Using the polio programme to deliver primary health care in Nigeria: implementation research

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Abstracts in العربية, 中文, Français, Русский, and Español at the end of each article.

Introduction

The World Health Organization (WHO) has called for universal health coverage (UHC) to be available for all people and communities, emphasizing the need for promotive, preventive, curative, rehabilitative and palliative health services that do not expose the user to financial hardship. 1 Achieving UHC, including quality essential service coverage and financial protection for all, is a target of sustainable development goal (SDG) 3 to ensure healthy lives and promote well-being for all at all ages. 2 Furthermore, the Global Vaccine Action Plan also seeks to realize a world in which all individuals and communities enjoy the full benefit of immunization, including use of immunization systems for delivery of other primary health-care programmes. 3 Given their global reach (98.8 of 116.2 million children younger than 5 years old; performed 676 678 antenatal consultations and treated 1 682 671 illnesses in women and children, including pneumonia, diarrhoea and malaria. The baseline survey found that 758 (19.6%) of 3872 children younger than 5 years had routine immunization cards and 690/3872 (17.8%) were fully immunized for their age. The endline survey found 1757/3575 children (49.1%) with routine immunization cards and 1750 (49.0%) fully immunized. Children vaccinated with 3 or more doses of oral polio vaccine increased from 2133 (55.1%) to 2666 (74.6%). Households’ use of mobile health services in the previous 6 months increased from 509/1472 (34.6%) to 2060/2426 (84.9%).

Conclusion Integrating routine primary-care services into polio eradication activities in Nigeria resulted in increased coverage for supplemental oral polio vaccine doses and essential maternal, newborn and child health interventions.
People in hard-to-reach settlements generally experience low coverage of basic public health services including routine immunization and maternal, newborn and child health services. In 2013, Nigeria had made progress in maternal and child health, but continued to record high estimates of newborn, under-five and maternal mortality. The country also had the 10th highest under-five mortality rate globally and the 15th highest maternal mortality of 560 per 100,000 live births (contributing to 14% of global maternal deaths, with 40,000 estimated deaths). For each of the indicators, the rates in the northern zones where polo transmission continued were as much as twice as high or more than the national figures.

Nigeria had been implementing traditional polio eradication strategies, including increasing immunity through routine immunization, regularly scheduled house-to-house oral polio vaccine supplemental immunization activities and sensitive surveillance for acute flaccid paralysis. Additionally, through the polio emergency operations centre, the polio programme had been continuously innovating to improve vaccine coverage (e.g. through use of satellite mapping and vaccine carrier trackers to identify unreached areas). Monitoring data showed that these efforts were achieving good results and that campaigns were reaching more children with every vaccination round. However, there were still a high number of unvaccinated children, especially in underserved communities and hard-to-reach areas, demonstrated by monitoring data and the presence of polio cases. In late 2013, to address this problem, the polio emergency operations centre adopted a new approach with technical and financial support from its partners: the WHO, the United Nations Children's Fund (UNICEF) and the Bill & Melinda Gates Foundation. The aim was to reach more children with routine immunizations, including oral polio vaccine, while also providing maternal and child health survival interventions during mobile outreach sessions in six priority northern states of Nigeria. This integrated approach became known as the Hard to Reach communities project. The project aimed to raise population immunity to polo and enable hard-to-reach and vulnerable communities to access essential primary health-care services including maternal, newborn and child health care.

This manuscript presents the evaluation of the project. We aimed to measure the project's effectiveness by assessing changes in immunization coverage, basic public health knowledge and access to and use of public health services in the selected communities.

Methods

Project implementation

We implemented the project for 18 months between 1 June 2014 and 30 September 2015. The project proposed to expand on an existing mobile outreach strategy for routine immunization that was part of Nigeria’s national policy but not consistently implemented. The enhanced strategy provided routine immunization together with a basic integrated package of primary health-care interventions focused on maternal, newborn and child health.

The emergency operations centre selected a total of 3176 settlements in six northern states (Bauchi, Borno, Kaduna, Kano, Katsina and Yobe). Hard-to-reach settlements were communities that had geographically difficult terrain with any local or state border, scattered households, nomadic populations, waterlogged or riverine areas, or where it was difficult to access the health-care facilities due to insecurity. UNICEF managed implementation in Kaduna and Katsina, and WHO managed implementation in Bauchi, Borno, Kano and Yobe.

Each of the 84 mobile health teams comprised at least one nurse or midwife, a community health extension worker and a health records assistant. Staff were identified, trained and equipped with weighing scales, stethoscope, health commodities (e.g. essential drugs and consumables as contained in the UNICEF Emergency Health Kit) and recording tools. The 3-day training was provided within each state by facilitators using materials adapted from the Integrated Management of Childhood Illnesses and the Maternal, Neonatal and Child Health Week modules, with opportunities for refresher sessions during regular, monthly review meetings. Each team was assigned a specific number of settlements. Teams conducted mobile outreach visits to three to four settlements each week, and were expected to visit their assigned settlements once every 3 months. Their salaries were paid directly by UNICEF and WHO under non-staff consultancy contracts.

The teams coordinated closely with local health-care personnel and the community. They worked directly with the routine immunization focal person of the health facility in the settlement catchment area. Volunteer community mobilizers, usually women from the settlements, were engaged and paid a small stipend to announce the outreach dates and promote basic public health behaviours. These volunteers were trained in their respective wards of residence on community engagement and defaulter tracking.

The project also provided funds for transportation to the teams depending on route conditions (e.g. to hire four-wheel drive vehicle, motorcycle or boat). Team movements were monitored by local government facilitators, using checklists and mobile devices (a geographical information tracking system), which showed real-time movements for the purposes of monitoring settlement coverage and team security. Supervisors from partner organizations and the government project focal persons made supervisory field visits. There was an established programme review through monthly and quarterly review meetings at the state and subnational levels, respectively.

We summarized the records generated during each outreach session (numbers of children vaccinated, vitamin A provided, children dewormed and nutritional screenings done; numbers of people seen and treated for ailments) and sent them via mobile devices to a server domiciled with an independent geographical information system provider. Weekly summaries were collated to monitor the sessions conducted and coverage of services; and transmitted to the local and state government levels.

During the mobile outreach sessions, women and children in hard-to-reach settlements received a range of integrated health services. For example, pregnant women received antenatal care, malaria preventive therapy, iron folate, tetanus toxoid vaccine and treatment of illnesses (e.g. malaria and respiratory infections) or referral for care. Children aged 0–59 months received a full complement of routine immunizations (including oral polio vaccine), vitamin A supplements, deworming, diagnosis and referral for malnutrition, treatment of diarrhoea, pneumonia and malaria and additional referrals as required. In addition, all women attend-
ing outreach session were provided with health education on key household practices (hand washing, personal hygiene and infant feeding including exclusive breastfeeding).

**Study design**

To assess changes in coverage for polio immunization and maternal newborn and child health services, we conducted cross-sectional surveys at the start (baseline, March 2014) and after the implementation of the project (endline, November 2015). We used a simple random sampling method to select 317 (10%) of the 3176 hard-to-reach settlements where the project was implemented.

**Data collection**

A cross-sectional survey was made of women of childbearing age (15–49 years) in households containing at least one child aged 0–59 months (10 households in each settlement). In selected settlements with 10 or less households, all the households in the settlement were sampled and if 10 eligible mothers were not obtained, the surveyor moves to the nearest settlement within the same local government area and completed the process. In selected settlements with more than 10 households, the surveyor randomly selected the first household to be sampled and continued in a systematic way until 10 eligible mothers were obtained.

A total of 206 independent, trained surveyors administer the standardized questionnaires. The questionnaire asked about the women’s demographic characteristics; knowledge of common preventable diseases; household’s access to services and coverage; and household member’s use of the mobile health sessions in their communities. The women were also asked about vaccinations for children younger than 5 years old in the household. Interviewers asked to see the vaccination card and records of polio vaccinations, asked the reason why

### Table 1. Results of programme interventions in six states in the hard-to-reach communities project in Nigeria, June 2014 to September 2016

| Variable                                                                 | Kaduna    | Katsina   | Bauchi    | Borno     | Kano      | Yobe      | Total       |
|--------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| Population of target communities*                                        | 8 152 952 | 7 784 740 | 5 633 157 | 5 799 337 | 12 983 043| 3 274 833 | 44 528 062  |
| Key interventions delivered                                               |           |           |           |           |           |           |             |
| Total no. of doses of oral polio vaccine given                            | 338 910   | 577 317   | 641 107   | 598 454   | 370 342   | 453 278   | 2 979 408   |
| No. of children (aged 0–11 months) fully oral polio vaccine immunized    | 13 303    | 27 449    | 57 612    | 62 758    | 31 712    | 33 049    | 225 883     |
| No. of children fully immunized (measles vaccination)                    | 22 392    | 61 042    | 93 465    | 83 765    | 20 917    | 65 299    | 346 880     |
| No. of children receiving growth monitoring                              | 309 731   | 388 175   | 378 633   | 211 320   | 270 673   | 282 622   | 1 841 154   |
| No. of children given vitamin A                                           | 204 987   | 371 362   | 359 743   | 209 850   | 220 256   | 288 786   | 1 654 984   |
| No. of children dewormed                                                  | 210 502   | 346 617   | 361 161   | 201 471   | 197 901   | 244 988   | 1 562 640   |
| No. of women reached with message on exclusive breastfeeding              | 220 609   | 251 830   | 258 686   | 140 121   | 290 819   | 197 258   | 1 359 323   |
| No. of adults reached with education on key household practices and health promotion | 236 799   | 385 656   | 293 861   | 164 018   | 315 849   | 210 345   | 1 606 528   |
| No. of minor ailments treated                                             | 151 346   | 263 707   | 225 234   | 348 312   | 326 116   | 367 956   | 1 682 671   |
| No. of antenatal consultations done                                       | 27 312    | 55 795    | 239 077   | 127 569   | 55 186    | 171 739   | 676 678     |
| No. of tetanus toxoid vaccine doses given                                 | 42 458    | 57 156    | 130 354   | 129 980   | 36 823    | 91 128    | 487 899     |
| No. of iron folate doses given                                            | 38 766    | 57 452    | 220 548   | 91 051    | 42 144    | 71 319    | 521 280     |
| No. of malaria intermittent preventive treatment doses given              | 24 038    | 50 605    | 67 425    | 80 931    | 29 729    | 37 718    | 290 446     |

*a* Projected population by states from Nigeria 2006 population census.

*b* Key household practices of integrated management of childhood illnesses.
any child had not been vaccinated and verified children’s tuberculosis vaccine scars. Surveys were administered over a period of 7–10 days at baseline (15–24 March 2014) and endline (3–16 October 2015). Due to population dynamics, for example, nomadic populations and displacement due to insecurity, the survey participants were not the same at baseline and endline. Households and respondents were not included in our second survey if they had not lived in the community for more than 6 months. Similarly, the settlements were not always the same, but must have been in the sampling frame, i.e. the selected settlements where the intervention was implemented.

We also collected data from the project records on the services provided during the mobile outreach sessions, which included summaries of children vaccinated, numbers of clients seen and the diseases treated.

Data analyses

Analysis for the baseline and endline surveys were conducted separately to determine outcomes and to evaluate the integration of services. Analyses included comparisons of reported data across the six states during the studied periods. Descriptive analyses were used to compare information across the selected variables.

Ethical considerations

The surveys formed part of the monitoring and evaluation activities of the Hard-to-Reach communities project, that was not intended as research work, but instead as an intervention to improve vaccination uptake among hard-to-reach communities. However, the government of Nigeria approved the project as part of the Global Polio Eradication Initiative activities to achieve the goals of the national polio eradication emergency plans and granted permission for the activities in the project.

We obtained ethical clearance from the Bauchi state health research ethics committee. The survey assistants obtained informed consent from each survey participant after interpreting and explaining the consent section of the questionnaire in the participant’s local language. Those who gave their consent continued with the interview.

Results

Project outcomes

During the project period, the mobile outreach sessions delivered 2979408 supplemental doses of oral polio vaccine to children younger than 5 years and 346880 children were fully immunized (measles vaccine was used as a proxy for full immunization). More than 1.5 million children were dewormed; 6767880 antenatal care consultations were performed; 1359323 women were provided information on exclusive breastfeeding and more than 1.68 million illnesses among women and children were treated, including pneumonia, diarrhoea and malaria (Table 1).

Demographic characteristics

At baseline, we interviewed 3166 women with 3873 children younger than 5 years old. The endline survey included interviews with 2426 women with 4651 children younger than 5 years old.

Table 2 presents the demographic characteristics of the women. In the baseline sample, Fulani were the major ethnic group (1077; 37.1%) and one-quarter of women (730; 25.1%) were from nomadic populations. At baseline, many women (1216; 41.8%) had no education and 1382 (47.6%) had Koranic rote learning only. Most of the women were crop farmers (1112; 38.3%). In the endline sample, the distribution of occupational characteristics was similar, but there was a lower proportion of women with no education (912; 37.6%) and Hausa were the majority ethnic group (987; 40.7%).

Awareness of diseases

At endline there was higher awareness about vaccine-preventable diseases
and use of mobile outreach services among household caregivers. In the baseline survey, of the 2204 (75.8%) women aware of vaccine-preventable diseases, 523 (23.7%) were aware of measles and 484 (22.0%) of polio. In the endline survey, of 2105 (86.8%) women aware of vaccine-preventable diseases, 1806 (85.8%) and 1544 (73.3%) were aware of measles and polio, respectively. The numbers of women aware of cerebrospinal meningitis were 18 (0.8%) at baseline and 156 (7.4%) at endline. An increase in the mothers’ level of awareness was also recorded for tuberculosis, yellow fever and pertussis (Table 3).

**Immunizations**

At baseline, 758 out of 3872 children in the sample (19.6%) had routine immunization cards and 690 (17.8%) children were fully immunized for their age. At endline, 1757 of 3575 children (49.1%) had routine immunization cards and 1750 (49.0%) were fully immunized. The number of children with zero doses of polio immunization decreased from 445 (11.5%) at baseline to 167 (4.7%) at endline. The main reason for zero doses was caregivers refusing vaccination, with numbers reducing from 152 (36.9%) to 23 (13.9%; Table 3).

**Access to services**

Table 4 shows that the reported provision of mobile routine immunization outreach services coordinated through the nearest health facility in the 6 months before the survey increased from 34.6% (509/1472) to 84.9% (2060/2426). There was also an increase in reported access to free health services in the 2 weeks before the survey from 8.4% (122/1447) at baseline to 75.9% (858/1130) at endline.

**Discussion**

The integration of the polio eradication platform with additional primary health services to underserved communities demonstrates how an integration of outreach services can increase coverage and knowledge, reinforcing efforts to attain UHC and SDG 3.14,15 The model could be applied in areas where polio vaccine and routine immunization mobile outreach programmes could reach normally hard-to-reach and vulnerable communities with maternal, newborn and child health services they might not otherwise access.

The project appeared successful in increasing polio vaccination coverage as well as routine immunization and basic maternal, newborn and child health services among the selected communities, some of whom may never had had contact with the health system. There have been no polio cases or poliovirus-positive environmental samples in any of the settlements since the project began.17 The inclusion of volunteer community mobilizers helped to foster community involvement and demand for polio vaccine and other health-care services.14 Communities accessed free primary health care at mobile services. Knowledge about public health practices and services and some disease conditions improved. However, knowl-

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**Table 3.** Vaccination coverage for children younger than 5 years old and household caregivers’ awareness of vaccine-preventable diseases in the hard-to-reach communities project in Nigeria, at baseline (March 2014) and endline (November 2015)

| Variable | No. (%) of respondents |
|----------|------------------------|
| **Children’s vaccination history** | | |
| Total children sampled | 3872 (100.0) | 3575 (100.0) |
| Age of children sampled, months | | |
| < 6 | 518 (13.4) | 330 (9.2) |
| 6–8 | 275 (7.1) | 330 (9.2) |
| 9–23 | 1259 (32.5) | 1271 (35.6) |
| 24–35 | 572 (14.8) | 575 (16.1) |
| ≥ 36 | 1210 (31.3) | 1069 (29.9) |
| No response | 38 (1.0) | 0 (0.0) |
| Children with routine immunization card | 758 (19.6) | 1757 (49.1) |
| Children fully immunized for age at the time of survey | 690 (17.8) | 1750 (49.0) |
| Children with visible BCG scar | 904 (23.3) | 580 (16.2) |
| Children given supplemental oral polio vaccine, no. of doses | | |
| 0 | 445 (11.5) | 167 (4.7) |
| 1–3 | 1045 (27.0) | 742 (20.8) |
| > 3 | 2133 (55.1) | 2666 (74.6) |
| Don’t know | 249 (6.4) | 0 (0.0) |
| Reasons for zero dose of oral polio vaccine | | |
| Caregiver refused vaccination | 152 (36.9) | 23 (13.8) |
| **Awareness of vaccine-preventable diseases** | | |
| Total caregivers interviewed | 2906 (100.0) | 2426 (100.0) |
| Caregiver aware of any vaccine-preventable diseases | 2204 (75.8) | 2105 (86.8) |
| Caregiver aware of specific diseases | | |
| Cerebrospinal meningitis | 18 (0.8) | 156 (7.4) |
| Tuberculosis | 46 (2.1) | 250 (11.9) |
| Yellow fever | 40 (1.8) | 619 (29.4) |
| Pertussis | 101 (4.6) | 843 (40.0) |
| Polio | 484 (22.0) | 1544 (73.3) |
| Measles | 523 (23.7) | 1806 (85.8) |

BCG: bacille Calmette–Guérin.

1 The denominator for percentages is the number of children with zero doses of supplemental oral polio vaccine.

2 The denominator for percentages is the number of caregivers aware of any vaccine-preventable disease.

Note: Inconsistencies arise in some values due to rounding.
edge about pertussis and yellow fever decreased. This may not be unconnected with the fact that with the drive for polio eradication, sensitization on other disease conditions may have been downplayed.

Critical to the success of the project was securing the resources needed to train, equip, transport, supervise and remunerate the workforce. Of course, the additional staffing, transport, community mobilizers and costs of maternal, newborn and child health supplies required more funds than would oral polio vaccine or routine immunization sessions alone. However, by packaging these additional services together with polio vaccines and routine immunization outreach, economies of scale may be achieved. This hypothesis would benefit from further cost–benefit and cost–effectiveness studies.

Another key component was stakeholder engagement and national and state government involvement in project design, monitoring, supervision and reviews, together with community and traditional leaders. This is similar to Cambodia’s integrated immunization programme, which has planned a national level monitoring strategy aimed at provision of adequate management support to provinces and districts.

A longer-term impact evaluation would be required to measure outcomes in terms of reduction in morbidity and mortality associated with the interventions offered.

We experienced some challenges, however, which may or may not arise if such an approach were applied in other country settings. Security, for example, proved to be a major challenge particularly in Borno and Yobe states where the Boko Haram militant group insurgency caused insecurity and population displacement. The project adjusted by using funds to deliver integrated services to camps of internally displaced persons. Armed robbery and intercommunal clashes were also concerns. In Kaduna state, for example, the project could no longer serve one local government area due to prolonged intercommunal clashes, and UNICEF had to select another local government area in its place.

A lesson is that programme implementation should be reviewed regularly so it can be adjusted flexibly, especially where health systems are affected by protracted humanitarian crises.

Health workers also observed that people from non-targeted settlements routinely arrived to seek services from the mobile teams, suggesting strong community demand. However, this also made target populations more difficult to enumerate and created challenges for stock management.

Our evaluation was not without limitations. Data collection was not uniform across the implementing states as WHO and UNICEF managed their programmes slightly differently, hindering comparative analysis across all data points. For instance, while the teams in Bauchi, Borno and Kano states used registers to capture treatment of clients, the in Kaduna and Kano teams used tally sheets. Project reviews found health workers were not uniformly aware of the package of services to be offered and at times lacked sufficient skills to deliver the full package. This was similar to other findings where coverage and other quality indicators of integrated services were not always disaggregated by the service delivery approach. Future efforts should address the need for uniformity of data collection variables for comparison and more uniformity in training materials and supervision of the mobile health teams.

Given the demanding nature of the work and the scarcity of health-care workers in some areas, it was at times difficult to identify and retain qualified staff and ensure a full complement of services per mobile team. Finally, there was the challenge of not depleting the mainstream health personnel by employing health workers seeking additional income, also reported in other studies.

Table 4. Access to and use of health-care services reported by household caregivers in the hard-to-reach communities project in Nigeria, at baseline (March 2014) and endline (November 2015)

| Variable | Baseline | Endline |
|----------|----------|---------|
|          | Total respondents | No. (%) agreeing | Total respondents | No. (%) agreeing |
| Used mobile routine immunization service in the previous 6 months | 1472 | 509 (34.6) | 2426 | 2060 (84.9) |
| Aware of availability of free mobile health-care service | 1830 | 396 (21.6) | 2426 | 1975 (81.4) |
| Any member of the family accessed mobile health-care service in the previous 2 weeks | 1447 | 122 (8.4) | 1130 | 858 (75.9) |

While the project promoted referrals (arising from severe acute malnutrition, for example) these were not always possible if there was no referral centre nearby or if fees at the health facility were prohibitively costly for clients.

Overall, the project demonstrated how the polio platform could be used to deliver an integrated mobile health strategy that helps to achieve greater equity for marginalized and vulnerable populations. Funding a dedicated, trained and equipped team of health workers to target hard-to-reach communities will have an impact in improving equitable access to basic health services. As a polio legacy project, it has also demonstrated how an integrated routine immunization mobile strategy could be planned, implemented and monitored to achieve greater equity for marginalized and vulnerable populations living in hard-to-reach areas.

As the project in some of the states improved delivery of health care to underserved areas, some state governments (Kano and Yobe) are offering continued support to sustain funding for its delivery. Furthermore, WHO’s emergency programme, with funding from Borno and Yobe states, are conducting ongoing outreach in those states. The Canadian government is funding an ongoing collaboration with UNICEF in Niger, Jigawa, Taraba and Zamfara states.

The polio eradication platform, which usually includes expertise in how to plan to reach every child younger than 5 years, including those in vulnerable communities, could be used to plan integrated delivery of primary health-care services. Furthermore, countries that include outreach sessions in their immunization strategy can integrate essential maternal, newborn and child health services and deliver them to...
use routine immunization. These efforts will require additional resources and continued commitment from governments. The Hard-to-Reach communities project demonstrates that those resources can result in more equitable access to health care for the most vulnerable, a key to UHC and achievement of SDG 3.

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Résumé
Utilisation du programme de lutte contre la poliomyélite pour dispenser des soins de santé primaires au Nigéria: recherche sur la mise en œuvre

Objectif Evaluator un projet qui intègre des services de soins de santé primaires essentiels au programme d'administration du vaccin antipoliomyélite oral au sein de communautés difficiles à atteindre et mal desservies au nord du Nigéria.

Methods In 2013, the centre d’intervention d’urgence pour la lutte contre la polio du Nigéria a adopté une nouvelle approche visant à augmenter rapidement l’immunité contre la poliomyélite et à réduire la morbidité et la mortalité néonatales, infantiles et maternelles. Nous avons sélectionné, formé et équipé quatre-vingt-quatre équipes des communautés sauvages au nord du Nigéria.

Results Nous avons sélectionné, formé et équipé quatre-vingt-quatre équipes, dont 3176 étaient des villages difficiles à atteindre. Afin de mobiliser ces équipes, nous avons formé et équipé les leaders communautaires et les agents mobilisateurs. Nous avons également assuré l’approvisionnement des équipes et la fourniture de services de santé de base. Le taux de couverture des soins de santé primaires a augmenté de manière significative.

Conclusions Un tel projet peut être un modèle pour renforcer l’accès aux soins de santé primaires dans les communautés difficiles à atteindre. Les efforts du centre d’intervention d’urgence pour la lutte contre la polio ont montré que le renforcement des services de santé primaires est crucial pour réduire la morbidité et la mortalité néonatales, infantiles et maternelles.
Resumen

Utilización del programa de lucha contra la polio para prestar atención sanitaria primaria en Nigeria: investigación de la aplicación

Objetivo Evaluar un proyecto que integró los servicios esenciales de atención primaria en el programa de vacunación oral contra la polio en comunidades de difícil acceso y desatendidas del norte de Nigeria.

Métodos En 2013, el centro de operaciones de emergencia contra la polio de Nigeria adoptó un nuevo enfoque para aumentar rápidamente la cobertura de las dosis suplementarias de la vacuna oral para prevenir la polio y desparasitar a 1 562 640 niños menores de 5 años, realizaron 676 678 consultas prenatales y trataron a 1 682 671 enfermedades de mujeres y niños, incluidas la neumonía, la diarrea y el paludismo. La encuesta de referencia concluyó que 758 niños menores de 5 años tenían tarjetas de vacunación de rutina y 690 de 3872 (17,8%) estaban totalmente inmunizados para su edad. El uso de los servicios sanitarios móviles por parte de los hogares en los seis meses anteriores aumentó de 509/1472 (34,6%) a 2060/2426 (84,9%).

Conclusión La integración de los servicios de atención primaria de rutina en las actividades de erradicación de la poliomielitis en Nigeria dio lugar a un aumento de la cobertura de las dosis suplementarias de la vacuna oral y de las intervenciones esenciales de salud materna, neonatal e infantil.
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