Reimbursement of malaria chemoprophylaxis for travellers from Europe to Sub-Saharan Africa: cost-effectiveness analysis from the perspective of the French national health insurance system

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study compared the cost-effectiveness of reimbursing malaria chemoprophylaxis at a rate of 65% against the usual strategy of no reimbursement, for French residents who occasionally travelled to Sub-Saharan Africa. The authors concluded that 65% reimbursement was a cost-effective strategy from the perspective of the French national health insurance system. The analysis had several limitations and the reporting, especially for the effectiveness data, was insufficient. The authors' conclusions should be treated with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of two drug reimbursement strategies, for malaria chemoprophylaxis, for travellers with medical insurance from the French national health insurance system (FHS), who occasionally visit Sub-Saharan Africa, including Madagascar and the Union of the Comoros.

Interventions
The policies for patented malaria chemoprophylaxis drugs were 65% reimbursement from the FHS compared with the usual practice of zero reimbursement. The chemoprophylaxis was chloroquine (Savarine or Nivaquine) plus proguanil (Paludrine) for intermediate chemoresistance and atovaquone plus proguanil (Malarone), mefloquine (Lariam), or doxycycline (Doxypalu) for intermediate or high chemoresistance.

Location/setting
France/primary care.

Methods
Analytical approach:
A decision tree was used to synthesise the costs and effects, from a variety of sources. The authors reported that the perspective of the FHS was adopted.

Effectiveness data:
The effectiveness data were from published studies. The estimation of the probabilities of certain events was described in detail and several assumptions were reported. The primary clinical outcome was the effectiveness of malaria chemoprophylaxis, which was defined as the percentage reduction in relative risk of malaria.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The number of malaria cases prevented and the number of malaria-related deaths prevented were the measures of benefit.

Cost data:
The analysis included the costs of hospitalisation and out-patient treatment for non-severe malaria cases, intensive care treatment, hospitalisation and out-patient treatment for the adverse effects of malaria chemoprophylaxis, sick leave due to malaria, and malaria chemoprophylaxis medications at 65% or zero reimbursement rate. The resource use for each of the malaria chemoprophylaxis treatments was based on unpublished sales volume data in France. Hospitalisation costs were estimated using diagnosis-related group data. All costs were reported in Euros (EUR).

Analysis of uncertainty:
A probabilistic sensitivity analysis, using Monte Carlo simulation, was used to produce the 95% confidence intervals for the costs and effects. The majority of parameters were assigned a distribution and all were triangular. One-way sensitivity analysis on all the model parameters was also conducted to determine the uncertainty around the malaria chemoprophylaxis 65% reimbursement cost. Three-way sensitivity analysis was conducted, by varying the probability of contracting malaria per stay in Sub-Saharan Africa, the probability of recourse to malaria chemoprophylaxis, and the cost of atovaquone plus proguanil for an average length of stay of two weeks. A scenario with higher use of atovaquone plus proguanil treatment, compared with the other malaria chemoprophylaxis treatments, was also tested.

Results
The total annual costs were reported for both strategies. The malaria cases were 6,321 (95% CI 6,096 to 8,951) for zero reimbursement and 3,836 (95% CI 3,298 to 5,940) for 65% reimbursement. The malaria-related deaths were 34 (95% CI 30 to 45) for zero reimbursement and 21 (95% CI 16 to 29) for 65% reimbursement.

When 65% reimbursement was compared with zero reimbursement, the incremental cost was EUR 11,933 per additional malaria case prevented or EUR 2,281,133 per additional malaria-related death prevented.

One-way sensitivity analysis showed that the cost of 65% reimbursement was sensitive to many model parameters, which were all reported. The three-way sensitivity analysis demonstrated that, for 65% reimbursement to be dominant (more effective and less costly) over zero reimbursement the probability of contracting malaria per stay in Sub-Saharan Africa had to be greater than 2.1%, the probability of recourse to malaria chemoprophylaxis had to be over 80%, and the cost for atovaquone plus proguanil per two-week average length of stay had to be less than EUR 43.

Authors’ conclusions
The authors concluded that the analysis favoured the reimbursement of malaria chemoprophylaxis at a 65% rate, for French residents who occasionally travelled to Sub-Saharan Africa.

CRD commentary
Interventions:
The intervention and the rationale for choosing the comparator were explicit. The comparator was the usual practice for malaria chemoprophylaxis reimbursement. The intervention was limited to those malaria chemoprophylaxis drugs that were recommended by the French Public Health Authority.

Effectiveness/benefits:
A systematic review was not reported and neither was a quality assessment. The details of the source studies, such as their designs and populations, were not reported. This makes it impossible to know if all relevant evidence was considered and to judge the validity of the evidence. The measures of benefit were disease specific. They did not capture the impact of the intervention on a patient’s quality of life and do not permit cross-disease comparisons to be made, but they were clinically meaningful and will be of use to those working in this area.

Costs:
The costs reflected the stated perspective. Their sources were reported and they appears to have been appropriate for the study setting. The resource use was not reported, but it is not clear whether this was due to a lack of data or the use of diagnosis-related group data. The sources for the unit costs were from different price years, but no adjustments for inflation and no price year were reported. These limitations affect the generalisability and transferability of the results.

Analysis and results:
The model structure, including a diagram, was clearly reported, as were the modelling assumptions. The issue of
uncertainty was satisfactorily addressed, but more details of the results of the sensitivity analyses might have been useful. The results of the probabilistic sensitivity analysis were not presented as cost-effectiveness acceptability curves nor scattergrams, instead the confidence intervals surrounding the costs and effects were reported. The authors briefly discussed some limitations of their study and these mainly related to the sources for the data and the assumptions made.

Concluding remarks:
The analysis had several limitations and the reporting, especially for the effectiveness data, was insufficient. The authors’ conclusions should be treated with caution.

Funding
Not stated.

Bibliographic details

PubMedID
18440663

DOI
10.1016/j.healthpol.2008.03.002

Original Paper URL
http://dx.doi.org/10.1016/j.healthpol.2008.03.002

Indexing Status
Subject indexing assigned by NLM

MeSH
Africa South of the Sahara; Chemoprevention /economics; Cost-Benefit Analysis; Europe; Female; France; Humans; Malaria /prevention & control; Male; National Health Programs /economics; Reimbursement Mechanisms; Travel

AccessionNumber
22009100443

Date bibliographic record published
02/03/2009

Date abstract record published
13/10/2010