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PJBS

ISSN 1028-8880

**Pakistan
Journal of Biological Sciences**

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Malaria Cases in Three Districts in the Midlands Province, Zimbabwe

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Abstract: The number of malaria cases in the under 5, 5-14 and above 15 years age groups in three districts in the Midlands Province were studied over a period of one year, from January to December 2003. The total number of malaria cases in all the three age groups were significantly different in all the districts ($p < 0.05$). Gokwe had the highest number of cases in all the age categories ($p < 0.05$). The malarial cases tended to be highly seasonal in Gokwe but to a lesser extent in Kwekwe. There was a high monthly variation of malarial cases in Gweru. Although the >15 years age group had the highest number of cases, the number of cases in the under five age group is a cause for concern. *Plasmodium falciparum* had a prevalence of $>86\%$ in all the districts during the rainy season. The implications of these findings are discussed in relation to the health and socio-economics of the three districts.

Key words: Malaria, prevalence, *Plasmodium falciparum*, Zimbabwe

INTRODUCTION

Malaria is a parasitic disease that is caused by the sporozoan *Plasmodium*. In Zimbabwe, *P. falciparum* is the most common species and the most dangerous^[1].

Despite a commitment by African leaders in 2000 to "roll back" malaria, the disease remains by far one of the greatest health threats that need to be controlled on the continent also ravaged by the HIV/AIDS pandemic. WHO recently revealed that malaria kills at least one million people annually in sub-Saharan Africa^[2]. Malaria cases are also being exacerbated by the high levels of HIV infection, that weaken the immune system rendering people with HIV more susceptible to contracting the disease^[3].

In Zimbabwe, the malarial zones include parts of the Midlands Province and the low lying areas such as the Zambezi valley, Binga, Hwange and Muzarabani^[1]. The objective of this study was to determine the disease pattern of malaria in three endemic districts in the Midlands Province in different age groups as well as the prevalence of *P. falciparum* in these districts.

MATERIALS AND METHODS

Study districts: Gweru, Gokwe and Kwekwe districts have a climate that is characterized by one rainy season that extends from November to April and one dry season that lasts from May to October. The dry cold season occurs from May to July^[4]. Gweru has an altitude of 1420 m above sea level and receives an annual rainfall of 676 mm. This district includes urban and peri-urban areas where small-scale farming occurs. Gokwe has an altitude of

1283 m above sea level and receives an annual rainfall of 790 mm. The district was a former forest reserve and some sections are still so. Cotton growing is done on a large scale. Kwekwe has an altitude of 1205 m above sea level and receives an annual rainfall of 655 mm. It is a mining area and recently there has been an upsurge of illegal gold panning.

Malaria cases: The number of malaria cases for under 5, 5-14 and above 15 years age groups for Gokwe, Gweru and Kwekwe districts in the Midlands Province from January to December 2003 were obtained from the Midlands Provincial Medical Director. From November 2003 to April 2004, 30 monthly blood samples of people from the three districts suspected of having malaria were tested in the laboratory for prevalence of *Plasmodium falciparum*. Thin smears were prepared, stained with Giemsa stain and examined under the microscope for presence or absence of *P. falciparum*. An immunological test kit to test for presence of antibodies to *P. falciparum* was used to identify *P. falciparum* when the species identification was in doubt. Blood collected from patients was centrifuged and the plasma collected. The plasma was then introduced into the test kit. A negative result was shown by a single red band and a positive one was shown by two red bands in the test region.

Statistical analysis: Differences in the total number of malaria cases between the three districts and within the age groups were done using analysis of variance using the MINITAB computer program.

RESULTS AND DISCUSSION

Meteorological data: The results of total monthly rainfall, the maximum and minimum temperatures for the three districts from January to December 2003 showed that Gokwe received the highest rainfall followed by Kwekwe and Gweru had the least rainfall (Fig. 1).

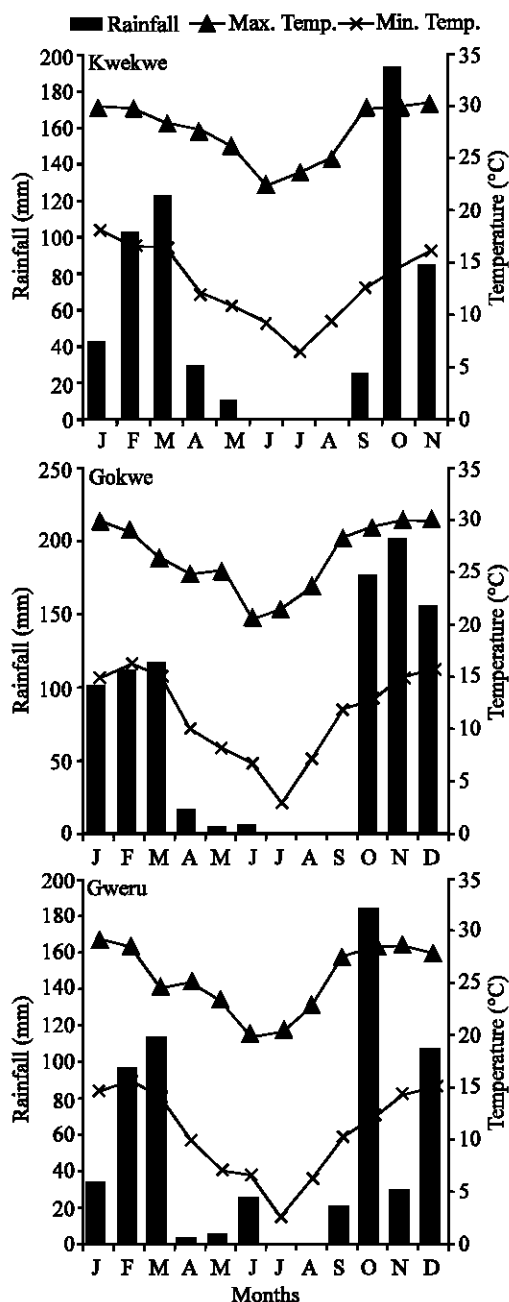


Fig. 1: Total monthly rainfall, mean monthly maximum and minimum temperatures for Kwekwe, Gweru and Gokwe districts from January to December 2003

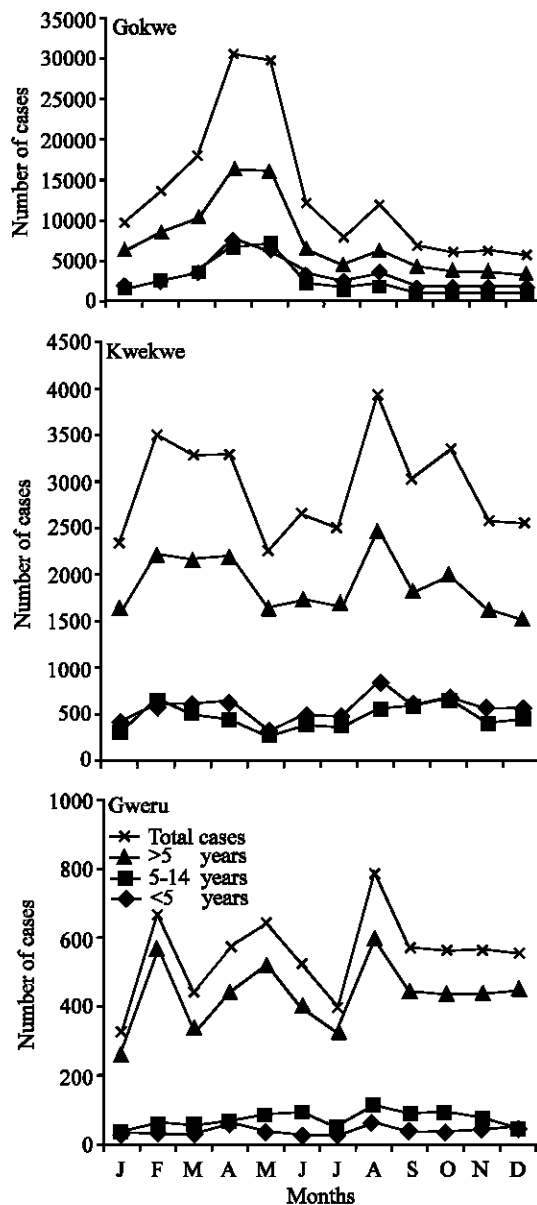


Fig. 2: Number of malaria cases in different age groups in Gokwe, Kwekwe and Gweru districts recorded between January and December 2003

Malaria cases: Malaria cases in Gokwe district were highly seasonal and followed the rainfall pattern. In Kwekwe district the peak number of cases were during the rainy season with a drop during the dry cold season and another peak at the beginning of the dry hot season. In Gweru district there was a high monthly variation in the number of malaria cases (Fig. 2). Significant differences in the total number of malaria cases were noted between districts and within age groups ($p < 0.05$). The prevalence

Table 1: Prevalence (%) of *Plasmodium falciparum* in Gweru, Gokwe and Kwekwe districts recorded between November 2003 and April 2004

Months	Gweru	Gokwe	Kwekwe
November 2003	86.6	93.3	86.6
December 2003	86.6	96.6	90.0
January 2004	93.3	96.6	93.3
February 2004	96.6	100.0	96.6
March 2004	90.0	96.6	93.3
April 2004	86.6	93.3	93.3

of *P. falciparum* during the rainy season varied from 86 to 96.3% in Gweru and Kwekwe districts and from 93 to 100% in Gokwe district (Table 1).

Malaria is a health problem in the Midlands Province, especially in the Gokwe district. The high number of cases in the under five age group is a cause for concern. *P. falciparum*, the most common species of *Plasmodium* in the Midlands Province is especially dangerous to small children and pregnant women. Adults from areas where malaria is endemic develop a form of partial immunity. This partial immunity develops slowly and only in response to repeated infections^[3]. Pregnant women tend to lose immunity to diseases and become susceptible to malaria resulting in abortion, still births and low birth weight^[5]. The transmission of malaria tends to be seasonal and follow the rainfall pattern in Gokwe and to some extent in Kwekwe district. In Gweru district, transmission of malaria seems to occur all year round. This implies that breeding sites of the vector, the mosquito are available all year round. This has serious implications on the control strategies of malaria in the Gweru district.

Gokwe is an impoverished and rural district where the majority of people are too poor to afford preventatives such as mosquito nets and mosquito repellents. The villagers also live far from health amenities. Gweru and Kwekwe districts have better medical amenities as compared to Gokwe. On the other hand, Gokwe receives more annual rainfall than either Gweru or Kwekwe. This also has a bearing on the high number of malaria cases in Gokwe district.

The implications of the findings of this study have a bearing on the health and productivity of people in the Midlands Province. Malaria tends to burden the health delivery system of the clinics and hospitals. Malaria cases are likely to be exacerbated by the HIV infection that is prevalent in Zimbabwe (about 26% of the population)^[6]. The problem of HIV and AIDS in above 15 age group probably lowers the immune system and puts the people at risk of contracting the disease. In Zimbabwe, HIV is most prevalent in the 15 to 49 age group^[6]. The three districts are important agro-ecological zones. Frequent malaria infections results in absenteeism from school in the 5-14 age group and at work places in the above 15 age group. This impacts negatively on the economy of the

province. If the agrarian reforms that are currently taking place are to succeed in the Midlands Province, concerted efforts should be put in place to control malaria. Control strategies such as vector control and environmental management should be intensified especially in Gokwe district. In Kwekwe the second malaria peak in July to October could be attributed to breeding of mosquitoes in mining areas as well as the pot holes left by the gold panners.

A draw back in the attempts to control malaria in Zimbabwe is that effective anti-malarial drugs are not yet accessible to those who need them or are at risk. Recently it has been reported that *P. falciparum* is developing resistance to chloroquine, the drug that is currently used in Zimbabwe^[7,8].

ACKNOWLEDGMENTS

We would like to express our gratitude to the Provincial Medical Director of the Midlands Province for giving us permission to use the malaria data from hospitals and clinics in the study districts.

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