Gambia: Evaluation of the Mobile Health Care Service in West Kiang districta

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Introduction
For many years, as part of its ongoing nutrition research, the Dunn Nutrition Unit of the British Medical Research Council has been providing clinical services to the population in its research area in West Kiang district, the Gambia. The primary health services include antenatal care. Although these services operate in addition to those offered in the neighbouring government facilities, a maternal death was registered in 1988. The woman had received antenatal services in the project area. This sparked off renewed interest in identifying feasible ways to reduce maternal mortality in the district. As a consequence a study was designed to measure the effectiveness of a limited range of antenatal and postnatal care measures in a designated intervention area. For purposes of comparison a control area with similar geography, population composition, and expected number of pregnancies was identified. The study period covered the period 1989-1991 in order to establish a sufficiently long period for data collection and obtainment of reliable results.

Objectives and methods
West Kiang was chosen as the district where interventions should take place. In order to determine the effects of some of the improved antenatal care measures data was also collected from a similarly remote district (Upper Baddibu).

The objectives of the research study were to determine the effectiveness of the following interventions:

(i) traditional birth attendants (TBAs) to provide surveillance for early identification of pregnant women;
(ii) registration of pregnant women in an antenatal care programme;
(iii) treatment of anaemia;
(iv) treatment of infections;
(v) identification of potential obstetric problems, with prompt referral for tertiary care when indicated; and
(vi) emergency treatment and rapid transfer of obstetric emergencies for specialist care.

Situation analysis: primary and maternal care services in the research area
The intervention area - West Kiang
West Kiang district covers a peninsula with difficult access to areas which are further removed from the main road. The population consists of subsistence farming communities living in hamlets and villages with populations ranging from 40 to 1 300 inhabitants. Karantaba, the project site, is one of the main villages in the district.

Before the project began the villages were served by an MCH team and primary health care workers consisting of community health nurses (CHNs), trained traditional birth attendants (TBA), and village health workers. Supervision of the village-based health activities was provided from a health centre which was staffed by a midwife, 2 CHNs, a health inspector, and a dispenser. A physician was also available intermittently. The health centre acted as a first referral level facility and consists of a dispensary, several small examination rooms, an operating theatre and delivery room, a small laboratory, and 2 wards with a total of 12 beds. The MCH team visited the outlying villages once a month. While women were encouraged to come to the health centre for antenatal care, poor means of transport and communication severely reduced access to these services for expectant mothers from the surrounding villages. Furthermore, a male midwife had been posted to the health centre which led to problems of non-acceptance of services by a number of women concerned. In effect, of the 150 women supposed to be registered with the midwife at any one time, only 80 - 110 actually attended antenatal care. In addition, shortages of transport, fuel, and drugs reduced possible clinic attendance.

These government services were supported by maternal care provided for 3 villages within the coverage area of the MRC Dunn Nutrition Unit. The antenatal services extended by the Unit consist of early enrolment of pregnant women in antenatal care, establishment of initial haemoglobin sta-

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tus and repeat measurements during the course of the pregnancy, combined malaria prophylaxis and iron and folate supplementation, identification and treatment of infections, and early referral to deliver at hospital for high-risk pregnancies. A fairly good degree of success in preventing maternal morbidity and mortality had been established in the 3 villages covered by these services since the beginning of the programme in 1974. For example, a survey on haemoglobin levels throughout pregnancies showed that while 41% of women had a level below 9.5 g/dl at some stage during their pregnancy, only 11% still suffered from the condition at the time shortly before delivery or referral, a tribute to a functioning iron and folate supplementation programme.

The control area – Upper Baddibu
Like West Kiang, Upper Baddibu is remote, most of the population relies on subsistence farming and lives in hamlets and villages of 40–1 300 inhabitants. Health services are provided by the government health centre, with almost similar staffing patterns but very reduced in-patient facilities. Laboratory tests for haemoglobin, for example, have to be carried out at a health centre situated at a distance of 20 kilometers from the PHC service base. Throughout the intervention period in West Kiang district no changes were introduced to the operations of health services in Upper Baddibu other than measures to improve the collection of antenatal and postnatal care data.

Operational changes in West Kiang district
The main strategy to strengthen the existing services was to improve the staffing of Karantaba Health Centre and to provide training for traditional birth attendants. Job descriptions for all MCH team members were established and the roles and tasks to be performed by each team member of the health centre were spelled out for the physician, the midwives, the community health nurses (CHN), and the traditional birth attendants. This was considered an important first step to ensure that every health worker knew exactly which tasks had to be performed.

Additional training was provided for CHNs in essential laboratory tasks e.g. establishment of haemoglobin levels, urine testing for protein, and malaria test slide preparation and interpretation. Schedules for an increased number of routine visits to the outlying villages were established.

In order to provide additional services more staff had to be posted to the study area. They consisted of 1 midwife and 2 more CHNs, bringing the total to 2 midwives and 4 CHNs at the health centre. This staffing pattern ensured that continuity in service delivery could always be guaranteed both for staff touring the villages and those present at the health centre. To ensure essential community support two women were recruited from each village and given a 4-week course to become trained TBAs.

Service delivery
Each midwife assumed the responsibility for antenatal and maternal care for specific villages within the catchment area of Karantaba Health Centre. By assigning specific villages to each midwife it was felt that this would enhance the continuity of care and increase accountability. Thus each midwife would visit each village under her responsibility twice a month. In order to maximize the utilization of existing transport, visits to the villages were made to coincide with the routine MCH tours.

During the village visits routine antenatal checks were undertaken. As anaemia had been identified as one of the major health problems affecting women in the area, specific emphasis was placed on the measurement of haemoglobin levels. Iron supplementation was introduced routinely after the twelfth week of pregnancy combined with malaria prophylaxis during the rainy season. Health education, postnatal checks, and provision of family planning advice and contraceptives were further parts of the comprehensive ante- and postnatal care included in the scheme.

The role of the TBA as part of the maternal care team was also enhanced. They were required to accompany the midwife during the village visits. It was felt that this would facilitate early identification of pregnant women and the payment requested for the TBA services would establish the linkage between the services and the expectant mother. The TBAs and midwives were further expected to ensure compliance with advice for referral. As an incentive to the women the scheme paid for hospital and treatment charges. In addition to their tasks in assisting home deliveries, the TBAs were also required to accompany women referred during labour to the next level of care.

In order to ensure continued support from the TBAs a small amount of money was re-distributed to each TBA for each delivery attended. The payment was made on the occasion of a refresher meeting held once a year.

Clinic organisation
The organisation of clinic schedules at the health centre and the number of women seen for antenatal care during any one session were seen as critical elements in the delivery of quality maternal services in the intervention area. A maximum of 25 women were seen during an antenatal clinic session thus avoiding the overcrowding, accompanying fragmentation, and routine, poor quality delivery of antenatal services which is characteristic of many service delivery schemes throughout the develop-
Women with antenatal and infant welfare clinics were scheduled together. The small staff of 1 nurse/midwife, 3 CHNs, and 1 rural nurse attendant sometimes had to cope with more than 100 women attending for antenatal care and more than 200 under-fives for immunization and check-up. This organizational pattern inevitably results in fragmentation of services, and inadequate application of procedures.

By contrast, the additional midwife posted in West Kaeng and redistribution of patients over several clinic sessions throughout the working week allowed for a more holistic approach to maternal care. Midwife and CHN cared for the presenting mothers as a team, and the village TBA was frequently present during the antenatal check. In case of problems a treatment plan would be jointly worked out between the midwife, the TBA, and the patient. If appropriate, the husband or another relative would also be called in to prepare for a possible emergency. Timely identification of women at risk was ensured and the referral system improved.

For the attending staff the new organizational pattern led to higher job satisfaction and increased opportunities to provide quality care.

### Results of the improved service delivery scheme

#### Antenatal care

The effects of the new measures were soon apparent. Early registration for antenatal care clearly improved in the intervention area. By the end of the 23rd week of pregnancy 63.3% of all pregnant women had registered with the service. By that time only 24% of pregnant women in the control area had presented for antenatal registration and preventive care.

Specific emphasis was placed on checking and maintaining haemoglobin levels above 9.5 g/dl. Table 1 and Fig. 1 summarize the main effects of the increased attention given to the prevention of anaemia by safeguarding adequate haemoglobin levels in West Kaeng. The mean haemoglobin level of the women in the sample was 11.0 g/dl throughout the 39-week pregnancy period, whereas in Upper Baddibu only a mean of 8.4 g/dl was calculated.

Table 1 indicates that the upgrading of personnel, diagnostic and therapeutic skills, and adherence to established schedules and procedures have resulted in substantial improvements in maternal

### Table 1

Antenatal care and haemoglobin levels, end of intervention period, Gambia, 1991

<table>
<thead>
<tr>
<th>Intervene - Créée</th>
<th>West Kaeng intervention area – Zone d'intervention de West Kiang</th>
<th>Upper Baddibu control area – Zone témoin de Upper Baddibu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of records - Nombre de dossiers - Valeur</td>
<td>Number of records - Nombre de dossiers - Valeur</td>
</tr>
<tr>
<td>Women with at least one haemoglobin check - femmes ayant eu au moins 1 contrôle de leur taux d'hémoglobine</td>
<td>780 - 92.7%</td>
<td>669 - 84.9%</td>
</tr>
<tr>
<td>Average number of haemoglobin checks per woman - Nombre moyen de contrôles effectués par femme</td>
<td>724 - 2.7</td>
<td>568 - 1</td>
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<tr>
<td>Women receiving one Hb check during last 6 weeks of pregnancy - Femmes ayant eu au moins un contrôle de leur taux d'hémoglobine au cours des 6 dernières semaines de grossesse</td>
<td>724 - 73.2%</td>
<td>570 - 23.5%</td>
</tr>
<tr>
<td>Women with Hb ≤9.5g/dl (regardless of stage of pregnancy) - Femmes ayant un taux d'hémoglobine ≤9.5g/dl (quels que soit le stade de la grossesse)</td>
<td>724 - 29.4%</td>
<td>568 - 75.5%</td>
</tr>
<tr>
<td>Mean Hb level in g/dl - Taux moyen d'hémoglobine en g/dl</td>
<td>724 - 11.0</td>
<td>568 - 8.4</td>
</tr>
<tr>
<td>Iron/folate supplementation prescribed (Hb ≤9.5g/dl) - Prescription d'un supplément de fer/folate (Hb ≤9.5 g/dl)</td>
<td>326 - 57.1%</td>
<td>430 - 2.3%</td>
</tr>
</tbody>
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*Fig. 1 Ref: Gambie, 1991*
care in the intervention area. This is further underlined by an assessment of the amount of minor and major morbidity experienced during pregnancy and subsequently attended to. While the 794 pregnant women in the intervention area (West Kiang) presented for a total of 841 treatment episodes, the ratio was distinctly different in the control area, Upper Baddibu, i.e. 149 treatment episodes over 722 pregnancies (multiple visits included).

Pregnancy outcome

One of the most striking differences between the intervention and the control area is the number of maternal deaths recorded. In West Kiang 1 maternal death occurred giving a ratio of 1.3 per 1,000 live births. In Upper Baddibu 5 maternal deaths were registered which leads to a ratio of 7.0 per 1,000 live births in Upper Baddibu. All maternal deaths occurred during or after delivery in the village.

In analysing the maternal deaths, it is found that the only maternal death registered in the intervention area was, in all likelihood, preventable. The mother was a primigravida who developed eclampsia after a home delivery. Inappropriate checking of blood pressure and lack of immediate referral after the onset of convulsions are quoted as responsible factors for this unnecessary death.

In the control area 1 case of pulmonary embolus and 1 of postpartum haemorrhage were registered – the latter could possibly have been preventable, had appropriate antenatal and postnatal care been available. While medical evidence of the cause of death of the remaining cases was inconclusive, the investigator suspects that anaemia may have played a major role. In this connection the preventive action of iron/folate supplementation during pregnancy, and in particular during the period prior to delivery is once again underlined.

Analysis of the other findings of the study, however, gives an inconclusive picture of the impact of the service interventions on pregnancy outcome in West Kiang District. Both stillbirths and early neonatal (perinatal) deaths were considerably higher in the intervention area than in the control area (Table 2). Under-reporting of still births in the control area is a possible explanation for this result. It seems that more detailed research and specific attention to data accuracy is necessary in order to further qualify the impact of specific measures on pregnancy outcome. Finally, there is concern that perinatal mortality may not be as readily reduced as maternal mortality amongst the socially disadvantaged groups. There is evidence of a much lower perinatal mortality ratio amongst socially and economically better placed persons in the intervention area. It would appear that improvements in general living conditions may have a larger impact on perinatal mortality than on maternal mortality.

Summary

A project to improve the quality of maternal health services was carried out over a 3-year period in West Kiang district, Gambia. Coverage of maternal care was strengthened through upgrading of personnel, TBA training, improved treatment and referral schemes, and increased numbers of visits to rural outreach areas. A control district was used to compare the impact of the interventions. During the project period of 3 years a single maternal death was registered in the intervention district, and 5 in the control area. While improved staffing and service provision led to higher degrees of coverage of maternal care services, reductions in maternal morbidity could not be documented in the intervention area. Given concern over the quality of the data possibly influencing this result, further research is necessary to determine the relationship between improved mobile maternal care services and their impact on maternal morbidity and perinatal outcome.
Résumé

Gambie: Evaluation de l’antenne mobile de soins de santé de West Kiang

Dans le district de West Kiang, en Gambie, un projet visant à améliorer la qualité des services de santé maternelle a été poursuivi pendant trois ans. La couverture des soins de santé maternelle a été améliorée par un renforcement des qualifications du personnel, une formation des accoucheuses traditionnelles, une amélioration des systèmes de soins et d’orientation-recours, et une augmentation des consultations dans les zones rurales reculées. L’impact de ces interventions a été évalué par rapport à une zone témoin. Pendant la période d’application du projet, un seul décès maternel a été enregistré dans le district d’intervention, contre 5 dans la zone témoin. Si le renforcement du personnel et des services eux-mêmes a permis d’obtenir une meilleure couverture des services de soins maternels, aucune réduction de la morbidité maternelle n’a pu être prouvée dans la zone d’intervention. Il est possible que ce résultat soit en partie imputable à la qualité des données, et il faudrait donc poursuivre les recherches pour pouvoir déterminer le lien existant entre l’amélioration des services mobiles de santé maternelle et une évolution favorable de la morbidité maternelle et de l’issue des grossesses.