Background
The colposcopy-directed punch biopsy is widely used in the management of women with abnormal cervical cytology; however, its accuracy compared with definitive histology from an excision biopsy is not well established.

Objectives
To assess the accuracy of the colposcopy-directed punch biopsy to diagnose high-grade cervical intraepithelial neoplasia (CIN) by performing a systematic review and meta-analysis.

Search strategy
A systematic search of MEDLINE, EMBASE and the Cochrane Library was performed.

Selection criteria
Articles that compared the colposcopically directed cervical punch biopsy with definitive histology from an excisional cervical biopsy or hysterectomy.

Data collection and analysis
Random effects and hierarchical summary receiver operating characteristic regression models were used to compute the pooled sensitivity and specificity applying different test cut-offs for outcomes of high-grade CIN.

Main results
Thirty-two papers comprising 7873 paired punch/definitive histology results were identified. The pooled sensitivity for a punch biopsy defined as test cut-off CIN1+ to diagnose CIN2+ disease was 91.3% (95% CI 85.3–94.9%) and the specificity was 24.6% (95% CI 16.0–35.9%). In most of the studies, the majority of enrolled women had positive punch biopsies. Pooling of the four studies where the excision biopsy was performed immediately after the punch biopsy, and where the rate of positive punch biopsies was considerably lower, yielded a sensitivity of 81.4% and specificity of 63.3%.

Conclusion
The observed high sensitivity of the punch biopsy derived from all studies is probably the result of verification bias.