2009) Mexico (*SP*)

No effect in utilization	Intention to treat and complier effects for low-asset holders show lower OOP expenditures for the SP-insured with low assets for overall, inpatient, and outpatient care; female-headed households had lower inpatient OOP expenditures; all insured had lower inpatient and outpatient care, but no significant effect was found for overall care (including drug costs)	**n.a.**

Continued

Table 2. *Continued*

Utilization	Financial Protection	Health Status
10. Sosa-Rubi et al. (2009a) Mexico (SP)		
n.a.	Different types of facility utilizations are reported; these imply different costs; those with SP prefer SP facilities and the cheapest care over private care and non-SP government hospital service care, which costs more than SP care but is cheaper than private care; private care is preferred to non-SP government care	**n.a.**
11. Sosa-Rubi et al. (2009b) Mexico (SP)		
Those with SP had better access to diabetes care; they had higher rates of insulin shots, regular tests, and physician visits	**n.a.**	Higher proportion of the insured with glucose control, and lower proportion with very poor glucose control
12. Wagstaff (2007) Vietnam (VHCFP)		
Increase in both outpatient and inpatient utilization but substantially increased inpatient care utilization; impact on utilization among the poor is even less noticeable	Results robust to different matching techniques and samples; there is no effect on overall OOP expenditures; however, there is a lowered risk of high or catastrophic OOP expenditures; even with this protection among the insured, one-third still faced catastrophic expenditures; the poor may have received more risk protection from high expenditures	**n.a.**
13. Axelson et al. (2009) Vietnam (VHCFP)		
Small but positive impact on overall health care utilization; the insured do not have greater difference in utilization of inpatient care; statistically significant effect is present only for outpatient visits in community hospital	From the cross-sectional study, the OOP expenditures were higher for the insured; differences-in-difference measure of two periods showed a larger reduction in expenditures for the insured for inpatient care and a reduction in catastrophic expenditures of 20 percent; the opposite result was found for outpatients	**n.a.**

14. Wagstaff (2010) Vietnam (VHCFP)

No impact on the use of either outpatient or inpatient health care services	Triple-differencing estimates yield insurance effects with a sizable reduction of expenditures; poorer groups also experienced a significant reduction	**n.a.**

15. Jowett et al. (2004) Vietnam (health insurance not presently in place)

Overall, insured patients are more likely to use outpatient facilities, public providers, and inpatient services	**n.a.**	**n.a.**

16. Wagstaff and Lindelow (2008) China (Basic Medical Insurance Programme)

The results suggest that the insured may use health services more frequently; analysis suggests that insurance facilitates the use of higher-level services	The results vary for different data sets and specifications; the general picture that emerges is that insurance results in a lower OOP expenditures and is likely to increase the probability of incurring catastrophic expenditures at different threshold levels	**n.a.**

17. Wagstaff et al. (2009) China (NCMS)

In the analysis by regions, the scheme increased outpatient and inpatient utilization; households with insurance have more doctor visits and inpatient spells; results differ by health centers; the richest quintile responded more favorably	The results vary; for delivery services, all regions showed lower costs for the insured; for the overall OOP expenditures, a mixed result emerges; total OOP expenditures increased in most regions, except two, mirroring the case for inpatient visits	**n.a.**

Continued

Table 2. *Continued*

Utilization	Financial Protection	Health Status
18. Lei and Lin (2009) China (NCMS)		
No significant evidence on increase in the utilization of formal medical service; however, utilization significantly decreases the use of traditional Chinese folk doctors and increases the utilization of preventive care, particularly general physical examinations	Authors detect no impact on expenditures from any of the estimations presented in the work	Among the estimation presented, the propensity score matching shows marginally higher health for the insured
19. Wang et al. (2009) China (Rural Mutual Health Care, Community-based Health Insurance)		
n.a.	**n.a.**	EQ-5D dimensions and specific dimensions were reported for the entire population with the Differences-in-Difference measure; decrease in illness is significantly higher among the insured for all dimensions and for pain/discomfort and anxiety and depression from two types of propensity score matching

[†]All measures are the average treatment on the treated unless specified.

[‡]Empty cells indicate no information for the category.

(3) No influence of initial conditions, such as chronic illness (except in Colombia; Miller et al. 2009)

(4) No influence of distance to health centers or rural residency (except in Mexico, where people in rural areas sign up more frequently; Sosa-Rubi, Galarraga and Harris, 2009)

The initial health condition did not matter. A detailed study by Gine, Townsend and Vickery (2008) on the uptake of agricultural insurance against bad weather showed that adverse selection played a small role in uptake. None of the studies we examined explicitly included a variable for trust in government or financial institutions, levels of risk aversion, availability of care, or understanding of insurance. Not all studies reported enrollment, even though the issue of who enroll influences the outcome of a social program.

Utilization

The studies report whether the use of overall or specific types of health care was higher for insured people than for uninsured people within a specific time interval. Studies conducted across multiple time periods compare changes across two groups. To measure any incidence of utilization, studies use logit or probit; to measure the impact of insurance on the number of incidences per household or person, count data models can be used. Most studies reported on both inpatient and outpatient care. Choice of facility, which has cost implications, was also reported through a multinomial model.

Membership in health insurance schemes may lead to overuse of health care as a result of two types of moral hazards: overuse because the cost of any given point of contact with the health care system for the insured is low or nearly zero and overuse because insurance involves a third-party payer, which can encourage greater health care utilization. Thus, the utilization rate may not reflect actual welfare gains. There was no estimation of unnecessary care in any of the studies. Where there was a financial barrier to care, increased care gained through insurance is likely to indicate unambiguous welfare improvement.

In the case of Ghana, Mensah, Oppong and Schmidt (2010) report a higher utilization rate for pregnancy care among the insured, although the sample is small. For Nicaragua (Thornton and Field 2010) and Georgia (Bauhoff et al. 2010), insurance targeted mostly to the poor did not induce higher utilization, although the study in Georgia reported higher utilization by those with higher assets. In Burkina Faso (Gnawali et al. 2009) and India (Aggarwal 2010), the two community-managed schemes, there were overall increases in health care use, but there was no impact on inpatient utilization.

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Trujillo, Portillo and Vernon (2005) and Miller, Pinto and Vera-Hernandez (2009) indicate positive effects for the same insurance program in Colombia at different times. The insured received care more often, and the latter study reported a higher use of preventive care after changes to the payment structure for the provider. Both studies report no difference in inpatient care for insured and noninsured groups.

For Mexico's *Seguro Popular* (SP), studies report differing results: King et al. (2009) report no higher utilization for the insured for all health care, whereas Sosa-Rubi, Galarraga and Lopez-Riduaura (2009) report that diabetics insured under SP have better access to diabetic care compared to the corresponding figures for diabetics who are uninsured.

Three studies of VHCFP from Vietnam report conflicting results. Wagstaff (2007) reported higher utilization rates for inpatient and outpatient care, with substantially higher inpatient care. Axelson et al. (2009) reported a small increase in overall utilization, mostly because of increased outpatient care. Although both papers use propensity score matching, they use different data. A subsequent study by Wagstaff (2010), which used a different data and methodology, found no effect of insurance on utilization. The results from both papers by Wagstaff are not robust to functional specifications. For insurance prior to VHCFP, Jowett, Deolalikar and Mattinsson (2004) use instrumental variables on the decision to seek care and the type of health center used. They report that the insured are more likely to use health services and public services than the uninsured.

Contradictory results emerge from two studies on Chinás NCMS. Wagstaff et al. (2009) show that in China, the insured, including the insured poor, use health services more often in comparison to the noninsured. Lei and Lin (2009) show no overall effect for utilization but find a drop in the use of traditional care and an increase in preventive care.

We cannot claim that insurance yields a higher probability of care seeking. It is particularly telling that different results can be obtained for the same insurance. Of the 15 studies reporting utilization, nine studies report a higher utilization rate among the insured. Recall that increased usage may not always indicate welfare improvement.

Financial Protection

Insurance should protect the insured from incurring high levels of health care costs. An effective health care system that includes insurance and other forms of social protection should provide much broader financial risk protection. None of the insurance schemes offered protection for financial loss due to reduced labor supply, which is among the main reasons for the lack of consumption smoothing, as noted by Gertler and Gruber (2002). Miller et al. (2009) mention, in passing,

the important issue of whether health insurance can go beyond reducing health care costs to eliminate significant adverse effects of health shocks so that households can maintain their standard consumption and saving bundles (Townsend 1994; Chetty and Looney 2006). Most studies addressed only the issue of OOP expenditures and do not include insurance premiums or entry fees into insurance. Some studies used the measure of catastrophic payment, defined as a threshold proportion of all expenditures (or some type of income measure, which is usually imprecise), that is spent on health. The denominator varied across studies, as did the threshold levels. Because a reduction in the average level of OOP expenditures for a household would reflect a reduction in high-level OOP expenditures, many studies reported on this value. One way of describing the impact of insurance on financial risk protection is to examine the right tail of the distribution of OOP expenditures. Distributional analysis may require the use of quantile regression methods that help to analyze the occurrence of high levels of expenditures at different income levels.

One indicator of improved wellbeing is found by measuring the reprieve from high levels of OOP expenditures by the poor in comparison to populations without insurance. This indicator was not clearly identified in any of the studies. Low levels of increased spending may actually indicate greater contact with health services, which may occur through insurance. Comparisons between insured and noninsured groups at the average level of OOP expenditures may not yield a clear measure of welfare.

Nonetheless, the studies compared the average expenditure between the insured and the noninsured at the household level as well as the incidence or probability of incurring high or catastrophic expenditures, measured at different thresholds. Some studies on the determinants of expenditures for hospital care noted the large fraction of zeroes because many people do not use hospital care. Although a two-part model can be used by first considering the likelihood of the use of health services, this model was not incorporated in most of the studies reported here. It was difficult to discern whether some studies reported costs only for those who adopted health care, which may be an observed indicator for being ill. One disadvantage of such an approach is that among the poor, some people may not use health care at all, even when they are ill.

For Georgia, Bauhoff et al. (2010) report lower levels of OOP expenditures for the insured, with a larger impact for inpatient care. Thornton and Field (2010) use baseline data to show that insurance does not provide cost savings in Nicaragua when the cost of insurance is taken into account. Aggarwal's (2010) study of community insurance in India shows a favorable impact for overall care among the insured but found no effect for inpatient care. Miller et al. (2009) find overall lower OOP expenditures and a lower incidence of high-level expenditures for the insured.

Sosa-Rubi et al. (2009a) report that pregnant women with Mexican SP insurance use SP-sponsored state services, the care with the lowest OOP expenditure. Nevertheless, the evidence is unclear because there is a preference among the insured for expensive private care over cheaper types of state-sponsored care. The urban poor seem to have benefitted the most from SP. King et al. (2009) confirm that for all types of care, OOP expenditures are lower for the insured under SP insurance.

For Vietna's VHCFP, Wagstaff (2007) shows no overall impact on OOP expenditures for the insured. However, there is some protection for high levels of expenditures, with the poor experiencing a small effect. The results are susceptible to the matching methods used. Axelson (2009) uses data from two periods and finds a protective effect of insurance; however, there is no impact when a single cross-sectional data period is examined. Wagstaff (2010) uses data from three periods and finds strong and robust measures of a greater decline in OOP expenditures for the insured.

Lei and Lin (2009) do not find a significantly lower level of OOP expenditures for people insured under China's NCMS. Wagstaff et al. (2009) note weak evidence for lower OOP expenditures for the insured under the NCMS; however, this evidence is sensitive to matching methods. For deliveries, the insured received protection, although this protection was weaker for the poorer population. Wagstaff and Lindelow (2008) use a number of econometric specifications through instrumental variable analyses and report that people insured in a (now discontinued) Chinese health insurance scheme actually experienced higher levels of catastrophic payments, measured at various threshold levels.

Only four of 16 studies reporting on costs provided conclusive indications of lower average OOP expenditures for the insured. Seven studies provided mixed results, and two showed no effect. Five studies reported a lower incidence of catastrophic OOP expenditures.

Health Status

Surprisingly, only six studies reported on health measures. It is presumed that health insurance would induce greater access for the insured and thereby lead to better health. With the exception of the study on the health insurance scheme from Colombia (Miller et al. 2009), no study reported that supply-side improvement accompanied the introduction of insurance. If health insurance implementation is not accompanied by a significant improvement in the quality of supply and does not lead to greater utilization, then we should not expect health improvement. Financial protection is the main aim of insurance. However, if a range of health outcomes improves or death rates decline for the insured, then it is possible that we can attribute better health outcomes to health insurance.

Mensah et al. (2010) show lower levels of infant death, although these levels are not statistically significant. Wang et al. (2009) use EQ-5D, a standardized index value instrument for use as a measure of a wide range of health conditions, to report on a community-based health insurance program in China. They find that the scheme had positive effects on health status for all insured people and for the poor. Measuring regional changes, Dow and Schmeer (2003) find no correlation in changes in infant mortality as regional insurance uptake improves. For Nicaragua, Thornton and Field (2010) show no improvement in health. Sosa-Rubi et al. (2009b) examine Mexicós SP insurance and show improved glucose control among diabetics with insurance than those without insurance. Lei and Lin (2009) find no improvement in health status for the China's NCMS.

Discussion and Conclusion

We now summarize our conclusions and note some methodological issues. We offer very little in terms of broad results regarding the impact of insurance, once implemented, on the intended beneficiaries.

Studies reporting on enrollment showed that low enrollment is commonly observed for many of the insurance schemes; enrollment seems to be related to perceptions, education, and cultural factors rather than to factors related to health and health care, such as initial health status and distance to health centers. The study from Nicaragua indicated that there was considerable confusion about coverage. We do not observe a pattern regarding enrollment and outcome; for example, China and Vietnam had high enrollment. Nevertheless, there is no indication that insurance worked well for the participants, although more recent analysis shows positive results from Vietnam. Given the low coverage, policies could include incentives for insurance or could even mandate required enrollment. Enrollment may also be low because the administrative implementation process may be poor.

It is perhaps most important to prevent high levels of OOP expenditures through insurance. There is some evidence that this may be the case. Some of the studies that report only average expenditures could not capture this effect. The present method of setting catastrophic expenditures at various levels of income is arbitrary and complicates comparisons among studies. One option is to examine the expenditure distributions of the insured and the noninsured, particularly at high levels of expenditures. However, this technique is of limited use if there are high levels of selection into insurance. The possibility of quantile regression methods can be explored (Angrist and Pischke 2009).

Counterintuitively, for most of the health insurance schemes, the poorest among the insured fared less well. One reason that average expenditures may not

be lower for the insured poor than for the uninsured poor is that the latter may not seek any care or may give up on care altogether when the appropriate care is well beyond reach without insurance. However, if this were the predominant reason why the poor do not receive the full effect of insurance, then insurance should induce higher levels of health-seeking behavior. We do not find this to be the case. One reason for the low level of health-seeking behavior may be a lack of understanding of insurance or the existence of hidden charges other than those covered by insurance.

Two studies explicitly note that, although a causal link was not established, features of the payment scheme may have affected the outcome. In the older insurance scheme in China, fee-for-service may have given rise to cost (Wagstaff and Lindelow 2008). In the case of Colombia, the incentive structures in the providers' contract may have given rise to higher use of preventive care (Miller et al. 2009). Studies should identify health system and household economic factors that may determine impact. For example, mechanisms for copayments, expectations from reimbursement policies, and the presence of various financial mechanisms have been shown to produce variations in uptake, utilization, and health improvement in the U.S. market (Newhouse and the Insurance Experiment Group 1993; Deb, Trivedi, and Zimmer 2006). In the low- and middle-income country study settings, the full range of variations may not exist as it does in the U.S. market. Qualitative studies may shed some light in this regard. Health insurance schemes differed sufficiently from one another in this review to avoid implying any relationship between the specificities of health insurance schemes and outcomes.

In this review, we found that many studies used data collected for purposes other than the evaluation of insurance schemes. Thus, important questions may be missing from general living standard surveys to allow the assessment of the welfare implications of insurance, such as detailed questions on illnesses. Longitudinal surveys would be more robust in capturing selection effects and the extent to which health insurance schemes provide risk protection against health shocks.

Both the development of rigorous impact evaluation methodology for social programs (Imbens and Wooldridge 2009) and the introduction of health insurance schemes for the poor in low- and middle-income countries are new phenomena. Our report of 19 studies may be encouraging. However, for impact studies to be useful for future considerations of health insurance schemes, greater attention must be given to the rigor and uniformity of welfare measurements, especially in terms of risk protection and evaluation methodologies. In the future, examining a larger number of studies would allow for meta-analyses (regressions), which would facilitate more conclusive remarks regarding program features and

outcomes. Further, given that health insurance schemes can differ and exist in different contexts, studies should emphasize pathways through which programs affect outcomes. Although we did not identify such studies, both qualitative and quantitative methods can be used to trace these pathways. Policy makers would benefit from a greater number of rigorous studies that examine the pathways through which programs are likely to affect welfare.

Notes

1. Databases from the 1950s to September 2010 were searched: the Cochrane EPOC group Specialised Register and Library (3. 2010), MEDLINE, EMBASE, ECONLIT, ISI Web of Knowledge, CAB Abstracts, CENTRAL, DARE, ELDIS, and IDEAS as well as websites from the World Bank, the World Health Organization, and the U.S. National Bureau of Economic Research. Expert opinions and searches in key journals yielded findings of additional studies published before July 2011.   2. Adverse selection is one of the reasons mandatory insurance is prescribed in many instances. Voluntary enrollment increases the possibility of adverse selection, which is one of the reasons that enrollment fees must be low and the cost of the program must be subsidized.

3. Yip and Berman's (2001) study was among the early empirical papers on health insurance for developing countries that recognized the selection problem. They addressed the issue through simulation.

4. Studies with random allocation at the cluster level using informal matching methods cannot be justified; see Devadasan et al. (2010).

5. Two of the reviewed studies attempted this approach. Sepehri, Sarma and Simposon (2006) attempt to control selection through the use of fixed-effect or random-effect models for individuals in a panel. Similarly, Sparrow, Suryahadi, and Widyanti (2010) model insurance impact with baseline self-reported health status, which is nearly akin to a fixed-effect model. They report that self-reported illness is likely to be unreflective of actual illness status.

6. Reporting the determinants of insurance involved straightforward identification issues. We include enrollment results from a few studies for which we did not include impact results: Sun et al. (2009), Dror et al. (2009), Schneider and Diop (2001), and Msuya (2004). No studies had high enrollment at the time reported by the study.

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