Promoting safe motherhood through the private sector in low- and middle-income countries

Ruairí Brugha¹ & Susanne Pritze-Aliassime²

Abstract The formal private sector could play a significant role in determining whether success or failure is achieved in working towards goals for safe motherhood in many low- and middle-income settings. Established private providers, especially nurses/midwives, have the potential to contribute to safe motherhood practices if they are involved in the care continuum. However, they have largely been overlooked by policy-makers in low-income settings. The private sector (mainly doctors) contributes to overprovision and high Caesarean section rates in settings where it provides care to wealthier segments of the population; such care is often funded through third-party payment schemes. In poorer settings, especially rural areas, private nurses/midwives and the women who choose to use them are likely to experience similar constraints to those encountered in the public sector — for example, poor or unaffordable access to higher level facilities for the management of obstetrical emergencies. Policy-makers at the country-level need to map the health system and understand the nature and distribution of the private sector, and what influences it. This potential resource could then be mobilized to work towards the achievement of safe motherhood goals.

Keywords Maternal welfare; Maternal health services/supply and distribution; Private sector; Nurse midwives/utilization; Physicians/utilization; Health policy; Socio-economic factors; Developing countries (*source: MeSH, NLM*).

Mots clés Protection maternelle; Service santé maternelle/ressources et distribution; Secteur privé; Sage-femme/utilisation; Médecin/utilisation; Politique sanitaire; Facteur socio-économique; Pays en développement (*source: MeSH, INSERM*).

Palabras clave Bienestar materno; Servicios de salud materna/provisión y distribución; Sector privado; Enfermeras obstetrices/utilización; Médicos/utilización; Política de salud; Factores socioeconómicos; Países en desarrollo (*fuente: DeCS, BIREME*).

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Voir page 621 le résumé en français. En la página 621 figura un resumen en español.

انظر صفحة 621 للاطلاع على الكلمات المتناحية والمنحص باللغة العربية

Introduction

Around 99% of the estimated 500 000 deaths of women that occur each year as a result of pregnancy take place in developing countries (1), accounting for one third of deaths in women aged 15-49 years in these settings (2). Skilled attendance of health care staff at childbirth, and also timely access to emergency obstetrical care and interventions delivered in health facilities, are essential steps in reducing maternal mortality and morbidity (3) because most obstetric complications cannot be predicted or prevented (4). Improving the access, affordability, utilization, and quality of such services — wherever they are provided — is a policy priority (5). It requires governments to develop new skills to enable them to be effective guarantors of the quality of health services, wherever people can and choose to access them (6). World Health Day 1998, which was dedicated to safe motherhood, recommended that governments work with private providers - for example, by mandating insurance companies to include safe motherhood among services covered (7). The present paper reviews evidence on health care from low- and middle-income countries (LMICs) in an attempt to assess the contribution of formal, professionally qualified privatefor-profit providers (doctors, midwives, nurses) to delivery care. Trained or untrained traditional birth attendants are excluded from this definition. The paper reviews the limited evidence on technical quality, appropriateness, and responsiveness of such services, and evaluates the potential of available mechanisms or leverages for policy-makers to work with the for-profit private sector. The aim is to identify what private sector policy interventions could assist in achieving safe motherhood goals in different contexts.

The extent of private provider involvement in delivery care

The blurred public-private divide

In most LMICs, private providers lie outside of the direct control of the state, operating on a for-profit or non-profit basis working in private facilities such as clinics and hospitals. In the poorest countries, most of them work alone (8). Traditional distinctions between public, private for-profit, and non-profit providers — the last-mentioned often being faith-based or mission facilities — are not clear cut. Data from demographic household surveys (DHS) categorize deliveries of infants by location — public facility, private facility, or home — which may not indicate the training and profit status of the provider (8, 9). For example, home deliveries are often attended by trained or untrained traditional birth attendants, and they can also be attended by a private or public midwife, which was common practice in Malaysia until the 1990s (10). From the late 1980s the Government of Indonesia trained and deployed to villages 54000 midwives, hired on three-year renewable contracts (11). One

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of the goals of this venture was "developing the midwives into successful private practitioners and providing them with proper financial incentives" (11). Doctors employed in the public sector may be remunerated in a private capacity for patients admitted to private wards in public hospitals (12), or they may practise, legally or illegally, in private hospitals and clinics (13).

Demographic health surveys

DHS data give some indication of the scale of delivery attendance that is outside the direct control of the state, and the differences between countries (14). Table 1 shows the socioeconomic status of women in five large LMICs — one country from each of five WHO Regions (Africa, Eastern Mediterranean, the Americas, South-East Asia, Western Pacific). Socioeconomic status is by the category of professional health worker who attended the delivery (doctor, nurse, or trained-midwife), and by delivery location (home, public or private facility). The wealth status of the population is separated into quintiles, from the poorest 20% to the richest 20%. Women living in wealthier households were more likely than poorer women to receive delivery care from a professional attendant (14). In all countries there was a consistent trend among the wealthy towards doctorattended deliveries. In poorer countries, notably Kenya and Indonesia, most of the professional care was from a nurse, with wealthier women more likely to receive such care than poorer women (14). Urban residence showed a similar but less marked gradient of access to professional care, compared with rural residence. The poor/rich ratio, which compares the poorest and richest quintiles, is used to compare access of patients to services and is often used as an indicator of inequality within a country (14). The population average shows the percentage of all women, for each country, who had access to these different types of care. In Brazil, almost 90% of deliveries had a professionally trained attendant, compared with a third to a half in the other countries. Attendance by a doctor ranged from 78% in Brazil to only 7% in Indonesia, where 42% of deliveries were attended by a nurse or trained midwife, including 20% of the poorest quintile, 96% of whom delivered at home.

Between 10% and 15% of all deliveries took place in a private facility, ranging from 30% in Kenya to 42% in Egypt in the highest socioeconomic category. In all countries wealthier women were far more likely than poorer women to have their infant delivered in a private facility. Differences in the type of facility (private or public) between urban and rural areas were less marked: delivery in a private facility ranged from twice as common in urban than in rural Indonesia to little difference between urban and rural settings in Kenya. Categorization of for-profit status is problematic: a significant proportion of private facilities in Kenya may have been non-profit and a high proportion of public facility deliveries in Brazil may have been attended by doctors in a private capacity. However, the data suggest an important private market in this wide range of LMIC settings. DHS and country studies show privately provided antenatal care ranging from 13% to 48% of pregnancies in four LMICs (9, 15, 16). Data on health care providers also indicate a large private market for pregnancy services, especially in urban areas, with high proportions of obstetricians working in private practice in low-income, as well as middle-income, countries (17–20).

Do private providers contribute to safer motherhood?

Wealthier settings

Evidence on the quality of private pregnancy-related care is patchy: many of the published studies focus on overprovision and inappropriate interventions by private doctors, especially unnecessary Caesarean (C) sections, which are more likely when doctors supervise and control childbirth. C-section rates in private institutions in Mexico had risen to 48% by 1997 (21), which is much higher than the WHO recommended rate of 5-15% (22, 23). In public institutions, which carry out 32% of all deliveries, C-section rates were 48% for patients who were covered by a government employees' social security system (substantially publicly funded) compared with 23% for patients not covered by a third-party payment system (21). It was conservatively estimated that in Mexico "the total cost of excessive Caesarean sections for public healthcare institutions is US\$ 12 204 774" (21). Close to 90% of private institutions' C-sections were costed at a unit value 10 to 30 times higher than the same operation in a public facility. The authors did not attempt to estimate the increased morbidity and mortality to mothers and children due to unnecessary C-sections.

Studies from Brazil also showed higher C-section rates among wealthier women, despite these women being at a lower risk during childbirth than are poorer women (24, 25). In the USA, a similar finding was attributed to different "financial, personal, practical and professional incentives to practice in a certain way" in two-class systems of care (26). Rates of 70–90% have been reported for private hospitals in Brazil, which were attributed to doctor-induced "demand" (27). In South Africa, the rates of induced deliveries and C-sections were ten times higher and 50% higher, respectively, in the private sector compared with the public sector (28). These differences were attributed to a fee-for-service reimbursement system. Other factors probably contribute to doctor-induced oversupply, such as a (incorrect) belief that C-sections are safe and constitute better care (21, 29). A reason cited by obstetricians for working in the private sector in Venezuela was that it would be easier to provide better quality care there than in the public sector (30). An evaluation of the indications for and quality of elective hysterectomies in rural India, which were reimbursed through a community-based health insurance scheme on a fee-per-item basis, reported that most hysterectomies were performed "on demand" (31), and also that quality of care varied "from excellent to dangerous" — more frequently the latter among both public and private providers.

Poorer settings

Little is known about the quality of care provided by privatefor-profit professional birth attendants in poorer countries. In many rural settings, most childbirth still occurs at home, and pregnant women have difficulty in accessing emergency care in the formal health system when needed. A reduction in maternal mortality following the training and deployment of midwives to villages in Matlab, Bangladesh, was later

Table 1. Distribution of deliveries in five countries, showing professionally trained attendant and delivery location, by socioeconomic status of the women

Poorest 20% Second Middle Fourth Richest 20% Professional attendant (%):	Method/location of delivery	Quintiles					Population average ^a	Poor/rich ratio	Urban richest	Rural richest
Professional attendant (%): Doctor	or delivery		Second	Middle	Fourth				quintile	quintile
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^a Percentage of women who had access to the different types of care stated.

Source: Ref. 14.

b Results not shown due to very small numbers of cases. C NA = not applicable.

attributed to a combination of factors including training, better referral systems, and easier access for patients to higher level facilities, with appropriate high-quality care at all levels (32). This re-evaluation of the programme showed that there had been concurrent declines in mortality in a comparison area not yet receiving trained village midwives. The Matlab programme was evaluated initially for "before-andafter" effects and later by a time series analysis, but not by a randomized controlled trial. The lack of a control group made it difficult to unpack the effects of the intervention from wider changes in the health system. Therefore, the authors advised "caution" when interpreting the findings (32).

In Indonesia the training of professional midwives who were contracted with the Ministry of Health and deployed to villages resulted in a higher coverage of skilled attendance at childbirth (33). There was a subsequent decline in hospital admissions from 1.1% to 0.7% for obstetrical emergencies that required life-saving interventions, where at least 1% of women were estimated as requiring such an intervention (33). This decline was initially attributed to a lack of emergency transport and economic constraints on women and their families (34). Audits of 130 maternal deaths were conducted by village midwives at the community level, supplemented by record review and discussion with staff of 30 cases "who were in contact with the health services before death" (35). "Delays in decision-making and poor quality of care at the health facility were seen as contributing factors in 77% and 60% of the (30) deaths, respectively" (35). Delays were mainly due to "economic constraints" and "refusal to seek care", whereas "problems of distance or transport did not appear to be prominent" (35). The experiences in Bangladesh and Indonesia illustrate that better evidence is needed on what packages of care are effective (36), on the constraints on women to accessing care, and on the relative contribution of the different intervention components to preventing maternal mortality in different settings (32, 33).

Why women living in poor settings choose private providers

Women living in rural Nigeria reported that they preferred private obstetric services to public services when private services were more accessible, because of their flexible payment schedules, and chose private services instead of the government hospital because a doctor was more frequently available (17). In Uganda, private doctors and midwives were perceived by rural community members as more expensive but also more responsive to patients: "these people really care for patients for they know it their source of income" (sic) (37). The way that health services are organized in public sector facilities, especially in hospitals that have a large complement of doctors and nurses/midwives, usually precludes women from receiving continuity of care from a single care-giver throughout pregnancy to delivery; they are more likely to obtain such care from a midwife or doctor operating in the private sector. Studies in highincome countries show that such continuity of care is highly valued by women and that it contributes to improved pregnancy outcomes (38). The woman's trust in her private doctor may not be justified, but is highly valued by both doctor and patient (30). In poorer urban settings, private providers are operating in a very competitive market (39). Consequently, they respond to what they perceive to be patient demand (40), but sometimes they provide what they know is unnecessary and unethical care to maximize income, knowing that regulatory controls are ineffective (41). It is likely that the passivity of women and their inability to question or challenge the appropriateness of maternity care provided in Lebanon (42) is common in poorer settings. Inherent constraints on the "demand side" call for a "supply side" response.

Private sector policy responses

Wealthy and poor settings may require different policy responses. In terms of private providers' practices, there is considerable overlap between patients being wealthy, having third-party payment coverage, and living in urban areas; and between being poor, cash-paying and a rural dweller. In the former, a major challenge is to control overprovision and prevent unnecessary interventions, especially high rates of C-section in low-risk women. Finding ways to intervene becomes a greater policy priority where public finances and public resources subsidize privately provided care, as in Mexico (21).

However, most of the avoidable maternal mortality and morbidity worldwide occur in poorer settings, due to the underprovision of (often lack of access to) skilled birth attendants and emergency obstetrical care to women who need them. The case for policy interventions is based on the hypothesis, which needs to be tested, that the for-profit private sector is an important part of the "continuum of care" (11). The advantage of working with this sector, especially with midwives with established practices, is that private facilities are likely to be viable enterprises, used by women who are unable to access other options and/or because of the responsive care they provide. In Indonesia, the rapid deployment of professional midwives to villages encountered problems of low staff retention rates (43), which may have been due to lower cost competitors (traditional birth attendants) and lack of a viable market. It would be instructive to explore why such top-down privatization approaches have had only partial success, with private midwives requiring state support several years after being posted to these communities. Failure to first analyse the context may have been a factor.

What works with private providers?

"Experience over the past decade has also shown that no single intervention is by itself sufficient; what is needed is a continuum of care to reduce maternal and newborn morbidity and mortality" (44). Analysis of private sector providers and their practices shows that there is also no single, sufficient, and correct approach to working with this sector (45). Policy objectives and strategies need to be tailored to specific contexts, which differ between and within country settings, and take into account the complexity and difficulties involved (46). Policy guidance to achieving goals for safe motherhood has sometimes lacked depth, and in one case was restricted to: "The private sector and NGOs [nongovernmental organizations] have an increasing role in providing pregnancy and delivery care, and as consumers are able to choose from a variety of providers — public, private

non-profit and private for-profit — regulation of these providers will be critical for maintaining quality" (11). This may help to explain why governments have focused most of their efforts on the direct provision of services (47). Some recent reviews have helped to fill the evidence gap on how to work with private providers (13, 39, 46).

Dealing with overprovision

The capacity to purchase and determine what services are purchased is the most powerful leverage that the public sector has over the private sector (13). Pregnancy care for population subgroups with high C-section rates is usually purchased through third-party payment schemes, which are funded by combinations of government, employer, employee, and member contributions. Rates that range from 48% for insured patients to 23% for non-insured, in public institutions where doctors are reported to receive no extra payment for the work (21), suggest that doctors are motivated by a complex set of incentives, not limited to profit to the individual provider. However, the authors in the Mexican study do not speculate about the possibility of indirect or informal financial incentives in public institutions. Attributing major differences in intervention rates to deep-rooted professional beliefs (21), segmented markets with "two-class systems of care" (26), and power imbalances between women and doctors (27) may not give the full picture.

Competitive markets do not exist unless those who purchase services can recognize and are willing to demand effective and appropriate care. It is difficult to question high aggregated, institutional C-section rates, especially in hospitals that receive emergency referrals, without reliable disclosure of the case mix and risk factors in individual cases. The "standard primipara", a subset of first-time pregnant women with low risk and low need for intervention (estimated to be 43% in one study), provides a possible basis for inter-unit comparisons of maternity care, controlling for differences in case mix seen in different units (48). Malaysia not only shifted childbirth from the home to institutions in the 1980s, but also initiated a quality assurance system whereby hospital "outliers" were required to investigate and explain poor performance (10). Evidence shows that service users, if unassisted, are unable to negotiate appropriate safe motherhood care (30, 42). Effective quality assurance and control of provision requires intervention by the state, by third party purchasers, or through accreditation systems, supported by the medical profession (46). Both the state (21) and third-party purchasers (28) have sometimes failed to use these financing leverages effectively.

Getting the poor to safe motherhood services

The primary goal in safe motherhood is to reduce the huge burden of pregnancy-related morbidity and mortality in poor settings. Most of the burden is in low-income countries. There is consensus on the components of the package: an effective continuum of care from skilled attendance in pregnancy and delivery, with affordable and rapid access to health facilities that can provide high-quality emergency interventions for the minority of women who need them (11, 44). All are necessary and none are sufficient. Strategies exist for each component: training, in-service training, and supervision (33); access for providers to radio or telephone and emergency transport for

rapid referral (10, 49); use of community loans (50) and voucher systems (13) to prevent delays in seeking care; and also audit systems to identify systems failures, including delays and deficiencies of care at the health facility (35).

A health systems approach (44) calls for governments to recognize that in many settings private providers, especially private midwives working in underserved areas, are likely to be — for good or bad — part of that continuum. Regulation, through licensing practice entry and registration of health facilities, is one of the tools for managing the private sector (46). However, governments will have more success in bringing private providers into a regulatory net, protecting women from unsafe care, if they also enable providers by involving them in supportive strategies (46). One key to meeting the needs of poorer women is for governments to work with the established private providers that these women use — that is, professional midwives, doctors, and skilled birth attendants - strengthening their linkages with referral facilities (public and private). Such collaborations could also facilitate the transition from home-based to facility-based delivery, providing essential obstetric care (10).

Conclusion: how to move forward

This review has presented a simplified typology of health care in wealthy and poor settings. Policy approaches need to be adapted to the different and often highly diverse settings in which a country's health care is carried out. Overprovision and underprovision of care co-exist, and the type of care is often segmented by socioeconomic status, geographical access, and options for care. Approaches for meeting the unmet needs of the poor and underserved are simpler conceptually than in practice. Understanding how health care is currently provided within a country's health system (36, 39), including the public-private mix, is the starting point. A top-down commitment to bottom-up approaches (44) will require that governments, with the support of international agencies and donors, comprehensively map their country's health care system: location of private (and public) providers; qualifications, training levels, and training needs of providers; registration status and facility capacity; current coverage for essential services (so as to estimate met and unmet needs at the community level); and degree of access to higher level facilities, referral links, and constraints (communication, transport, feedback from facilities, etc.). Future demographic and other household surveys, if they disaggregate the public-private mix of health service utilization more effectively (39), will assist but not substitute for micro-level mapping. Macro-level mapping is also needed to identify the players operating at a national level who have an interest or stake in safer motherhood different ministries, nongovernmental and civil society organizations, and professional bodies and associations representing nurses, midwives and doctors (13, 46). In countries and settings where there is an established and thriving formal private sector, working with the latter will be an essential step "to establish how health systems can reach their full potential in ensuring improved maternal and newborn health" (44). ■

Conflicts of interest: none declared.

Résumé

Promouvoir la maternité sans risque par le biais du secteur privé dans les pays à revenu faible ou intermédiaire

Dans bon nombre de régions à revenu faible ou intermédiaire, le succès ou l'échec des stratégies visant à mettre en place la maternité sans risque pourrait bien être déterminé en grande partie par le rôle joué par le secteur privé. Les dispensateurs de soins privés déjà présents, en particulier les infirmières et les sages femmes, peuvent aider à faire adopter les pratiques de la maternité sans risque s'ils participent à l'ensemble des soins. Cependant, les responsables de l'élaboration des politiques de ces régions n'ont pas du tout tenu compte du rôle qu'ils pouvaient jouer. Le secteur privé (principalement les médecins), dans les endroits où il fournit des soins à des segments de population plus aisés, a tendance à entraîner une surconsommation de soins et des taux de césariennes élevés; ces soins sont souvent financés par des systèmes

de tiers payant. Dans les endroits plus pauvres, en particulier dans les régions rurales, les infirmières et sages femmes privées et les femmes qui choisissent de faire appel à elles risquent de se heurter aux mêmes contraintes que celles rencontrées dans le secteur public — par exemple un accès limité ou financièrement inabordable aux établissements de santé de niveau supérieur pour la prise en charge des urgences obstétricales. Les responsables de l'élaboration des politiques dans les pays doivent établir la carte du système de santé, comprendre la nature et la répartition du secteur privé et les aspects qui influent sur ce dernier. Cette ressource potentielle pourrait ensuite être mobilisée afin de participer à la réalisation des objectifs de la maternité sans risque.

Resumen

Promoción de la maternidad sin riesgo a través del sector privado en los países de ingresos bajos y medianos

El sector privado formal podría contribuir en gran medida al éxito o fracaso de las actividades orientadas a alcanzar las metas de maternidad sin riesgo en muchos entornos de ingresos bajos o medianos. Los dispensadores de salud reconocidos en el sector privado, especialmente las enfermeras/parteras, tienen muchas posibilidades de contribuir a las prácticas de maternidad sin riesgo si participan en el continuum asistencial. Sin embargo, en gran parte han sido ignorados por los formuladores de políticas en los entornos de ingresos bajos. El sector privado (principalmente los médicos) fomenta la sobreprestación de servicios y las tasas altas de cesárea en los entornos donde atiende a los sectores más ricos de la población; tal atención es financiada a

menudo mediante mecanismos de pago por terceros. En los entornos más pobres, especialmente en las zonas rurales, las enfermeras/parteras privadas y las mujeres que recurren a ellas suelen sufrir limitaciones similares a las encontradas en el sector público, como por ejemplo un acceso escaso o inasequible a establecimientos de nivel superior para el manejo de las emergencias obstétricas. Es necesario que los formuladores de políticas a nivel de país determinen la estructura del sistema de salud y comprendan la naturaleza y distribución del sector privado y los factores que influyen en él. Este recurso potencial podría ponerse así al servicio del logro de las metas de maternidad sin riesgo.

ملخص

استراتيجية التدبير العلاجي المتكامل لأمراض الطفولة: الامتثال لتوصيات الإحالة والمتابعة في والاية الجزيرة، السودان

أ شم بحاجة للستابعة، وكان الامتنان للتوصية بالتنامة لدى 529 طفلاً (44%). وقد كان 165 من القانمين على رعاية الأطفال (99%) على اطلاع على التوصية بالمتابعة ولكيهم أم يمتشوا لها لأن حالة الأطفال فد أغسستا، وقد كان الامتنال يزداد بازدياد مستوى التعليم لمدى الفاتمين على الرعاية، وإذا ما أعطبت الأدوية في الزيارة الأولى، وإذا كانت فترة المتابعة قصيرة (2-5 أيام).

الاستنتاج: إن المسلمية من المناطق المحلودة الموارد التي تقبوا للمعجد فيها تطبيل استرائبجية التدبير العلاجى المتكامل لأمراض الطعولة، أم يؤخذ أكثر من نصف الأطفال الذين تصحوا بإحالتهم إلى المستشفى خلال الساعات الأربعة والعشرين الأولى. وقد تلقى معظم الأطفال الدين يحتاجون للمنابعة الجرعة العلاجية الأولى في المرفق الصحى، وقد امندح القائمون على رعابة الإطفال حدا الجانب من استراتبجية النديير العلاجي المتكامل لأمراض الطفولة، وذلك عما قد يشجمهم على العودة وعلى التقييم، وقد يتحسن معدل الرجوع إذا ما تم التخطيط لمزيارات الحالية كي تقتصر توصيتها على العودة بعد 14-30 يوما.

الغرض: التعرَّف على مدى اتباع الأسر للتوصيات الخاصة بالإحالة وبالمتابعة ضمن استراتيجية التدبير العلاجي المتكامل لأمراض الطفولة، وعلى العوامل التي تؤلسر على استجابة الأمر لتلك التوصيات.

الطويقة: تحت دراسة الأطفال الذين تتراوح أعمارهم بين شهرين وخمس سوات تمن أحضروا إلى عاملين صحيين مدربين على استراتيجية الندير العلاجي المتكامل لأمراض الطفولة في ناحية المسعية الصحية في السودات وقت متابعة الاطفال الذين أشير بمتابعتهم أو إحلامهم وفقاً لتصنيف استراتيجية التدير العلاجي المتكامل لأمراض الطفولة لمعرفة فيما إدا كانت الأمر قد امتثلت تتوصيات الإحالة أو المتابعة، وأحريت مقابلات مع القائمين على رعاية الأطفال لموقة فيما إذا كانوا قد امتثلوا للتوصيات أم لم يمتلوا، وقد أجريت مناقشات في جموعات مع العاملين الصحيين وتقانمين على رعاية الأمتال وأفراد من لجميد.

الموجودات: أغلت الدراسة 5745 طفالاً العدر 162 منهم (3%) بماحة إلى إحالة عاجلة، وقد التحق 53 طفالاً بهاجه (33%) بالمستشفى في الهار اليوم، وأوضح ما يقرب من نصف الأشر ثمن لم يروروا المستشفى أن السبب هو التكاليف، وبشكل مجمل تم تصيف 1197 طفلا (21%) على الكلمات المفتاحية: حدمات صحة الأطفال، الرعاية الصحية الأولية: إبناء الرعاية الصحية، متكامل، الإحالة والاستشارة، امتثال الريض، الطفل، الأسرة، العوامل الاقتصادية الاجتماعية، السودان. (المصدر: رؤوس الموضوعات الطبية - المكتب الإقبيمي لشرق المتوسط).

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