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Economic Evaluations of Vision Screening Interventions for Children: A Systematic Review

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Background and objectives: The Child Visual Health and Vision Screening Protocol (2018) was developed to inform the creation of school-based vision-screening programs in Ontario. Evidence for the cost-effectiveness of such interventions compared to standard care are important for resource-allocation but lacking in Canada. Study objective is to review the literature on economic evaluations of vision-screening interventions for children. Results will inform the design of an economic evaluation of vision-screening interventions in Ontario.

Approach: Electronic databases, grey literature and health technology assessment websites were employed in the structured search validated with search filters from the InterTASC Information Specialists' Sub-Group and the Peer Review of Electronic Search Strategy checklist. Included studies were: (1) cost-utility analysis (CUA), cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), or cost-analysis (CA) methods, (2) interventions targeting children under six years of age and designed to detect amblyopia and/or uncorrected refractive errors, (3) interventions compared to alternative screening interventions, no screening or a usual care strategy, and (4) published after 2002. Study quality was assessed with the Pediatric Quality Appraisal Questionnaire (PQAQ).

Results: Nine of 671 publications were included, published from 2003-2012 in Germany (n=2), UK (n=1), Sweden (n=1), Canada (n=1) and USA (n=4). Societal (n=3), third-party payer (n=4) and a combination (n=1) of cost perspectives were employed. Analytical techniques included CUA/CEA combination (n=3), CEA (n=3), CUA (n=1), CBA (n=1) and CA (n=1). CUAs made assumptions of health utility and quality-adjusted life years using expert opinion or values from other studies. Study conclusions were most sensitive to the disutility of unilateral vision impairment (n=3) and the prevalence of the target condition (n=2). Highest scoring domains of the PQAQ were *discounting* (mean=0.86, SD=0.5), *target population* (mean=0.81, SD=0.27), and *economic evaluation* (mean=0.78, SD=0.34); lowest were: *incremental analysis* (mean=0.52, SD=0.50), *costs and resource use* (mean=0.44, SD=0.22), and *analysis* (mean=0.41, SD=0.22).

Conclusion: Significant variability exists in the quality of methods employed by published economic evaluations. Prospective studies on the impact of amblyopia and/or refractive errors on the health-related quality of life of young children are required to better inform the conduct of CUAs.