

The effectiveness of contracting-out primary health care services in developing countries: a review of the evidence

Xingzhu Liu,¹ David R Hotchkiss^{2*} and Sujata Bose³

Accepted 22 August 2007

The purpose of this study is to review the research literature on the effectiveness of contracting-out of primary health care services and its impact on both programme and health systems performance in low- and middle-income countries. Due to the heightened interest in improving accountability relationships in the health sector and in rapidly scaling up priority interventions, there is an increasing amount of interest in and experimentation with contracting-out. Overall, while the review of the selected studies suggests that contracting-out has in many cases improved access to services, the effects on other performance dimensions such as equity, quality and efficiency are often unknown. Moreover, little is known about the system-wide effects of contracting-out, which could be either positive or negative. Although the study results leave open the question of how contracting-out can be used as a policy tool to improve overall health system performance, the results indicate that the context in which contracting-out is implemented and the design features of the interventions are likely to greatly influence the chances for success.

Keywords Contracting-out, primary health care services, private sector, literature review

KEY MESSAGES

- While the review of the selected studies suggests that contracting-out has in many cases improved access to services, the effects on other performance dimensions such as equity, quality and efficiency are often unknown.
- Little is known of the health system-wide effects of contracting-out, which could be either positive or negative.
- The context in which contracting-out is implemented and the design features of the interventions are likely to greatly influence the chances for success.

Introduction

Over the last 10 years, an increasing number of countries have turned to contracting-out as a means of improving the

performance of their health systems. Recent experiences include contracting-out of non-government health providers in Afghanistan, Bangladesh, Cambodia, Guatemala, Haiti and India for the provision of clinical, reproductive, preventive and reproductive health services. Current interest in contracting-out, as a contractual arrangement by which the government (purchaser) provides compensation to private providers (contractors) in exchange for a defined set of health services for specified target populations, is driven by a number of factors, including: the need to rapidly scale-up new global health initiatives that target health problems such as HIV/AIDS,

¹ National Institutes of Health, Fogarty International Center, 31 Center Drive – MSC 2220, Bethesda, MD 20892, USA.

² Tulane University, School of Public Health and Tropical Medicine, 1440 Canal Street, New Orleans, LA 70112, USA.

³ Private consultant, 8500 Carlynn Drive, Bethesda, MD 20817, USA.

* Corresponding author. Tulane University, School of Public Health and Tropical Medicine, 1440 Canal Street, New Orleans, LA 70112, USA.
E-mail: hotchkis@tulane.edu

tuberculosis and malaria; frustrations regarding the availability, quality and efficiency of centralized publicly provided services; shortages of public health care personnel; poor health worker incentives and motivation in public health care facilities; public preferences for private care (as evidenced by the heavy reliance on households as the largest source of funds in most low-income and many middle-income countries); and the growth in recent years of non-governmental organizations (NGOs), franchises and social marketers.

However, contracting-out remains controversial. Despite its potential to improve service delivery performance by stimulating competition among providers and providing economic incentives for improved performance by linking payment to provider performance, critics claim that, in many developing country contexts, contracting-out may be unlikely to achieve its intended objectives because: the administrative costs are high; the market assumptions regarding the number of private providers to compete for contracts are unrealistic; it is possible that contracting may result in further fragmentation of the health system; and governments with weak capacity to deliver services may also be weak in a stewardship role (Palmer *et al.* 2006).

Unfortunately, the debate on its effectiveness has not been settled, and the question of how and under what conditions contracting-out can be used as a policy tool to improve health system performance remains unanswered, in part because evidence of the effectiveness of contracting-out is scarce. There have been several attempts to review the evidence of the effects of contracting-out in developing countries. The earliest review was conducted by Mills and Broomberg in 1998, when contracting-out initiatives were just becoming popular, the contracted services included mostly non-clinical services and hospital care, and the literature on contracting evaluation was limited. The authors found that in some cases (e.g. Zimbabwe and South Africa), contracted providers could provide services of the same or higher quality at lower cost, while in other cases, there were no significant differences in performance between contracted and public providers (e.g. Ghana and Tanzania). It was concluded that the results were mixed and it was too early to judge the long-term effects of contracting-out interventions.

The second literature review, performed by England (2004), focused on the effect of contracting-out on equity in access, specifically the capacity of contracting-out to improve access to services among the poor. England concluded that although forms of contracting were in place in many countries and there was a growing literature on contracting experiences, few of these experiences were subject to proper evaluation methods, particularly with respect to their impact on the poor. Rather than making conclusions on whether contracting-out can be used as a policy tool to improve equity in access to contracted services due to limited evidence, the author discussed the potential contracting strategies for improving equity.

The third and the most recent review, conducted by Loevinsohn and Harding (2005), assessed 10 developing country cases for which at least a before-and-after comparison was performed on health delivery performance indicator(s) associated with the objectives of the contracting-out initiatives. The authors concluded that contracting for the delivery of

primary care can be very effective, that improvements can be rapid, and that contracting for health service delivery should be expanded and evaluated rigorously.

This literature review attempts to improve the evidence base on the effectiveness of contracting-out in a number of ways. First, it focuses on the effects of contracting-out on both programme and health system performance. While the objectives of contracting-out projects are typically defined at the programme-level, we are also interested in better understanding how attainment of project-level objectives influences health systems performance. The effects on health systems are particularly important. For example, if the objectives of a project are to increase coverage of services and the quality of care, these objectives can be achieved at a cost higher or lower than public provision, and/or at reduced or improved equity in access. Second, the review focuses only on primary health care services in order to ensure that clear categories of contracting-out interventions are discussed and compared. Third, effectiveness is defined to include all four dimensions of health system performance—access, equity, quality and efficiency—rather than focusing only on a subset of these dimensions in order to avoid potentially biased conclusions on contracting-out's effectiveness on health system performance. Fourth, the review is based on selection criteria that are more inclusive than those used in previous reviews. While tight literature selection criteria can help to improve the quality of the literature, too little literature will affect the capacity to draw broad conclusions. Fifth, we include a number of new studies. Of the 16 studies selected for this review, five were published in 2005 or later, including three studies which offer new evidence of the effectiveness of large-scale interventions in Bangladesh and Cambodia considered by Loevinsohn and Harding (2005).

Methods

The literature reviewed comes from research studies from both electronic and manual sources. Literature was identified through the PubMed and Google search engines and by searching the websites of the World Bank, the World Health Organization, the United States Agency for International Development, and the United Kingdom Department for International Development. In order to comprehensively search the literature, the authors used broad keywords, such as 'contracting', 'performance-based pay', 'health' and 'developing countries'. Literature was also identified and gathered manually by checking the references in four previous literature reviews (Mills and Broomberg 1998; Rosen 2000; England 2004; Loevinsohn and Harding 2005) and searching literature stockpiled by the present authors.

The gathered documents, both journal publications and technical reports, were then screened according to two inclusion criteria:

- Content criterion: In order to ensure that clear categories of contracting-out interventions are discussed or compared, we only selected studies that evaluate contracting-out of private health care providers for multiple primary health care services in developing countries. Excluded from the review were evaluations of: contracting-in; contracting-out for

hospital and non-health services; contracting public providers; contracting-out the delivery of single health services (i.e. DOTS); and contracting-out in developed countries.

- Quality criterion: In order to capture a broad range of studies that assess the effectiveness of contracting-out, we included studies based on a wide range of research designs. These included experimental controlled designs; non-randomized controlled designs; pre-designed before-and-after designs without controls; retrospective before-and-after study designs (i.e. based on provider records); and cross-sectional study designs with controls.

All searches were performed between September 2003 and July 2004 and between February 2007 and April 2007. In cases where essentially the same study appeared both as a published article and as a non-published report, the published article was chosen. A number of studies were excluded on account of scant information on such criteria as the type of contracting-out intervention and the methodology used in the study. Of the over 130 publications we gathered, we selected for this literature review 16 research articles that assess 13 separate contracting interventions. Eight of the 16 studies were published in peer-reviewed journals, and the other nine studies are technical reports or policy briefs prepared by the World Bank, the Asian Development Bank, or the Brookings Institute. With the exception of the Bangladesh rural nutrition intervention and that on Cambodia's primary health care, all the interventions were evaluated by only one study.

Results

This section presents: (1) the main findings regarding the types of contracting-out interventions we reviewed, along with contextual factors that may influence impact at both a programme and a health systems level, (2) an overview of the quality of the studies included in the literature review, and (3) the findings of the review with respect to four dimensions of health systems performance: access, equity, quality and efficiency.

Forms of contracting-out and contextual factors

Table 1 lists the country interventions that were evaluated through the selected studies, along with selected intervention characteristics, study characteristics and key findings. All of the interventions evaluated are donor-sponsored initiatives in which the purchasers are usually national governments, and the providers consist of national NGOs (in 11 of the 13 cases), international NGOs (in Cambodia) or individual private providers (in South Africa). All the interventions evaluated were sub-national in scope, but the scale in terms of the target population varied widely, ranging from 15 million individuals in the case of the rural Bangladesh Integrated Nutrition Project (BINP) to 54 000 individuals in the case of the India child treatment programme.

The types of services contracted vary depending on the programme. In general, they can be categorized as follows:

- Specific services for defined health conditions—diarrhoea, ARI and fever among children (Chowdhury *et al.* 2002) and

malnutrition among children, adolescents and women (Marek *et al.* 1999; Khan and Ahmed 2002; OED 2005; Pelletier *et al.* 2005)

- Packaged and specified primary health care, including maternal, child health, and family planning services (Eichler *et al.* 2001) and various combinations of primary health care services (i.e. Mahmud *et al.* 2002; Lavadenz *et al.* 2001; Bloom *et al.* 2006)
- Unspecified primary health care (Vladescu and Radulescu 2002).

As indicated in column 2 of Table 1, the dominant majority of the contracting-out initiatives had the goal of improving access to the specified basic health services, with the assumption that the increase in cost-effective health services to underserved populations will increase equity in terms of access and health outcomes, and improve the overall efficiency of limited health resources. Specific programme objectives also included strengthening NGO capacity to deliver health care (Eichler *et al.* 2001), improving the health status of children and women (Marek *et al.* 1999; OED 2005; Pelletier *et al.* 2005), and improving quality of health services delivery (Chakraborty *et al.* 2000; Vladescu and Radulescu 2002; Bloom *et al.* 2006).

Both the programme- and health system-level effects of contracting-out are likely to depend on the context in which contracting-out is implemented and the financial incentives stipulated in the contract. In Table 1, we describe whether contracting was implemented to 'add to' or to 'replace' existing publicly provided services (if any), which gives an indication of the government's specific strategy of partnering with the private sector for the delivery of the specified services in the intervention areas. Of the 13 country cases, four were implemented in areas where publicly provided services were currently available (Bangladesh urban intervention, Haiti, India and South Africa), four were implemented in areas where publicly provided services were either unavailable or irregular (Bangladesh rural intervention, Guatemala, Madagascar and Senegal), and five were implemented to replace the publicly provided services that were currently available (Bolivia, Cambodia, Costa Rica, Croatia and Romania).

We also present in Table 1 information on whether the contract stipulated 'pay-for-performance' features, which is defined by whether payment was 'conditional on taking a measurable action or achieving a predetermined performance target' (Eichler 2006). In addition to information on whether payments were based on fixed-prices, fee-for-service or capitation, this indicator of 'pay-for-performance' is intended to gauge whether health information was actually used to provide financial incentives to providers, which could potentially influence all aspects of programme and health systems performance, including coverage and utilization rates, service quality and efficiency. Of the 13 cases included in Table 1, seven were characterized by 'pay-for-performance' features. Of these seven contracts, two stipulated bonuses for good performance (Bangladesh urban intervention, Haiti) and five stipulated that payments be withheld for poor performance (Bolivia, Cambodia, Costa Rica, Madagascar and Senegal). For the other six countries, the articles we reviewed provided no indication of 'pay-for-performance' contractual features.

Table 1 Summary of studies on contracting-out for primary health care services

Country and studies	Primary services covered and stated programme objectives	Added to or replaced existing publicly provided services	Payment based on performance	Type of research design and data	Performance indicators	Key findings
(1) Bangladesh (Khan and Ahmed 2002; OED 2005; Pelletier <i>et al.</i> 2005)	Growth monitoring, and nutritional support for pregnant and lactating women and for children (access, quality)	Contracting implemented in rural areas where public sector provides no organized nutritional services	No, fixed price payments were stipulated in contract	Pre-designed before-and-after study with controls based on household survey data (OED 2005) Cross-sectional design with controls based on provider survey data (Khan and Ahmed 2002)	Access <ul style="list-style-type: none"> • Anthropometry of children, women and adolescent girls • Programme participation • Knowledge and practices • Birth weight Quality <ul style="list-style-type: none"> • Child anthropometry Efficiency <ul style="list-style-type: none"> • Cost/individuals enrolled • Cost/individuals participating • Cost/adult equivalents participating • Cost/person-days enrolled • Cost/person-days participating 	<ul style="list-style-type: none"> • Positive effect on knowledge and prenatal care use, on the use of available services such as vitamin A and iron supplementation, and on practices concerning infant feeding • No clear additional effect on child nutritional status, weight gain during pregnancy, or birth weight • Contracted NGO facilities were not found to be more efficient in the delivery of nutrition services when cost per person-days of service delivered is considered
(2) Bangladesh (Mahmud <i>et al.</i> 2002)	Primary care (immunization, prenatal and obstetric care, family planning, health communications, disease treatments) (access, equity)	Added to existing publicly provided services	Yes, performance bonus included in the contract	Pre-designed before-and-after study with controls based on household and provider survey data	Access <ul style="list-style-type: none"> • % of health centres providing immunization • % of health centres providing family planning method • % of health centres providing laboratory (haemoglobin) tests Quality <ul style="list-style-type: none"> • % of clients reporting that waiting times were acceptable • % of prescriptions provided with a specific diagnosis 	<ul style="list-style-type: none"> • Contracted NGOs did much better than public sector for the specified indicators • Expenditures for service delivery among NGOs and public sector comparable • Improved access to primary care by the urban poor
(3) Bolivia (Lavadenz <i>et al.</i> 2001)	Primary health care focusing on maternal and child health (access, quality)	Replaced existing publicly provided services	Yes, contracting was based on achieving process and outcome indicators, but there was no specific information	Pre-designed before-and-after study with-out controls based on routine reporting system data	Access <ul style="list-style-type: none"> • No. of birth deliveries in hospital and primary care • No. of outpatient visits 	<ul style="list-style-type: none"> • Outpatient consultations increased by 55% in the contracted network (83% in the hospital and 18% in the network's primary care centres) • Institutional deliveries increased by 41% and the percentage of deliveries in the primary care centres grew from 5% of the total to 9%

(4) Cambodia (Bhushan <i>et al.</i> 2002; Schwartz and Bhushan 2004; Bloom <i>et al.</i> 2006)	Immunization, family planning, antenatal care, provision of micronutrients and other nutritional support, and simple curative care (access, quality, efficiency)	Replaced existing publicly provided services	Yes, contract stipulated penalties for non-achievement of targets. In at least one instance, the government suspended payment for inadequate performance	Pre-designed experimental controlled study with random assignment based on household and provider survey data	<p>Access</p> <ul style="list-style-type: none"> • Service utilization <p>Equity</p> <ul style="list-style-type: none"> • Service use by the poor <p>Quality</p> <ul style="list-style-type: none"> • Health centre management indicators • Perceived quality of care • Incidence of reporting sickness • Incidence of diarrhoea • Infant mortality <p>Efficiency</p> <ul style="list-style-type: none"> • Total, public and household costs 	<ul style="list-style-type: none"> • Large positive and significant effects on contracted service utilization rates • Positive and significant effect on health • Little effect on non-targeted service utilization rates • Positive and significant effects on use of public facilities • Negative effect on perceived quality of care • Negative effect on incidence of reporting an illness and diarrhoea • Negative effect on private out-of-pocket spending per capita, positive effect on public spending per capita, and no effect of total health spending, compared with traditional public delivery • Increase in access to basic health care and lower per capita private spending by the under-served poor
(5) Costa Rica (Cercone <i>et al.</i> 2005)	Primary health care services (access, efficiency, quality)	Replaced existing publicly provided services	Yes, contract stipulates penalties for not achieving 85% of established performance targets	Retrospective design using post-intervention time series data on routine reporting system data and cross-sectional design with controls	<p>Access</p> <ul style="list-style-type: none"> • Service utilization (7 indicators) <p>Quality</p> <ul style="list-style-type: none"> • General mortality • Infant mortality <p>Efficiency</p> <ul style="list-style-type: none"> • Use of general, specialist, emergency, non-medical and first time care • Costs per capita 	<ul style="list-style-type: none"> • Increased use of general care and decreased use of specialist care per capita • Use of non-medical, emergency and first time visits per capita were not different from the traditional public clinics • Expenditures per capita in contracted clinics 30% lower compared with traditional public clinics • Mortality the same for both groups
(6) Croatia (Hebrang <i>et al.</i> 2003)	Primary health care services (access, quality, efficiency)	Replaced existing publicly provided services	No, capitated payments not based on performance	Pre-designed before-and-after study with controls based on provider survey data on perceptions	<p>Access</p> <ul style="list-style-type: none"> • Possibility of obtaining precise first visit appointment inside working hours • Possibility of obtaining precise follow-up appointment inside working hours • Scheduling of visits by telephone 	<ul style="list-style-type: none"> • Contracted providers showed significant increases in the possibility of obtaining precise first and follow-up visits and scheduling visits by telephone compared with non-privatized group

(continued)

Table 1 Continued

Country and studies	Primary services covered and stated programme objectives	Added to or replaced existing publicly provided services	Payment based on performance	Type of research design and data	Performance indicators	Key findings
(7) Guatemala (Danel and La Forgia 2005)	Basic package of services, giving priority to prevention, maternal and child care, and basic curative care (access, equity, quality, and efficiency)	Contracting implemented in rural areas where public care was irregular or unavailable	No, performance targets were written into contracts, but were not specified due to an absence of baseline data	Cross-sectional study with controls based on household and provider survey data	Access <ul style="list-style-type: none"> • Service utilization Quality <ul style="list-style-type: none"> • Client satisfaction Efficiency <ul style="list-style-type: none"> • Unit and per capita costs • Labour productivity 	<ul style="list-style-type: none"> • Utilization rates of immunizations, prenatal care and ORS under contracting-out model were similar to traditional public delivery model, but inferior to contracting-in model • Client satisfaction reported to be higher under contracting-out than under traditional public delivery • Results on economic efficiency were mixed: NGOs had significantly higher unit costs but significantly lower per enrollee costs for both the basic benefits package and for specific services compared with traditional public service delivery
(8) Haiti (Eichler <i>et al.</i> 2001)	Maternal, child health, and family planning services (access, quality, efficiency)	Added to pre-existing government services, NGO services were already available	Yes, contract stipulated that NGOs could receive bonuses based on performance that could equal as much as 10% of historically established budgets	Pre-designed before-and-after study with-out controls based on household survey data	Access <ul style="list-style-type: none"> • % of women using ORT to treat diarrhoea in children • Immunization coverage • Coverage of 3 prenatal visits Quality <ul style="list-style-type: none"> • % of clinics with at least 4 modern methods of family planning • % of women using ORT correctly • Discontinuation rate for oral and injectable contraceptives 	<ul style="list-style-type: none"> • Improvement in immunization coverage and availability of modern contraceptive methods • Proportion of mothers who reported using ORT increased and the proportions of mothers who reported using ORT and did so correctly also increased significantly in two of three NGO areas • Performance in prenatal visits and reducing the discontinuation rates for oral contraceptives and injectables was relatively weak
(9) India (Chakraborty <i>et al.</i> 2000)	Treatment of childhood illness according to WHO guidelines (quality)	Added to pre-existing government services, NGO services were already available	No	Pre-designed before-and-after study with-out controls based on provider survey data	Quality <ul style="list-style-type: none"> • % of diagnoses using watch or timer to measure respiratory rate • % of treatment recommending ORS for diarrhoea cases • % of diagnoses asking about history of illness • % of diagnoses touching child as part of examination 	<ul style="list-style-type: none"> • Statistically significant increase in quality-related indicators

(10) Madagascar (Marek <i>et al.</i> 1999)	Nutrition services (monthly growth monitoring for children, education to women, referral, food supplementa- tion, access to water stand pipes) (access, quality)	Contracting imple- mented in areas where public care was irregular or unavailable	Yes, minimum thresholds were identified and measured, and contracts were ter- minated for poor performance	Pre-designed before- and-after study with controls based on household survey data	Access <ul style="list-style-type: none"> • % of children weighed monthly in the cohort of beneficiaries • % of women attending the weekly health and nutrition education sessions • % of children malnourished in cohort Quality <ul style="list-style-type: none"> • Child anthropometry 	<ul style="list-style-type: none"> • Service coverage increased • Malnutrition rate decreased
(11) Romania (Vladescu and Radulescu 2002)	Primary health care (preventive and curative care) (access, quality, efficiency)	Replaced traditional public sector deliv- ery of services	No, the payments were based on both fee-for-service and capitation mechanisms	Retrospective design (using post-interven- tion time series data on clinic level outputs)	Access <ul style="list-style-type: none"> • Immunization coverage • Number of consultations • Number of patients registered • Share of patients getting pre- and post-natal check-ups • Number of home visits Quality <ul style="list-style-type: none"> • Patient satisfaction 	<ul style="list-style-type: none"> • Increased patient satisfaction • Increased use of preventive care • Increased output (the number of consultations) • Weak regulatory and moni- toring capacity • No proven improvement in access to the under-served • No reduction in use of hospital service
(12) Senegal (Marek <i>et al.</i> 1999)	Nutrition services (monthly growth monitoring for children, education to women, referral, food supplementa- tion, access to water stand pipes) (access, quality)	Contracting imple- mented in areas where public care was irregular or unavailable	Yes, minimum thresholds were identified and measured, and contracts were ter- minated for poor performance	Pre-designed before- and-after study with controls based on household survey data	Access <ul style="list-style-type: none"> • % of children weighed monthly in the cohort of beneficiaries • % of women attending the weekly health and nutrition education sessions • % of children malnourished in cohort Quality <ul style="list-style-type: none"> • Child anthropometry 	<ul style="list-style-type: none"> • Service coverage increased • Malnutrition rate decreased
(13) South Africa (Mills <i>et al.</i> 2004)	Primary health care services (curative only) and drugs provided by indivi- dual GP contracts (access)	Added to existing nurse-based public clinics in poor communities	No, contract stipu- lated fee for service plus flat fee per prescription	Cross-sectional study with controls based on provider survey data, supplemented with record reviews and focus group discussions	Quality <ul style="list-style-type: none"> • Structural quality of care indicators • Knowledge of providers • % of STI, diabetes and hyper- tension patients treated cor- rectly Efficiency <ul style="list-style-type: none"> • Input shares and unit costs 	<ul style="list-style-type: none"> • Cost per visit of contracted GPs similar to public clinic's • Clinic staff costs as a percen- tage of total costs higher among contracted GPs than among public clinics • Structural quality of care indi- cators worse among con- tracted GPs than among public clinics • Knowledge of correct treat- ment for STIs lower among contracted GPs than among public clinic staff

Quality of the studies

Table 1 provides an overview of the characteristics of the studies reviewed (columns 5 and 6). A few general key findings are noted with regard to the research design, indicators, data and overall quality of the studies.

First, there is wide variation in the types of research design used in the studies, ranging from a pre-designed experimental random controlled study with random assignment of the intervention (Cambodia), to pre-designed before-and-after studies with controls (Bangladesh BINP, Bangladesh urban intervention, Croatia, Madagascar, Senegal) and without controls (Bolivia, India, Haiti), to retrospective post-intervention time-series studies based on routine reporting system data (Costa Rica, Romania), to pre-designed cross-sectional studies with controls (Bangladesh BINP, Costa Rica, Guatemala, South Africa). While each of these types of studies presents useful findings either on differences between contracting-out and existing public service provision or on differences among contracted out areas across time, the first two types are the most rigorous for assessing the impact of contracting-out on performance dimensions such as service utilization and equity, as they potentially allow one to assess, in varying degrees, the counter-factual question, 'what would have happened had the intervention not been implemented?'

It should be pointed out that the evaluation of the largest of these experiences, the Bangladesh BINP intervention, has been the subject of intense controversy (Save the Children UK 2003; Pelletier *et al.* 2005) due to concerns about a number of potential threats to internal validity, including the small number of control groups and the criteria used to select them, cross-contamination of the control group, the lack of controls for confounders, and the choice of indicators, among others. As described by Pelletier *et al.* (2005), this led to a re-analysis of the data by OED (2005), and as a result, more tempered conclusions than those reported in the literature review by Loevinsohn and Harding (2005).

Second, in terms of methodology, most of the studies are descriptive, which does not allow one to control for the influence of potential confounders on programme effects. Only four of the 13 interventions (Bangladesh BINP, Cambodia, Costa Rica and Guatemala) were evaluated through the use of regression analysis to assess the influence of the programme on health care seeking and/or provider behaviour.

Third, in terms of performance indicators, 11 of the 13 interventions were assessed with indicators of access, including one (Cambodia) that included indicators of both focal and non-focal health care services, seven were assessed with indicators of quality (which include indicators of structural attributes of providers, the process of health care, and health outcomes), one was assessed with indicators of equity, and five were assessed with indicators of efficiency. Only the Cambodia intervention was evaluated with the use of all four types of indicators.

Fourth, only seven of the 13 cases were evaluated with the use of population-based household data, and of these seven, only five (Bangladesh BINP, Bangladesh urban PHC, Cambodia, Madagascar and Senegal) were based on a pre-designed 'before-and-after' research design with controls, which allows one to assess the effects on utilization and equity. For the studies that assessed efficiency, all were based on provider data

collected either at one point (Bangladesh BINP, Costa Rica, Guatemala, South Africa) or two points (Cambodia) in time.

Health systems performance

This section reviews the implementation of contracting-out initiatives within the health sector, including evidence of their impact on access, equity, quality and efficiency. We also review the factors that influence the effectiveness of contracting-out on health outcomes where the literature permits.

Access

In a sample of six studies comparing contractor performance with government provision of the same services, Loevinsohn and Harding (2005) found that contractors were consistently more effective in terms of improving access to health care services. All four rigorous studies that looked at this dimension, using quasi-experimental research designs, found that contracting-out yielded positive results. Across the four studies, the net effect of contracting-out on the coverage rate of contracted services in the communities ranged from 9 to 26 percentage points.

Our literature review reinforces this theme. Consistently, contracting-out programmes whose objectives included increasing access to specified services, as measured by coverage rates, availability of services, and quantity of services provided and utilized, were associated with improvement. From a total number of 13 contracting-out projects we reviewed (Table 1), 12 were implemented with the explicit objective of improving access to the contracted health services. Of these 12 projects, 10 reported significantly positive results in increasing access to contracted health services. Moreover, the study by Bloom *et al.* (2006) found that contracting-out did not significantly affect the utilization of non-targeted health care services, after controlling for other factors, which is an indication that contracting-out did not harm health systems performance with respect to access to non-focal services. Overall, the literature supports the proposition that contracting-out can improve access to health services.

Equity

Our review suggests that the number of studies directly evaluating the effects of contracting-out on equity is quite limited. Among the 13 experiences we reviewed, only two had the clear objective of improving physical or economic access to basic health care by the poor (Bangladesh: Mahmud *et al.* 2002; Cambodia: Bloom *et al.* 2006). Both of these projects were rigorously evaluated and showed significant improvement in access by the targeted poor, indicating improvement in equity in access. In Bangladesh, the Urban Primary Health Care Project (Mahmud *et al.* 2002) contracted with NGOs to provide primary health care for the urban slums, and achieved significant improvement in access by the urban poor, indicating improvement in equity. In Cambodia, the intervention was found to provide more than proportional benefits to the poor, as health care utilization rates increased and the burden of out-of-pocket payments was eased among households in the bottom two socio-economic quartiles.

Other than these two cases, four contracting-out interventions were targeted to economically deprived communities

where publicly provided services were either irregular or unavailable [Senegal and Madagascar (Marek *et al.* 1999); Bangladesh (OED 2005; Pelletier *et al.* 2005); Guatemala (Danel and La Forgia 2005)]. For example, in Senegal and Madagascar, projects contracting nutritional services directly reach tens of thousands of malnourished children and their mothers, and the programmes fill a niche that had not been effectively met by the public sector. According to Marek *et al.* (2005), 79% of the costs of the Community Nutrition Project in Senegal are spent in poor target neighbourhoods. The authors point out that this achievement is more striking given the findings of other studies in Africa which indicate that the richest tend to benefit more than the poorest from public spending on health.

Based on the limited number of studies selected for this review, we conclude that contracting-out has the potential to improve equity in access to primary health care if the poor and the services that mostly benefit the poor are well targeted by the contracting-out initiatives. However, we are not able to answer the question of whether contracted private providers can perform better to improve equity than public providers because of a lack of sufficient evidence from comparative studies.

Quality

According to our review (Table 1), 11 out of the 13 experiences were assessed using one or more indicators of quality of care, either measures of structural attributes, process of care and/or health outcomes (Donabedian 1988). These studies can be divided into three categories: studies with uni-dimensional process indicators, studies with health outcome indicators, and studies with multi-dimensional measures.

Category 1: Studies with uni-dimensional structural or process indicators. Five of the 13 projects in our review (Romania: Vladescu and Radulescu 2002; Bangladesh: Mahmud *et al.* 2002; Haiti: Eichler *et al.* 2001; India: Chakraborty *et al.* 2000; Guatemala: Danel and La Forgia 2005) included indicators—such as patient satisfaction, patient waiting time and the percentage of disease treatment interventions that were in accordance with standardized medical practice guidelines—that map different aspects of quality. In these studies, evaluation results were positive in all four cases. This may be largely due to the narrow dimensions of quality measured in each case, making it easier to produce and measure changes.

In Romania (Vladescu and Radulescu 2001), an output-based contracting project with an emphasis on rural areas included higher patient satisfaction as one of the project's objectives, alongside helping providers to become more attuned to client needs. In this study, doctors notably increased their output and provided emergency and weekend coverage in higher percentages. At the same time, patient surveys revealed that family doctors had become more client-oriented and that the contracting-out interventions led to higher levels of client satisfaction.

In Guatemala, where a large intervention was implemented with the aim of improving service quality, the authors found that client satisfaction was higher among clients of contracted services vs. clients of traditional public services (Danel and La Forgia 2005).

In Haiti, a pay-for-performance initiative with NGOs (Eichler *et al.* 2001) included only one client-based measure of quality: the percentage reduction in waiting time for childcare. The study documented an improvement in this dimension of quality.

In India, a contracting initiative designed to improve the management of childhood illness by private practitioners incorporated indicators with a more clinical orientation to measure quality of care: the percentage of disease treatment interventions that followed standardized medical practice guidelines. A programme evaluation (Chakraborty *et al.* 2000) demonstrated improvements ranging from 25% to 75% on selected indicators. For example, the percentage of doctors who used a watch or timer to measure respiratory rate improved from 14% before the intervention to 71% after. Similarly, the percentage of doctors recommending ORS for diarrhoea improved from 16% to 48%. However, it should be noted that these changes were measured only a short time—7 months—after implementation, making it difficult to tell whether such changes were sustained.

In Bangladesh, a study of the contracting-out project that provided primary health care for the urban poor used 'the percentage of clients saying waiting time was acceptable' as an indicator of quality. Study results revealed that NGO providers performed better in this regard than public providers.

Category 2: Studies with health outcome indicators. Four of the 13 projects in our review (Madagascar: Marek *et al.* 1999; Senegal: Marek *et al.* 1999; Bangladesh: OED 2005; Costa Rica: Cercone *et al.* 2005) used health outcomes as indicators of quality. With the exception of Costa Rica, which focused on primary health care service delivery, the common feature of these contracting-out projects is that the services are for improvements in nutritional status. Therefore, the indicators for measuring changes in nutritional status are more likely to reflect the effect of interventions because of the established link between the interventions and the health outcomes.

For the Costa Rica intervention, the authors did not find a difference in infant mortality rates between the areas where contracting-out was implemented and the control areas. For two of the three nutrition interventions, there is evidence of improvements in nutritional status (Madagascar: Marek *et al.* 1999; Senegal: Marek *et al.* 1999; Bangladesh: OED 2005).

The contracting-out of nutritional services in Senegal and Madagascar (Marek *et al.* 1999) used 'percentage of children malnourished in the cohort' as a quality indicator. The authors found that the percentage of children malnourished declined rapidly, ostensibly demonstrating diminished malnutrition among the children the projects reached. In Senegal, a community-based study in one city confirmed, with two cross-sectional surveys, that malnutrition rates decreased in entire neighbourhoods that benefited from the project. The study showed that, after 17 months of project implementation, severe malnutrition disappeared among children aged 6–11 months, going from 6% to 0%, while moderate malnutrition declined among those aged 6–35 months from 28 to 24%. Marek *et al.* seem fairly confident that such impact was directly linked to the project because there were no significant changes in socio-economic characteristics between the baseline and the impact studies. Additionally, the study showed that

malnutrition rates were lower among children who had benefited in the past from the project compared with those who never took part. Specifically, 23% of children aged 12–17 months who had taken part in the project in the past experienced low weight, compared with 30% among those who had never taken part.

For the large-scale rural nutrition project in Bangladesh (BINP), the study by OED (2005) suggests that there was no evidence of an additional effect of the intervention on child nutritional status, weight gain during pregnancy or birth weight, although the authors did find evidence of improvements in prenatal care use and Vitamin A and iron supplementation coverage. The finding regarding anthropometric outcomes differs from an earlier study based on the same data reported in Loevinsohn and Harding (2005).

Category 3: Studies with multi-dimensional measures. Two of the 13 interventions (Cambodia: Bhushan *et al.* 2003 and Bloom *et al.* 2006; South Africa: Mills *et al.* 2004) used multi-dimensional measures—indicators covering two or more dimensions of structure, process and health outcomes—to evaluate quality of care.

In the Cambodia studies, quality of primary health care was measured at both the health centre and the referral hospital levels with structural, process and health outcome indicators. In the study by Bhushan *et al.* (2003), quality of care at both health centres and referral hospitals was measured through direct observation techniques. The authors used a set of indicators to construct a health care quality score, and found that the quality score for contracted providers was slightly better than the score for public providers (the findings achieved statistical significance). In the analysis by Bloom *et al.* (2006), the results of regression models in which the dependent variables are incidence of reporting a sickness, incidence of diarrhoea among children, infant mortality and client satisfaction suggest that the intervention had a negative effect on incidence of both reporting a sickness and diarrhoea, but not on infant mortality, compared with areas served by traditionally run public facilities. Surprisingly, the intervention was also found to be negatively associated with client satisfaction, after controlling for other factors. The authors offer a number of potential explanations for this finding, including the possibility that contracting was drawing in clients who would otherwise be visiting drug sellers for treatment, in which waiting time is typically shorter, and that people visiting after the introduction of the intervention had a different idea of what constitutes quality of care.

In the South Africa study, Mills *et al.* (2004) compared contracted General Practitioners (GPs) and public facilities and found that indicators of structural quality of care and knowledge of correct treatment of sexually transmitted diseases were lower among GPs than among staff at comparison public facilities. One potential explanation for the latter finding is that GPs work in remote areas and may lack opportunities for continuing medical education and contact with peers. The authors also note that GPs were paid on a fee-for-service basis, which may have encouraged high volumes of patients and minimal investment in inputs.

In general, our review suggests that contracting-out projects are more likely to improve quality of care if: (1) quality is

operationally defined and indicators associated with quality are well developed; (2) quality indicators are linked to the payment to providers (although the number of interventions that incorporated pay-for-performance features is small); and (3) quality indicators (e.g. health outcomes) have an established association with utilization of contracted services. Overall it is difficult to ascertain whether contracting-out improves quality of care compared with direct public provision, as quality has been either undefined or inconsistently defined across different contracting-out projects, and because most evaluations do not include control groups. For the few studies with a control group, the number of cases (or providers) was too small to produce reliable results.

Efficiency

Despite the growing interest and experience with contracting-out in developing countries, there is still relatively little evidence on the impact of these initiatives on efficiency. This is all the more surprising given that a key rationale for the interest in contracting is its perceived potential for greater efficiency compared with direct public sector provision. Yet, in our review, efficiency improvement was an explicitly stated objective for only two of the 13 primary health care cases, and assessments of the relative efficiency of contracted private providers vs. public providers were conducted in only five studies (Bangladesh: Khan and Ahmed 2002; Cambodia: Bloom *et al.* 2006; Costa Rica: Cercone *et al.* 2005; Guatemala: Danel and La Forgia 2005; South Africa: Mills *et al.* 2004).

Overall, these studies provide mixed findings on the influence of contracting-out on programme efficiency. Two studies suggest that, from the perspective of the government, contracted private providers are either less efficient or more costly than public providers (Bangladesh BINP: Khan and Ahmed 2002; Cambodia: Bloom *et al.* 2006), two provide mixed findings (Guatemala: Danel and La Forgia 2005; South Africa: Mills *et al.* 2004), and one study found contracted private providers to be less costly than public providers (Costa Rica: Cercone *et al.* 2005).

In Bangladesh, Khan and Ahmed (2002) measure the relative efficiency of private vs. public Community Nutrition Centres by estimating the costs per number of individuals enrolled, the number actually participating in the programme and the person-days of service delivered. The results suggest that the NGOs were more efficient in the delivery of nutrition services than public providers when cost per enrollee is used as the efficiency indicator, but were less efficient when cost per person-days of service delivered, which the authors believe to be a better indicator, is considered. One potential explanation for this finding is that NGOs may have over-enrolled individuals in the programme, which is supported by their research findings on the underlying nutritional status of the populations in areas served by NGO facilities. However, the study by OED (2005) found no evidence of the effectiveness of the BINP project on nutritional outcomes, a strong indication that this highly costly programme is not cost-effective compared with public service delivery.

In Cambodia, the study by Bloom *et al.* (2006) found the contracted services were more costly to the government than direct provision. On a per capita basis, contracting-out increased

public health spending by a significant and very substantial \$2.93 per capita in 2003, against a comparison mean of \$1.59. However, from a societal perspective, the authors found that total costs per capita did not increase, largely due to the intervention having a strongly negative influence on household out-of-pocket expenditures. Thus, the contracted NGOs performed better than public institutions with similar amounts of total financial input.

The Guatemala and South Africa studies found mixed findings regarding the relative efficiency of contracted private vs. public providers. In Guatemala, NGOs had significantly higher unit costs per capita both for the basic benefits package and for specific services compared with traditional service delivery, but they had significantly lower per enrollee costs than in traditional public service delivery (Danel and La Forgia 2005). The reason for this difference is not clear. In South Africa, Mills *et al.* (2004) found that costs per curative health care visit for contracted GPs and public clinics were similar, but that the costs structures varied substantially, with GPs having substantially lower capital cost shares compared with public clinics.

Only in the Costa Rica study were the results of contracting-out on efficiency found to be positive (Cercone *et al.* 2005). The authors' results suggest that cost per capita was lower in areas serviced by contracted providers than in the areas served by traditional public providers. The results also suggest that the NGOs achieved costs saving by reducing the technological intensity of health care services provided, and that the possibility of being penalized for not achieving the targets stipulated in the contract provided effective financial incentives for the providers to rationalize care in ways that reduce costs.

One problem with the studies described above is that either they only include operational costs at the level of the provider, or they do not clarify whether they include other costs, such as procurement and administrative costs to the purchaser. This leaves unanswered the question of whether contracting-out is ultimately less expensive to the purchaser than direct provision if one accounts for the costs of contract management, monitoring and evaluation. It is possible that contracting-out does not save the purchaser money if one factors in these other expenses. For example, in a South Africa study not included in our literature review, the authors (Mills 1997) found generally lower production costs at contracted hospitals, but the benefits in terms of financial savings accrued almost entirely to the contracted hospitals themselves, not to the government, because of increased governmental spending on transaction costs. Ultimately, the answer to this question is the one that will interest purchasers most and it still requires further investigation before sound conclusions can be drawn.

None of the studies in our review provide information about the actual costs of managing contracted services. Marek *et al.* (1999), looking at contracted nutrition services in Senegal and Madagascar, estimated the cost of executing and monitoring a contract at 13–17% of the overall project budget. Specifically, the authors mentioned that 17% was the amount charged by a Senegalese NGO that acted as a management unit to contract other NGOs to deliver nutrition services. In Madagascar, the costs of technical coordination and project management were 13% of project costs. Such figures will probably vary depending

on the context and on the health intervention in question, but this study does at least provide estimates of transaction costs.

In conclusion, studies suggest that contracting-out of health services to private providers has the potential to lower production costs for similar services. However, it remains unclear whether contracting lowers the overall cost of health service delivery, including costs to the purchaser for contract management and monitoring and evaluation. It has also not been possible to demonstrate that contracting-out increases the efficiency of the overall health system.

Discussion

The purpose of this study has been to review the literature on the effectiveness of contracting-out of primary health care services on both programme and health systems performance in both low- and middle-income countries. Given the heightened interest in contracting-out as a means of both improving accountability relationships in the health sector and rapidly scaling up priority interventions, we believe that reviewing the evidence of this reform is particularly timely.

Our review of the available studies of programme-level effects suggests that contracting-out has produced mixed results. Almost all of the interventions reviewed have the stated objective of improving access to services, and many of these may have been designed primarily to achieve that particular goal. As such, the evidence suggests that contracting-out has achieved impressive results in improving both the availability of services and population-based utilization rates, particularly in under-served areas where publicly provided services are irregular or unavailable. However, many of these same studies did not assess other dimensions of programme performance such as equity, quality and efficiency. In fact, based on our review, the number of contracting-out interventions in which performance dimensions such as equity (one of the 13 cases), efficiency (five of the 13 cases) and quality (six of the 13 cases) were examined is extremely limited, making it difficult to assess what the effect on these other dimensions may have been.

The two largest cases of contracting-out in recent years, a primary health care programme in Cambodia and a nutrition programme in Bangladesh, have been extensively evaluated, but have produced disparate findings. In Cambodia, the only case where a randomized evaluation is available and where all four performance dimensions were examined, Bloom *et al.* (2006) found that contracting-out can achieve impressive results. Contracted international NGOs achieved large improvements in the receipt of Vitamin A by children, in antenatal care and immunization, as well as in reducing rich-poor disparities in the use of health care services, and in improving the quality of care. The authors also found that contracting-out was substantially more expensive to the government compared with traditional public service provision, but it substantially reduced the level of household out-of-pocket expenditures on health care services.

For the Bangladesh BINP programme, which aimed to improve nutrition outcomes in rural areas, the available evidence suggests that contracting-out was not as successful. Although results of a study by OED (2005) do find that

contracting-out nutrition services led to improvements in prenatal care use, coverage of Vitamin A and iron supplementation, and knowledge among women of better intra-household health practices, there was no evidence of any additional effect of the programme on child nutritional status, weight gain during pregnancy, or birth weight. Moreover, a study by Khan and Ahmed (2002) suggests that contracted NGO facilities are relatively less cost-effective in delivering nutrition services when compared with comparable public facilities.

As pointed out by previous researchers, findings on the effectiveness of contracting-out on programme performance must be understood in the context in which different contracted providers are working (Mills *et al.* 2004). A number of characteristics may be important, including the capacity and experience of both purchaser and providers, the degree of managerial autonomy of the contracted provider, as well as the attributes of the contract, which include the type of services covered, the duration of the contract, the procurement process, the specification of performance requirements, and provider payment mechanisms (Liu *et al.* 2007). While the studies we reviewed do not allow us to assess the importance of most of these characteristics, our review suggests that some may matter. For example, the evidence presented in this review is consistent with the premise that contracting-out produces better results when contracts incorporate pay-for-performance features (i.e. Cambodia) compared with when they do not (i.e. Bangladesh BINP). However, this conclusion should be viewed as tentative, as the studies we reviewed indicate that only seven of the 13 interventions incorporated pay-for-performance features and we do not know enough about other interventions where this feature has not been reported.

Our review also suggests that there appears to be relatively little understanding of how contracting-out primary health care services influences the broader health system. That there is so little available evidence on the health systems effects of contracting-out greatly limits any conclusions that can be drawn from the studies we reviewed. In fact, of the 16 studies we reviewed, only the study by Bloom *et al.* (2006) in Cambodia examined one potential system-wide effect, whether contractors diverted effort from health services not explicitly targeted for improvement by the project, and found no evidence of this. There are a number of ways in which contracting-out could lead to either positive or negative effects, particularly in cases in which the magnitude of the investment in contracting is large, and where the emphasis of the programme is on rapid and efficient scale-up. These effects could be on equity, efficiency, access, quality and sustainability of health systems, which in turn influence the utilization and coverage of services not covered by the contract, and, ultimately, the burden of diseases from sources other than the focal diseases. As examples, introducing contracting in areas with existing public service delivery may result in further fragmentation of health care systems, and linking payment to specified services may lead to gaming of the system and, as a result, reduced availability and quality of non-focal services. In general, the effects of contracting-out could be intentional or unintentional, and the unintentional effects could have positive or negative consequences for health system performance (Bennett and Fairbank 2003).

There are several methodological limitations with our study. First, assessing the internal validity for many of the studies is difficult, particularly for those in which relatively little information is provided on the research and sampling design. Second, except for a few cases, information on the context in which contracting-out was implemented and on attributes of the contract was scanty, making it difficult to clearly annotate the form of the contracting and to assess the replicability of the experiences. Third, all but one of the studies are longitudinal studies without randomized designs and/or baseline data, or were cross-sectional, which results in problems with obtaining external validity. Fourth, there is a risk of 'publication bias', with both peer-reviewed and non-peer-reviewed studies reporting positive effects being more likely to be published.

Conclusions

Overall, while the review of the selected studies suggests that contracting-out has in many cases improved access to services, the effects on other performance dimensions such as equity, quality and efficiency are often unknown. Moreover, little is known of the system-wide effects of contracting-out, which could be either positive or negative. Although the study results leave open the question of how contracting-out can be used as a policy tool to improve overall health system performance, the results indicate that the context in which contracting-out is implemented and the design features of the interventions are likely to greatly influence the chances for success.

Our review suggests that more evidence is needed on the programme effects of contracting-out. Given the methodological shortcomings of the evidence base, particular emphasis should be placed on assessments that incorporate a more comprehensive treatment of the costs of contracting-out (from the perspectives of the purchaser, the provider and the household), longer time series, the use of multivariate methods at the individual and/or household levels, and the use of control groups. Continued research along the lines of Bloom *et al.* (2006) would be of particular interest. Moreover, that there is potential for both positive and negative effects of contracting-out, both intentional and unintentional, on health system-wide performance suggests that it is of critical importance to monitor and evaluate the effects of such interventions on broader health systems. Because comprehensive evaluations of the effect of contracting-out on programme and health systems performance are difficult to do, they might best be done through a package of studies rather than through a single study. Such evaluation efforts might benefit from the use of a comprehensive conceptual framework, along the lines suggested by Liu *et al.* (2007), of the determinants of the impact of contracting-out on health systems performance.

Acknowledgements

The paper was prepared with financial support from the United States Agency for International Development through the Partners for Health Reformplus Project (PHRplus) and the Health Systems 20/20 Project, and from Abt Associates Inc., where the first and third authors were employed at the time.

The authors are grateful for the comments provided by Sara Bennett, Ricardo Bitran, Kara Hanson, Charlotte Leighton, Willy McCourt, Anne Mills, and two anonymous reviewers and for research assistance from Manisha Panwar.

References

- Bennett S, Fairbank A. 2003. The system-wide effects of The Global Fund to fight AIDS, Tuberculosis and Malaria: a conceptual framework. Technical Report No. 031. Bethesda, MD: The Partners for Health Reformplus Project, Abt Associates Inc.
- Bhushan I, Keller S, Schwartz B. 2002. Achieving the twin objectives of efficiency and equity: contracting health services in Cambodia. ERD Policy Brief Series, Number 6. Manila: Asian Development Bank, Economics and Research Department.
- Bloom E, Bhushan I, Clingingsmith D *et al.* 2006. Contracting for health: evidence from Cambodia. Unpublished Working Paper. Washington, DC: Brookings Institution.
- Cercone J, Briceño R, Gauri V. 2005. Contracting PHC services: the case of Costa Rica. In: La Forgia GM (ed.). *Health system innovations in Central America: lessons and impact of new approaches*. World Bank Technical Paper No. 54. Washington, DC: World Bank.
- Chakraborty S, D'Souza SA, Northrup RS. 2000. Improving private practitioner care of sick children: testing new approaches in rural Bihar. *Health Policy and Planning* **15**: 400–7.
- Chowdhury S. 2002. Educating mothers for health: output-based incentives for teaching oral rehydration in Bangladesh. Washington DC: World Bank.
- Danel I, La Forgia FM. 2005. Contracting for basic health services in rural Guatemala – comparison of performance of three delivery models. In: La Forgia GM (ed.). *Health system innovations in Central America: lessons and impact of new approaches*. World Bank Technical Paper No. 54. Washington, DC: World Bank.
- Donabedian A. 1988. The quality of care: how can it be assessed? *Journal of the American Medical Association* **260**: 1743–8.
- Eichler R. 2006. Can “pay for performance” increase utilization by the poor and improve the quality of health services? Discussion paper, Working Group on Performance-Based Incentives. Washington DC: Center for Global Development.
- Eichler R, Auxila P, Pollock J. 2001. Performance-based payment to improve the impact of health services: evidence from Haiti. *World Bank Institute Online Journal*, April.
- England R. 2004. Experiences of contracting with the private sector: a selective review. London: DFID Health Systems Resource Centre.
- Hebrang A, Henigsberg N, Erdeljić V *et al.* 2003. Privatization in the health care system of Croatia: effects on general practice accessibility. *Health Policy and Planning* **18**: 421–8.
- Karim R, Lamstein SA, Akhtaruzzaman M *et al.* 2003. The Bangladesh Integrated Nutrition Project Community-Based Nutrition Component Endline Evaluation. Dhaka, Bangladesh: University of Dhaka, and Medford, MA: Tufts University.
- Khan MM, S Ahmed. 2003. Relative efficiency of government and non-government organisations in implementing a nutrition intervention programme—a case study from Bangladesh. *Public Health Nutrition* **6**: 19–24.
- La Forgia GM, Mintz P, Cerezo C. 2005. Is the perfect the enemy of the good? A case study on large-scale contracting for basic health services in rural Guatemala. In: La Forgia GM (ed.). *Health system innovations in Central America: lessons and impact of new approaches*. World Bank Technical Paper No. 54. Washington, DC: World Bank.
- Lavadenz F, Schwab NS, Straatman YH. 2001. Redes publicas, descentralizadas y comunitarias de salud en Bolivia. *Pan-American Journal of Public Health* **9**: 182–9.
- Liu X, Hotchkiss DR, Bose S. 2007. The impact of contracting-out on health system performance: a conceptual framework. *Health Policy* **82**: 200–11.
- Loevinsohn B. 2001. Contracting for the delivery of primary health care in Cambodia: design and initial experience of a large pilot test. Washington DC: World Bank.
- Loevinsohn B. 2002. Practical issues in contracting for primary health care delivery: lessons from two large projects in Bangladesh. Washington DC: World Bank.
- Loevinsohn B, Harding A. 2005. Buying results? Contracting for health service delivery in developing countries. *The Lancet* **366**: 613–5.
- Mahmud H, Ullah Khan A, Ahmed S. 2002. Mid-term health facility survey—urban primary health care project. Dhaka: Mitra and Associates.
- Marek T, Diallo I, Ndiaye B, Rakotosalama J. 1999. Successful contracting of preventive services: fighting malnutrition in Senegal and Madagascar. *Health Policy and Planning* **14**: 382–9.
- Mills A. 1997. Contractual relationships between government and the commercial private sector in developing countries. In: Bennett S, McPake B, Mills A (eds). *Private health providers in developing countries: serving the public interest?* London: Zed Press.
- Mills A, Broomberg J. 1998. *Experiences of contracting: an overview of the literature*. Geneva: World Health Organization. Macroeconomics, Health and Development Series, No. 33.
- Mills A, Palmer N, Gilson L *et al.* 2004. The performance of different models of primary care provision in Southern Africa. *Social Science and Medicine* **59**: 931–43.
- Operations Evaluation Department (OED). 2005. *Maintaining Momentum to 2015? An impact evaluation of interventions to improve maternal and child health and nutrition outcomes in Bangladesh*. Washington, DC: World Bank.
- Palmer N. 2000. The use of private-sector contracts for primary health care: theory, evidence and lessons for low-income and middle-income countries. *Bulletin of the World Health Organization* **78**: 821–9.
- Palmer N, Strong L, Wali A, Sondorp E. 2006. Contracting-out health services in fragile states. *British Medical Journal* **332**: 718–21.
- Pelletier D, Shekar M, Du L, Kostermans K. 2005. The Bangladesh Integrated Nutrition Project Effectiveness and Lessons. Bangladesh Development Series – Paper Number 7. Dhaka: World Bank.
- Rosen JE. 2000. Contracting for reproductive health care: a guide. HNP/Population and Reproductive Health Thematic Group. Washington DC: The World Bank.
- Save the Children UK. 2003. Thin on the Ground – Questioning the Evidence Behind World Bank-Funded Community Nutrition Projects in Bangladesh, Ethiopia and Uganda. London: Save the Children Fund.
- Schwartz JB, Bhushan I. 2004. Improving immunization equity through a public-private partnership in Cambodia. *Bulletin of the World Health Organization* **82**: 661–7.
- Vladescu C, Radulescu S. 2002. Improving primary health care: output-based contracting in Romania. In: Brook PJ, Smith SM (eds). *Contracting for public health services: output-based aid and its application*. Washington DC: The World Bank.