



MALARIA SURVEILLANCE IN EUROPE<sup>1</sup>

by

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During the past ten years over 45 000 cases of imported malaria have been reported throughout Europe (Phillips-Howard & Bradley, 1989). In order to develop recommendations on preventive measures to reduce the risk of malaria, research workers from countries of Europe and North America have investigated reasons for infection in their travellers (Lobel et al., 1987, 1990; Steffen, 1990). Information from ongoing surveillance of cohorts of travellers has often been an important component of such investigations. However, many countries have few resources to conduct detailed research and depend solely on incidence data from their malaria surveillance systems for interpretation of risk and for determining the advice to be given on malaria prophylaxis (WHO, 1988).

Information on imported malaria cases collected by each European country has been assessed to determine whether data on key risk factors were collected and whether these data were compatible for comparative analysis between countries (Phillips-Howard & Bradley, 1989). The study showed that information on risk markers, such as age, sex, reason for travel, and occupation, were generally collected by all countries. However, determinants of risk (e.g., dates of travel abroad as a proxy measure for exposure to malaria risk; management of illness; and risk modifiers, such as chemoprophylactic cover and compliance) were not routinely collected by many countries. Furthermore, analysis of commonly collected data was restricted because of the great variation in the definitions and the measurement scales used for some variables.

An informal meeting of representatives responsible for malaria surveillance in Europe, sponsored by the World Health Organization, was held in April 1988 in Zurich to address problems of data collection through national surveillance. (See Annex 1 for list of participants.) The meeting was a follow-up of the recommendations made by both the European WHO working group on malaria risk for international travellers which met in Hungary in 1986 (WHO, 1986), and the informal consultation held on the same subject in Geneva in 1987 (WHO, 1988). The aims of the Zurich meeting included: discussion of the types of data collected on imported malaria cases, and development of a common surveillance case report form. Of the 27 countries of Europe, 12 were represented (Belgium, Denmark, Finland, France, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom). Proposals made at the meeting were forwarded to representatives from countries unable to attend in order to obtain their comments.

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Representatives summarized the systems of surveillance used by their countries and described some of the difficulties encountered in monitoring malaria cases. The main issues concerned under-reporting, variation in reporting between different networks (e.g., "compulsory" notifications to the national surveillance system, and reports received from the laboratory network), and recent changes to their case report forms and surveillance systems. Categories of travellers at greatest risk of malaria infection differed substantially between the countries of Europe.

Particular attention was focused on the standardization of case reporting, including the possible design of a standard European case report form. Most countries agreed that common variables, that have been given a standard definition, need to be collected throughout Europe and other non-malarious countries to ensure that malaria risk can be adequately measured and compared between countries. However, travellers from non-malarious countries who acquire malaria are not homogeneous, and in addition the current methods of reporting malaria cases are not uniform (WHO, 1986). The design of a single standard case report form for non-malarious countries, containing all variables of interest, was therefore considered to be unfeasible at the present time. Moreover, concern was expressed on the possibility that in some countries an increase in the number of variables covered by existing report forms might reduce the current levels of reporting by physicians.

Questions used to collect data on the countries' case report forms were considered in turn. A group of data variables was generally recommended to be essential for collection (see Table 1). Optional data (Table 2) included additional questions, considered by some countries to be essential, but not required by others. The variables and their definition are given in the following Tables 1 and 2. Wording of the questions on the report forms was discussed but it was recognized that it would in any case vary upon translation. It was therefore agreed that each country would adopt its own wording. Similarly, because in some countries malaria reports are included in a general infectious disease report form, the positioning of questions was considered best left to each country.

Other topics discussed included the methods available for collecting representative denominator data. This was identified as a key problem for most countries, and it was felt that further consultation on this subject was desirable.

TABLE 1. DETAILS ON VARIABLES RECOMMENDED FOR COMMON USE

Name	Family name, all other names.
Age	Date of birth, age in years. If only one variable can be recorded, preference is given to date of birth to enable investigation of congenital malaria.
Sex	Male, female, unrecorded.
Nationality	Representatives indicated that countries define nationality either by (i) place of birth, (ii) place of residence, or (iii) as recorded on passport. The meeting agreed that "as on passport" was preferable.
Address in place of residence	The resident status of different groups varies from country to country. Particular problems are with short-term migrants (e.g., students and visitors) and long-term migrants (e.g., ethnic minority groups and refugees settled in non-malarious countries). The group proposed "where do you live". Confusion may be minimized by asking for address in reporting country and address in country of permanent (usual) residence. The question on residence should be worded in such a way as to make it clear that it is not a formal or legal residence question, but about where people usually live.
Reason for travel	<p>Numerous reasons for travel were discussed and grouped into categories. Representatives named categories important in their countries. The main ones are:</p> <p>(a) Resident of reporting country:</p> <p>Holiday: tourist, visiting friends and relatives;</p> <p>Work: business, labourer, sea/air crew, missionary, military;</p> <p>Other: student, other.</p> <p>(b) Visitor to reporting country:</p> <p>Holiday: tourist, visiting friends and relatives;</p> <p>Work: business, expatriate, labourer;</p> <p>Other: student, refugee, new immigrant.</p>
Prophylaxis	Names of drugs taken during trip. Dose of each drug; number of tablets, or quantity of medicine taken daily/weekly. Regimen: length of time tablets taken before, during and after trip.
Compliance	<p>Countries describe compliance in many ways. Reports need to define if drugs were taken absolutely regularly, or less regularly. The meeting agreed that "ideal" or "complete" prophylaxis was appropriate for patients who took drugs absolutely regularly. "Not ideal" should be used to indicate incomplete compliance.</p> <p><u>Note.</u> Patients may state that they fully complied but were taking suboptimal doses. These should be classed as compliant, but can be regrouped as required during analysis.</p>

TABLE 1. DETAILS ON VARIABLES RECOMMENDED FOR COMMON USE (continued)

Countries of infection	It was agreed that many clinicians do not know which countries are malarious. Thus, all countries visited should be recorded. The probable country of infection may then be judged by the surveillance staff.						
Dates of visit	Dates of arrival and departure from each country. The date of departure from the malarious country is necessary since the patient may have stopped over in a non-malarious country on the way home.						
Date of onset	This does not always have to correspond to date of diagnosis.						
Date of diagnosis	Date of diagnosis by practising physician.						
Date of treatment	Date of treatment by practising physician, or of self therapy. The above dates refer to malaria diagnosed after return home. If malaria was diagnosed overseas, it needs to be recorded elsewhere as a separate variable.						
Place of diagnosis	Name and address of the hospital, laboratory or clinician that diagnosed malaria (by blood slide).						
Method of diagnosis	In some instances, malaria cases are diagnosed clinically without blood slide confirmation. While it is necessary to separate these cases from slide confirmed cases, the meeting agreed that including "clinical diagnosis" as an option for diagnosis may cause some practising physicians to think that this is a valid form of diagnosis. The meeting proposed that the report form should ask: <table border="0" style="margin-left: 100px;"> <tr> <td></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> </tr> <tr> <td style="padding-left: 20px;">"Was malaria diagnosed by blood slide</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table> <p style="margin-left: 20px;">"If no, how was the case diagnosed ....."</p>		Yes	No	"Was malaria diagnosed by blood slide	<input type="checkbox"/>	<input type="checkbox"/>
	Yes	No					
"Was malaria diagnosed by blood slide	<input type="checkbox"/>	<input type="checkbox"/>					
Species	Each species must be grouped separately. Some countries have had difficulty grouping their mixed infections. The meeting agreed that, where species were mixed, each should be marked separately on the report form. Grouping into a category called "mixed" would then be conducted during analysis only. In addition to specified species, other groups to be included on the report form are: "not known" where species cannot be distinguished, and "no parasites found". The latter group is useful if patients have scanty parasitaemia and cannot be diagnosed until further slides are submitted.						
Class	The meeting felt that the classification of malaria used traditionally (e.g., induced, introduced, etc.) was no longer valid for non-malarious countries. The new classes proposed were: "Imported, transfusion, other injection (specify), airport, congenital, and other (specify)".						
Treatment	Name, dose and regimen of therapeutic drugs. Method of administration. Use of antirelapse (terminal therapy) drugs. Treatment of recrudescence or relapse.						
Outcome	Recovered, died, unknown. If died, date and cause of death must be established. This may require special follow-up of individual deaths.						

TABLE 2. DETAILS ON VARIABLES CONSIDERED OPTIONAL FOR REPORTING

Occupation	This enables classification into social class. Countries would define their own groups since occupations vary greatly between countries.
Length of residence in reporting country	This question is important for countries with large immigrant groups. "How long have you lived in reporting country" was agreed to be appropriate.
Ethnicity	Resident status and nationality do not reflect the ethnicity of many immigrant groups. This would be identified by asking "Where were you born". Children of ethnic minority groups who are born in the reporting country will need to be defined using their names.
Physician	The name and address of the physician or practitioner is required for follow-up studies of the patient.
Tests of resistance	Few countries have facilities available to assay regularly levels of resistance. However, these data are very useful, and, where resistance tests are conducted, the results need to be recorded on the case report forms.

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