Varicella and paediatric staff: current practice and vaccine cost-effectiveness
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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.

Health technology
The health intervention examined in the study was a staff varicella programme in paediatric centres, consisting of determination of immune status, counselling, and vaccination of seronegative staff (with two doses of vaccine).

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised healthcare workers (HCWs) in hospital paediatric wards.

Setting
The setting was paediatric centres. The economic study was conducted at the John Radcliffe Hospital at Oxford, UK.

Dates to which data relate
The effectiveness evidence was gathered in May 2001. No dates for resource use or the price year were reported.

Source of effectiveness data
The effectiveness evidence came from a single study.

Link between effectiveness and cost data
The costing was conducted on a sample different from that used in the effectiveness analysis.

Study sample
A sample of 22 hospitals treating paediatric inpatients was selected (19 tertiary paediatric hospitals were included) in May 2001. All hospitals received telephone contacts. The method of sample selection was not reported. The number and characteristics of HCWs contacted was not stated. Power calculations were not relevant to the study design.

Study design
This was a cross-sectional study, conducted in 22 centres. There was no comparison group because all 22 hospitals were contacted by telephone and interviewed. There was no further contact with the HCWs of the hospitals.
Analysis of effectiveness
Data coming from all 22 hospitals were used in the analysis. The telephone survey aimed to interview occupational health staff with respect to the varicella policy in place at their centres, if any. The data retrieved from the interview were as follows: availability of staff information regarding HCW immune status, presence of a varicella policy, and characteristics of the varicella policy.

Effectiveness results
Staff information regarding HCW immune status was available at 21 of the 22 hospitals. These 21 hospitals followed similar policy: exposed non-immune HCWs had to remain off clinical work for minimum periods of 8 to 10 days and those subsequently developing chickenpox had to remain away for a minimum of five days after rash onset, or as long as the rash remained vesicular. A vaccination policy was actually implemented at only one hospital. In the vast majority of hospitals (n=15), the history of varicella infection was obtained and then followed by serology if history was negative or uncertain; in two hospitals history of varicella infection was obtained without any further investigation; in two hospitals, history of varicella infection was obtained and serology was performed only on those working with neonates if history was negative or uncertain; and finally, in two hospitals, all paediatric staff were tested for varicella serology.

Clinical conclusions
The effectiveness analysis showed that UK hospitals usually carry out policies for knowledge of staff varicella immunity, although with different degrees of further investigation when history is uncertain or negative. However, varicella vaccination policies are not routinely implemented.

Measure of benefits used in the economic analysis
No summary benefit measure was used in the economic evaluation, thus the study was classified as a cost-consequences analysis (CCA).

Direct costs
Discounting was not conducted but would have been relevant as costs were incurred over a period of five years. Unit costs were analysed separately from quantities of resources used. The economic analysis focused on two groups of costs: those related to the vaccination exposure due to the lack of a staff varicella policy (replacement time for staff excluded from clinical duties and zoster immunoglobulin (ZIG) therapy) and the predicted costs of implementing a vaccination policy (determination of immune status, counselling, and vaccination of seronegative staff with two doses of vaccine). The cost/resource boundary appears to have been that of the hospital. The estimation of resource use was based on actual data coming from the Radcliffe Hospital, and included episodes involving staff exposed to varicella and infants exposed to potentially infectious nurses. Unit costs were estimated from hospital sources. No price year was reported.

Statistical analysis of costs
Costs were treated deterministically.

Indirect Costs
Indirect costs were not included in the economic analysis.

Currency
UK pounds sterling (£).

Sensitivity analysis
Sensitivity analyses were not conducted.
Estimated benefits used in the economic analysis
Please refer to the effectiveness results reported above.

Cost results
The total costs of varicella exposure due to the lack of a staff varicella policy involving staff vaccination over a period of five years was 2,474. The total costs of vaccine implementation would have been 1,601.

Synthesis of costs and benefits
A synthesis of costs and benefits was not conducted and as such the study has been classified as a CCA.

Authors' conclusions
The authors concluded that the introduction of a varicella vaccination programme for HCWs would result in a small increment to the cost of many UK hospitals, which usually record the varicella history of their HCWs but do not implement any vaccination policy. However, this extra cost could be easily offset by the costs associated with the presence of non-immune staff.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear. The staff varicella programme based on vaccination was compared with the current varicella policy observed in most of the UK hospitals. You should decide whether it represents a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The analysis of the effectiveness was based on a cross-sectional study, which used a descriptive design. This raises the issue of the validity of the evidence gathered in the study because of the limitations of the design, which only permitted the description of the situation from which no conclusions about cause/effect relationships could be drawn. There was no comparison group and the study intervention was not ‘allocated’ to the hospital, which limited their role observing the situation. A further limitation was the fact that it was not clear whether the sample of hospitals included in the analysis could be considered representative of the overall staff varicella policy in the UK. Thus caution is required when interpreting the conclusions of the effectiveness analysis; namely that no vaccination policy is generally implemented in the UK.

Validity of estimate of measure of benefit
No summary benefit measure was used in the analysis because a CCA was conducted. Please refer to the commentary reported above (validity of estimate of measure of effectiveness).

Validity of estimate of costs
The perspective adopted in the study was not explicitly stated but appears to have been that of the hospital. The authors provided a clear description of the calculation process and unit costs were reported separately from quantities of resources used. This facilitates replication of the analysis. However, the price year was not reported. Discounting was likely to have been relevant due to the long time horizon of the study, but was not conducted. Data were estimated from a single centre and sensitivity analyses were not performed. Both costs and quantities were treated deterministically and no statistical tests were conducted. The total costs of the staff varicella vaccination policy were based on hypotheses concerning resource use, as the programme was not actually implemented at the study hospital.

Other issues
The authors did not compare their findings with those from other studies and did not address the issue of the
generalisability of the study results to other settings. Sensitivity analyses were not conducted and cost estimates came from a single hospital. As a result, the overall external validity of the analysis appears low. It would have been interesting had the impact of the varicella policies in terms of exposures and contacts resulting in transmission of the disease been assessed.

**Implications of the study**
The study results suggest that, from the perspective of the hospital, a staff varicella vaccination policy may lead to cost-savings in the long-term. However, the study does not address clearly the clinical implications of such a programme.

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