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A ten-year cross sectional study of trends of laboratory-confirmed Malaria in the republic of South Africa

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2012
http://hdl.handle.net10539/13750

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ABSTRACT FOR MSC RESEARCH REPORT FOR BEATRICE LYDIA MWAGOMBA: 502907

REPORT TITLE:

A TEN-YEAR CROSS-SECTIONAL STUDY OF TRENDS OF LABORATORY CONFIRMED MALARIA IN THE REPUBLIC OF SOUTH AFRICA

ABSTRACT

Introduction: Malaria is a vector-borne parasitic disease with heterogeneous distribution in time and space. The sub-Saharan African region harbours the largest proportion of the global malaria cases and contributes over 90% to the deaths due to malaria. The present study aimed to identify trends of laboratory-confirmed malaria in both malaria endemic and non-endemic areas of South Africa over a period of ten years (January 2000 to December 2009). The association between malaria and demographic characteristics was also explored in this study.

Materials and methods: This analytical cross-sectional study used secondary malaria surveillance data obtained from eight South African provinces through the National Health Laboratory Service. A population subset that utilised public health care facilities during the study period was included. Chi-square test of proportions was used to test if there were significant differences in the distribution of demographic and temporal characteristics among the laboratory-confirmed malaria cases. Annual parasite incidence of malaria was calculated to estimate malaria incidence in the population. Logistic regression models were constructed to determine the association between malaria and demographic characteristics.

Results: There were 175,069 suspected malaria cases from the endemic provinces of which 26,367 (15.1%) were laboratory confirmed; 130,980 (40.2%) suspected cases were from non-endemic provinces of which 42,488 (32.4%) were diagnosed as malaria. The overall malaria positivity rate was 21.4%. There were more cases of malaria among males (62.9%) than females,

among individuals aged 25-44 years (44.0%) than individuals in any other age-group and among those living in non-endemic provinces (60.8%) than those living in endemic provinces.

Malaria incidence declined from an overall API of 64 per 100,000 population in 2000 to 50 per 100,000 population in 2009. Thus, a linear downward trend in malaria incidence was observed over the ten-year period ($p<0.001$). The incidence of malaria in both endemic and non-endemic provinces was highest in the month of January (15 per 100,000 and 24 per 100,000 respectively).

The following demographic factors were found to be independently associated with increased malaria incidence: male gender (adjusted odds ratio (aOR) 1.54, CI: 1.51-1.57, $p<0.001$) and non-endemic province-type (aOR 2.68, CI: 2.63-2.73, $p<0.001$). Age was inversely associated with malaria incidence. Individuals in 45-64 and $\geq$ 65 year age-groups were 20% (aOR 0.80, CI: 0.77-0.82, $p<0.001$) and 51% (aOR 0.49, CI: 0.46-0.53, $p<0.001$) less likely to have malaria respectively.

Conclusion: There was a high incidence of laboratory-confirmed malaria in previously malaria non-endemic parts of South Africa especially Gauteng and North West provinces in the past decade. Targeted information, education and communication (IEC) to all travelers during the annual festive and holiday seasons should be reinforced to minimize importation of malaria into non-endemic areas.