

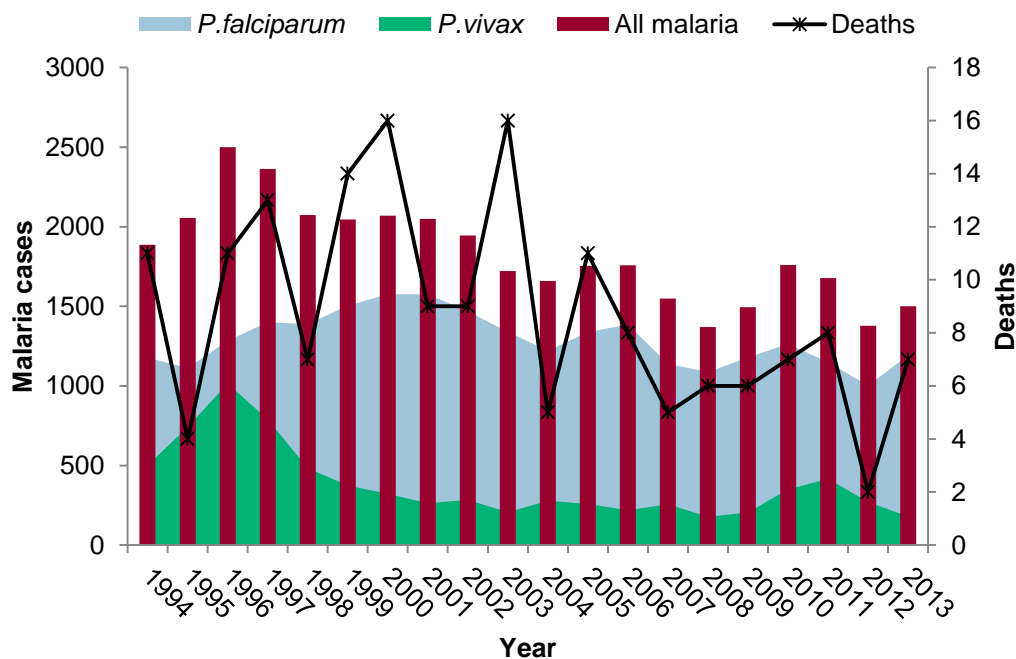
## Infection report (Travel health)

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### Malaria imported into the United Kingdom in 2013: Implications for those advising travellers

This article presents data on malaria imported into the United Kingdom (UK) in 2013, based on figures reported to the Public Health England (PHE) Malaria Reference Laboratory (MRL) on behalf of all UK countries. For details on methods of data collection for malaria see *Imported malaria and high risk groups* [1]. Data analysis was conducted by the PHE Travel and Migrant Health Section.

**Figure 1. Cases of malaria in the United Kingdom (including deaths): 1994– 2013**



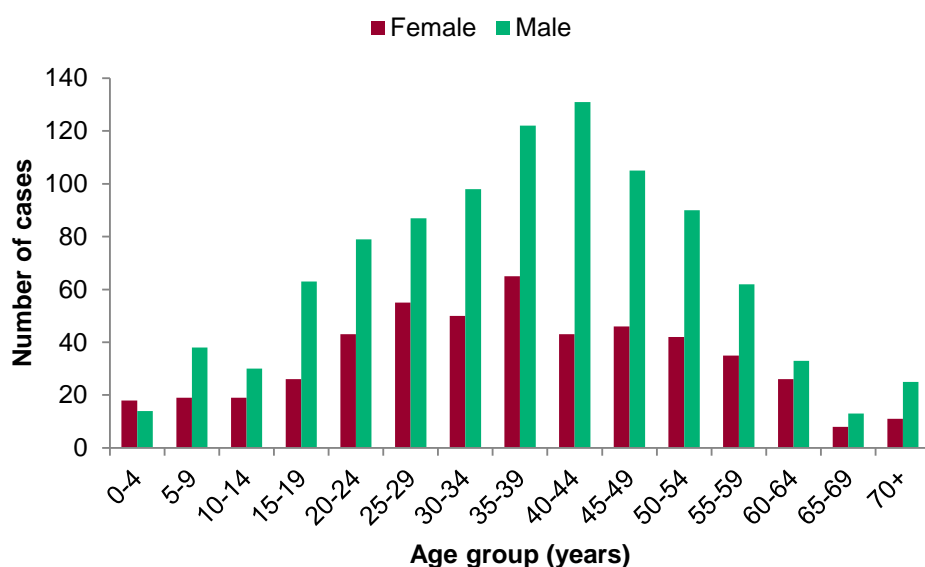
In 2013, 1501 cases of malaria were reported in the UK (1412 in England, 59 in Scotland, 22 in Wales and 8 in Northern Ireland), 9% higher than 2012 but 5.6% below the average number of cases reported each year between 2004 and 2013.

Seventy-nine percent of malaria cases in 2013 (compared with 73% in 2012) were caused by (the potentially fatal) *Plasmodium falciparum* and this high proportion of falciparum malaria reflects the fact that most malaria imported to the UK is acquired in Africa. The proportion due to vivax malaria continued to fall back from a rise in recent years (179 in 2013, compared to 271 reported in 2012 and 416 in 2011) [Figure 1].

#### Age/sex

Age and sex were known for 1496 cases; of these two-thirds (990) were male, consistent with previous years. Males dominated all age groups except the 0-4 years group [Figure 2]. The median age was 37 years (38 for males, 37 for females). Those aged 16 years and under accounted for 11% of all cases.

**Figure 2. Cases of malaria in the United Kingdom by age and sex: 2013**



## Geographical distribution

**Table 1. Cases of malaria in the United Kingdom by geographical distribution: 2013 and 2012**

Geographical Area	2013	2012	% change
London PHEC	785	676	16%
London - North East & North Central HPT	258	257	0%
London - North West HPT	122	107	14%
London - South East HPT	298	224	33%
London - South West HPT	105	88	19%
London - unknown HPT	2	-	
West Midlands PHEC	91	104	-13%
Yorkshire and Humber PHEC	88	75	17%
Greater Manchester PHEC	70	74	-5%
South Midlands and Hertfordshire PHEC	53	57	-7%
Sussex, Surrey and Kent PHEC	61	46	33%
Anglia and Essex PHEC	55	42	31%
Thames Valley PHEC	41	38	8%
Avon, Gloucestershire and Wiltshire PHEC	40	34	18%
Wessex PHEC	35	34	3%
Cheshire and Merseyside PHEC	15	45	-67%
East Midlands PHEC	35	23	52%
Cumbria and Lancashire PHEC	24	18	33%
Devon, Cornwall and Somerset PHEC	13	20	-35%
North East PHEC	6	10	-40%
<b>England total</b>	<b>1412</b>	<b>1296</b>	<b>9%</b>
Scotland	59	53	11%
Wales	22	22	0%
Northern Ireland	8	6	33%
Other UK territory	-	1	
<b>UK Total</b>	<b>1501</b>	<b>1378</b>	<b>9%</b>

PHEC: Public Health England Centre; HPT: Health Protection Team

London continues to report the largest proportion of cases in England (56%), with cases resident in South East London increasing by a third between 2012 and 2013. Similar increases were seen in Sussex, Surrey and Kent (33%), Anglia and Essex (31%), Cumbria and Lancashire (33%) and the East Midlands (52%) [Table 1].

## Travel history

The breakdown of malaria cases reported by region of acquisition and parasite species is shown in Table 2. The majority of cases (where travel history is known) continue to be acquired in West Africa (65%), followed by East Africa (11%) and South Asia (10%). While it is important not to over-interpret changes in individual countries because numbers are low, cases acquired in Pakistan halved (70) compared with 2012 (141), possibly returning to baseline levels after a previous increase associated with flooding in 2010 and 2011. There has, however, been an 18% increase in cases acquired in Sierra Leone (185), following the 51% increase between 2011 (104) and 2012 (157). Similarly after seeing a fall in cases acquired in Nigeria since 2009, 460 cases were reported in 2013 representing a 23% increase compared to 2012 (373). There were two cryptic cases where there was no explanatory travel history or other source of infection identified.

**Table 2. Cases of malaria in the United Kingdom by species and region of acquisition: 2013**

Region of acquisition* [2]	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. ovale</i>	<i>P. malariae</i>	Mixed	2013 Total	2012 total
Western Africa	826	1	49	21	9	<b>906</b>	722
Eastern Africa	120	6	15	9	-	<b>150</b>	142
Southern Asia	6	134	-	-	-	<b>140</b>	221
Middle Africa	106	-	4	5	2	<b>117</b>	66
Northern Africa	28	-	-	2	-	<b>30</b>	32
Africa unspecified	24	-	4	1	-	<b>29</b>	21
South America	1	7	-	-	-	<b>8</b>	3
South-Eastern Asia	1	4	-	-	-	<b>5</b>	3
Oceania	1	2	-	-	-	<b>3</b>	4
Western Asia	-	1	-	-	-	<b>1</b>	1
Southern Africa	1	-	-	-	-	<b>1</b>	7
Cryptic	2	-	-	-	-	<b>2</b>	-
Not stated	78	24	6	1	2	<b>109</b>	147
<b>Total</b>	<b>1192</b>	<b>179</b>	<b>78</b>	<b>39</b>	<b>13</b>	<b>1501</b>	1378

*P* = *Plasmodium*

\* Note that the region of acquisition in this table is based on the current United Nations World Region classification [2], which is a slightly different classification than used in previous HPR reports. Caution should therefore be exercised when comparing these data with data before 2012. Contact [tmhs@phe.gov.uk](mailto:tmhs@phe.gov.uk) for further information.

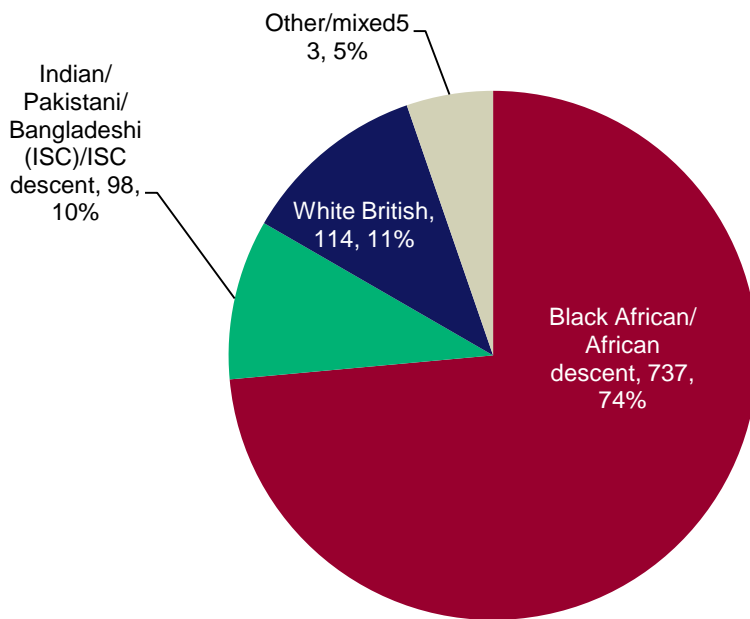
Seven deaths from malaria were reported in 2013, all from falciparum malaria acquired in western or eastern Africa. There is a small variation in the number of deaths from malaria in the UK every year but the total for 2013 is consistent with the annual average of 6.5 over the last 10 years.

Of those with travel history/country of residence information available (1257, 84%), the majority of malaria cases and deaths reported in the UK were UK residents who had travelled abroad (1045, 83%); 123 (10%) cases (no deaths) were new entrants (including UK expats and foreign students) and 89 (7%) cases (including one death) were foreign visitors to the UK.

For cases that travelled abroad from the UK, reason for travel was known for 832/1045 (80%). Of these, 681 (82%) had visited family in their country of origin, 102 (12%) travelled for business (including armed forces and civilian air crew) and 49 (6%) travelled for a holiday.

## Ethnicity and country of birth for cases that travelled abroad from the UK

Figure 3. Ethnicity of malaria cases that travelled abroad from the UK: 2013 (N=1002)



The majority of malaria cases that travelled abroad from the UK were of Black African ethnicity or African descent (African descent is determined from other information about the patient if ethnicity is not given). Of cases of non-White British ethnicities with information about country of birth (527), 361 (90%) were non-UK born.

### Chemoprophylaxis

Among patients with malaria who had travelled abroad from the UK, where the history of prophylaxis was obtained, 596/737(81%) had not taken prophylaxis. Of those that had taken some form of prophylaxis (141), 109 (84%) had taken a drug that is currently recommended by the PHE Advisory Committee for Malaria Prevention in UK Travellers (ACMP) for their destination [3]; however, this only represented 15% of the total cases with prophylaxis information. (Note that whether the cases had taken the drug regularly was poorly completed and should also be taken into consideration when interpreting these data.) Although these proportions are similar to the last 5-6 years, in the early 2000s the proportion of those who had not taken prophylaxis was much lower (48% in 2000, 41% in 2001). The proportion of the total cases with prophylaxis information that took a drug recommended by the ACMP has however remained between 12% and 16% since 2000.

These data imply that health messages about the importance of antimalarial prophylaxis are still not reaching groups who are at particular risk of acquiring malaria, e.g. those who are visiting family in their country of origin, particularly those of Black African ethnicity.

It seems likely that these groups are either not seeking or not able to access medical advice on malaria prevention before they travel, or they are not being given good advice, or they are not adhering to it; they may not perceive themselves to be at risk because the destination is familiar to them. Probably all these factors contribute. The burden of falciparum malaria in particular falls heavily on those of Black African ethnicity, and this group is important to target for pre-travel advice [4]. The PHE MRL is working with African Diaspora Action Against Malaria (ADAAM) to address this.

A recent analysis of malaria deaths over 20 years in the UK [5] has shown that, while African born travellers visiting family in their country of origin are at particular risk of acquiring malaria, once acquired the risk for mortality is significantly higher in those born outside Africa and travelling for other reasons

(e.g. holiday travellers). There is also a strong association between increasing age and mortality, so elderly travellers should also be considered a particular risk group.

## Malaria reporting

There is some under-reporting of malaria cases in the UK. The most complete source of information about malaria in the UK comes from the PHE MRL surveillance data, which are used to inform the UK malaria prevention strategy [3]. Malaria is a notifiable disease and clinical and laboratory staff are also obligated under law to notify cases to their Proper Officer [6]; however, in 2013, only 12% of malaria cases reported to MRL were officially notified. A capture-recapture study estimated that the MRL surveillance system captured 56% of cases (66% for *P. falciparum* and 62% for London cases) [7]. Clinical and laboratory staff are therefore reminded of the need to notify cases they diagnose to the Proper Officer and to report all cases to PHE Malaria Reference Laboratory; a form for this purpose is available at [www.malaria-reference.co.uk](http://www.malaria-reference.co.uk).

## Prevention advice

Malaria, an almost completely preventable but potentially fatal disease, remains an important issue for UK travellers. Failure to take prophylaxis is associated with the majority of cases of malaria in UK residents travelling to malarial areas. The number of cases in those going on holidays is small but there is continuing evidence that those of African or Asian ethnicity who are non-UK born and going to visit family are at increased risk of malaria, as well as a number of other infections [8]. Those providing advice should engage with these population groups wherever possible, including using potential opportunities to talk about future travel plans outside a specific travel health consultation, such as during new patient checks or childhood immunisation appointments [9].

The ACMP guidelines [3] and resources available from the National Travel Health Network and Centre (<http://www.nathnac.org/>) should assist clinicians in helping travellers to make rational decisions about protection against malaria.

## References

1. Smith AD, Bradley DJ, Smith V, Blaze M, Behrens RH, Chiodini PL, *et al*. Imported malaria and high risk groups: observational study using UK surveillance data 1987-2006. *BMJ* 2008; **337**:a120. doi: 10.1136/bmj.a120
2. United Nations Statistics Division. *Composition of macro geographical (continental) regions, geographical sub-regions, and selected economic and other groupings* [online]. Accessed 9 April 2014. Available at: <http://millenniumindicators.un.org/unsd/methods/m49/m49regin.htm>
3. Chiodini PL, Hill D, Field V, Whitty CJM, Lalloo D. *Guidelines for malaria prevention in travellers from the United Kingdom*. London, Public Health England: 2013. Available at: [http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb\\_C/1195733823080](http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1195733823080)
4. Health Protection Agency. *Foreign travel-associated illness – a focus on those visiting friends and relatives, 2008 report*. London: HPA, 2008. Available at: [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1231419800356](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1231419800356)
5. Checkley AM, Smith A, Smith V, Blaze M, Bradley D, Chiodini PL, *et al*. Risk factors for mortality from imported falciparum malaria in the United Kingdom over 20 years: an observational study. *BMJ*. 2012 Mar 27; 344: e2116. doi: 10.1136/bmj.e2116.
6. HPA legacy website. Notifications of Infectious Diseases [online]. Available at: <http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/NotificationsOfInfectiousDiseases/>
7. Cathcart SJ, Lawrence J, Grant A, Quinn D, Whitty CJ, Jones J, *et al*. Estimating unreported malaria cases in England: a capture-recapture study. *Epidemiol Infect* 2010; **138** (7): 1052-8
8. Wagner KS, Lawrence J, Anderson L, Yin Z, Delpech V, Chiodini PL, *et al*. Migrant health and infectious diseases in the UK: findings from the last 10 years of surveillance. *J Public Health* 2014; **36** (1): 28-35
9. Public Health England. Migrant Health Guide [online]. Available at: <http://www.hpa.org.uk/MigrantHealthGuide/>