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A Public-Private Partnership Improves Clinical Performance In A Hospital Network In Lesotho

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ABSTRACT Health care public-private partnerships (PPPs) between a government and the private sector are based on a business model that aims to leverage private-sector expertise to improve clinical performance in hospitals and other health facilities. Although the financial implications of such partnerships have been analyzed, few studies have examined the partnerships' impact on clinical performance outcomes. Using quantitative measures that reflected capacity, utilization, clinical quality, and patient outcomes, we compared a government-managed hospital network in Lesotho, Africa, and the new PPP-managed hospital network that replaced it. In addition, we used key informant interviews to help explain differences in performance. We found that the PPP-managed network delivered more and higher-quality services and achieved significant gains in clinical outcomes, compared to the government-managed network. We conclude that health care public-private partnerships may improve hospital performance in developing countries and that changes in management and leadership practices might account for differences in clinical outcomes.

Lesotho is an emerging middle-income country in southern Africa that aims to achieve equitable access to health services and good quality of health care within a context of high rates of HIV and TB prevalence and high levels of maternal mortality.¹ Approximately 23 percent of the population reside in the capital district of Maseru,² where the largest hospital, with more than 400 beds, acts as a national referral hospital.

In 2008 the government of Lesotho entered into a partnership with a private consortium for hospital services. At the time of this agreement, the national referral hospital and its three community-based clinics were struggling with the aging infrastructure of their facilities, human resource shortages, poor management practices, increasing costs of health services, and decreasing service quality.³ Faced with hav-

ing to make major investments in infrastructure, concerned about poor performance, and wanting to improve the cost-effectiveness of the facilities' operation,^{4,5} the government of Lesotho opted to replace the government-managed facility with a new hospital managed by the public-private partnership (PPP).

This type of partnership is a business model in which a public service is funded by and operated through a formal partnership between the government and the private sector. There are many models of such partnerships in health care with different risk management, financing, incentive, and payment structures^{6,7} (see online Appendix Exhibit A1).⁸ Partnerships in health care are operating in a number of countries, mostly in the developed world.^{4,6,7,9,10}

Tsepong (Proprietary) Ltd., a consortium of Netcare (a private South African health care provider) and several locally owned businesses, won

a competitive bidding process in 2008 to partially finance and fully design, build, equip, and operate the new facility.^{11,12} Tsepong also refurbished and managed the three existing community-based clinics and built a fourth clinic. The new PPP-managed hospital and its four clinics formed an integrated health care network that replaced the government-managed hospital and its three clinics. The renovated clinics opened in May 2010. The PPP-managed hospital and the new clinic opened in October 2011, as the government-managed hospital closed.

The Lesotho public-private partnership is outlined in an eighteen-year contract between Tsepong and the Lesotho government. According to this agreement, Tsepong is responsible for “cofinancing, building, maintaining, and delivering services.”^{13(p1500)} (See Appendix Exhibit A2.)⁸ The government retains its role as the payer for health care services and is responsible for setting quality and performance standards and overseeing compliance with the terms of the partnership.

Based on outputs at specified performance levels, Tsepong receives a yearly unitary payment over the course of the contract to repay its construction loan and finance annual operating expenses. The level of payment to Tsepong by the government is contingent on Tsepong’s meeting contractual performance indicators measured through quarterly audits by a jointly appointed independent monitor.¹² The indicators measure performance in such areas as clinical care, patient volume, equipment, facilities management, and staff certification and training.

Having the same entity (in this case, Tsepong) be responsible for both construction and health care services and remunerating it only for services that meet output and quality standards provide incentives for the private partner to build an appropriate facility and provide high-quality care while containing costs.⁴ In a health care public-private partnership, the contractual agreement creates a level of accountability in cost management and quality that may be difficult to achieve if instead the government is both the purchaser and the provider of care.¹³

These partnerships may be attractive for health care delivery because they allow governments to take advantage of private-sector expertise to improve the quality and management of services, leverage private financing to provide infrastructure, and more accurately plan their health care expenditures.^{6,14,15} However, the trade-offs for governments in such partnerships include concentrating control inside the private partner, which may lessen overall public control; and governmental need for the expertise and resources to manage complex, long-term con-

tracts and the interorganizational relationships that go with them.¹⁶

Many contractual and financial implications of PPP agreements have been assessed.^{7,17–19} However, few studies have examined the impact of health care public-private partnerships on clinical performance outcomes. Given that PPP contracts tie financing to performance levels, health care partnerships should in theory improve or maintain quality of care according to agreed-upon standards. Some studies suggest that public-private partnerships improve the quality of care.^{7,9,20} Nonetheless, there are concerns that this might not always be the case, because quality objectives may conflict with cost containment efforts and because it is difficult to measure health care outcomes.

The purpose of this study was to compare measures of capacity, utilization, clinical quality, and patient outcomes before and after the implementation of a health care public-private partnership. Our study adds to the literature by offering insights into the relationship between such a partnership and clinical outcomes in a developing country. Understanding how the use of such a partnership affects clinical and other outcomes is important for assessing cost-effectiveness^{4,7} and is useful to governments and health policy leaders considering such partnerships as a way to improve hospital performance.

Study Data And Methods

BASELINE AND ENDBLINE STUDIES In anticipation of the start of the public-private partnership in Lesotho, a baseline study was conducted in 2007 to assess services at the government-managed hospital and its three clinics.³ Findings from this baseline study serve as benchmarks for the PPP network. This study was funded by the International Finance Corporation of the World Bank Group and was completed before the new hospital was built. The government-managed hospital was a large national referral hospital and the only public hospital in Maseru. It served the same catchment area as the PPP-managed hospital, which replaced it. Many staff members who worked in the government-managed network now work in the PPP-managed network.

In 2013, a year and a half after the PPP-managed hospital opened, the Global Partnership on Output-Based Aid—a multidonor trust fund administered by the World Bank Group that provides subsidy funding and technical support to developing countries—funded an endline study. This study’s purpose was to reexamine a subset of the measures collected in the baseline study and identify structural and organizational differences between the new and old hospital

networks.²¹ It provided a rare opportunity to assess the impact of a health care public-private partnership on clinical and other measures. The Global Partnership also provided a \$6.25 million grant to fund operations of the PPP clinics before the PPP hospital opened and government payments to Tsepong began.

MEASURES Sixteen measures were collected at baseline and endline. One additional measure was collected at endline only: survival rate in the neonatal intensive care unit (NICU). We report on the following commonly used measures of capacity and utilization: numbers of beds, staff members, inpatient admissions, and ambulatory care and casualty (emergency) visits; hospital occupancy rates; inpatient lengths-of-stay;²² and patient outcomes—specifically, rates of mortality (in the hospital and the neonatal intensive care unit [NICU] and in pediatric cases with pneumonia), stillbirths, and cesarean sections.^{23–26} We also report on the following clinical quality measures that affect the provision of care that is both timely and effective (two facets of care quality): the availability of an emergency crash cart (a wheeled cart stocked with equipment, supplies, and drugs for use in resuscitations), the availability of thrombolytic agents, patient triage in the casualty unit, and laboratory test turnaround times.

Our measures differed from those assessed quarterly by the independent monitor. The only overlap was in the assessment of the numbers of inpatient admissions and ambulatory care visits. We measured laboratory test turnaround times more precisely than the independent monitor did: We used the turnaround time in minutes, while the independent monitor used the percentage of tests completed within sixty minutes.

For hospital-specific measures, we report the following results for the government-managed and the PPP-managed hospitals: numbers of inpatient admissions and inpatient days, average length-of-stay, hospital occupancy rate, numbers of patients triaged in the casualty unit, rates of NICU survival and pediatric mortality due to pneumonia, and availability of crash carts.

For measures that used combined data from a hospital and its clinics, we report the following results for the government- and PPP-managed networks: numbers of beds, staff members, and ambulatory visits; percentage of casualty visits; availability of thrombolytic agents; average lab test turnaround times; and rates of mortality, stillbirth, and cesarean section. Since the government- and PPP-managed networks organized their maternity services differently across the respective hospitals and their clinics, we measured the numbers of beds and staff members and the rates of mortality, stillbirth, and cesare-

Health care partnerships should in theory improve or maintain quality of care according to agreed-upon standards.

an sections at the network level.

We list definitions and present data collection methods in Appendix Exhibit A3.⁸ In addition, we used interview data from key informants regarding differences in hospital systems and management before and after the implementation of the public-private partnership to aid in interpreting our findings.²¹

DATA COLLECTION Quantitative data from the baseline study of the government-managed network were collected for the period from April 1, 2006, to March 31, 2007, and data from the endline study of the PPP-managed network covered the period January 1–December 31, 2012. Observational data on the availability of equipped crash carts, patient triage in the casualty unit, and the availability of thrombolytic agents were collected between September and December 2007 in the baseline study, and between February and April 2013 in the endline study.

Baseline data were collected by direct observation and from inpatient and outpatient register books. Endline data were collected by direct observation and from hospital computerized records and review of medical and other hospital records (for more details about measures, measure definitions, and data collection methodologies, see the Appendix).⁸

Qualitative data were collected from interviews with thirty-six key informants who included hospital service chiefs, executive management team members, clinical providers, and Ministry of Health personnel who worked with the public-private partnership and on oversight committees. Each interview lasted 30–60 minutes. We used semistructured interview guides to explore differences in the quantity of care provided, the quality of services, patient outcomes, and hospital processes. While these qualitative data are not the focus of this study, we used them to help interpret our quantitative

findings.

DATA ANALYSIS To assess differences in quantitative measures before and after the implementation of the public-private partnership, we performed chi-square analyses for categorical data and two-sided *t*-tests for continuous data, using a *p* value of ≤ 0.05 to indicate significance. For qualitative data analysis of interviews, we coded transcripts to identify themes that related to differences between the government- and PPP-managed networks.²⁷ We then organized codes into broad domains. Coded segments were tracked using Microsoft Excel.

The protocol for research was reviewed and approved by the Boston University Medical Center Institutional Review Board and the Lesotho Research and Ethics Committee of the Ministry of Health.

LIMITATIONS Several limitations to our study warrant mention. We did not measure all aspects of hospital operations. However, we selected measures that touch on important indicators of hospital care quality. For some measures, data collection methods differed between the baseline and endline studies: In the baseline study, data for all utilization measures and many patient outcomes were manually collected from registries, whereas in the endline study, these data were collected from computerized records. There may be differences in the quality of the data based on collection methods, although we

could not verify or quantify any differences. Data collection methods are described in Appendix Exhibit A3.⁸

In addition, we did not examine contractual or financial aspects of the public-private partnership, which may have implications for efficiency and performance.^{4,18,19}

Finally, the generalizability of our results is limited. Each public-private partnership is tailored to the circumstances of the country and the purpose of the partnership, and these differences may influence outcomes.^{4,17,19}

Study Results

CAPACITY AND UTILIZATION Capacity, measured by operational beds—beds that are regularly maintained and staffed and are immediately available for the care of admitted inpatients—was comparable in the government- and PPP-managed networks (Exhibit 1). However, staffing levels in the PPP-managed network were higher than in the government-managed network. Most increases in health staff occurred in clinical personnel, and the majority of these were increases in the number of nurses.

Utilization also increased at the PPP-managed network: Compared to the government-managed network, there were more admissions and ambulatory care visits, and hospital occupancy percentages were higher (Exhibit 1). In contrast, the

EXHIBIT 1

Capacity And Utilization Measures At Hospital Networks Managed By The Government Of Lesotho And By A Public-Private Partnership (PPP)

Measure	Government-managed (2006-07)	PPP-managed (2012)	Percent difference
CAPACITY^a			
Operational beds in networks	417	414	-1
Operational beds in clinics	8	24	200
Operational beds in hospitals	409	390	-5
Staff members in networks	642	882	37
Clinical staff members	345	563	63
Registered nurses	130	284	118
Physicians	57	70	23
Other clinical staff members	158	209	32
All nonclinical staff members	297	319	7
UTILIZATION			
Inpatient admissions ^b	15,465	23,341	51
Inpatient days ^b	91,808	116,648	27
Average inpatient length-of-stay (days) ^b	5.9	5	-16**
Hospital occupancy (percent) ^b	61	82	33**
Ambulatory care visits ^a	165,584	374,669	126
Casualty visits (percent of ambulatory care visits) ^a	16 ^c	5 ^d	-69**

SOURCE Authors' analysis of data from the 2006-07 baseline study (Bicknell W et al. Queen Elizabeth II and the new PPP hospital [see Note 3 in text]) and the 2013 endline study (Vian T et al. Endline study for Queen 'Mamohato Hospital public-private partnership [PPP] [see Note 21 in text]). ^aCombined data from hospitals and clinics. ^bData from hospitals only. ^c26,493 casualty visits out of 165,584 ambulatory care visits. ^d20,563 casualty visits out of 374,669 ambulatory care visits. ***p* ≤ 0.05

average length of inpatient stay and the number of casualty visits as a percentage of ambulatory care visits were significantly lower at the PPP-managed network.

To compare average lengths of inpatient stay for similar types of patients, we removed the data on ICU and NICU services from the PPP-managed hospital (neither of these units existed at the government-managed hospital) and the data from TB wards at the government-managed hospital (the PPP-managed hospital referred TB cases to a specialty TB clinic). The average length-of-stay then was 5.8 days at the government-managed hospital and 4.9 days at the PPP-managed hospital.

CLINICAL QUALITY Clinical quality varied considerably between the government- and PPP-managed networks, as analyzed in terms of four measures (Exhibit 2). Only one emergency crash cart was available at the government-managed hospital in the casualty unit, and it was not accessible within four minutes' travel time from any of the four medical wards. At the PPP-managed hospital, each medical ward and the casualty unit had an assigned crash cart, and all were accessible within one minute's travel time from patient rooms. On average, 86 percent of the carts were fully equipped.

Nursing staff members did not routinely triage patients in the casualty unit at the government-managed hospital. Instead, a nonclinical administrative staff member used his or her judgment to prioritize patients' care needs. In contrast, 84 percent of patients were triaged by nursing staff members within five minutes of arrival in the casualty unit at the PPP-managed hospital.

International best practices include having thrombolytic agents available for patients with myocardial infarction²⁸ and ischemic stroke.²⁹ The government-managed network did not stock thrombolytic agents. In contrast, the PPP-managed network stocked recombinant tissue plasminogen activator for stroke and streptokinase for myocardial infarction.

The average turnaround time for laboratory tests at the PPP-managed network was forty-nine minutes. The baseline evaluation of the government-managed network could not assess this measure because relevant data were not collected in laboratory records.

PATIENT OUTCOMES Patient outcomes were analyzed in terms of five measures and showed decreased rates of mortality and stillbirths and an increased rate of cesarean sections at the PPP-managed network, compared to the government network. In the PPP-managed hospital, 46 per-

EXHIBIT 2

Clinical Quality And Patient Outcome Measures At Hospital Networks Managed By The Government Of Lesotho And By A Public-Private Partnership (PPP)

Measure	Government-managed (2006-07)	PPP-managed (2012)	Percent difference
CLINICAL QUALITY			
Availability of equipped crash carts (percent) ^a	20	86	330**
Patient triage in the casualty unit (percent) ^b	0	84	— ^c
Availability of thrombolytic agents (percent)	0	100	— ^c
Lab test turnaround times (minutes)	— ^d	48.6 ^e	— ^d
PATIENT OUTCOME (PERCENT)			
NICU neonatal survival ^f	— ^d	69.8	— ^d
Hospital mortality ^g	12	7.1	-41**
Pediatric mortality due to pneumonia ^h	34.4	11.9	-65**
Stillbirth ⁱ	4	2	-50**
Cesarean section ⁱ	7.2	26.8	272**

SOURCE Authors' analysis of data from the 2006-07 baseline study (Bicknell W et al. Queen Elizabeth II and the new PPP hospital [see Note 3 in text]) and the 2013 endline study (Vian T et al. Endline study for Queen 'Mamohato Hospital public-private partnership [PPP] [see Note 21 in text]). **NOTES** Some measures of clinical quality and patient outcomes—the availability of equipped crash carts, the use of patient triage in the casualty unit, neonatal survival in the neonatal intensive care unit (NICU) and pediatric mortality rate due to pneumonia—use data from the hospitals only. All others use data from the hospitals and their clinics. ^aQuantities of items on a fully equipped crash cart were not given in the baseline study (2006-07). The best-case scenario is that the crash cart at the government-managed hospital was fully equipped, yielding a 20 percent score for availability of a fully equipped crash cart within four minutes' travel time from the four medical wards and the casualty unit. ^bFor the government-managed hospital, *n* = 303 cases; for the PPP-managed hospital, *n* = 75 cases. ^cWhen the baseline is 0, it is not possible to calculate percentage difference. The increase in percentage points from baseline to endline is 84 percentage points for patient triage in the casualty unit and 100 percentage points for availability of thrombolytic agents. ^dNot applicable. ^e*N* = 1,113. ^fPercent of neonates weighing less than 1,500 grams who survived to discharge (*N* = 94). ^gFor government-managed networks, *n* = 15,465; for PPP-managed networks, *n* = 23,341. ^hFor government-managed networks, *n* = 358; for PPP-managed networks, *n* = 286. ⁱFor government-managed networks, *n* = 5,150 births; for PPP-managed networks, *n* = 7,431 births. ***p* < 0.05

Overall, the PPP-managed network compared favorably with the government-managed network.

cent of neonates in the NICU weighed less than 1,500 grams (the usual definition of very low birthweight), and 69.8 percent of these patients survived to discharge. The government-managed hospital did not have a NICU, so this measure was not assessed at baseline. Given the medical complexity of providing care to these infants, however, it is likely that without a NICU, most infants would not have survived to discharge at the government-managed hospital.³⁰

Hospital mortality rates were significantly lower at the PPP-managed network than at the government-managed network. However, we could not assess patient acuity at either baseline or endline. Thus, comparisons of hospital mortality rates between the two networks should be interpreted with caution.

Compared to the government-managed network, the PPP-managed network had significantly lower rates of stillbirth and pediatric mortality due to pneumonia, but significantly higher cesarean section rates. Stillbirths are categorized as macerated or fresh. Macerated stillbirths are associated with insults occurring during the antenatal period, whereas fresh stillbirths may suggest suboptimal care during labor and delivery.³¹ Unfortunately, records at the government-managed network did not distinguish between macerated and fresh stillbirths. Sixty percent of the stillbirths at the PPP-managed network were macerated.

Discussion

We compared measures of capacity, utilization, clinical quality, and patient outcomes before and after the implementation of a health care public-private partnership to better understand how such a partnership affected outcomes in Lesotho. Overall, the PPP-managed network compared favorably with the government-managed network. The PPP-managed network served more patients (that is, had higher numbers of inpatient admissions and ambulatory care visits) and appeared to provide more efficient care (had

lower average lengths of inpatient stay, lower numbers of casualty visits as a percentage of all ambulatory care visits, and higher hospital occupancy rates). Where we could measure clinical quality at both networks, that quality also improved at the PPP-managed network—which had greater availability of crash carts, a higher percentage of patients triaged, and thrombolytic agents in stock.

Patient outcomes also improved at the PPP-managed network, compared to the government-managed network. However, hospital mortality rate comparisons should be interpreted with caution, and we could not assess if cesarean sections were medically necessary at either network.

Direct comparisons of mortality rates would be misleading without taking into account patient acuity—that is, if patients at one facility were notably sicker than patients at the other. We could not assess patient acuity at either network. However, in our qualitative research, clinical staff members suggested that at the time of the baseline study, very sick patients may have sought treatment in South Africa rather than at the government-managed network in Lesotho or may have been discharged to die at home. This was not perceived to be the case at the PPP-managed network.

It cannot be proved that prior to the implementation of the public-private partnership very sick patients sought treatment in South Africa or were discharged to die at home. But if it is true, it suggests that the mortality rates at the government-managed network were lower than would be expected and that despite caring for a patient population with higher acuity, the PPP-managed network had a lower mortality rate than the government-managed network did.

There are many structural and organizational differences between the government- and the PPP-managed networks that might account for our findings. The government-managed hospital was more than a hundred years old and had aging equipment and infrastructure. The PPP-managed hospital was a completely new facility with three recently renovated clinics and one new clinic that had new infrastructure and equipment, which allowed staff members to offer improved services.²¹ For instance, the PPP-managed hospital had a new ICU and NICU, additional labor and delivery rooms and operating rooms, 24/7 access to pharmacy and laboratory services, and additional and improved diagnostic equipment (such as a magnetic resonance imaging machine). In addition, the PPP-managed network had more clinical staff members, particularly nurses. Increased levels of nursing staff have been associated with im-

proved outcomes.³²

The PPP-managed network also had better access to data and an emerging data-based decision-making culture. The government-managed network used paper registries and patient records, whereas the PPP-managed network had an electronic medical record system. This system allowed the PPP-managed network to produce more accurate and reliable monthly reports and to more easily track clinical and administrative metrics.

We noted that committees to review evidence on performance (for example, a maternity mortality committee) existed at the PPP-managed network but had not existed at the government-managed network. These committees used data to inform hospital practices and procedures. Informants in qualitative interviews told us that some performance review committees had existed at the government-managed network but did not have access to data.

Computerized records were also instrumental in ensuring the availability of medications. For example, the pharmacy in the PPP-managed network had a computerized system that allowed pharmacists to monitor stock throughout the network.

The PPP-managed network also had a different management structure than the government-managed network, which may account for improved outcomes. One key informant stated: “Day-to-day running is totally different [at the PPP-managed hospital]. There are clear policies and guidelines for running equipment, subsystems. Everyone has guidelines.”

At the government-managed network, policies and guidelines were not always made clear and available or followed. In contrast, at the PPP-managed network, policies and guidelines were clear and were disseminated to and used by staff members. For example, policies and procedures related to our measures included a pharmacy policy to do inventories of all crash carts twice a day and replace used or expired stock, and a policy in the casualty unit about how to triage patients.

At the PPP-managed network, staff members were held accountable for following procedures and were given feedback on their performance. According to our qualitative research, this was not generally the case at the government-managed network. A key informant said: “At the [government-managed hospital] we were doing what we wished. People were doing their work, but were going away at any time they want[ed]. People here are very disciplined, which I think is because of management.”

In addition, there were a number of opportunities for training and staff development at the

We identified improvements in hospital performance after the implementation of the public-private partnership.

PPP-managed network, whereas such opportunities were not common at the government-managed network.³ For instance, all new staff members in the PPP-managed network received orientation at the hospital, service, and ward levels, as appropriate to their role, and the staff included clinical facilitators to conduct in-service training to address gaps in knowledge or skills. Other training was done for selected groups or individuals. For instance, some nurses working in the casualty unit of the PPP-managed hospital were sent to South Africa for a six-month trauma course.

Staff members interviewed during our qualitative research who had worked in both networks stated that leaders communicated expectations more clearly and consistently at the PPP-managed network and managers made decisions in a more timely fashion, compared to the situation in the government-managed network. One key informant said, “Here [at the PPP-managed hospital] there is more interaction with management, the meetings we have, the communications.”

This greater interaction may increase staff accountability and the ability to efficiently respond to emerging situations. Improvements in hospital managerial practices have been noted in other public-private partnerships and associated with improved outcomes.⁹

We identified improvements in hospital performance after the implementation of the public-private partnership. However, it should be noted that the timeframe in which the endline study was conducted might have been too early to fully demonstrate all of the partnership’s benefits. It often takes time for operations at a new hospital to stabilize, and projects of this scale may also suffer from start-up problems.³³ At the time of the endline study, specialty services were in transition. The PPP-managed hospital had just hired

an intensivist and was actively recruiting other specialists.

The PPP-managed network had a significantly lower average inpatient length-of-stay compared to the government-managed network, with a comparable number of hospital beds. This suggests that the PPP-managed network provided more efficient care, but we could not conduct a cost-benefit or cost-effectiveness analysis. Similarly, the number of casualty visits as a percentage of all ambulatory visits was lower in the PPP-managed network than in the government-managed one. This suggests that the PPP clinics provided care for patients who otherwise might have inappropriately accessed care through the casualty unit. These findings support the premise that public-private partnerships are structures that can leverage private-sector efficiencies.⁷

The cesarean section rate is a measure of access to an obstetric intervention for averting maternal and neonatal deaths and preventing complications.³⁴ There is no empirical evidence for an optimal cesarean section rate. However, given postsurgical risks associated with cesarean sections, it is important to limit the intervention to cases where it is medically necessary.³⁴

The cesarean section rate increased significantly at the PPP-managed network compared to the government-managed network, but the rate at baseline was very low compared to international averages.³⁵ The PPP-managed network's cesarean section rate is likely associated with a policy to do cesarean sections in all mothers who

had previously had cesarean sections, and with physicians' being conservative in their interpretations of cardiotocography studies—a relatively new technology at the PPP-managed hospital used to track fetal heart rate and uterine contractions.

Hospital staff members interviewed in our qualitative research suggested that as physicians gained experience interpreting cardiotocography findings, fewer operations were being performed, and they were more medically appropriate. Reasons for cesarean sections were not measured at the baseline study or the endline study, so we could not draw conclusions about the medical necessity of the surgical intervention at either hospital.

Conclusion

Overall, results from the analysis of baseline and endline studies indicate that the PPP-managed network in Lesotho delivered more clinical services and services of higher quality and achieved improved patient outcomes, compared to the government-managed network. The PPP-managed network's infrastructure, staffing and resources, access to data, clearly defined procedures and policies, staff accountability, and leadership may account for the improved performance. Findings from Lesotho suggest that a health care public-private partnership may present opportunities for other developing countries to broadly improve their clinical and organizational performance. ■

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of the Department of Veterans Affairs or the US government.

NOTES

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