

THE IMPACT OF PRE-DEPARTURE SCREENING AND TREATMENT ON NOTIFICATIONS OF MALARIA IN REFUGEES IN SOUTH-EAST QUEENSLAND

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Abstract

This study aimed to investigate changes in the notification rate of malaria in refugees over a period of national policy change on pre-departure screening. Notifying clinicians were interviewed to complete a standardised enhanced surveillance form. A decline in refugee malaria notifications occurred after implementation of a national policy to offer pre-departure malaria screening and treatment as necessary to refugees. Surveillance data support the benefit of offering pre-departure screening and treatment as necessary to refugees. *Commun Dis Intell* 2010;34(1):37–40.

Keywords: malaria, refugees, screening, south-east Queensland

Introduction

Around 3.2 billion people live at risk of malaria, with areas of 107 countries and territories at risk of transmission in 2004.¹ The disease causes around 1 million deaths each year, and average losses of economic growth of 1.3% annually in the most affected countries. Sub-Saharan Africa is the worst affected region, with 60% of cases and more than 80% of deaths.¹

Malaria transmission is often heightened in refugee camps because of the lack of adequate shelter and mosquito protection, malnourishment in displaced populations, and difficulty accessing appropriate treatment.² Passenger manifests of refugees arriving in Australia confirm that many departed Africa from such camps, and Australian studies since the year 2001 have shown that between 5% and 10% of recently arrived refugees from Africa have parasitaemia.^{3–6}

Queensland, similar to Western Australia and the Northern Territory^{3,4} has resettled an increasing number of refugees from Africa since the turn of the century. Data for the area served by the Brisbane Southside Public Health Unit (BSPHU) in south-eastern Queensland (Figure 1) also demonstrate this increase in settlement numbers prior to the 2006/07 financial year.

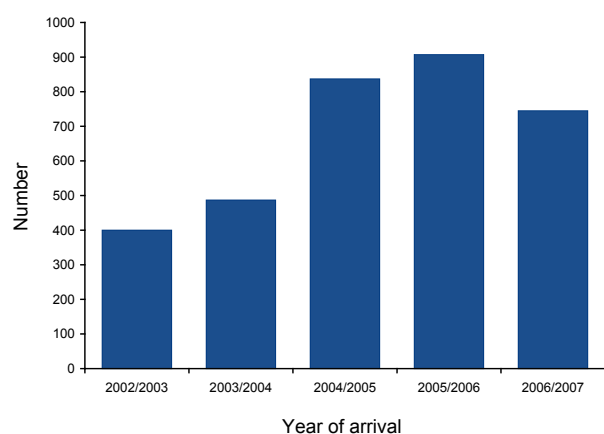
In the decade prior to 2005, notifications of malaria to the BSPHU were limited in number and usually associated with overseas travellers returning

to Australia. In 2005 there was a sudden increase in notifications to 116 for the year, from a previous 5 year average of 54.⁷ This increase was noted in public health units around the country, and was widely noted to be associated with recently arrived refugees.

Application for entry to Australia as a refugee requires the applicant to undergo a visa medical examination, including age dependent HIV and tuberculosis screening.⁸ Prior to 2005, the visa medical examination was the only health assessment protocol in place for those seeking entry to Australia via the Offshore Resettlement Program.

As national awareness developed that the increased malaria notifications were associated with recently arrived refugees, policy recommendations aimed at providing a broader health assessment for offshore refugees were developed. These initially (in the latter half of 2005) involved a pre-departure medical examination and treatment (unless contraindicated) with Fansidar® (sulfadoxine and pyrimethamine). However, a new policy to undertake rapid diagnostic testing (RDT) for malaria, and treatment (with artemether/lumefantrine combination) according to the result, prior to travel to Australia was implemented by the Commonwealth Department of Health and Ageing (DOHA), the (then) Commonwealth

Figure 1: Number of African humanitarian entrants settling in the Brisbane Southside Public Health Unit area, 2002 to 2007



Source: Statewide Multicultural Health Program, Queensland Health.

Department of Immigration and Multicultural Affairs (DIMA) and the Communicable Diseases Network Australia from March 2006.⁹ The policy was implemented over the next 6 months.

Local enhanced surveillance was continued throughout 2006 and 2007 to monitor the expected changes in malaria notifications in response to implementation of these policies. These results are presented here.

Methods

During 2005, enhanced surveillance was commenced on all new notifications of malaria to the BSPHU. A one page questionnaire was completed by BSPHU staff by contacting the clinician who had requested the investigation for malaria on the case. Information was collected about the age, sex, refugee status, country of origin/country of first asylum, pre-departure treatment, and illness details for each case. A refugee was defined as a person who entered Australia via the Offshore Resettlement Program from any country. If the clinician was not aware of some of the details requested including whether the case had received pre-departure screening, this information was checked against the DIMA manifests that accompany offshore refugees. This surveillance continued throughout 2006 and 2007.

The information was entered into a Microsoft Excel database and periodically analysed using Excel and Epi Info ver 6 over the next 3 years. Chi-squared tests were used to assess the statistical significance of changes in proportions, while ANOVA was used to assess the statistical significance of changes in means.

Enhanced surveillance was conducted in accordance with Chapter 3 of the (Queensland) *Public Health Act 2005*. Electronic data were de-identified and password protected.

Results

The majority of refugees notified with malaria during 2005–2007 were young males who originated from Africa, and the vast majority were infected with *Plasmodium falciparum* (Table 1). The number and proportion of refugee notifications was greatest in 2005 and declined in the subsequent 2 years (Figure 2). This decrease was statistically significant ($P = 0.005$).

As the refugee notification numbers declined, the epidemiology of malaria notifications also changed, although not all observed changes were statistically significant. The proportion of notifications among refugee children aged less than 15 years was 66% in 2005, 74% in 2006 and 50% in 2007 ($P = 0.155$), while the average age of all malaria notifications

increased from 20 years in 2005, to 22 years in 2006 and 28 years in 2007 ($P = 0.016$). A change in the country of origin/country of first asylum of the refugee cases also occurred. In 2005, the great majority of refugees with malaria came from camps in Liberia and Tanzania. In 2006, they mainly came from Tanzania, and in 2007, cases came from a variety of locations throughout Africa including Kenya, Liberia, Sudan, Tanzania and Uganda.

Figure 2: Number of notifications identified as refugees, by age group

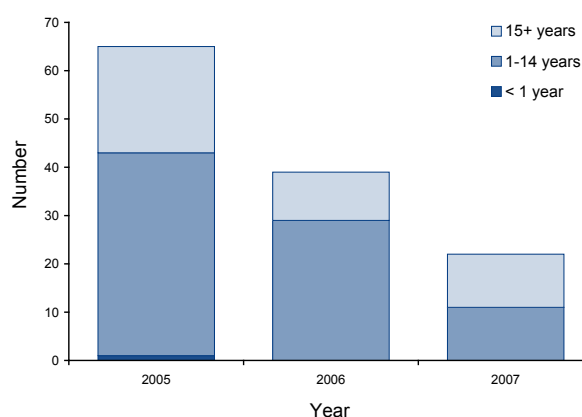


Table: Demographic characteristics of refugees notified with malaria, Brisbane Southside Public Health Unit, 2005 to 2007

Demographic	Range/per cent	Number
Age range	0–63 years	126
Age group		
< 15 years	66%	83
15+ years	34%	43
Gender		
Males	56%	71
Females	44%	55
Place of origin		
Africa	97%	123
Other	3%	3
Plasmodium spp		
<i>falciparum</i>	89%	113
<i>vivax</i>	3%	3
<i>ovale</i>	2%	3
<i>malariae</i>	2%	2
Mixed infection	3%	4
Unknown	1%	1

* Numbers may not add to same total because of missing data; missing data have been excluded to calculate percentages.

The joint policy of the Commonwealth DIMA, DOHA, and the Communicable Diseases Network Australia dated March 2006, indicates locations with pre-departure screening available at that time included Kenya (including cases transiting from Uganda, Tanzania, Democratic Republic of the Congo, Burundi and Rwanda), Ethiopia, Ghana, Guinea, and Sierra Leone. The proportion of cases from countries evidently without pre-departure screening increased from 2006 to 2007 (8% to 41%; $P = 0.005$).

According to health manifest data, 31% of refugee notifications were screened for malaria prior to departure in 2006, with 77% screened in 2007. However, for 52% of notifications (69% in 2006 and 23% in 2007), health manifest data on pre-departure screening was incomplete.

The data on pre-departure malaria treatment of refugee notifications was also generally poor, with status unknown for 100% of cases in 2005 and an average of 40% of cases in 2006 and 2007. Where pre-departure treatment status was known, the proportion who were treated for malaria prior to departure decreased (17 of 23 cases [74%] in 2006 and 1 of 13 cases [8%] in 2007; $P < 0.001$).

Discussion

The decrease in malaria notifications to the BSPHU coincided with the implementation of the recommendation to offer offshore refugees screening (and treatment as appropriate) for malaria prior to travel to Australia. A causal association cannot be inferred, however the benefit of the introduction of pre-departure screening and treatment for malaria appears supported by this decrease in notifications. In addition to the decline in numbers, there was an increase in the proportion of refugee notifications from countries where pre-departure screening was not available across the study period. This also seems to support the benefit of pre-departure screening, although an increasing intake of refugees from such countries with a decrease in refugees from screening countries could have affected the results.

Other possible reasons for the decline in notifications include:

1. a decline in the number of refugees settling in the Public Health Unit's jurisdiction over the study period;
2. a decrease in screening for or detection of malaria once refugees arrived in Australia, and
3. changes in the incidence of malaria in the countries of asylum.

The first two of these reasons for the decline in notifications are unlikely. Firstly, data from the

Statewide Multicultural Health Program show continued settlement of African refugees in south-east Queensland across the study period, with what appears to be only a small drop in total numbers of arrivals (Figure 1). Secondly, screening and investigation for malaria in the local area is likely to have increased rather than decreased. Prior to 2006, there were no co-ordinated screening services for refugees in the area of the BSPHU. February 2006 saw the commencement of a refugee health service with a focus on screening and immunisations in a local area where many offshore refugees were resettling.¹⁰ Since 2006 the BSPHU has also worked to increase awareness of refugee health issues among other service providers.

However, these data are still subject to the same limitations as other notifiable conditions surveillance data. That is, that most notifications depend on the investigation practices of clinicians, which are closely associated with the health care seeking behaviours of the population. This may change over time, and in the refugee population particularly, may be influenced by a range of factors. Potential barriers to accessing health care that may fluctuate include a lack of access to culturally appropriate services, a past history of torture or trauma, and a distrust of government services. It cannot be determined how much influence, if any, these factors had on the health seeking behaviours of refugees over the study period, although the commencement of a local dedicated refugee health service would go some way to increasing access to culturally appropriate services over this period.

Changes in the incidence of malaria in different countries across Africa may explain at least some of the decline in notifications. It is noted that the countries of origin / countries of first asylum of cases changed across the study period, so different degrees of endemicity and / or transmission of malaria in these countries may have impacted on results.

When considering the data presented here in relation to the benefit of pre-departure screening for malaria, it should be noted that not all offshore refugees have access to RDT. There are inevitably some points of departure for Australia at which testing is not available. This will include some people who relocate under the Special Humanitarian Program, and may account for some of the missing data relating to screening and treatment. Further, treatment with artemether/lumefantrine is a 3 day course that is not observed by medical staff, so failure of therapy may result from non-compliance. Malaria upon arrival may also result from reinfection after treatment, or low antigen loads at the time of RDT causing a false negative result.

The change in policy from no pre-departure screening; to pre-departure medical exam and treatment with Fansidar® in 2005; to pre-departure medical exam, RDT for malaria and treatment with artemether/lumefantrine according to the result in 2006 would have affected the results in a number of ways. Firstly, the further decline in notifications noted in 2007 may be explained by the fact that RDT was phased in over 2006. Secondly, the increase in the proportion of notifications listed as having pre-departure screening from 2006 to 2007 may have resulted from the changing definition of pre-departure screening for malaria as RDT was phased in over 2006. Lastly, the decrease in the proportion of refugees who received pre-departure treatment for malaria from 2006 to 2007 may have been due to continued use of Fansidar® in 2006 while RDT and treatment with artemether/lumefantrine was gradually introduced. Artemether/lumefantrine is the recommended first line treatment for uncomplicated *falciparum* malaria.¹¹

Other authors have reported on the benefits of pre-departure treatment of malaria¹² though it has been acknowledged that malaria still occurs in the refugee population after arrival in Australia.¹³ To our knowledge, no other study has reported the results of malaria surveillance among refugee populations in Australia for the time period over which the national policy on pre-departure screening changed.

Our data support the continuation of pre-departure RDT and treatment as appropriate for malaria. However, as malaria cases will still occur despite pre-departure screening, post-arrival testing and treatment of refugees is still recommended.¹⁴

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