



Ministry of Defence

Ad Hoc Statistical Bulletin

Mefloquine Hydrochloride prescribing in the UK
Armed Forces, 1 April 2007 – 31 March 2015

Date 12 January 2016

Overview

This is an ad hoc statistical bulletin providing information on Mefloquine Hydrochloride (Mefloquine) prescribing in the UK Armed Forces. This bulletin has been provided in response to recent media coverage and to ensure the public has equal access to the information.

Mefloquine (marketed in UK as Lariam) is used to prevent or treat malaria by killing the blood phase of the parasites. It may be currently prescribed as prophylaxis for military personnel deployed to areas with a recognised risk of malaria. This includes regions within a number of countries for example Kenya, the Congo, Guinea, Ghana, and Sierra Leone. Mefloquine is one of the four main chemoprophylaxis drugs that are available for use in UK to prevent malaria. Others include Doxycycline; Chloroquine; Proguanil; and Atovaquone (when combined with Proguanil it is marketed as Malarone). All of these drugs have a recognised profile of side effects.

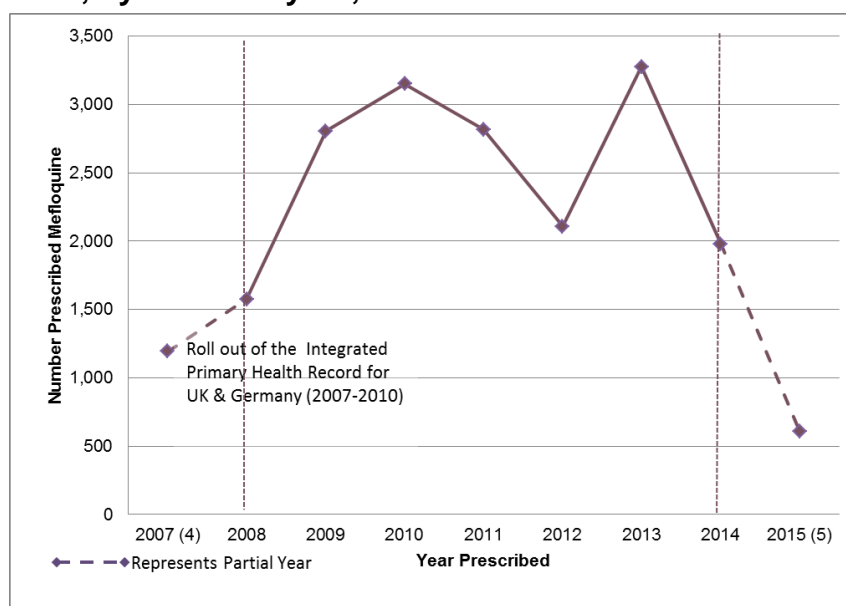
Malaria is a serious febrile illness. If malaria is not diagnosed and treated promptly it can be fatal, specifically if the *P.falciparum* strain is contracted. The Government therefore has a duty of care to provide members of our Armed Forces with appropriately tested and effective methods of chemoprophylaxis. The exact choice of drug offered to personnel depends on a number of factors, including the region the individual is deploying to, their health and any past history of side effects. Taking antimalarial tablets when visiting an area where there is a malaria risk can reduce the risk of malaria by about 90%.

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Link to stats: <https://www.gov.uk/government/statistics/mod-national-and-official-statistics-by-topic>

Figure 1: UK Armed Forces personnel prescribed Mefloquine^{1,2,3}, 01 April 2007 – 31 March 2015, by calendar year, Number



Between 01 April 2007 and 31 March 2015, a minimum of **17,368** UK Armed Forces personnel were prescribed Mefloquine at least once.

Over the same time period approximately 104,000 UK Armed Forces personnel were prescribed a different anti-malarial drug. Thus of the UK Armed Forces personnel prescribed anti-malarials, approx 86% did not receive Mefloquine in this time period.

Source: Defence Medical Information Capability Programme (DMICP)

1. As recorded in DMICP, extracted 18 August 2015

2. Please note, an individual may have been prescribed Mefloquine in more than one year and therefore the sum of each year may not equal the total number of individuals prescribed over the whole period

3. Please note figures presented for the period 2007-2010 may be incomplete due to the rollout of DMICP. See background notes for more detail.

4. 01 April 2007 to 31 December 2007 - dotted line on graph represents incomplete year

5. 01 January 2015 to 31 March 2015 - dotted line on graph represents incomplete year

Please note these figures includes both Regular and Reservist personnel and therefore differs from previously published figures which were for Regular personnel only.

The numbers presented are based on personnel who have been prescribed the drug; it does not take into account whether the individual has taken the drug.

Mefloquine Stock Levels

In August 2015 Surgeon General's headquarters carried out a stocktake of amounts of chemoprophylaxis drugs held by the MOD. In order to allow comparisons between drugs (some of which are taken weekly and some of which are taken daily) the number of doses available for a six month deployment were also calculated.

Table 1: Chemoprophylaxis drugs held by the MOD, August 2015, Tablets and Doses for a Six Month Deployment, Percentages

Chemoprophylaxis drug	Tablets in Stock	Doses in Stock for a Six Month Deployment	Dosage
	%	%	
Chloroquine	1.8	10.8	310 mg once weekly
Chloroquine and proguanil (travel pack)	75.5	56.0	310mg chloroquine once weekly; 200mg proguanil once daily
Proguanil	10.5	-	<i>Not prescribed as individual drug; prescribed with Chloroquine (1)</i>
Mefloquine	1.2	14.0	250mg once weekly
Atorvaquone and Proguanil (Malarone)	1.6	3.0	100mg proguanil/250mg atovaquone daily
Doxycycline	9.4	16.2	100mg once daily

Source: Surgeon General's headquarters Stock Audit August 2015

1. Proguanil is not prescribed on its own as malaria chemoprophylaxis, it is prescribed with Chloroquine. Therefore the amount of Chloroquine tablets has been used to calculate doses.

The figures represent a snap shot of the stock held by the MOD in August 2015. Stock levels change over time as it is used and reordered, thus the numbers presented do not indicate prescribing patterns. The information compiled does not indicate whether the stock levels for their facility were high, normal or low, nor where they were in their ordering cycle.

Deployment

Of the **131,000^a** UK Armed Forces personnel deployed on Operation HERRICK between 01 April 2007 and 31 December 2014, **536 (0.4%)** had a record of being prescribed Mefloquine in the DMICP data warehouse for deployment in Afghanistan^b on Operation HERRICK. Additionally;

- a. **40,477 (31%)** UK Armed Forces personnel were prescribed Chloroquine and Proguanil
- b. **4,095 (3%)** UK Armed Forces personnel were prescribed Doxycycline
- c. **2,554 (2%)** UK Armed Forces personnel were prescribed Atovaquone plus Proguanil (Malarone)
- d. **12,908 (10%)** UK Armed Forces personnel were prescribed chemoprophylaxis but we are unable to identify which chemoprophylaxis they were prescribed from the data warehouse

54% of UK Armed Forces personnel deployed in Afghanistan^e on Operation HERRICK did not have a record of being prescribed a chemoprophylaxis drug in the primary care electronic data warehouse. This population includes personnel who may not have required a prescription for a chemoprophylaxis drug (as they were considered low risk, for example deployed to the central operating base where the risk of malaria was low) and personnel who were prescribed a chemoprophylaxis drug but it was entered in the medical record as free text and not coded in Defence Medical Information Capability Programme (DMICP) data warehouse.

Please note personnel have been counted for each chemoprophylaxis drug prescribed, thus adding up the numbers will not equal the total number of personnel identified as having a

^a Number represents anyone deployed on Op HERRICK to all locations, not only Afghanistan.

^b Please note, personnel can be prescribed Mefloquine for deployment on Op HERRICK for locations other than Afghanistan, these figures are not included in this publication.

prescription due to double counting. For example a patient who has been prescribed Mefloquine and Atovaquone plus Proguanil at different time points will have been counted against each drug prescribed.

Background notes:

This ad hoc statistical bulletin has been released in response to the recent media coverage on the prescribing of Mefloquine in the UK Armed Forces. This statistical bulletin ensures MOD is open and transparent about the methodology and quality of any statistics and that equal access is given to all, as required by the Code of Practice for Official Statistics.

The MOD use a range of prevention drugs in line with the guidance provided by Public Health England's Advisory Committee on Malaria Prevention (ACMP) to ensure the treatment provided is going to be the most effective.

The Ministry of Defence needs to be able to use the most appropriate drug for the areas to where our people deploy to help ensure their protection against this disease. The choice of prescribed treatment depends upon a number of factors including:

- the region to which personnel are being deployed
- the individual's medical history, for example, past history of side effects or contraindications to the drug.

Drug options include Chloroquine; Chloroquine plus Proguanil; Mefloquine (Lariam); Doxycycline; and Atovaquone plus Proguanil (Malarone®).

Data Sources:

Prescription data

UK Armed Forces personnel include trained and untrained personnel; Regulars and Reservists.

Information presented relates to the number of personnel prescribed Mefloquine not the total number of prescriptions. Individuals have only been counted once in each year regardless of the number of prescriptions received. Therefore the sum of each year may not equal the total number of UK Armed Forces personnel prescribed over the whole period.

Data on prescriptions for Mefloquine were derived from the DMICP data warehouse. Data were extracted as at 18 August 2015. DMICP commenced during 2007 and comprises an integrated primary Health Record (iHR) for clinical use and a pseudo-anonymised central data warehouse. Prior to this data warehouse, medical records were kept locally, at each individual medical centre. By 2010, DMICP was in place for the UK and the majority of Germany. Rollout to other overseas locations commenced in November 2011.

To identify whether personnel were prescribed chemoprophylaxis for their deployment in Afghanistan on Op HERRICK, Defence Statistics sought advice from Permanent Joint Headquarters (PJHQ) with regards to how long prior to deployment they would be prescribed the drug. The time between prescription and deployment was indicated between 2 days and 6 weeks

prior to deployment. This has been used to establish who has been prescribed antimalarials for their specific deployment. Anyone who had not been prescribed an antimalarial within 43 days prior to deployment or whilst on deployment, have not been included in the numbers presented.

The number of prescriptions presented should be treated as **minimum** for the following reasons:

- UK Armed Forces personnel who leave the Armed Forces and subsequently register at a MOD medical centre as a civilian were not included in the numbers presented.
- It is possible that UK Armed Forces personnel were prescribed Mefloquine prior to their medical record being held in DMICP, therefore these records were not available centrally.
- If Mefloquine prescriptions were recorded as free text only in the patient medical record they have not been included in the data.
- It may also have been possible to prescribe Mefloquine to UK Armed Forces personnel through a Patient Specific Direction. In these cases the name of the drug prescribed was not recorded in the data warehouse therefore these have not been included in the data.
- In addition if Mefloquine was prescribed by the NHS it has not been included in the numbers presented.

The data on Mefloquine presented is based on personnel who have been prescribed the drug; it does not ensure the individual has taken the drug.

Mefloquine Stock Levels

Electronic searches were conducted from DMICP for Surgeon General's Secretariat to identify chemoprophylaxis stock levels held by Defence Primary Healthcare facilities. Additional electronic searches were conducted by Defence Equipment Support on stock levels held centrally or for operational purposes. The central warehouse in Donnington holds stocks for personnel who are on or who are going on Operations. In addition some high readiness units have an entitlement to hold certain drug stocks in order that they can deploy at short notice.

Larger Defence Primary Healthcare facilities are able to prescribe and dispense as they have their own in-house dispensaries. Smaller Defence Primary Healthcare facilities outsource the dispensing function to a community pharmacy under a Ministry of Defence-wide contract.

The contract is currently with Lloyds pharmacy and dispensing is undertaken at specific branches agreed between Lloyds pharmacy and the MOD. The stock levels provided in this response do not include stocks of chemoprophylaxis drugs held at these facilities. The drugs held at these facilities will not be held for the sole purpose of the MOD and will also be used by the pharmacies local community.

Deployment

Deployment on Op HERRICK includes deployments to a number of locations. In order to audit a relevant cohort of people for prescription of Mefloquine, MOD only considered personnel who were deployed on Op HERRICK in Afghanistan. Therefore there may be other locations on Op HERRICK where personnel were prescribed Mefloquine which were not included in this publication.

Personnel prescribed Mefloquine for a deployment were identified if they were prescribed the drug either up to 43 days prior to deployment or whilst on deployment.

Data on deployment was derived from the JPA 'Move and Track' system which was introduced in April 2007. Due to on going validation, some data may be provisional.

Please note, DMICP and Move and Track are live systems, and thus figures may change as a result.

Glossary:

Defence Medical Information Capability Programme (DMICP) - The DMICP programme commenced during 2007 and comprises an integrated primary Health Record (iHR) for clinical use and a pseudo-anonymised central data warehouse.

Malaria – Malaria is a mosquito-borne infectious disease of humans and other animals caused by parasitic protozoans (a group of single-celled microorganisms) belonging to the genus *Plasmodium*.

Mefloquine Hydrochloride - Mefloquine is used to prevent or treat certain types of malaria. It works by killing the parasites that cause malaria. It is used to prevent malaria in people who are in areas where there is an increased risk of getting malaria.

Operation HERRICK - Operation HERRICK is the name associated to all British operations in Afghanistan. Operation HERRICK also encompasses the whole of the Joint Operation Area in the region so personnel deployed to this operation do not have to be solely deployed within Afghanistan. Not all supporting operational posts are geographically located within Afghanistan. Operation HERRICK consists of the British contribution to the Nato-led International Security Assistance Force (ISAF) and support to the US-led Operation Enduring Freedom (OEF).

Patient Registration Type – Within DMICP there are different types of registration available; these largely define personnel whose primary healthcare is delivered by the Defence Medical Services and personnel whose primary healthcare is delivered by the NHS, with a record also being held on DMICP (such as the Army Reserve). There are numerous different subgroups of registrations which can be further split into 'military' registrations which contain military specific data (such as Service number) and 'civilian' registrations which do not contain military specific data.

**ANNEX A to Ad Hoc
Statistical Bulletin:
Mefloquine Hydrochloride
prescribing in the UK
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Table A1: UK Armed Forces personnel prescribed Mefloquine^{1,2,3}, 01 April 2007 – 31 March 2015, by calendar year, Number.

Year Prescribed	Number Prescribed Mefloquine
All	17,368
2007 ⁴	1,192
2008	1,576
2009	2,803
2010	3,149
2011	2,816
2012	2,108
2013	3,276
2014	1,979
2015 ⁵	608

Source: Defence Medical Information Capability Programme (DMICP)

1. As recorded in DMICP, extracted 18 August 2015.

2. Please note, an individual may have been prescribed Mefloquine in more than one year and therefore the sum of each year may not equal the total number of individuals prescribed over the whole period

3. Please note figures presented for the period 2007-2010 may be incomplete due to the rollout of DMICP. See background notes for more detail.

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