

Difficulties in organizing first indoor spray programme against malaria in Angola under the President's Malaria Initiative

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Problem Successful attempts to control malaria require understanding of its complex transmission patterns. Unfortunately malaria transmission in Africa is often assessed using routine administrative reports from local health units, which are plagued by sporadic reporting failures. In addition, the lack of microscopic analyses of blood slides in these units introduces the effects of many confounding diseases.

Approach The danger of using administrative reports was illustrated in Angola, the first country in which malaria control was attempted under the President's Malaria Initiative, a development programme of the Government of the United States of America.

Local setting Each local health unit submitted monthly reports indicating the number of suspected malaria cases to their municipality. The identification of the disease was based on clinical diagnoses, without microscopic examination of blood slides. The municipal and provincial reports were then passed on to the national headquarters, with sporadic reporting lapses at all levels.

Relevant changes After the control effort was completed, the defective municipal reports were corrected by summarizing only the data from those health units which had submitted reports for every month during the evaluation period.

Lessons learned The corrected data, supplemented by additional observations on rainfall and mosquito habitats, indicated that there had probably been no malaria transmission before starting the control operations. Thus the expensive malaria control effort had been wasted. It is unfortunate that WHO is also trying to plan and evaluate its malaria control efforts based on these same kinds of inadequate administrative reports.

Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español. الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

Control of malaria in epidemic-prone areas of Africa is difficult, partly because of rapid changes in transmission. Where there are short and erratic rainy seasons, control efforts are especially important in rainy years when malaria is deadly, but can be virtually irrelevant in dry years when there is no transmission. This was illustrated in the first attempt to control malaria in Africa by the President's Malaria Initiative (PMI), a development programme of the Government of the United States of America.

Context

Malaria is an important disease in Angola, where Portuguese is the official language. Malaria is given as the reason for half of all hospital admissions and one-quarter of all hospital deaths. In a population of 10–15 million people, there are 1.5 million malaria cases reported annually.^{1–3}

In 2005, under the direction of the US Agency for International Development (USAID), PMI began with a malaria control programme in Angola.² It is not clear why Angola, a country with rich oil resources, was selected. Even though rising oil revenues generated over US\$ 1000 per capita, only US\$ 1 per capita was designated for malaria in the national budget.⁴ In the southern provinces where the project started, there was only one malaria officer and one vehicle. The technical staff of the National Malaria Control Program (NMCP)

in the capital city of Luanda consisted of four people. They had no vehicles at their headquarters and only a small laboratory and storage room.

Crude data on malaria distribution were provided by the Ministry of Health in reports received from the provinces through normal administrative channels. USAID selected southern Angola as the target area, based on these administrative reports.

Vigorous objections by the authors to the lack of reliable current data on mosquitoes and malaria for the proposed spray area were overcome by what proved to be false reassurances from USAID that staff from the US Centers for Disease Control (CDC) would collect the data in due time.

USAID decided in advance to use spraying of houses with the synthetic pyrethroid lambda-cyhalothrin in a wettable powder formulation with 10% active ingredient as the sole control method. It was to be sprayed at 0.03 mg of active ingredient per square metre of interior wall.⁵

Using spraying as the only method for malaria control can be fast but is unusual. Normally several methods are used in an integrated strategy.^{6–12} At least six key components were included in large malaria control efforts by WHO in Nigeria and the Sudan in previous decades.¹³

In an effort to rush initiation of the PMI, one of the consultants hired by USAID – the technical director – was sent to Angola in August 2005, within a month of PMI being announced. Because USAID was unable to arrange a meeting

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Table 1. Comparison of presumed cases of malaria reported by Huila provincial health care system during peak of malaria seasons in 2005 and in 2006

Municipality	Jan 2005	Feb 2005	Mar 2005	Total cases in 2005	Jan 2006	Feb 2006	Mar 2006	Total cases in 2006	Ratio (%) of malaria cases 2006/2005
Sprayed in 2006									
Humpata	811	1 122	1 822		378	858	535		
Lubango	9 601	10 013	10 768		9 511	8 707	10 440		
Total	10 412	11 135	12 590	34 137	9 889	9 565	10 975	30 429	89
Not sprayed									
Chibia	1 606	2 146	3 431		1 781	2 447	1 724		
Kakondo	2 387	4 234	4 171		6 664	1 341	2 038		
Total	3 993	6 380	7 602	17 975	8 445	3 788	3 762	15 995	89

with the NMCP in Luanda, the technical director travelled directly to the target area in the south. About 400 local men and women were quickly trained to spray the interior walls of houses.

Findings

By most measures the spray programme was efficient. The spraying was accomplished at the ideal time in the malaria transmission cycle; just as very light rains began in early December 2005. Spraying continued to the end of March 2006, reaching houses of half a million people in Huila and Kunene Provinces.

After the spray programme was underway, simple observations by the technical director indicated a general absence of adult malaria mosquitoes throughout the province and even an absence of suitable larval habitats. Also, retrospective analysis of rainfall data from a local airport indicated that southern Angola was in the fifth year of a worsening drought, a likely explanation for the lack of mosquitoes.

The problem

Two factors distorted the administrative reports on malaria: irregular omissions of monthly reports from various health units and lack of laboratory confirmation of the malaria cases. Thus other fever-causing diseases were certainly included in the reporting, such as diarrhoeal diseases and seasonal viral infections. This is a problem in many parts of Africa.

The reported malaria data were re-analysed to remove the impact of erratically omitted monthly reports. Further analysis was restricted to those units

that had reported data for every month for the entire period of comparison.

The corrected numbers of cases of reported malaria were compared for 2005 and for 2006 in Humpata and Lubango, the two municipalities that had been sprayed, and for Chibia and Kakondo, two similar municipalities in Huila Province that had not been sprayed.

During the normal malaria transmission period in January, February and March of 2006, after the houses in Humpata and Lubango had been sprayed, the number of malaria cases was 30 429, about 89% of the 34 137 reported for the same months during 2005 when no spraying had been conducted (Table 1).

Furthermore, in adjacent and similar unsprayed municipalities of Chibia and Kakondo, the numbers of malaria cases in 2006 was 15 995, also 89% of the 17 975 cases reported in 2005 (Table 1). Thus there was no detected impact of the spraying on reported malaria cases when sprayed and unsprayed municipalities were compared.

Discussion

Implementation of this large-scale malaria control effort despite the lack of malaria transmission in southern Angola during 2005–2006 was unique and unfortunate. One fault of this project was the rush to spray. Seldom has a

large spray programme been so hurried that pretreatment evaluation was omitted.^{10–13} This mistake might be due to lack of experience of the PMI leadership with the complexities of malaria control in Africa. It might also have been wiser to start PMI in a country with a stronger commitment to malaria control.¹⁴ Future PMI projects in Angola would also benefit from greater language proficiency by all USAID and CDC personnel.

Unfortunately the global malaria control effort by WHO is currently being evaluated by the same faulty process that caused this mistake in Angola, using administrative reports to evaluate epidemiological progress.^{1,2,15} Careful monitoring of rainfall and epidemiology greatly improves the cost-effectiveness of malaria control.¹⁶

Conclusion

The first PMI programme to control malaria in Africa failed to have an impact in southern Angola because of hurried and inadequate preparation, based primarily on administrative reports of malaria prevalence (Box 1). ■

Competing interests: None of the authors currently work for PMI or USAID.

Box 1. Lessons learned

- Preparation is important. Don't rush the project.
- Determine real need for the programme before investing time and money.
- Obtain reliable current data. Don't rely on administrative reports to provide prevalence data.

Résumé

Difficultés dans l'organisation du premier programme de pulvérisations intradomiciliaires contre le paludisme en Angola, dans le cadre de l'Initiative du Président contre le paludisme

Problématique Le succès des tentatives pour endiguer le paludisme passe par la compréhension des schémas complexes régissant la transmission de cette maladie. Malheureusement, en Afrique, la transmission du paludisme est souvent évaluée d'après des rapports administratifs de routine émis par des unités sanitaires locales, lesquels rapports font sporadiquement défaut. En outre, la pratique insuffisante par ces unités d'examen microscopiques confirmatoires d'étalements sanguins fait jouer à d'autres maladies le rôle de facteur de confusion.

Démarche Les risques de l'utilisation des rapports administratifs de routine ont été illustrés en Angola, premier pays à tenter d'endiguer le paludisme dans le cadre de l'Initiative du Président contre le paludisme, un programme de développement du gouvernement des États-Unis d'Amérique.

Contexte local Chaque unité sanitaire locale a soumis des rapports mensuels indiquant le nombre de cas présumés de paludisme à sa municipalité. L'identification de la maladie

reposait sur le diagnostic clinique, sans examen au microscope d'étalements sanguins. Les rapports municipaux et provinciaux étaient ensuite transmis au siège national, avec des absences sporadiques de rapport à tous les niveaux.

Modifications pertinentes A l'issue de l'effort mené contre le paludisme, les rapports municipaux lacunaires ont été corrigés en ne compilant les données que pour les unités sanitaires ayant soumis des rapports tous les mois pendant la période d'évaluation.

Enseignements tirés Les données corrigées et complétées par des observations supplémentaires sur les précipitations et les habitats des moustiques ont indiqué qu'il n'existait probablement pas de transmission du paludisme avant le début des interventions contre cette maladie. Ainsi, l'effort coûteux mené contre le paludisme avait été pur gaspillage. Il est également malheureux que l'OMS tente de planifier et d'évaluer ses efforts contre le paludisme sur la base de rapports administratifs inadéquats du même type.

Resumen

Problemas de organización del primer programa de rociamiento de interiores contra la malaria en Angola en el marco de la Iniciativa del Presidente contra la Malaria

Problema Si se quiere controlar eficazmente la malaria es preciso comprender la complejidad de su transmisión. Lamentablemente, en África la transmisión de esta enfermedad suele evaluarse a partir de los informes administrativos rutinarios de unidades de salud locales, que contienen abundantes errores de notificación. Además, la falta de análisis microscópicos de frotis sanguíneos en esas unidades conlleva la interferencia de numerosas enfermedades de confusión.

Enfoque Los riesgos de usar informes administrativos han quedado patentes en Angola, primer país que ha intentado combatir la malaria en el marco de la Iniciativa del Presidente contra la Malaria, un programa de desarrollo del Gobierno de los Estados Unidos de América.

Contexto local Todas las unidades de salud locales enviaban mensualmente a su municipalidad informes en los que indicaban el número de casos sospechosos de malaria. La identificación de la enfermedad se basaba en el diagnóstico clínico, sin examen

microscópico de frotis sanguíneos. Los informes municipales y provinciales se transmitían luego a las sedes nacionales, con lapsos de notificación esporádicos a todos los niveles.

Cambios destacables Una vez finalizadas las actividades de control, los informes municipales defectuosos fueron corregidos resumiendo solo los datos de las unidades de salud que habían enviado informes para cada mes durante el periodo de evaluación.

Enseñanzas extraídas Se desprende de los datos corregidos -complementados con observaciones adicionales sobre las precipitaciones y los hábitats de los mosquitos- que probablemente no había habido transmisión de la malaria antes de dar comienzo a las operaciones de control. Así pues, el mucho dinero invertido en esta iniciativa antimalárica se despilfarró. Es de lamentar que la OMS pretenda también planificar y evaluar sus actividades de control de la malaria basándose en el mismo tipo de informes administrativos inadecuados.

ملخص

صعوبات في تنظيم أول برنامج لرش المبيدات داخل المنازل في أنغولا ضمن المبادرة الرئاسية لمكافحة الملاريا

الأوضاع المحلية: ترفع كل وحدة صحية محلية إلى البلدية التابعة لها بلاغات شهرية تشير إلى عدد حالات الملاريا المشتبه بها. ويعتمد اكتشاف المرض على التشخيص السريري، بدون اللجوء إلى الفحص المجهرى لسرائح الدم. ثم ترفع البلاغات من البلديات والمناطق إلى الإدارة الوطنية المختصة، وتقع كل حين وآخر أخطاء على جميع مستويات نظام التبليغ.

التغيرات ذات العلاقة: بعد اكتمال جهود مكافحة، يتم تصحيح البلاغات التي بها أخطاء، والواردة من البلديات، عن طريق تلخيص البيانات التي وردت من الوحدات الصحية التي تكون قد دأبت على تقديم البلاغات الشهرية طوال فترة التقييم.

المشكلة: تتطلب المحاولات الناجحة لمكافحة الملاريا فهماً لأنماط انتقالها المعقدة. ومن المؤسف أن تقييم سريّة الملاريا في أفريقيا يجري غالباً باستخدام بلاغات إدارية روتينية صادرة عن الوحدات الصحية المحلية، التي تعاني كل حين وآخر من فشل نظام التبليغ فيها. بالإضافة إلى، أن نقص التحليل المجهرى لسرائح الدم في هذه الوحدات يؤدي إلى تأثر التشخيص بعدد من الأمراض المثيرة للارتباك.

الأسلوب: إن خطر استخدام البلاغات الإدارية كان ظاهراً في أنغولا، وهي أول دولة تجري محاولة مكافحة الملاريا فيها ضمن المبادرة الرئاسية لمكافحة الملاريا، وهي برنامج تنموي تدعمه حكومة الولايات المتحدة الأمريكية.

المكلفة لمكافحة الملاريا قد أهدرت. ومن المؤسف أن منظمة الصحة العالمية تحاول أيضاً تخطيط جهود مكافحة الملاريا وتقييمها اعتماداً على هذه الأنواع من البلاغات الإدارية غير الملائمة.

الدرس المستفادة: تشير البيانات التي جرى تصحيحها، واستكمالها بمشاهدات إضافية حول هطول الأمطار ومواطن معيشة البعوض، إلى احتمال عدم حدوث سריّة للملاريا قبل بدء عمليات مكافحة هناك. وأن الجهود

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