

Accelerating reproductive and child health programme impact with community-based services: the Navrongo experiment in Ghana

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Objective To determine the demographic and health impact of deploying health service nurses and volunteers to village locations with a view to scaling up results.

Methods A four-celled plausibility trial was used for testing the impact of aligning community health services with the traditional social institutions that organize village life. Data from the Navrongo Demographic Surveillance System that tracks fertility and mortality events over time were used to estimate impact on fertility and mortality.

Results Assigning nurses to community locations reduced childhood mortality rates by over half in 3 years and accelerated the time taken for attainment of the child survival Millennium Development Goal (MDG) in the study areas to 8 years. Fertility was also reduced by 15%, representing a decline of one birth in the total fertility rate. Programme costs added US\$ 1.92 per capita to the US\$ 6.80 per capita primary health care budget.

Conclusion Assigning nurses to community locations where they provide basic curative and preventive care substantially reduces childhood mortality and accelerates progress towards attainment of the child survival MDG. Approaches using community volunteers, however, have no impact on mortality. The results also demonstrate that increasing access to contraceptive supplies alone fails to address the social costs of fertility regulation. Effective deployment of volunteers and community mobilization strategies offsets the social constraints on the adoption of contraception. The research in Navrongo thus demonstrates that affordable and sustainable means of combining nurse services with volunteer action can accelerate attainment of both the International Conference on Population and Development agenda and the MDGs.

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Voir page 954 le résumé en français. En la página 954 figura un resumen en español.

يمكن الاطلاع على الملخص بالعربية في صفحة 955.

The 1978 Global Health Conference goal of achieving “health for all” by the year 2000 was endorsed by all African governments. Yet, as the new millennium approached, accessible health care remained a distant dream for most African households.¹ With only a decade remaining to meet the United Nations Millennium Development Goal (MDG) of reducing childhood mortality by two-thirds by 2015, no African country is on target. Moreover, expanding access to comprehensive reproductive health services has also been an unfulfilled goal of African governments. After a decade of regional commitment to the 1994 Cairo International Conference on Population and Development (ICPD) agenda, concern is mounting that reproductive health programmes in the region are not working. In West Africa, in particular, the demographic role of family planning

programmes remains the subject of unresolved policy debate.² This paper discusses the lessons learned from an experimental study undertaken by the Navrongo Health Research Centre to resolve debate about feasible means of attaining the MDGs and ICPD goals. The Navrongo experiment developed strategies for community-based reproductive and child health services, tested the impact of the strategies proposed and guided national reform based on lessons learned.

The Navrongo experiment: background

The Navrongo experiment took place in Kassena-Nankana District, an isolated rural northern district of Ghana’s most impoverished region where health, social and economic problems severely constrain development. Baseline mortality

rates assessed in the early 1990s were well above national levels. Cultural traditions were known to sustain high fertility and impede progress with health interventions.³ The economy in the study area was dominated by subsistence agriculture; literacy was low (particularly among women); and traditions of marriage, kinship and family-building emphasized the economic and security value of large families. Health-care decision-making was strongly influenced by traditional beliefs, animist rites and poverty. Parental health-care-seeking behaviour was governed more by tradition than by awareness of modern health-care options. Conducting experimental research in such an unpromising locality ensured that any success arising from project interventions could not be dismissed as a by-product of favourable economic trends and social circumstances.

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The factorial design of the experiment was configured with two experimental arms. One arm of the experimental design emphasized the value of aligning community health services with the traditional social institutions that organize village life. Policy focused on this perspective received impetus from an international health conference held in 1987 by the United Nations Children's Fund (UNICEF)/WHO in Bamako, Mali, for African ministers of health.⁴ The "Bamako Initiative" proposed a framework for promoting community-engaged management, financing and leadership of health services.⁵ Despite the conceptual appeal of Bamako, international appraisals of actual implementation of the proposals generated mixed results.⁶ Nonetheless, elements of the Bamako Initiative were adopted as national policy in Ghana, such as a commitment to developing community health committees, volunteer services and community financing of essential drugs.⁷ Evaluations of the Ghana programme showed, however, that turnover of volunteers was high, quality of care was low and supervision was lax.⁸ Reliance on volunteers remained an appealing policy option, however, because approaches based on the assignment of professional workers led to potential difficulties with the sustainability of investment in facilities, equipment and personnel.⁹

The second arm of the experiment concerned strategies for relocating health service staff from clinics to community locations. In the early 1990s, more than 2000 "community health nurses" were hired, trained for 18 months, and deployed to districts throughout Ghana to address lapses in the volunteer scheme.¹⁰ While the costs of community nurses' salaries, training and basic equipment could be met by available government revenue, the community nurse programme encountered serious operational difficulties when it was implemented on a large scale. In the absence of community facilities where nurses could live and work, the programme assigned all nurses to subdistrict health centres located on average more than 10 km from the rural households they were serving. Communities were not connected with the initiative and contributed nothing to its sustainability. Caseloads were low, calling into question the likelihood that deployment of community nurses could contribute to community health.¹¹ Community nurses nonetheless remained

an appealing concept if operational problems with deployment in the community could be resolved to improve the accessibility of nurse services. Nurses already working in the programme had been trained to provide curative services for acute respiratory infections, malaria and other ailments. They could also provide care for diarrhoeal diseases, immunization services and comprehensive family planning and safe motherhood care and could be entrusted with care and referral services that volunteers could not provide. Antibiotic therapy, basic midwifery services and injectable contraceptives were examples of services that were available only from nurses. A brief regimen of additional training was provided to enable these nurses to organize community health services, engage in community diplomacy and supervise the activities of volunteers.

In summary, health policy debate focused on the relative merits of two alternative approaches to extending health care to community locations. The proponents of volunteer strategies based their arguments on evidence that vibrant social institutions could support affordable community-led services. The provision of professional nurse services was supported by evidence that volunteer programmes were not working and that there were a range of health interventions and technologies that only nurses could provide.

Methods

The experimental design

In response to policy debate, a three-community pilot study was conducted in 1994 to gauge community advice about health service implementation and develop plausible strategies for solving problems. A succession of in-depth interviews and focus groups of panels of married men, married women, community leaders and health workers were conducted to assess perceived health service needs. These sessions were followed by pilot implementation of services to test the feasibility of the proposed approaches and to permit appraisal of the reactions of community and health workers to services rendered. This process of dialogue, implementation and calibration clarified the operational details and the steps required in launching a community health experiment. Villagers were consulted about appropriate ways to organize, staff, and implement primary health care and

family planning services. Chiefs, elders and women's groups were involved in discussing practical means of developing leadership of operations to deliver community health care services.¹² Particular attention was directed to mechanisms for fostering community contribution of labour and materials for constructing the health compounds to which nurses were to be assigned. The mechanics of launching this programme and listening to its stakeholders generated practical insights into ways of changing programmes from clinic-focused services to community-based care. These steps were clarified by modifying the programme over time and reconvening focus-group discussions with members of the pilot communities to gauge their reactions and garner their advice.¹³

After a pilot trial of 18 months, an experimental phase was launched in 37 communities to test the hypotheses that strategies developed in the pilot scheme could lead to reduced fertility and reduced childhood mortality. The factorial design was configured with two experimental arms.¹⁴

The "community health officer" arm of the experiment reoriented existing clinical nurses to enable them to provide community health care and assigned these re-trained workers to village locations with the new designation "community health officers." Nurses entering the programme had completed 18 months of training in basic curative health services, public health, immunization and family planning. Reorientation involved 6 weeks of intensive in-service training in methods of community engagement, service outreach and community health care planning. Chiefs and elders were requested to convene community gatherings to seek volunteer support for constructing dwellings, using local designs, materials and resources. Once this collective effort had produced a completed "community health compound," a community health officer was assigned to the facility where she then lived and worked. Communities were obliged to maintain the facility, provide security and meet the nurse's daily living needs. The costs of essential drugs were borne by the community. The Ministry of Health provided start-up pharmaceutical kits, essential clinical equipment, staff salaries and motorcycles. Services were provided during household visits made at 90-day intervals, augmented with daily care based at the community

health compound, which was provided during well-publicized hours of duty.

The *zurugelu* (togetherness) arm of the experiment mobilized the cultural resources of chieftaincy, social networks, village gatherings, voluntary activities and community support. Community liaison was directed towards arranging quarterly community gatherings, the recruitment and management of male health service volunteers, outreach to community networks and other mechanisms for integrating project management into the traditional system of social organization and communication. A prominent feature of the *zurugelu* dimension was a gender component, developed in the course of the pilot study. Activities were designed to build male leadership, ownership and participation in reproductive health services and to expand women's participation in community activities that have traditionally been the purview of men.¹⁵ This social-action agenda was designed to enhance the autonomy of women in seeking reproductive and child health care, thereby reducing the social costs of women's participation in the programme. The *zurugelu* system extended to the Navrongo communities the Bamako Initiative's model for recovering the cost of essential drugs by equipping volunteers with bicycles, providing them with a start-up kit of essential drugs and conducting training in managing services and revolving accounts so that the flow of supplies would be sustainable and financed by the community.

Because the two experimental arms could be assigned independently, jointly or not at all, a four-celled experiment was implied by the design. Cell 1 constituted an independent test of the impact on fertility and child survival of developing the *zurugelu* approach to community health care. Cell 2 tested the independent effect of assigning community health officers to village locations. Cell 3, the joint-implementation cell, tested the impact of mobilizing community-based health care through traditional institutions combined with referral support and resident ambulatory care provided by community health officers. All cells, including the cell 4 comparison area, were provided with subdistrict clinical services, equivalent densities of staff and equivalent access to supplies and technical training.¹⁶ The four subdistrict health-centre zones of Kassena-Nankana District were each randomly assigned to

one of the four cells where surrounding contiguous geographical zones corresponded to alternative strategies for delivery of community health services. Areas in and around Navrongo town were excluded from the study area, under the assumption that the social and economic conditions in the town would bias experimental results.

Of necessity, four contiguous clusters of communities were grouped in referral service catchment areas corresponding to four subdistrict health centres. The project is therefore a "plausibility design" rather than a true experimental study.¹⁷ Nonetheless, the research systems of the Navrongo Centre provided an element of rigour that would not be obtainable with a simple cross-sectional comparison.¹⁸ The study district was equipped with a longitudinal demographic surveillance system for assessing the impact of the experimental programme. This system recorded all vital events, migrations, person-days at risk and relationships of members of extended households for 139 000 rural residents enumerated in a census of the district in May and June 1993 and observed in 90-day data collection cycles over the period between 1 July 1993

and 31 December 2004.¹⁹ Saturation coverage of demographic surveillance eliminates sampling error, and prospective monitoring eliminates the recall biases associated with survey research. Although the results presented below are based on tabulations of cell differentials over the study period, separate survival analyses have shown that bivariate results are robust to the introduction of controls for pre-experimental cluster differentials and parental characteristics.²⁰ Similarly the assessment of impact on fertility has been regression-adjusted for individual reproductive patterns before programme implementation and shown to be robust to regression controls for maternal characteristics, such as age and educational attainment and pre-experimental fertility levels.²¹ For these reasons, the Navrongo experiment is an unusually rigorous quasi-experimental assessment of the impact of community health services.

Results

Impact on child survival

An analysis of demographic surveillance data, by cells, of the Navrongo experiment demonstrates that assigning community health officers to village locations had a pronounced impact on child

Fig. 1. Trends in mortality in children younger than five years (5q0) in communities of the Kassena-Nankana District by cell of the Community health and Family Planning Project, 1996–2003

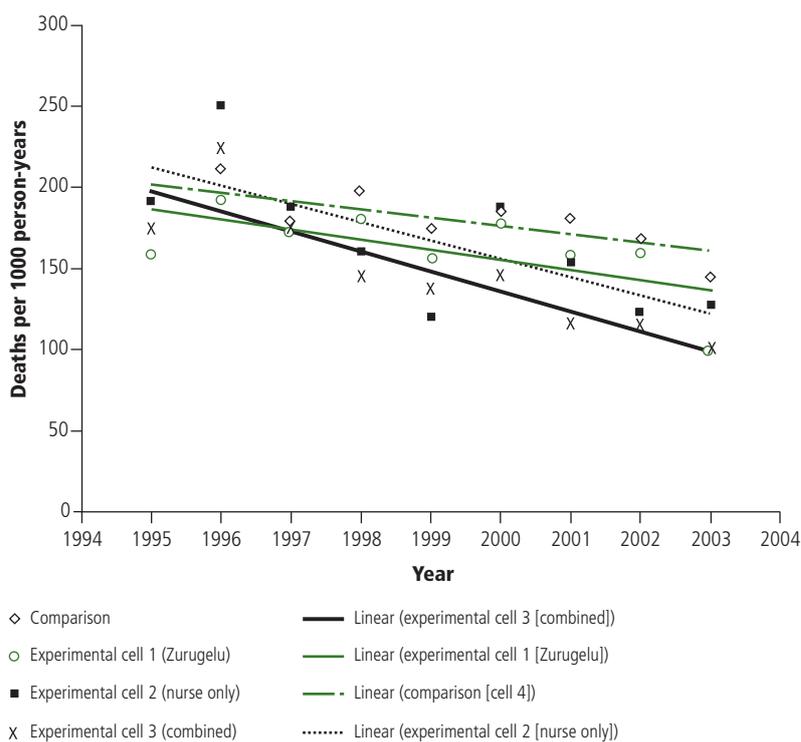
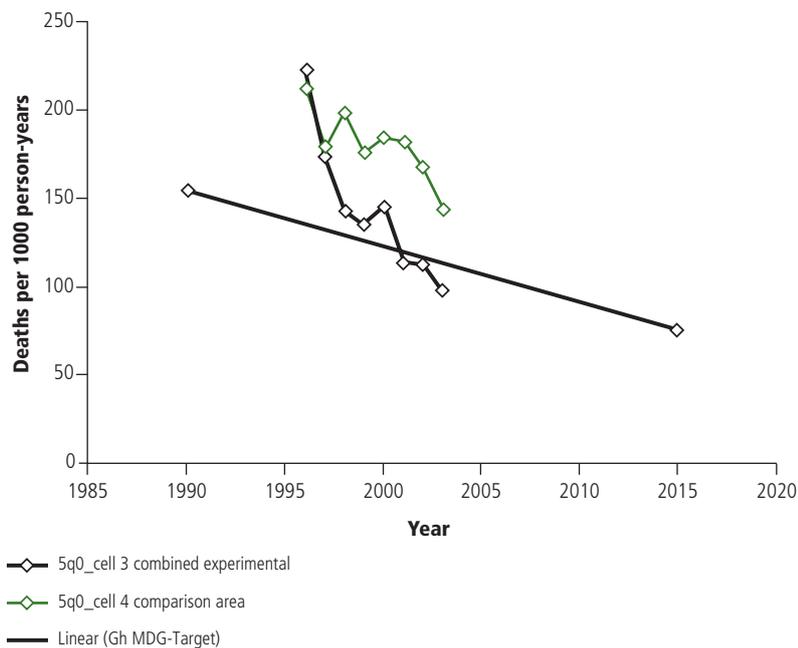


Fig. 2. Trends in mortality in children younger than 5 years (5q0) for communities of Kassena-Nankana District located in the combined experimental cell and the comparison area, 1995–2003



^a GhMDG = Ghana Millennium Development Goal.

Source: Binka FN, Bawah AA, Phillips JF, Hodgson HV, Adjuk MA, MacLeod BB. Rapid achievement of the child survival Millennium Development Goal: evidence from the Navrongo Experiment in northern Ghana. 2006 (unpublished).

mortality (Fig. 1). Mortality rates in the comparison area also declined owing to the child mortality-reducing effects of insecticide-impregnated bednets²¹ and other health interventions such as vitamin A supplementation.²² But the results in cells 2 and 3 indicated that assigning nurses to communities accelerated progress in achieving the MDG on child survival relative to the trend in the comparison area. However, in cell 1, where volunteers worked without a resident nurse, trends were similar to those in the cell 4 comparison areas, indicating that volunteers made no contribution to increased child survival.²³

This finding was corroborated by qualitative research on parental health-care-seeking behaviour. In impoverished families, parents dealing with childhood illness tend to seek care first from traditional healers because deferred payment customs and social arrangements make traditional healing a more feasible option than clinical care. Volunteers lacked the credibility to change this dynamic, whereas services provided by community health officers were acceptable substitutes for those of traditional healers. Community health officers working with chiefs and elders devel-

oped deferred payment procedures that permitted parents to acquire health services for their children on demand, with the expectation that extended family social insurance customs would permit recovery of costs for essential drugs. Such a system of social engagement for deferring payment eludes other modern health care providers in the Ghanaian health system. Improving geographical and social access to basic curative and

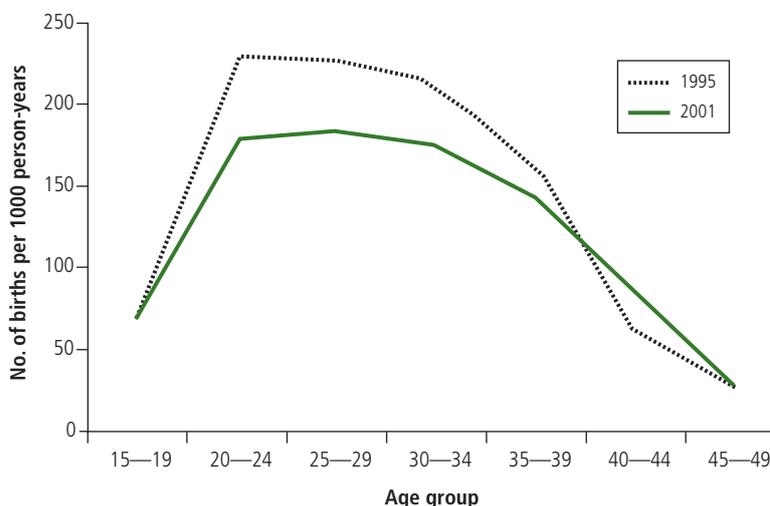
preventive services enabled community health officers to make major gains in child survival. The Navrongo experiment enabled the project area to achieve the child-survival MDG within 8 years (Fig. 2). Over the period 1995–2003, child mortality declined from 212 to 145 deaths per thousand person-years in the comparison area, versus 224 to 100 per thousand person-years in the combined experimental area.

Impact on fertility

Over the period 1997–2003, the Navrongo experiment exhibited a pronounced impact on fertility (Fig. 3 and Fig. 4). On average, total fertility rates in the “combined cell” (cell 3) of the experiment were one birth fewer than the total fertility rate expected in the absence of the intervention. Regression adjustment for the possible confounding effects of pre-project fertility differentials, women’s educational attainment and number of co-wives support the hypothesis that the supply of family planning services can have a beneficial impact, even in an impoverished rural African setting.¹⁶

Social and survey research has explained how the effects on fertility arose. Baseline research showed that the unmet need for contraception in the study area was almost entirely related to demand for longer intervals of birth spacing and that nearly half of the women were amenorrhoeic, separated from their spouses or otherwise not at risk of becoming pregnant. Few women expressed the view that childbearing should be ended through individual volition or family planning.

Fig. 3. Age-specific fertility, combined cell 3, Navrongo, Ghana



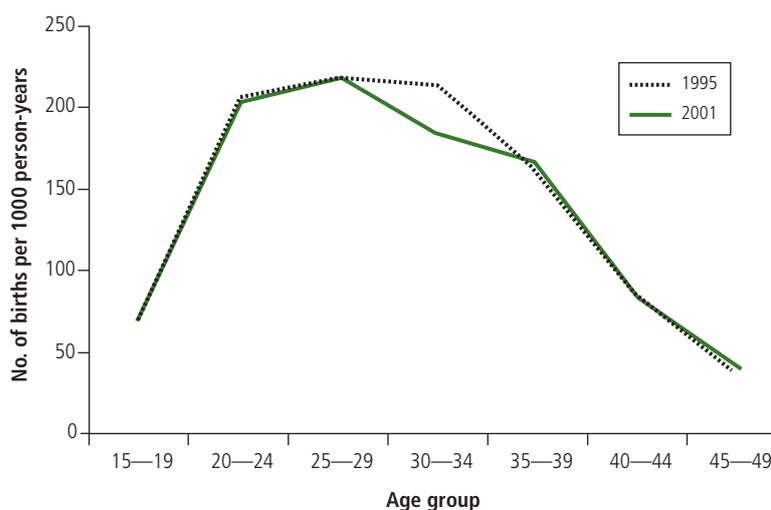
Research showed a strong association, however, between stated desires to space births and subsequent spacing behaviour. Spacing preferences are relevant to women of all ages, and the impact of the project reflects this underlying climate of demand for contraception. Fig. 3 and Fig. 4 show the implications of this climate of demand for family planning. In each 5-year age group, fertility declined in the experimental cell 3 area (Fig. 4) relative to that in the comparison area,¹⁶ where it did not decline. This is consistent with survey research showing that the experiment addressed an unmet need for increased child spacing, which had an equivalent impact across all age categories.

The study's findings demonstrate that achieving an impact on fertility requires that accessible services be established with a well-developed mechanism for offsetting the social costs of fertility regulation. The community-engagement strategies in the *zurugelu* arm of the project were designed to build male involvement in the programme. Over 80% of the volunteers were men, and most community activities in cells to which they were assigned were focused on nurturing the participation of traditional leaders and heads of kinship groups and of extended families in the promotion of health care and family planning. Community-engagement activities also involved individual women and women's social networks. The combined effect of outreach to men and women reduced gender stratification in reproductive decision-making.

Conclusion

The Navrongo experiment demonstrates contrasting results on fertility and child survival: cells where nurses were assigned experienced equivalent trajectories in decline in childhood mortality. Reducing fertility depended upon combining the presence of nurses with community mobilization and the involvement of men in family planning. These findings attest to the demographic importance of developing social access to care in conjunction with improving geographical access to a broad range of technologies for improving reproductive and child health. Reducing child mortality required credible nursing services that supplanted traditional health-seeking behaviour with accessible preventive and curative health interventions affecting

Fig. 4. Age-specific fertility, comparison cell 4, Navrongo, Ghana



Source: Ref. 21.

all of the major childhood illnesses — respiratory infections, malaria and diarrhoeal diseases. Approaches that used community volunteers had no impact on mortality, in part because volunteer services could not offer antibiotic therapy and in part because the volunteer services lacked sufficient credibility to supplant traditional health-seeking behaviour. The results from Navrongo thus challenge the rationale for volunteer-based health programmes designed to improve child survival.

Male volunteers were crucial to achieving an impact on fertility. Providing convenient access to contraceptive supplies was an essential, but insufficient component of the reproductive health services. This suggests that extending access to family planning services can fail to address adequately the social costs of fertility regulation in a traditional society. Achieving results with family planning services requires developing ways of offsetting the social constraints to adoption of contraceptives — the opposition of husbands, ambivalence of community leaders and concerns of women in polygynous unions that contraception diminishes their social status and value to extended families. Simple means of mobilizing male support through public gatherings, engagement of chieftains, and outreach to men can address women's fears about the social costs of contraception and men's anxieties about loss of status. Volunteers focusing outreach on such problems offset the social constraints on use of contraception.

While the Navrongo experiment had an impact on fertility it provided no evidence that services induced a fertility change that increased with experimental exposure time. Long-term observation of differential effects in each of the cells shows that early experimental differentials remained constant over time. Although the project's activities generated preferences for limiting fertility, the new climate of demand for family planning has yet to translate into an expanding and sustained fertility transition of the sort observed in Asia and in east and southern Africa. The results suggest that improving access to integrated health service and improving community engagement for family planning will reduce fertility, but cannot solve the problem of high fertility in isolation from other social, economic or health developments.

The Navrongo experiment thus demonstrates ways to simultaneously address the global agenda for achieving both the ICPD goals and MDGs using existing health technologies at a minimal cost. The total budget for the combined cell of the Navrongo initiative was US\$ 8.72 per capita per project year, of which US\$ 1.92 was the incremental cost of the project. Accumulating and using research results was crucial to building this success into a national programme, which has now been scaled up to a community-based health-care reform in every region of Ghana.²⁴ ■

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Competing interests: none declared.

Résumé

Accélération de l'effet des programmes en faveur de la santé infantile et génésique proposant des services au niveau communautaire : résultats relevés au Ghana par le centre de recherche de Navrongo

Objectif Déterminer l'impact démographique et sanitaire de l'affectation de personnel infirmier et de volontaires à proximité des villages pour y dispenser des services de santé dans la perspective d'étendre à plus grande échelle ces résultats.

Méthodes Pour évaluer l'impact sur la fécondité et la mortalité d'une harmonisation des services de santé communautaires avec les institutions sociales traditionnelles régissant la vie dans les villages, les chercheurs ont utilisé un test de plausibilité à quatre variables et des données fournies par le système de surveillance démographique de Navrongo, destiné à suivre dans le temps ces variables.

Résultats L'affectation de personnels infirmiers à proximité des communautés a permis de faire baisser de plus de 50 % en 3 ans les taux de mortalité infantile et de réduire dans les zones étudiées à 6 ans le temps nécessaire à la réalisation de l'objectif du Millénaire pour le développement (OMD) concernant la survie des enfants. Elle a également provoqué une diminution de 15 % de la fécondité (correspondant à une naissance sur le taux de fécondité total). Le coût programmatique supplémentaire était de US \$ 1,92/personne s'ajoutant au budget de US \$ 6,80/personne, affecté aux soins de santé primaire.

Conclusion L'affectation de personnel infirmier dans des centres situés à proximité des communautés, où ce personnel peut dispenser des soins curatifs et préventifs de base, a permis de réduire substantiellement la mortalité infantile et d'accélérer les progrès en direction de l'OMD concernant la survie des enfants. Les démarches faisant appel à des volontaires issus des communautés sont néanmoins sans effet sur la mortalité. Les résultats de l'étude montrent que la mesure consistant à améliorer l'accès aux moyens contraceptifs est insuffisante, si elle est mise en œuvre isolément, pour répondre aux coûts sociaux de la régulation des naissances. Les contraintes liées à l'adoption d'une contraception peuvent être compensées par le déploiement efficace de volontaires et de stratégies de mobilisation de la communauté. L'étude réalisée par le centre de Navrongo démontre ainsi que la mise en œuvre combinée des moyens abordables et durables que sont les soins infirmiers et l'intervention de volontaires peut accélérer la réalisation des priorités de la Conférence internationale sur la population et des objectifs du Millénaire pour le développement.

Resumen

Aceleración del impacto del programa de salud reproductiva e infantil mediante servicios comunitarios: experimento en Navrongo (Ghana)

Objetivo Determinar el impacto demográfico y sanitario del despliegue de enfermeras y voluntarios por las aldeas con miras a expandir los resultados.

Métodos Se utilizó una prueba de plausibilidad con cuatro celdas para analizar el impacto de la armonización de los servicios de salud comunitarios y las instituciones sociales tradicionales que organizan la vida comunal. Se emplearon datos del Sistema de Vigilancia Demográfica de Navrongo, con el que se siguen de cerca los eventos de fecundidad y mortalidad a lo largo del tiempo, para estimar los efectos en esas dos variables.

Resultados La asignación de enfermeras a localidades de la comunidad redujo las tasas de mortalidad en la niñez en más de la mitad en un periodo de 3 años y acortó a 6 años el tiempo necesario para alcanzar los Objetivos de Desarrollo del Milenio (ODM) relacionados con la supervivencia infantil en las zonas estudiadas. La fecundidad también disminuyó en un 15%, lo que representa una reducción de un nacimiento en la tasa total de fecundidad. Los gastos programáticos añadieron US\$ 1,92 por

habitante a los US\$ 6,80 a que ascendía el presupuesto para atención primaria por habitante.

Conclusiones La asignación de enfermeras a lugares de la comunidad para que presten atención curativa y preventiva básica reduce sustancialmente la mortalidad en la niñez y acelera los progresos hacia los ODM relacionados con la supervivencia infantil. Las estrategias basadas en voluntarios de la comunidad, sin embargo, no tienen ningún impacto en la mortalidad. Los resultados también demuestran que, por sí solo, un mayor acceso a los anticonceptivos no basta para hacer frente a los costos sociales de la regulación de la fecundidad. Las estrategias eficaces de despliegue de voluntarios y movilización comunitaria compensan los obstáculos sociales a la adopción de anticonceptivos. Así pues, la investigación realizada en Navrongo demuestra que las combinaciones asequibles y sostenibles de servicios de enfermería y voluntariado pueden acelerar tanto el cumplimiento de la agenda de la Conferencia Internacional sobre la Población y el Desarrollo como el logro de los ODM.

ملخص

تسريع وتيرة تأثير برامج صحة الطفل والصحة الإنجابية في الخدمات المجتمعية: تجربة نافرونغو في غانا

الهدف: معرفة الآثار الديموغرافية والصحية على نشر الممرضات والمتطوعين للخدمات الصحية في المواقع القروية توجيهاً لتحسين النتائج.

الطريقة: استخدمت تجربة استحسان رباعية الخلايا لاختبار أثر تماشى الخدمات الصحية المجتمعية مع المؤسسات الاجتماعية التقليدية التي تنظم حياة القرية. وقد استُمدت المعطيات من نظام التردد الديموغرافي لنافرونغو الذي يتابع أحوال الخصوبة وحوادث الوفاة بمرور الوقت، وذلك لتقدير الآثار المترتبة عليهما.

النتائج: لقد أدى تعيين الممرضات في مواقع مجتمعية لإنقاص معدلات الوفيات بين الأطفال إلى نصف ما كانت عليه خلال ثلاث سنوات، كما سرّع ذلك من الوقت الذي سيستغرق بلوغ المرامي الإنمائية للألفية في المناطق المدروسة ليصل إلى ست سنوات. كما نقصت معدلات الخصوبة بمقدار 15%، وهذا ما يمثل نقصاً في الولادة ضمن مجمل معدلات الخصوبة. وقد أدى تطبيق البرنامج إلى إضافة تكاليف تقدير بـ 1.92 دولاراً أمريكياً لكل فرد

إلى ميزانية الرعاية الصحية الأولية التي تبلغ 6.8 دولاراً أمريكياً لكل فرد. **الاستنتاج:** لقد أدى تعيين الممرضات في المواقع المجتمعية التي يؤدي فيها الرعاية الأساسية العلاجية والوقائية إلى نقص واضح في معدلات وفيات الأطفال، وإلى تسريع وتيرة التقدم المُحرز نحو بلوغ المرامي الإنمائية للألفية المتعلقة ببقاء الأطفال. أما الأساليب التي تم فيها استخدام المتطوعين فلم يكن لها أي أثر على معدلات الوفيات. وتوضح النتائج أيضاً أن زيادة إتاحة الإمدادات من موانع الحمل لوحدها لا يكفي لمواجهة التكاليف الاجتماعية لتنظيم الخصوبة. إن استراتيجية نشر المتطوعين واستنهاض المجتمع بشكل فعّال يقلل من المعوقات الاجتماعية التي تحول دون تبني موانع الحمل، وتوضح البحوث المجراة في نافرونغو أن الوسائل المضمونة الاستمرار والميسورة التكاليف لضم خدمات الممرضات إلى أنشطة المتطوعين يمكنها أن تسرّع كل من بلوغ المرامي الإنمائية للألفية وتحقيق جول أعمال المؤتمر الدولي للسكان والتنمية.

References

- Bryce J, el Arifeen S, Pariyo G, Lanata C, Gwatkin D, Habicht JP. Reducing child mortality: Can public health deliver? *Lancet* 2003;362:159-64.
- Caldwell JC, Caldwell P. The cultural context of high fertility in sub-Saharan Africa. *Pop Dev Rev* 1987;13:409-37.
- Adongo P, Phillips JF, Kajihara B, Favorsey C, Debpuur C, Binka FN. Cultural factors constraining the introduction of family planning among the Kassena-Nankana of northern Ghana. *Soc Sci Med* 1997;45:1789-804.
- Knippenberg R. *The Bamako Initiative: primary health care experience*. Paris: International Children's Centre; 1990.
- United Nations Children's Fund. *The Bamako Initiative: a progress report*. New York: UNICEF; 1991.
- McPake B, Hanson K, Mills A. Community financing of health care in Africa: An evaluation of the Bamako Initiative. *Soc Sci Med* 1993;36:1383-95.
- United Nations Children's Fund. *The Bamako Initiative: rebuilding health systems*. New York: UNICEF, The Bamako Initiative Management Unit; 1995.
- Adjey S, Senah K, Cofie P. *Study on the implications of community health workers' distributing drugs in Ghana*. Accra: Ministry of Health (Ghana) Health Research Unit; 1995.
- Berman PA, Gwatkin DR, Burger SE. Community-based health workers: head start or false start towards health for all? *Soc Sci Med* 1987;25:443-59.
- World Bank. Making services work for poor people. *World development report: investing in health. The 2004 world development report*. New York: Oxford University Press; 2003.
- Agyepong I, Marfo C. Is there a place for community health worker programmes in primary health care delivery in Ghana? *A Report of the International Evaluation of the Dangbe West District Community Health Workers Programme by the District Health Management Team*. Accra: Ministry of Health (Ghana) and United Nations Children's Fund; 1992.
- Nazzar A, Adongo PB, Binka FN, Phillips JF, Debpuur C. Developing a culturally appropriate family planning programme for the Navrongo experiment. *Stud Fam Plann* 1995;26:307-24.
- Binka FN, Nazzar AK, Phillips JF. The Navrongo Community Health and Family Planning Project. *Stud Fam Plann* 1995;26:121-39.
- Awoonor-Williams JK, Feinglass ES, Tobey R, Vaughan-Smith MN, Nyonator FK, Jones TC. Bridging the gap between evidence-based innovation and national health-sector reform in Ghana. *Stud Fam Plann* 2004;35:161-77.
- Bawah AA, Akweongo P, Simmons R, Phillips JF. Women's fears and men's anxieties: the impact of family planning on gender relations in northern Ghana. *Stud Fam Plann* 1999;30:54-66.
- Debpuur C, Phillips JF, Jackson EF. The impact of the Navrongo project on contraceptive knowledge and use, reproductive preferences, and fertility. *Stud Fam Plann* 2002;33:141-64.
- Victora CG, Habicht J-P, Bryce J. Evidence-based public health: moving beyond randomized trials. *Am J Public Health* 2004;94:400-5.
- Habicht J-P, Victora CG, Vaughan JP. Evaluation designs for adequacy, plausibility, and probability of public health programme performance and impact. *Int J Epidemiol* 1999;28:10-8.
- Binka FN, Ngom P, Phillips JF, Adazu FK, MacLeod BB. Assessing population dynamics in a rural African society: the Navrongo Demographic Surveillance System. *J Biosoc Sci* 1999;31:373-91.
- Pence BW, Nyarko P, Phillips JF, Cornelius YD. *The effect of community nurses and health volunteers on child mortality: the Navrongo community health and family planning project*. New York: Population Council; 2005. Policy Research Division Working Paper No. 200.
- Phillips JF, Jackson EF, Bawah AA, Debpuur CY. The fertility impact of the Navrongo Project. *Paper presented at the Annual Meeting of the Population Association of America*, Minneapolis, 1-3 May, 2003.
- Binka FN, Adazu FK, Adjuik M, Williams LA, Lengeler C, Maude GH, et al. Impact of permethrin-impregnated bed nets on child mortality in the Kasena-Nankana district, Ghana: a randomized controlled trial. *Trop Med Int Health* 1996;1:147-54.
- Ghana Vitamin A Supplementation Trials (VAST) Study Team. Vitamin A supplementation in northern Ghana: effects on clinical attendance, hospital admissions, and child mortality. *Lancet* 1993;342:7-12.
- Nyonator FK, Awoonor-Williams JK, Phillips JF, Jones TC, Miller RA. The Ghana community-based health planning and services initiative: fostering evidence-based organizational change and development in a resource-constrained setting. *Health Policy Plan* 2005;20:25-34.