Baseline survey for malaria prevalence in Khyber Pakhtunkhwa Province, Pakistan

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Abstract

Background: *Plasmodium falciparum* and *P. vivax* are prevalent in Pakistan. Data on the epidemiology of *Plasmodium* infections in Khyber Pakhtunkhwa province are lacking.

Aims: This study aimed to: 1) determine the malaria prevalence in three districts of Khyber Pakhtunkhwa province with endemic malaria (Bannu, Dera Ismail Khan and Lakki Marwat); 2) determine household ownership of long-lasing insecticidal bed nets in the districts; and 3) assess malaria services in health facilities in the districts, in order to provide baseline information for malaria control in these areas.

Methods: A cross-sectional study was conducted. In total, 31 041 individuals were selected for the malaria prevalence survey, 864 households for the insecticidal net ownership survey and 98 health facilities for malaria services. Rapid diagnostic tests were used to test for malaria.

Results: Overall, 4297 (13.8%) people tested positive for malaria. The prevalence of *P. vivax*, *P. falciparum* and mixed infection was 92.4%, 4.7% and 2.9%, respectively. The prevalence of malaria infection differed significantly between districts ($P < 0.05$). Prevalence was higher in people over 14 years and in women for *P. vivax and P. falciparum* malaria ($P < 0.05$). Only 44.1% of households owned one or more insecticidal nets. The most common drugs used to treat malaria were primaquine (62.5% of cases) and chloroquine (36.1%).

Conclusions: The prevalence of malaria infection was high in the three districts. Malaria services in the health facilities were weak. Household ownership of long-lasing insecticidal nets was low. Malaria control or elimination strategies should be strengthened in these districts.

Keywords: malaria, prevalence, rapid diagnostic tests, Khyber Pakhtunkhwa, Pakistan

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Introduction

Malaria is still an important global public health problem. It is estimated that about three billion people are at risk of acquiring malaria and 212 million cases and 429 000 related deaths occurred in 2015 (*1*). Malaria is one of the most devastating parasitic diseases in Pakistan, with a higher malaria death rate compared with any other country in Asia. Plasmodium falciparum and P. vivax are two widespread species that cause a high rate of morbidity and mortality (*2*). According to the World Health Organization's (WHO) 2013 malaria report, the prevalence of P. vivax and P. falciparum was 88% and 12% respectively in Pakistan (*3*). An estimated 500 000 cases of malaria and 50 000 deaths attributed to malaria occur annually in Pakistan (*4,5*), with a 37% malaria incidence reported along the borders of Afghanistan and the Islamic Republic of Iran. In the past few decades, malaria transmission has been highest in the northern part of Pakistan, especially in Khyber Pakhtunkhwa province (*6,7*).

Malaria transmission is seasonal and Pakistan is susceptible to epidemic outbreaks in certain geographical areas, predominantly Khyber Pakhtunkhwa, Sindh and Balochistan provinces. In Khyber Pakhtunkhwa province, the three malaria-endemic districts are Bannu, Dera Ismail Khan and Lakki Marwat *(8)*. The peak season of *P. vivax* transmission is from June to September and again from April to June when relapses of *Plasmodium* infections developed from the previous season are observed *(9)*. The main *P. falciparum* transmission period in Pakistan is between August and December *(10)*.

Cross-sectional surveys on malaria transmission were conducted in five Afghan refugee camps between 24 June and 19 September, 2010, to evaluate malaria infection *(11)*. The prevalence of malaria infection in the camps ranged from 0–0.2% for *P. falciparum* and 0.4–9% for *P. vivax* using rapid diagnostic tests and 0–1.39% for *P. falciparum* and 5–15% for *P. vivax* using polymerase chain reaction techniques. The prevalence of antimalaria antibodies to *P. falciparum* and *P. vivax* antigens was 3–11% and 17–45% respectively *(11)*. A cross-sectional study of households in four geographically and sociodemographically distinct areas around Mumbai, India, found that most

households were familiar with bed nets as an essential control strategy, but only 30% used them and only 4% used insecticide-treated bed nets. Prevention practices and knowledge differed across the four areas *(12)*. A study in the Federally Administrated Tribal Areas of Pakistan reported that, 626 of 691 patients of all age groups and both sexes were positive for malaria using polymerase chain reaction. Among these positive cases, *P. vivax* (81.1%), *P. falciparum* (13.8%) and mixed infections (4.9%) containing both *P. falciparum* and *P. vivax* were reported *(11)*.

An epidemiological study was conducted in some areas of Pakistan but investigation of malaria transmission on a nationwide scale has been hindered by the shortage of data from several areas *(10)*. Surveillance of and reporting methods for *Plasmodium* infections are weak and epidemiological data inadequate.

It is most important to understand the burden of malaria in a specific area to obtain usable information for different stakeholders involved in prevention and control of malaria. Therefore, the present study aimed to determine the baseline burden of malaria and health facilities providing malaria services in three endemic districts of Khyber Pakhtunkhwa, Pakistan.

Methods

Study design, area and period

This was a cross-sectional study conducted in three districts of Khyber Pakhtunkhwa with endemic malaria: Bannu, Dera Ismail Khan and Lakki Marwat districts. The estimated total population in the study area was 3 634 186 (1 218 416 in Bannu, 1 239 247 in Dera Ismail Khan, and 1 176 523 in Lakki Marwat). The study was done between August and October 2015, which is the peak season for malaria transmission.

Before the survey, in 2014, the prevalence of malaria had peaked for several reasons, mainly socioeconomic as a result of an unstable political environment and the migration of people from North Waziristan to neighbouring districts in Khyber Pakhtunkhwa. A total of 950 000 people were displaced (73% women and children) and were resettled in local communities and camps *(13)*.

Sample selection

All 98 health care centres offering rapid diagnostic testing for malaria were surveyed in the three endemic districts (36 in Bannu, 37 in Dera Ismail Khan and 25 in Lakki Marwat). <body 1>Epidemiological data were obtained using a multistage cluster sampling technique: health care centres were first selected followed by simple random selection of households in urban and rural areas of the three districts. A total of 31 041 individuals and 864 households were included in this study. The strata were urban and rural locations. The data were categorized according to sex, age and *Plasmodium* species.

Rapid diagnostic test

Malaria rapid diagnostic tests detect evidence of malaria parasites in human blood. These tests allow reliable detection of malaria infections especially in remote areas with limited access to good quality microscopy services. Rapid diagnostic tests are comparatively easy to perform and interpret; they rapidly provide results, require limited training and allow malaria diagnosis by the public. These tests detect specific antigens produced by malaria parasites that exist in the blood of an infected individual. Some rapid diagnostic test kits detect a single species, either *P. vivax* or *P. falciparum*, some detect multiple species (*P. vivax, P. falciparum, P. ovale* and *P. malariae*) and some can differentiate between *P. falciparum* and non-*P. falciparum* infections. For rapid diagnostic tests, blood is usually obtained from a finger-prick and results are available within 15–30 minutes.

Data collection

The main data collection tool used in this study was a survey questionnaire, which consisted of three parts: registration form for the rapid diagnostic test, malaria facility service form for the health care centres and a long-lasting insecticidal nets (LLINs) form for households. Demographic data including age, sex, place of residence, the name of the health care centre, individual identification code were incorporated in the database for the rapid diagnostic test examination. The form on LLINs comprised questions on the family size and the total number of LLINs. The malaria facility service form comprised information on malaria diagnosis, treatment and LLIN distribution at the health care centre.

To assure the quality of data collected, a variety of quality control activities were implemented. Data collectors were trained, rapid diagnostic tests were rechecked (10% positive and 20% negative), experienced professionals provided supervision, and the integrity and completeness of the data were monitored.

Data analysis

SPSS, version 23 was used for data analysis. Means and standard deviations (SD) were calculated for continuous variables and frequencies and percentages for categorical variables. The chi-squared test was used to explore the relationship between categorical variables. $P \leq 0.05$ was considered statistically significant.

Ethical considerations

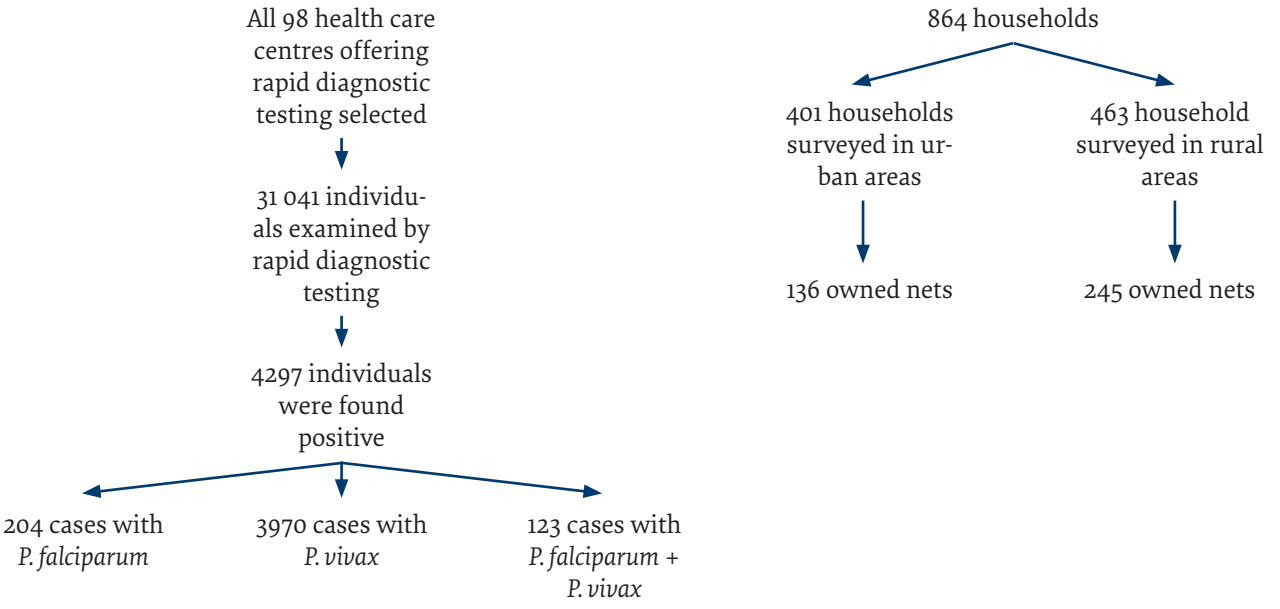
Ethical clearance for the study was obtained from the Institutional Review Board of Anhui Medical University, China. Permission to conduct the research and relevant information was obtained from the Directorate of the Malaria Control Programme, Pakistan.

For the LLIN survey, we obtained verbal consent from the householders who filled the questionnaires and were interviewed.

Results

Figure 1 shows the overall rate of malaria diagnosis at health centres and net ownership in households.

Figure 1 Flow chart of malaria diagnosis at health centres and net ownership in households



Characteristics of the sample

A total of 31 041 individuals with malaria symptoms attending the health centres (9117 individuals from Bannu, 13 659 from Dera Ismail Khan, and 8265 from Lakki Marwat) were surveyed. The male to female ratio was 1.17 and 60% were under 15 years of age (Table 1). A total of 864 households (286 households from Bannu, 312 from Dera Ismail Khan, and 266 from Lakki Marwat) were interviewed on LLIN ownership. Information on diagnosis, reporting and treatment facilities for malaria and the system for distribution of LLINs was obtained from the 98 health care centres. The services are provided by the government while international nongovernmental organizations provide the nets.

Prevalence of malaria infection

A total of 4297 (13.8%) people were positive for malaria using the rapid diagnostic test, of which 3970 (92.4%) were positive for *P. vivax*, 204 (4.7%) for *P. falciparum* and 123 (2.9%) showed mixed infection (*P. vivax* and *P. falciparum*). The average malaria prevalence in the three districts was 13.8%, while the average ratio of *P. vivax*/*P. falciparum* in the three districts was 0.05. The prevalence of malaria in Bannu district was higher than Lakki Marwat and Dera Ismail Khan districts, and the difference in malaria prevalence between the three districts was statistically significant ($\chi^2 = 594.74$, $P < 0.001$). Table 2 shows the prevalence of malaria infection in the three districts according to *Plasmodium* species.

The prevalence of malaria in children under five years and 5–14 years, and those more than 14 years was 5.2%, 10.5%, and 22.6% respectively (Table 3). The prevalence was higher in individuals more than 14 years than the other age groups ($\chi^2 = 1670.01$, $P < 0.001$) (Table 3). The prevalence of malaria was higher in females than males: *P. falciparum* 0.7% versus 0.6% ($\chi^2 = 11.87$, $P = 0.003$) and *P. vivax* 14.2% versus 11.5% ($\chi^2 = 39.71$, $P < 0.001$). For mixed infections no difference was found between males and females (0.4% each).

Malaria treatment in health care centres

The main treatment used for malaria infection reported by the health centres in all the districts was primaquine, followed by chloroquine (Table 4). In Bannu district, primaquine was used to treat 60.7% of the cases of malaria in the 36 health centres performing rapid diagnostic tests, followed by chloroquine in 37.2%. In Dera Ismail Khan district, 62.7% of cases of malaria in the 37 health centres performing rapid diagnostic tests were treated with primaquine and 36.2% with chloroquine. In Lakki Marwat district 64.2% of cases of malaria in the 25 health centres performing rapid diagnostic tests were treated with primaquine and 34.7% with chloroquine. Only a small number of cases were treated with artesunate + sulfadoxine-pyrimethamine and only 3 cases were treated with artemether + lumefantrine. In addition, only a small proportion of cases were treated with quinine. The chloroquine and primaquine usage ratio was 0.58 across all health centres.

Household net ownership

No mosquito nets were re-treated with insecticide in the three endemic districts. Fewer than half of the households (44.10%) owned one or more LLINs. All the LLINs had been distributed by The Global Fund (LLINs were introduced in 2004–2005 by The Global Fund). There were slight differences between the three districts: LLIN own-

Table 1 **Demographic characteristics of residents surveyed for malaria in three endemic districts in Pakistan, 2015 (*n* = 31 041)**

Characteristics	Bannu (*n* = 9117)	Dera Ismail Khan (*n* = 13 659)	Lakki Marwat (*n* = 8265)	Total (N = 31 041)
	No. (%)	No. (%)	No. (%)	No. (%)
Age (years)				
0–5	2523 (27.7)	3702 (27.1)	2461 (29.8)	8 686 (28.0)
5–14	1809 (19.8)	5543 (40.6)	2569 (31.1)	9 921 (32.0)
> 14	4785 (52.5)	4414 (32.3)	3235 (39.1)	12 434 (40.1)
Sex				
Male	4949 (54.3)	7665 (56.1)	4112 (49.8)	16 726 (53.9)
Female	4168 (45.7)	5994 (43.9)	4153 (50.2)	14 315 (46.1)

ership in Bannu was higher than Dera Ismail Khan and Lakki Marwat (χ^2 = 7.11, *P* = 0.029) (Table 5).

Discussion

Malaria incidence and prevalence can be effectively reduced through active and passive diagnosis *(14)*. Accurate evaluation of malaria infection can also be useful in scaling up control interventions and malaria surveillance in Pakistan *(15)*. Thus, to accomplish and continue the malaria eradication operation in Pakistan, the prevalence of *Plasmodium* species was determined in three endemic districts of Khyber Pakhtunkhwa using rapid diagnostic tests.

Since the late 1970s, the annual incidence rates of malaria reported by the health departments of four provinces have gradually increased. Punjab province reported a rapid increase until the mid-1980s, a slow decrease in the late 1980s and a rise in the 1990s. The current malaria prevalence in Punjab province is very low; the prevalence ranged from 1.7% in Lahore to 5.5% in Bhakkar districts. Khyber Pakhtunkhwa and Sindh provinces reported increases in malaria prevalence in all areas, while Baluchistan province reported an increase in the 1990s *(10,16)*. In the 1980s, the malaria burden was mostly in the northern and southern regions of Khyber Pakhtunkhwa province but this moved to western areas in the 1990s. By the end of the 1990s, a band of relatively high malaria prevalence extended from Swat and Chitral in the north to Mardan, Malakand, Swabi, and Khyber and Mohmmand along the western border with Afghanistan *(7)*.

Our study provides baseline information for malaria control in the three endemic districts of Khyber Pakhtunkhwa province. We found that in people with malaria symptoms, the overall prevalence of malaria was 13.8%, of which *P. vivax and P. falciparum* accounted for 92.4% and 4.7% respectively. The predominance of *P. vivax* is consistent with studies conducted in other parts of Pakistan *(10,17–19)*, but our findings differ from another study in East Balochistan *(20)*. Another study also described a high prevalence (10.8%) of *Plasmodium* infection and a high proportion of cases attributed to *P. falciparum* in Bannu, Hangu and Thall districts of Khyber Pakhtunkhwa province *(10)*. In other highly endemic districts of Khyber Pakhtunkhwa province (that were not part of our study), a comparatively high prevalence of *P. falciparum* was found, ranging from 16% in Buner *(21)* to 25% in Bannu and Abbottabad *(22,23)*. Cross-border migration may have contributed to the surge or maintenance of *Plasmodium* infections in these areas. From 1979 to 1982, refugees from Afghanistan fled across the border into Balochistan and Khyber Pakhtunkhwa provinces *(24)*.

Our study also shows a high prevalence of malaria in the age group > 14 years, which is consistent with other studies in Pakistan and India *(25,26)*. We also found a higher prevalence of malaria among females than males, which is similar to another study *(27)*, but differs from other studies *(28,29)*. The risk factors and reasons for the sex difference could not be explained because no data were provided on the behaviour of the study participants. In future, such data should be included as a study parameter. The average ratio of *P. falciparum*/*P. vivax* in all

Table 2 **Prevalence of malaria infection in three endemic districts in Pakistan according to *Plasmodium* species, 2015**

District	No.	Total	*P. falciparum*	*P. vivax*	*P. falciparum* + *P. vivax*	*P. falciparum*:*P. vivax*
		No. (%)	No. (%)	No. (%)	No. (%)	
Bannu	9 117	1735 (19.0)	112 (1.2)	1567 (17.2)	56 (0.6)	0.07
Dera Ismail Khan	13 659	1245 (9.1)	73 (0.5)	1111 (8.1)	61 (0.4)	0.07
Lakki Marwat	8 265	1317 (15.9)	19 (0.2)	1292 (15.6)	6 (0.1)	0.01
Total	31 041	4297 (13.8)	204 (0.7)	3970 (12.8)	123 (0.4)	0.05

Table 3 Prevalence of malaria infection by age and sex and *Plasmodium* species in three endemic districts in Pakistan, 2015

Characteristic	No.	*P. falciparum*	*P. vivax*	*P. falciparum* + *P. vivax*	Total	*P. falciparum*:*P. vivax*
		No. (%)	No. (%)	No. (%)	No. (%)	
Age (years)						
0–< 5	8 686	99 (1.1)	336 (3.9)	13 (0.2)	448 (5.2)	0.29
5–14	9 921	49 (0.5)	933 (9.4)	58 (0.6)	1040 (10.5)	0.05
> 14	12 434	56 (0.4)	2701 (21.7)	52 (0.4)	2809 (22.6)	0.02
Total	31 041	204 (0.7)	3970 (12.8)	123 (0.4)	4297 (13.8)	0.05
Sex						
Male	16 726	101 (0.6)	1930 (11.5)	64 (0.4)	2095 (12.5)	0.05
Female	14 315	103 (0.7)	2040 (14.2)	59 (0.4)	2202 (15.4)	0.05
Total	31 041	204 (0.7)	3970 (12.8)	123 (0.4)	4297 (13.8)	0.05

three districts was 0.05.

LLINs have played an important role in reducing malaria transmission over the past few decades. In the initial stage, LLINs were introduced in Pakistan, including in Khyber Pakhtunkhwa, and implemented by The Global Fund in Pakistan. Different approaches were used for distribution of the nets including the use of community health workers, campaigns to raise people's awareness about LLINs and their importance, and private outlets. In 2012, the procedure was reformed and a comprehensive LLIN distribution strategy was developed and implemented in endemic districts of Pakistan with the support of The Global Fund *(30,31)*.

Household ownership of LLINs in the three endemic districts was very low (44.1%); large numbers of LLINs should be disseminated freely to the residents to protect them from *Plasmodium* infection. During the household survey, it was noted that some people had not used the LLINs distributed three years before. Malaria health education should be provided in schools to encourage the use of LLINs *(30–32)*. In the three endemic districts, comprehensive interventions should be provided, such as antimalarial drugs, bed nets and malaria health education.

Malaria control needs an integrated approach, including prevention (mainly vector control) and early treatment, with effective antimalarial agents. In 2010, all countries in which *P. falciparum* malaria is endemic have progressively updated their treatment policy from use of monotherapy with drugs such as chloroquine, amodiaquine and sulfadoxine-pyrimethamine to the currently recommended artemisinin-based combination therapies. The combination therapies are generally highly effective and well tolerated. This has contributed significantly to reductions in worldwide mortality and morbidity from malaria. Unfortunately, resistance to artemisinin has arisen recently in *P. falciparum* in south-east Asia, which threatens these gains *(33)*.

According to our results, the main treatment used for malaria infection in the health centres in all the districts was primaquine, followed by chloroquine. Overall in the three districts, primaquine was used to treat 62.5% of the cases of malaria in the 98 health centres performing rapid diagnostic tests, followed by chloroquine in 36.1%. Only a small number of cases were treated with artesunate + sulfadoxine-pyrimethamine while only three cases were treated with artemether + lumefantrine. In 2004, the cure rate with chloroquine treatment was reported to be 58% in Punjab and only 17 % in Sindh and Balochistan *(4)*. While the effectiveness of sulfadoxine-pyrimethamine and amodiaquine in Balochistan resulted in a treatment success rate of 44 % and 47% respectively. The treatment rate with artesunate + sulfadoxine-pyrimethamine in the Federally Administered Tribal Areas in 2004 was 97%. Similarly, the tested efficiency of artesunate + sulfadoxine-pyrimethamine in Sindh, Balochistan and the Federally Administered Tribal Areas provided a treatment success rate of 100% in 2008. Likewise in 2009, the treatment rate with artemether and lumefantrine in the Federally Administered Tribal Areas, Balochistan, Khyber Pakhtunkhwa and Sindh was also 100% *(4)*.

Table 4 Malaria treatment in health centres performing rapid diagnostic tests in three endemic districts in Pakistan, 2015

District	Health centres	ACT (AS+SP)	Chloroquine	Primaquine	ACT (ART+LF)	Tab quinine	Total	Chloroquine: primaquine
	No.	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)		
Bannu	36	120 (0.3)	13 810 (37.2)	22 494 (60.7)	1 (0.0)	644 (1.7)	37 069	0.61
Dera Ismail Khan	37	133 (0.5)	9992 (36.2)	17 320 (62.7)	0 (0.0)	182 (0.7)	27 627	0.58
Lakki Marwat	25	19 (0.1)	11 935 (34.7)	22 110 (64.2)	2 (0.0)	352 (1.0)	34 418	0.54
Total	98	272 (0.27)	35 737 (36.1)	61 924 (62.5)	3 (0.0)	1178 (1.2)	99 114	0.58

ACT (AS+SP): artemisinin combination therapy (artesunate+sulfadoxine-pyrimethamine); ACT (ART+LF): artemisinin combination therapy (artemether + lumefantrine)

Table 5 Household ownership of long-lasting insecticidal nets in three districts with endemic malaria in Pakistan according to area, 2015

District	No. households surveyed		No. households owning nets		Ownership rate (%)		Total (%)
	Urban	Rural	Urban	Rural	Urban	Rural	
Bannu	135	151	46	89	34.1	58.9	47.2
Dera Ismail Khan	147	165	49	81	33.3	49.1	41.7
Lakki Marwat	119	147	41	75	34.4	51.0	43.6
Total	864		381		44.1		

In 1981, antimalarial drug chloroquine resistance was first identified in Sheikhupura district of Punjab. A study by the National Institute of Malaria Research and Training with analysis from 1977 to 1995 showed considerable R1 level chloroquine resistance (initial response good to the drug but parasitaemia returns within one month of cure) in Pakistan, with a frequency ranging from 30% to 84%. From 2004 to 2009, programme assessments of antimalarial drug's efficacy documented that resistance to chloroquine was common in falciparum malaria in all parts of the country, while resistance to sulfadoxine-pyrimethamine was 100%. Furthermore, artemisinin-based combination therapy has been found to be 100% effective in treating uncomplicated falciparum malaria cases; which is why this combination therapy was officially adopted as the first-line treatment for uncomplicated confirmed falciparum malaria *(4)*.

The study has some limitations. It was conducted in the three endemic districts of Khyber Pakhtunkhwa province (Bannu, Dera Ismail Khan, and Lakki Marwat); thus, the findings cannot be generalized to the whole country. Furthermore, due to the cross-sectional nature of the study, causality cannot be assumed in the association between risk factors and malaria prevalence. To determine the seasonal variation and other risk factors for malaria prevalence in these three districts another study should be done for a longer period.

The findings of our study indicate that the prevalence of malaria in the three endemic districts of Khyber Pakhtunkhwa is high. Bannu district had the highest prevalence of malaria. Individuals in the age group > 14 years were more affected by malaria. In all districts, the health care facilities for malaria services appeared weak. In addition, household LLIN ownership was also low. Special attention should be given to those living in these districts and malaria control or elimination strategies should be strengthened.

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Competing interests: None declared.

Enquête initiale sur la prévalence du paludisme dans la province de Khyber Pakhtunkhwa au Pakistan

Résumé

Contexte : Le *Plasmodium falciparum* ainsi que le *P. vivax* sont prévalents au Pakistan. Il n'existe pas de données disponibles sur l'épidémiologie des infections à *Plasmodium* dans la province de Khyber Pakhtunkhwa.

Objectifs : La présente étude avait pour objectifs i) de déterminer la prévalence du paludisme dans trois districts de la province de Khyber Pakhtunkhwa touchés par le paludisme endémique (Bannu, Dera Ismail Khan et Lakki Marwat) ; ii) de déterminer la proportion de ménages disposant de moustiquaires imprégnées d'insectiside à effet rémanent dans les districts ; et iii) d'évaluer les services de lutte antipaludique dans les établissements de santé de ces districts afin de fournir des informations de base permettant de lutter contre cette maladie dans ces zones.

Méthodes : Une étude transversale a été menée. Au total, 31 041 individus ont été sélectionnés pour l'enquête sur la prévalence du paludisme, 864 ménages pour l'enquête sur la possession de moustiquaires et 98 établissements de santé pour les services de lutte antipaludique. Des tests diagnostiques rapides ont été utilisés pour le dépistage du paludisme.

Résultats : Au total, 4297 personnes (13,8 %) ont été testées positives pour le paludisme. La prévalence de l'infection à *P. vivax*, à *P. falciparum* ou par les deux espèces était respectivement de 92,4 %, 4,7 % et 2,9 %. On a observé des différences importantes en ce qui concerne la prévalence de l'infection palustre entre les districts ($p < 0,05$). La prévalence de l'infection à *P. vivax* et à *P. Falciparum* était plus élevée chez les personnes de plus de 14 ans et chez les femmes ($p < 0,05$). Seulement 44,1 % des ménages possédaient une ou plusieurs moustiquaires imprégnées d'insecticide. Les médicaments antipaludiques les plus couramment utilisés étaient la primaquine (62,5 % des cas) et la chloroquine (36,1 %).

Conclusions : La prévalence de l'infection palustre était élevée dans les trois districts endémiques du Khyber Pakhtunkhwa. Les services de lutte antipaludique des établissements de santé étaient déficients. Le taux de possession par les ménages de moustiquaires imprégnées d'insecticide à effet rémanent était bas. Les stratégies de lutte antipaludique ou d'élimination de cette maladie doivent être renforcées dans ces districts.

مسح مرجعي لمعدل انتشار الملاريا في إقليم خيبر باختونخوا، باكستان

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الخلاصة

الخلفية: تنتشر كل من المتصورة المنجلية والمتصورة النشيطة في باكستان. ويتعذر الحصول على بيانات السمات الوبائية لحالات العدوى التي تسببها المتصورة في إقليم خيبر باختونخوا.

الأهداف: هدفت هذه الدراسة إلى تحديد معدل انتشار الملاريا ومعدل امتلاك الأسر للناموسيات المتينة المعالجة بمبيد الحشرات وتقييم خدمات الملاريا في المرافق الصحية في ثلاث مناطق بالإقليم مستوطنة بالملاريا (وهي بانو، وديرا إسماعيل خان، ولاكي مروات) من أجل توفير المعلومات الأساسية لمكافحة الملاريا في تلك المناطق.

طرق البحث: أُجريت دراسة مقطعية باستخدام أسلوب المعاينة العنقودية. وإجمالا، فقد اختير 31041 فردا لمسح معدل انتشار الملاريا، و 864 أسرة لمسح امتلاك الناموسيات، و 98 مرفقا صحيا لمسح خدمات الملاريا. واستخدمت الاختبارات التشخيصية السريعة لاختبار الملاريا.

النتائج: من بين الأفراد الخاضعين للاختبار والبالغ عددهم 31041 فردا، جاءت نتيجة اختبار الملاريا إيجابية لدى 4297 فردا (13.8%). وبلغ معدل انتشار العدوى بالمتصورة النشيطة، والمتصورة المنجلية، والعدوى المشتركة بينهما 92.4%، و 4.7%، و2.9% على التوالي. وكانت هناك اختلافات جوهرية بين معدل انتشار العدوى بالملاريا بين المناطق الثلاثة ($P < 0.05$). وكان معدل الانتشار أعلى في تلك المناطق دون سواها على امتداد 14 عاما ($P < 0.05$)، وفي صفوف النساء بالنسبة للعدوى بالمتصورة النشيطة والمتصورة المنجلية($P < 0.05$). ولم يمتلك ناموسية واحدة أو أكثر معالجة بمبيدات الحشرات سوى 44.1% من الأسر. وكانت الأدوية الأكثر شيوعا المستخدمة في علاج الملاريا البريماكين (في 62.5% من الحالات) والكلوروكين (36.1%).

الاستنتاجات: كان معدل انتشار الملاريا مرتفعا في المناطق الثلاثة المستوطنة بالمرض في إقليم خيبر باختونخوا. واتسمت خدمات الملاريا في المرافق الصحية بالضعف. وكان معدل امتلاك الأسر لناموسيات متينة معالجة بمبيدات الحشرات منخفضا. لذا، ينبغي تعزيز استراتيجيات مكافحة الملاريا أو القضاء عليها في تلك المناطق.

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