
REVIEW

Provider payment in community-based health insurance schemes in developing countries: a systematic review

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Objectives	Community-based health insurance (CBI) is a common mechanism to generate financial resources for health care in developing countries. We review for the first time provider payment methods used in CBI in developing countries and their impact on CBI performance.
Methods	We conducted a systematic review of the literature on provider payment methods used by CBI in developing countries published up to January 2010.
Results	Information on provider payment was available for a total of 32 CBI schemes in 34 reviewed publications: 17 schemes in South Asia, 10 in sub-Saharan Africa, 4 in East Asia and 1 in Latin America. Various types of provider payment were applied by the CBI schemes: 17 used fee-for-service, 12 used salaries, 9 applied a coverage ceiling, 7 used capitation and 6 applied a co-insurance. The evidence suggests that provider payment impacts CBI performance through provider participation and support for CBI, population enrolment and patient satisfaction with CBI, quantity and quality of services provided and provider and patient retention. Lack of provider participation in designing and choosing a CBI payment method can lead to reduced provider support for the scheme.
Conclusion	CBI schemes in developing countries have used a wide range of provider payment methods. The existing evidence suggests that payment methods are a key determinant of CBI performance and sustainability, but the strength of this evidence is limited since it is largely based on observational studies rather than on trials or on quasi-experimental research. According to the evidence, provider payment can affect provider participation, satisfaction and retention in CBI; the quantity and quality of services provided to CBI patients; patient demand of CBI services; and population enrollment, risk pooling and financial sustainability of CBI. CBI schemes should carefully consider how their current payment methods influence their performance, how changes in the methods could improve performance, and how such effects could be assessed with scientific rigour to increase the strength of evidence on this topic.
Keywords	Health insurance, third-party payments, developing country, systematic review
JEL codes	I13, I38

KEY MESSAGES

- Existing evidence suggests that the method of provider payment can impact the performance of community-based health insurance (CBI), through provider participation and support for CBI, population enrolment and patient satisfaction with CBI, quantity and quality of services provided, and provider and patient retention.
- However, the existing evidence is largely based on observational studies and thus causal relationships between provider payment and CBI outcomes have not been firmly established. Controlled experiments could substantially improve the strength of the evidence.
- Developing countries currently preparing or implementing national health insurance schemes can benefit from the experience of pre-existing CBI schemes, in particular the link between provider payment and CBI sustainability.

Introduction

Community-based health insurance: a general overview

In many developing countries, inability to pay impedes access to needed health care (WHO 2000; Gottret and Schieber 2006). Worse still, most care is paid for by households directly; private health care expenditures constitute a significant proportion of health care spending in most developing countries and are a major cause of impoverishment (Meessen *et al.* 2003; Frenk *et al.* 2006; McIntyre *et al.* 2006; Bärnighausen *et al.* 2007; Xu *et al.* 2007; World Bank 2010). Health insurance can reduce financial barriers to health care access and provide protection of individuals and families against the risk of unpredictable health care expenditures (Ranson 2002; Xu *et al.* 2007). In countries with large formal sectors, insurance contributions can be easily collected through payroll deductions or taxation (Woolhandler and Himmelstein 2002). In many developing countries, large proportions of the population work in the informal sector, limiting the ability to generate financial resources through payroll deductions or taxes. Community-based health insurance (CBI) collects resources from individuals who voluntarily enrol and are often employed in the informal sector. CBI thus offers an alternative for health insurance in settings where taxes are paid on only a small portion of national income (Bennett 2004; Ekman 2004).

CBI has been widely implemented in developing countries, including in Rwanda (Schneider and Hanson 2007), India (Devadasan *et al.* 2006), China (Wang *et al.* 2009), Ghana (Atim 1999) and Burkina Faso (De Allegri *et al.* 2006b). In Ghana, the national health insurance scheme was recently expanded by transferring enrolment of the population from CBI schemes to the national scheme (Agyepong and Adjei 2008; Yevutsey and Aikins 2010; Nguyen *et al.* 2011). In CBI, members of a community (often linked by geographical proximity or through employment-based relationships such as local trade unions) pool resources to share the financial risk of ill health (Bärnighausen and Sauerborn 2002).

Through enrolment in CBI, a disassociation of payment from the time of health care use is generated, facilitating the development of a financial buffer between service fees and seasonal fluctuations in income in communities (De Allegri *et al.* 2006b). There are various types of CBI financing, including *private hospital-sponsored insurance* (covering their own hospital-based services, such as the Community Financing Scheme in Nkoranza, Ghana) (Atim 1999; Smith and Sulzbach 2008), *NGO-sponsored insurance* to cover services delivered by their own clinics [Bangladesh Rehabilitation Assistance Committee (BRAC) in

Bangladesh, Action for community organization, rehabilitation and development (ACCORD) in India] or by private providers [Development of Humane Action (DHAN) Foundation and Kadamalai Kalanjia Vattara Sangam (KKVS), both in India] (Devadasan *et al.* 2006), and *community funds and Mutuelles*, where members prepay for services provided by government [Assurance Maladie à Base Communautaire (AMBC) in Burkina Faso and Blaville in Mali] (De Allegri *et al.* 2006a; Franco *et al.* 2008). CBI schemes in low-income countries are often beneficiaries of donor support, such as in the case of micro-health insurance schemes in Rwanda and Community Health Funds in Afghanistan (Rao *et al.* 2009).

Provider payment methods and CBI outcomes

CBI is a mechanism to generate financial resources for the health system. Just like in other types of insurance (such as private, for-profit or social insurance), provider payment methods can influence provider and patient behaviour in CBI and thus contribute to ensuring that sufficient funds are raised and that the limited funds are used efficiently (Bennett 2004). First, provider payment methods can affect provider satisfaction with a CBI and health worker participation and retention. Second, it is plausible that payment methods influence how far health workers encourage people in their communities to join the CBI. Health workers who are satisfied with the way the CBI pays them are more likely to support CBI and encourage their patients to enrol in such insurance schemes. Third, payment methods might affect population enrolment in a CBI both directly (e.g. through the level of patient copayments for health care) and indirectly (e.g. through their impact on the quantity and quality of health care services provided for CBI enrollees). Figure 1 shows hypothesized pathways from provider payment methods to CBI outcomes; Table 1 shows hypotheses based on the literature about the effect of provider payment mechanisms on CBI ability to contain costs and the capacity for financial planning.

In this study, we systematically review for the first time provider payment methods used in CBI in developing countries. In addition to a description of the types of provider payment methods used by CBI, our review covers the evidence on the impact of the payment methods on CBI performance, including provider participation, satisfaction and retention; the quantity and quality of care provided through the CBI; the cost and financial sustainability of CBI; patient satisfaction with care; and enrolment rates in CBI. Finally, we explore the relationship between provider participation in designing CBI payment methods and provider support for CBI once a scheme is introduced (see Figure 1).

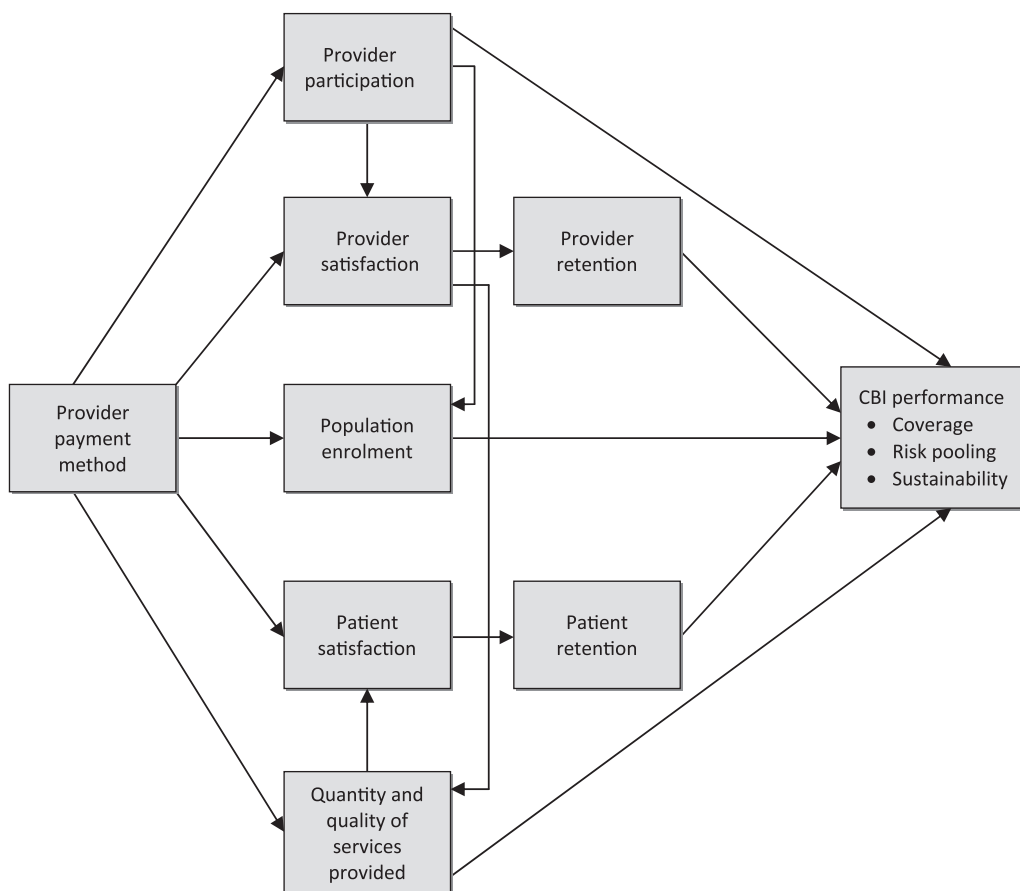


Figure 1 Community-based health insurance (CBI) provider payment methods and CBI outcomes.

Table 1 Provider payment methods and their potential effects on outcomes

Payment method	Summary information	Incentive directed at	Ability to contain costs	Potential for payment method to affect CBI capacity for financial planning*
Fee-for-service	Reimbursement of service fees incurred by insurance scheme enrollees	Providers	Low	Low
Capitation	Providers receive a flat payment per enrollee. In return for this flat payment, patients are entitled to services of a pre-defined benefit package	Providers	Medium	Medium
Salaries	Providers receive salary either from government or private health facility. Used in the majority of developing countries	Providers	High	High
Patient charges	Four major categories of patient charges: <i>co-payment, co-insurance, deductibles and payment ceilings</i>	Patients	Low	Medium

Notes: The first four columns are adapted from Carrin and Hanvoravongchai (2003).

CBI: community-based health insurance.

*CBI capacity for financial planning’ was included in the table to describe how various provider payment methods allow CBI schemes to estimate and plan for scheme expenses related to medical expenditures over a given fiscal period.

Materials and methods

Definition of community-based health insurance

To define CBI in this study, we used the primary and secondary criteria of CBI developed by the International Labour Organization’s Strategies and Tools against Social Exclusion

and Poverty (STEP) Program. The primary and secondary STEP inclusion and exclusion criteria to determine whether a health care financing scheme is a CBI or not are shown in Table 2. For several sources there was insufficient information to verify if the scheme met all secondary inclusion criteria, in which case

Table 2 Inclusion and exclusion criteria for community-based health insurance (CBI) according to the ILO STEP^a programme

Criteria level	Criteria for defining a CBI scheme
Primary inclusion criteria	<ul style="list-style-type: none"> • The scheme uses an insurance mechanism, i.e. a financial instrument, which, in return for payment of a contribution (or a premium), provides members with a guarantee of financial compensation or service on the occurrence of specified events. • The insurer collects a premium in regular time intervals, in exchange for a guarantee to provide monetary compensation or services when a specified event has occurred and the insured has suffered a loss.
Secondary inclusion criteria	<ul style="list-style-type: none"> • Members or beneficiaries of the insurance scheme contribute to the financing of the benefits, at least partially, from their personal income. • Beneficiaries of the scheme are insured on a voluntary or automatic basis. Most of the beneficiaries of the scheme are, in practical terms (averaged over a calendar year), excluded from existing (statutory) social security services or have an income at or below the national poverty line. • Beneficiaries are associated with, or involved in, the management of the scheme. Finally, the scheme is established outside the statutory social security system.
Exclusion criteria	<ul style="list-style-type: none"> • Prepayment schemes without risk sharing, which allow members to claim an amount of money or service that is equivalent to the amount prepaid during a defined period, cannot be considered insurance. • The same applies to savings and credit schemes.

Note: ^aILO STEP: International Labour Organization's Strategies and Tools against Social Exclusion and Poverty (STEP) Programme.

only the primary inclusion criteria were applied for inclusion of schemes in the review.

Data sources, search strategies and data extraction

We conducted the systematic search of relevant articles on 4 January 2010 in four scientific journal electronic databases: PubMed (to cover articles on financial-incentive programmes published in the medical literature), the Excerpta Medica database or EMBASE (to cover articles in medical journals that are not included in PubMed, in particular European journals), the Cumulative Index to Nursing and Allied Health Literature or CINAHL (to cover articles published in the literature on nursing and allied health professions), and National Health Services Economic Evaluation Database or NHS EED (to cover health economics studies). We used the Cochrane Library to search in NHS EED. In addition, we asked colleagues with a research interest in health system financing and provider payment to identify articles on provider payment in CBI in developing countries. Finally, we searched the reference lists of all publications included in the final review, as well as those of all articles that were excluded from the review because they were editorials, policy briefs or commentaries. We did not impose any restrictions on the time interval within which papers were eligible.

To identify articles for review, we combined four search themes using the Boolean operator "and": healthcare providers, community-based health insurance, provider payment methods and developing countries. We linked several search terms with the Boolean operator "or" in order to operationalize the search themes. We drew the search terms from the controlled vocabularies used for subject indexing in PubMed [i.e. Medical Subject Headings (MeSH)], EMBASE (i.e. Emtree), and CINAHL (i.e. CINAHL Subject Headings). We used all search terms from the controlled vocabularies in their "exploded" versions. That is, in addition to the selected terms, all narrower terms that are categorized below it in the vocabulary hierarchies were included in the searches. While

MeSH are available in NHS EED when searched through the Cochrane Library, we entered the search terms in all searchable, subject-specific fields (title, keyword and abstract), because such a search strategy has been found to be superior to MeSH-based strategies in NHS EED (Alton *et al.* 2006). The four search algorithms are shown in the Appendix. We did not apply any language restrictions in our search.

We extracted data on the name and location of the CBI scheme and its year of creation, target population, number of enrollees and their level of financial contribution, the services included in the benefit packages, the type of provider payment method used, and any evidence on the effects of provider payment methods according to our conceptual framework shown in Figure 1 (see Appendix 1 for details).

Results

We present our results in four sections. The first section presents the general characteristics of the CBI schemes identified in our review and the type and mix of provider payment mechanisms used. The second section discusses the evidence on the effects of provider payment on CBI performance. The final section discusses the relationship between provider participation in designing CBI payment methods and provider support for CBI once a scheme has been introduced.

CBI schemes and methods of provider payment included in final review

Figure 2 shows the different steps taken in the selection of articles for final review. We conducted full-text reviews of 99 articles. Thirty-four articles were included in the final review, which covered evidence on provider payment methods in 32 CBI schemes. With the exception of one article published in French (Criel *et al.* 2005), all articles included in the final review were published in English (see Table 3).

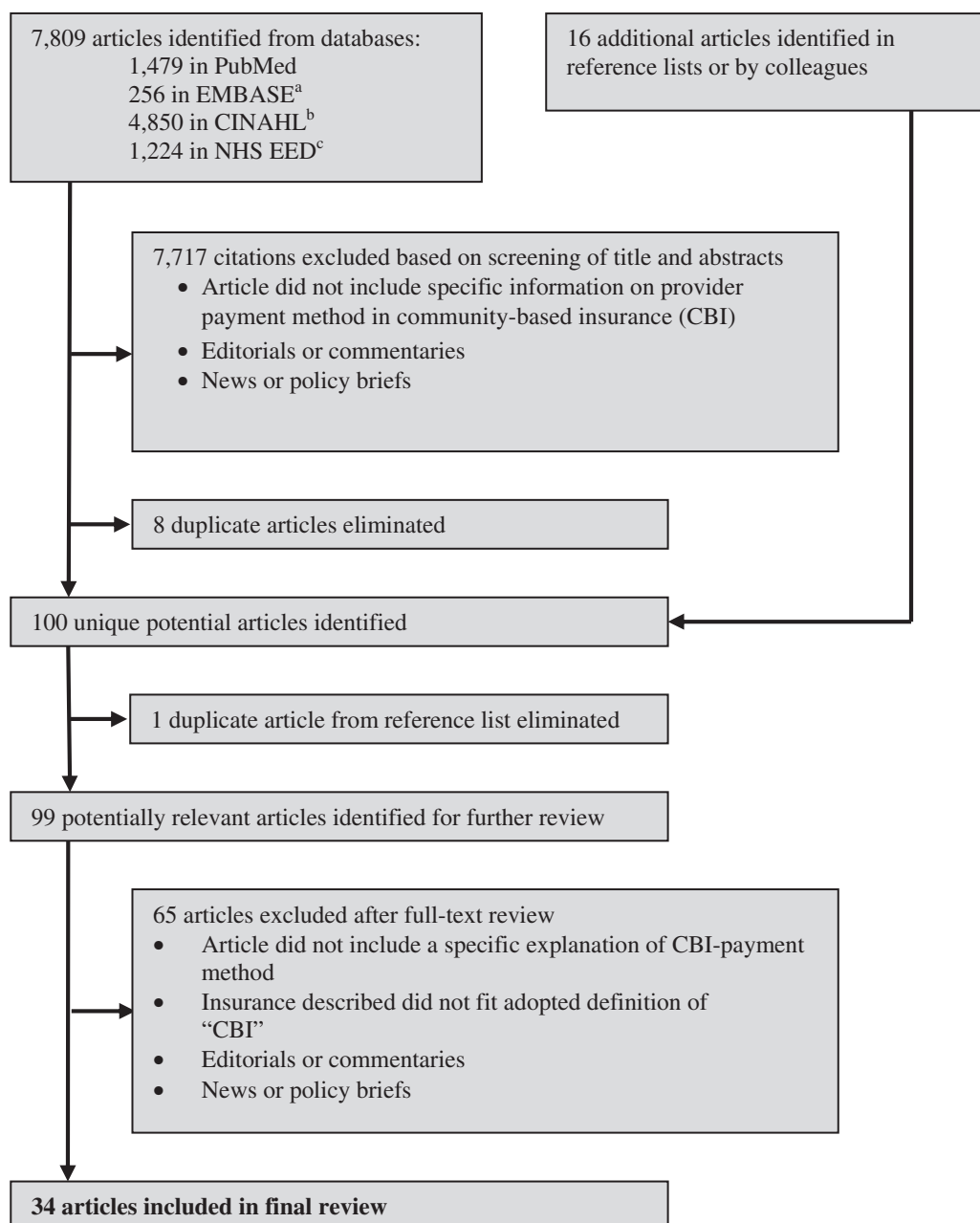


Figure 2 Flowchart of steps taken in systematic review.

Notes: ^aEMBASE: Excerpta Medica database.

^bCINAHL: Cumulative Index to Nursing and Allied Health Literature.

^cNHS EED: National Health Services Economic Evaluation Database.

The majority of CBI schemes reviewed were in South Asia (including schemes in India, Bangladesh and Afghanistan), with 13 in India alone. Ten of the reviewed schemes were located in sub-Saharan Africa; one of the 10 was composed of 54 different sub-schemes, which were introduced at the same time in Rwanda (Schneider and Hanson 2006; Schneider and Hanson 2007). Four CBI schemes were found in East Asia, and one in Latin America. The majority of all reviewed CBI schemes were established between 2000 and 2004 (70%), with the oldest currently operating schemes identified being the Student's

Health Home (SHH) in India (1952) (Devadasan *et al.* 2006) and the now dormant 19th century Jyorei scheme in Japan (Ogawa *et al.* 2003).

Most schemes applied a mix of various provider payment methods. Seventeen schemes used some form of fee-for-service payment method, with the majority of schemes reimbursing the patient after assessment of insurance claims. Twelve schemes used salary-based payments, with one of the 12 using salary plus performance-oriented bonuses. Seven schemes used capitation-based financing. Several CBI schemes applied

Table 3 General information on papers and schemes

Indicator	Literature published by commercial publishers	Grey literature*	Total
Total number of:			
Papers	32	2	34
Schemes	29	3	32
Geographical region (schemes):			
Sub-Saharan Africa	9	1	10
South Asia	14	3	17
East Asia	4	0	4
Latin America	1	0	1
Year of establishment (schemes):			
Pre-1990	6	0	6
1990–1994	5	1	6
1995–1999	4	2	6
2000–2004	11	1	12
2005–2009	1	0	1
Unknown	1	0	1

Note: *Grey literature is defined as material that is not published in easily accessible journals or databases (The Cochrane Collaboration 2011).

additional cost-containment tools: nine schemes applied a coverage ceiling, whereby the enrollee pays an indemnity if an upper limit of coverage is exceeded, and six schemes applied a co-insurance mechanism (see Table 4).

Note that the sources of funding differ across CBI schemes. In addition to contributions paid by CBI enrollees, which were paid either through co-insurance or indemnity payments, several CBI schemes paid providers with government or NGO funds. Six CBI schemes received additional funding through external subsidies; three from government funding and three from NGO funding. For CBI schemes using a co-insurance mechanism, the financing of enrollee health care costs was divided between the insurance scheme (or parent-NGO) and direct payments by the patient or enrollee. For salary-based payments, seven schemes used CBI or parent-NGO funds, while five schemes were financed by government funds. All schemes using capitation-based payments used CBI funds for financing.

Impact of provider payment methods on CBI outcomes

Effects of payment methods on provider participation, satisfaction and retention

Hardly any evidence exists on the effect of payment methods on provider participation, satisfaction and retention in CBI. Some descriptive qualitative evidence suggests that dissatisfaction with the choice of payment methods led to reduced participation rates of health professionals in CBI schemes in Uganda (Basaza *et al.* 2007; Basaza *et al.* 2008) and retraction of a hospital's participation in Guatemala (Ron 1999). These provider reactions are likely to have reduced the supply of health services to CBI enrollees, although the reviewed studies did not examine this question.

Effects of payment methods on quantity and quality of services provided

Several of the identified articles provided descriptive evidence on the effect of type of payment method on the quantity and quality of health care services provided to CBI enrollees. According to Sun *et al.* (2009), most village doctors in China earn money from only a limited number of services such as injections, and intravenous drugs. In addition, village doctors in China rely heavily on selling drugs to generate income. Differences in prescription behaviour between patients of the New Cooperative Medical Scheme (NCMS) (no. 30 in Table 4) and non-NCMS patients were assessed through evaluation of patient visit records. NCMS village doctors prescribed an average of 4.6 drugs per patient visit, while non-NCMS village doctors prescribed an average of 3.1 drugs per patient visit. At the NCMS village health stations in Linyi county, Shandong province, the village doctors prescribed more drugs to the insured patients than to the uninsured. The average number of drugs dispensed for the insured was 4.7, significantly higher than 3.9 for the uninsured. NCMS than for non-NCMS patients were also found to receive more injections and intravenous drugs than non-NCMS patients, and total medical costs were higher for NCMS than for non-NCMS patients (18.7 Yuan vs 11.3 Yuan) (Sun *et al.* 2009). The NCMS is thus likely to have exaggerated the existing problem of over-prescription and excessive injections and use of intravenous drugs, which was linked to the provider payment method.

Another study in rural China investigated the effects of changes in drug purchasing and provider payment within the Rural Mutual Health Care Scheme (RHMC) (no. 31 in Table 4). First, the RMHC implemented a supply-side policy where drugs were purchased through a competitive bidding process and distributed by township health centres to village clinics (and thus village doctors were not allowed to purchase and sell drugs themselves). Second, the RMHC changed provider payment by introducing a salary plus bonus method of payment. Regression analysis using panel data showed that due to the above-mentioned supply-side policy, outpatient visits and per-visit outpatient expenses decreased by 94.7% and 55.9%, respectively, controlling for insurance coverage (Zhou *et al.* 2009).

A study on the quality of hysterectomy care provided to enrollees in the Self-Employed Women's Association (SEWA) CBI in Gujarat, India (no. 11 in Table 4) used descriptive data to evaluate differences across patients who used private for-profit, private non-profit and public facilities. The choice of provider was left entirely up to the CBI member, who would pay at the time of service and then be reimbursed by SEWA within a 3-month period. Data suggested that the cost of hospitalization was on average less in public facilities than in private (for-profit or non-profit) facilities, and that fees were often tailored to the socio-economic status of the patients (Ranson and John 2001).

Effects of payment methods on patient demand for CBI services

Little evidence exists on the effect of CBI provider payment on patient demand for services. Analysing data from a cluster-randomized controlled trial, Ranson *et al.* showed for the SEWA CBI scheme in India (no. 11 in Table 4) that reducing the lag time for patient reimbursement through the introduction of

Table 4 Schemes, payment methods and associated articles

No. ^a	Name of CBI scheme	Payment method ^b	References
1	Community Financing Scheme, Nkoranza, Ghana (est. October 1990)	Capitation	Atim (1999); Smith and Sulzbach (2008)
2	Mutuelle Famille Babouantou de Yaoundé, Cameroon (est. November 1991)	FFS/patient reimbursement ^c	Atim (1999)
3	Assurance Maladie à Base Communautaire (ABMC), Nouna health district, Burkina Faso (est. January 2004)	Capitation	De Allegri <i>et al.</i> (2006a); De Allegri <i>et al.</i> (2006b); Gnawali <i>et al.</i> (2009)
4	Action for community organization, rehabilitation and development (ACCORD), Tamil Nadu (est. 1992)	Direct CBI payment (mechanism not reported)	Devadasan <i>et al.</i> (2006)
5	Bharat Agro Industries Foundation (BAIF), Maharashtra, India (est. 2001)	FFS/patient reimbursement plus patient coverage ceiling	Devadasan <i>et al.</i> (2006)
6	Development of Humane Action (DHAN) Foundation Kadamalai Kalanjia Vattara Sangam (KKVS), Tamil Nadu, India (est. 2000)	FFS/patient reimbursement plus patient deductible and patient coverage ceiling	Devadasan <i>et al.</i> (2006)
7	Jowar Rural Health Insurance Scheme (JRHS), Maharashtra, India (est. 1981)	Direct CBI payment (mechanism not reported) plus patient deductible	Devadasan <i>et al.</i> (2006)
8	Karuna Trust, Karnataka, India (est. 2002)	FFS plus patient coverage ceiling	Devadasan <i>et al.</i> (2006)
9	Navsarjan Trust, Gujarat, India (est. 1999)	FFS/patient reimbursement plus patient coverage ceiling	Devadasan <i>et al.</i> (2006)
10	Raigarh Ambikapur Health Association (RAHA), Chattisgarh, India (est. 1980)	FFS plus patient deductible and coverage ceiling	Devadasan <i>et al.</i> (2006)
11	Self-Employed Women's Association (SEWA) Medical Insurance Fund (part of the Integrated Social Security Scheme), Gujarat, India (est. 1992)	FFS/patient reimbursement plus patient coverage ceiling	Ranson and John (2001); Ranson (2002); Devadasan <i>et al.</i> (2006); Ranson <i>et al.</i> (2006); Ranson <i>et al.</i> (2007)
12	Student's Health Home (SHH), West Bengal, India (est. 1952)	FFS plus patient co-insurance	Devadasan <i>et al.</i> (2006)
13	Voluntary Health Services (VHS), Tamil Nadu, India (est. 1972)	FFS plus patient co-insurance	Devadasan <i>et al.</i> (2006)
14	Asociación por Salud de Barillas (ASSABA) community health financing scheme, Guatemala (est. 1996)	<i>Outpatient care:</i> Direct CBI payment (mechanism not reported) <i>Inpatient care:</i> capitation	Ron (1999)
15	Organizing for Educational Resources and Training (ORT) Health Plus Scheme (OHPS), Philippines (est. 1994)	<i>Outpatient care:</i> salary <i>Inpatient care:</i> capitation	Ron (1999)
16	54 micro-health insurance schemes in three health districts, Rwanda (est. 2000)	Capitation plus patient deductible plus government subsidies (salaries, salary mark-ups, drug donations)	Musango <i>et al.</i> (2004); Schneider and Hanson (2006); Schneider and Hanson (2007)
17	Maliando Mutual Health Organization, Kissoudougou District, Guinea (est. 1998)	Capitation plus patient deductible	Waelkens and Criel (2004); Criel <i>et al.</i> (2005)
18	Jyorei community health insurance, Japan (est. 19th Century)	Salary plus patient deductible	Ogawa <i>et al.</i> (2003)
19	Bangladesh Rehabilitation Assistance Committee (BRAC) Micro Health Insurance programme, Bangladesh (est. 2001)	<i>Outpatient care:</i> salary plus patient deductible <i>Inpatient care:</i> FFS	Ahmed <i>et al.</i> (2005)
20	Grameen Bank Kalyan (GK), Bangladesh (est. 1997)	<i>Outpatient care:</i> salary plus patient deductible <i>Inpatient care:</i> FFS/patient reimbursement plus patient co-insurance	Desmet <i>et al.</i> (1999)
21	Society for Social Services (SSS) Health Programme, Bangladesh (est. 1993)	<i>Outpatient care:</i> salary plus patient deductible <i>Inpatient care:</i> FFS plus patient co-insurance	Ahmed <i>et al.</i> (2005)
22	Save for Health Uganda (est. 1999)	Salary plus patient deductible	Basaza <i>et al.</i> (2007); Basaza <i>et al.</i> (2008)

(continued)

Table 4 Continued

No. ^a	Name of CBI scheme	Payment method ^b	References
23	Ishaka Scheme, Uganda (est. 1999)	Salary plus patient deductible	Basaza <i>et al.</i> (2007); Basaza <i>et al.</i> (2008)
24	Uplift Health, Pune City, India (est. 2003)	FFS/patient reimbursement plus patient coverage ceiling	Dror <i>et al.</i> (2009)
25	Nidan (associated with SEWA), Gujarat, India (est. 2001)	FFS/patient reimbursement plus patient coverage ceiling	Dror <i>et al.</i> (2009)
26	Bharatiya Agro Industries Foundation (BAIF), Pune, India (est. 2003)	FFS/patient reimbursement plus patient coverage ceiling	Dror <i>et al.</i> (2009)
27	Four Mutual Health Organizations developed by the Ministry of Health of Mali and the USAID-funded Partners for Health Reform project (BlaVille, Kemeni, Wayerma, Bougoula), Mali (est. 2003)	FFS/provider reimbursement plus patient co-insurance	Franco <i>et al.</i> (2008)
28	10 CBI schemes in Anambra state, southeast Nigeria (est. unidentified)	Direct CBI payment (mechanism not reported) plus salaries paid by government	Onwujekwe <i>et al.</i> (2009)
29	Community-Health Funds in four provinces (Parwan, Saripul, Nimroz, Hilmand), Afghanistan (est. 2005)	Patient deductible plus salaries paid by government	Rao <i>et al.</i> (2009)
30	New Cooperative Medical Scheme (NCMS), Linyi County, Shandong Province, China (est. 2003)	Capitation plus patient deductible	Sun <i>et al.</i> (2009)
31	Rural Mutual Health Care (RMHC), Shaanxi province, China (est. December 2003)	Salary plus performance-oriented bonus	Wang <i>et al.</i> (2009); Zhou <i>et al.</i> (2009)
32	Community Health Fund in Hanang District (est. in 1998), Tanzania (est. in 23 districts in 1995)	Salary	Chee <i>et al.</i> (2002)

Notes: ^aIn the text, CBI schemes are referred to by their name (and by the number shown in the first column of this table).

^bSee Supplementary Data Table for further description of the payment method.

^cFFS: Fee-for-service payment.

CBI: Community-based health insurance.

prospective reimbursement did not lead to increased service utilization. Although rates of claims increased significantly over time, differences between the intervention group receiving prospective reimbursement and the control group receiving the standard reimbursement were not significant (Ranson *et al.* 2007).

Effects of payment methods on CBI coverage and financial performance

The evidence on the impact of provider payment method on CBI performance in terms of coverage, risk pooling, and financial sustainability is mixed. In the above-mentioned cluster-randomized controlled trial in India, it was found that the introduction of prospective reimbursement for patients was not associated with either changes in the enrolment rate or socio-economic status of the SEWA scheme's enrollees (Ranson *et al.* 2007). According to the authors, there are several possible explanations for this finding: 'Firstly, the interventions did not tackle barriers such as distance to hospital, transportation costs, and the opportunity costs of hospital admission, especially for female members with many household responsibilities. Secondly, the interventions were more effective than anticipated among less poor members, suggesting that barriers faced by the poorest people in seeking hospital admission and submitting a claim were just as relevant to the less poor members' (Ranson *et al.* 2007).

A panel study on the Grameen Bank Kalyan (GK) scheme in Bangladesh suggests that sliding-scale premium and

co-payment levels, where payment levels of enrollees are linked to their economic status, were a deterrent to enrolment. While the policy intention of introducing a sliding scale for payments was cross-subsidization of medical expenses between rich and poor enrollees, after 15 years of operations, more than 20% of the poorest group and 50% of the wealthiest group had not enrolled. One reason for the relatively low coverage levels in the wealthiest group may have been the fact that the differences between socio-economic groups in the sliding scales of premiums and co-payments increased overproportionally with increasing income levels (Desmet *et al.* 1999).

Several studies also provided descriptive evidence of the relationship between a given provider payment method and CBI revenues and financial sustainability. Rao *et al.* (2009) used data from health management information systems to show that in five provincial CBI schemes in Afghanistan (no. 29 in Table 4), the CBI premium contributions covered only a small proportion of CBI salary costs (Rao *et al.* 2009). Using a case study design to collect information on the design, activities and performance of CBI schemes in India, Devadasan *et al.* (2006) found that cost escalation often became a challenge and attributed this observation to the fact that the majority of CBI-contracted providers charged on a fee-for-service basis. Since CBI schemes and their parent-NGOs have limited purchasing capacity, cost escalation can incite financial vulnerabilities and put the sustainability of the scheme at risk (Devadasan *et al.* 2006).

Ron (1999) found in a case study of the Organizing for Educational Resources and Training (ORT) Health Plus Scheme

(OHPS) in the Philippines (no. 15 in Table 4) that capitation payment to hospitals was seen as a financially viable approach to reduce financial risk to the CBI by reducing provider-generated demand for inpatient care. After several years of operation, it was found that there was no need to increase the level of capitation payments, as the number of 'high-cost' inpatient cases remained low and medical expenditures remained below revenue generated from capitation payments (Ron 1999).

Provider satisfaction and support of CBI

The level of provider participation in designing CBI payment methods was found to have a direct impact on the participation and buy-in of local health workers, as well as their general satisfaction to work with the CBI management, once the scheme became operational. Qualitative descriptive data from the CBI scheme in Nouna, Burkina Faso (no. 3 in Table 4) demonstrated that schemes that introduce payment methods without prior discussion or approval by local providers may face difficulties in ensuring provider participation in the scheme (De Allegri *et al.* 2006a; De Allegri *et al.* 2006b; Gnawali *et al.* 2009). Similar to the evidence from the Burkina Faso scheme, two qualitative studies on the Maliando Mutual Health Organization in Guinea (no. 17 in Table 4) found that lack of understanding of the community financing provider payment method contributed to weak provider support for the CBI, which in turn is likely to have led to the low enrolment rates in the CBI (Criel and Waelkens 2003; Criel *et al.* 2005). These studies illustrate how important it is to engage closely with health workers in setting up the payment method in a CBI.

Discussion

Community-based health insurance schemes often operate in economic environments of very limited resources, leading to challenges in achieving financial and organizational sustainability. In particular, it has often been difficult for schemes to enrol large proportions of the target population, constraining the risk pooling function of insurance. CBI sustainability can be affected by many factors, including accountability of the management team (Aggarwal 2010) and demand-side factors, such as adverse selection (Ranson 2002). Our review suggests that the method of provider payment has the potential to also be an important determinant of CBI sustainability, through mechanisms such as provider participation, satisfaction and retention in CBI; the quantity and quality of services provided to CBI patients; patient demand for CBI services; and population enrolment, risk pooling and financial sustainability of CBI.

In this review, we find that the majority of CBI schemes apply a combination of payment methods. The degree to which the methods of provider payment affect CBI performance outcomes is still to a large extent unknown. Our review found some evidence that certain types of provider payment (capitation, salary plus performance bonus) can lead to efficiency gains and contribute to improved CBI performance in developing countries, while others (namely fee-for-service) may pose threats to the long-term financial viability of CBI schemes.

Several interesting observations emerge from our literature review. First, where providers could generate income through drug sales the quantity and cost of drug prescriptions increased (Sun *et al.* 2009). By disassociating provider income from drug sales, one CBI scheme was able to attain improved financial efficiency through a reduction in over-prescriptions (Zhou *et al.* 2009). Second, paying providers through fee-for-service reimbursement (and allowing patients to choose their providers) generated challenges in financial planning through cost escalation and led to high variability in the quality of care provided (Ranson and John 2001). Third, reducing the lag time between service consumption and patient reimbursement did not lead to increases in patient utilization of CBI services, nor did it increase enrolment rates (Ranson 2002; Ranson *et al.* 2007). Fourth, the introduction of a sliding-scale co-payment system that was not well aligned with differences in socio-economic status led to poor enrolment rates (Desmet *et al.* 1999). Fifth, paying providers through capitation payments led to a reduction in provider-induced demand, while salary payments allowed for improved financial planning for a CBI scheme (Ron 1999). Sixth, it was found that a lack of consensus among providers how they should be paid by a CBI scheme can lead to reluctance to support the scheme (Criel and Waelkens 2003; Criel *et al.* 2005; De Allegri *et al.* 2006b). Finally, clear communication of the reasons for a particular method of provider payment can be important in garnering interest and support from providers working within the scheme (Basaza *et al.* 2007; Basaza *et al.* 2008).

Of course, the findings in the reviewed studies should not be taken to be necessarily generalizable to other settings. For instance, while capitation was found to contribute to cost savings and financial sustainability of CBI in one study, without apparent negative effects on service provision, it cannot be ruled out that capitation will have negative consequences in other settings, such as the denial of needed services.

Very few studies explicitly stated why the associated CBI schemes chose to adopt the provider payment systems they had implemented, although several commented on the role of providers in the process of determining the payment method. Provider payment methods can significantly influence provider behaviour. Indeed, in developed countries, the selection of payment methods has been one of the main instruments of health policy to affect provider behaviours (Mills *et al.* 2000; Carrin and Hanvoravongchai 2003; Roberts *et al.* 2008). Yet none of the 32 articles included in our review discussed the anticipated effects of the chosen payment methods on provider behaviour, nor the policy objective in choosing a particular method. There was limited evidence on how a particular payment method affected provider satisfaction with the CBI scheme. Several studies provided insights into how the use of various payment methods can directly or indirectly impact the financial or organizational sustainability of a CBI scheme. However, this evidence remains limited due to both the small number of studies that attempt to measure this relationship, as well as the fact that the majority of studies use observational data and do not apply rigorous evaluation designs.

The results identified in this study should be interpreted with caution. The majority of publications reviewed in our synthesis

used observational data. Moreover, many studies lacked a control or comparison group and were thus unable to identify the effect of provider payment on CBI performance. Ekman (2004) identified a similar finding in his systematic review on CBI, as did Faden *et al.* (2011) in their systematic review on health insurance and pharmaceutical management strategies in low- and middle-income countries. Experimental or strong quasi-experimental research designs could improve the strength of causal inference. The Cochrane Collaboration has adopted The Grades of Assessment, Development and Evaluation (GRADE) System for evaluating the quality of evidence within the context of systematic reviews. The GRADE approach defines the quality of a body of evidence as the extent to which one can be confident that an estimate of effect or association is close to the quantity of interest. The approach identifies four levels of quality. Randomized controlled trials start at the 'high' quality level of evidence, but can be 'down-graded' to 'moderate' quality, if they do not fulfil certain characteristics of strong trials, such as limitations in study design or execution, or inconsistency of results. Observational studies start at the low quality level of evidence, but can be upgraded to 'moderate', if they meet certain conditions of strong observational studies, such as large effect size. Upgraded observational studies and down-graded randomized trials are considered 'moderate' quality, while observational studies are considered 'low' and case series or case reports are considered 'very low' (Higgins and Green 2008).

With the exception of a randomized-controlled trial in India (Ranson *et al.* 2007) and an observational study using panel data in China (Zhou *et al.* 2009), most of the studies cited in this review belong to either the 'moderate' or the 'low' quality levels of evidence. The majority of studies are observational and suffer from a number of threats to causal inference. First, they commonly do not use longitudinal data and cannot rule out that observed associations are the result of causal relationships running both from the exposure (such as a particular payment method) to the outcomes (such as CBI enrolment) and from the outcome to the exposure, leading to simultaneity bias. Second, many studies of population effects of CBI payment methods do not control for selective participation in the CBI and thus are likely to suffer from significant selection bias due to differences in those people who enrol in CBI and those who do not. Some studies control for observed differences between CBI enrolees and non-enrolees (e.g. socio-economic status, preferences for type of health care, or health status) (Franco *et al.* 2008; Dong *et al.* 2009; Gnawali *et al.* 2009; Rao *et al.* 2009), but these studies cannot rule out that selection on unobserved factors has biased effect estimates.

Thus, the value of the evidence synthesized in this review does not lie in precise effect size estimates or proofs of causality, but rather (1) in confirming and refining initial hypotheses that provide payment methods affect CBI performance either directly (e.g. through cost-containment) or indirectly (e.g. through provider support of the scheme), and (2) in identifying an important information gap that calls for rigorous evaluation research in this domain. Given the substantial investment by national governments and international organizations in establishing CBI schemes in developing countries (Bennett 2004; Carrin *et al.* 2008), it is important to better

understand how the method of provider payment impacts an insurance scheme's long-term viability. Our study provides insight into this relationship within the context of CBI schemes. Future studies, in particular controlled trials, are required to improve the strength of the evidence on this relationship.

Our systematic review was limited to articles published in academic journals and grey literature available via the world-wide web. It is likely that many of the management teams of CBI in developing countries possess important insights on what works and what does not in particular settings, but have not published these findings. This potentially very valuable evidence could be collected, for instance, through structured interviews with CBI managers. Such a review of local knowledge based on management experience could serve to confirm further some of the relationships between provider payment methods and CBI performance that our review revealed. Our review also identified particular gaps in knowledge on the relationships between provider payment methods and CBI performance. These gaps include provider satisfaction with current methods of payment (and how this impacts their support for the scheme), the existence of innovative methods to motivate health workers (both financial and non-financial methods), and how changes in payment methods over time impact the financial viability of the scheme.

Conclusion

The effect of provider payment methods on the performance of public and private insurance schemes in high-income countries is often discussed and is well documented. It is well known that the provider payment method commonly serves as a strong incentive to act in particular ways. We synthesize for the first time the knowledge on provider payment methods used in CBI in developing countries and the evidence on the effect of the methods on CBI performance. We find initial evidence that provider payment methods can effect provider satisfaction, the quantity and quality of services provided, patient demand for CBI services and CBI performance outcomes (coverage, risk pooling and sustainability). However, we also identify substantial gaps on certain hypothesized relationships between provider payment and CBI outcomes, while on others, the evidence remains relatively weak.

Many developing countries, in particular in Africa, are currently preparing for or implementing national health insurance schemes (e.g. Ghana, Rwanda, Tanzania and Burkina Faso). Since these health insurance reforms often utilize experiences from pre-existing district and sub-district level community financing schemes, it would seem urgent to fill the evidence gap on the link between payment methods and CBI sustainability. Evidence generated at the district and sub-district level can be used to guide national policy, allowing policy makers to investigate how health workers respond to a given payment method before introducing a similar system at the national level. In future studies, researchers should attempt to apply evaluation methods that give rise to strong evidence, in particular experiments and quasi-experimental studies.

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Supplementary Data

Supplementary data are available at *Health Policy and Planning* Online.

Conflict of interest

The authors declare that they have no competing interests.

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Appendix A

Search algorithms

CINAHL:

MW Health Manpower+ or MW Nursing Manpower+ or MW Health Personnel+ and MW Health Insurance+ or MW Community Financing+ and MW developing+ or MW Africa South of the Sahara+ and health insurance reimbursement+ and community-based health insurance

(MW (Health Manpower)) or (MW (Nursing Manpower)) or (MW (Health Personnel)) and (MW (Health Insurance)) or (MW (Community Financing)) and (MW (developing)) or (MW (Africa South of the Sahara)) and (health insurance reimbursement) and (community-based health insurance)

4850 entries

EMBASE:

'health insurance'/exp AND 'health care manpower'/exp OR 'health care personnel'/exp AND 'motivation'/exp OR 'reimbursement' AND 'developing country'/exp

256 entries

PUB MED:

(((((health manpower[MeSH Terms]) OR (health personnel[MeSH Terms])) AND (health insurance[MeSH Terms])) OR (community financing[MeSH Terms])) AND (Africa South of the Sahara[MeSH Terms])) OR (developing countries[MeSH Terms])) AND (health insurance reimbursement[MeSH Terms] OR (motivation[MeSH Terms]))

1479 entries

NHS EED:

Health Manpower OR Health Personnel AND Financial Support OR Training Support OR Physician Incentive Plans OR Health Planning OR Health Insurance Reimbursement AND Health Insurance OR Health Financing OR Community Financing AND developing countries OR Africa

1224 NHS EED