A modeled economic analysis of a digital tele-ophthalmology system as used by three federal health care agencies for detecting proliferative diabetic retinopathy.

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The objective of this study was to compare, using a 12-month time frame, the cost-effectiveness of a non-mydriatic digital tele-ophthalmology system (Joslin Vision Network) versus traditional clinic-based ophthalmoscopy examinations with pupil dilation to detect proliferative diabetic retinopathy and its consequences. Decision analysis techniques, including Monte Carlo simulation, were used to model the use of the Joslin Vision Network versus conventional clinic-based ophthalmoscopy among the entire diabetic populations served by the Indian Health Service, the Department of Veterans Affairs, and the active duty Department of Defense. The economic perspective analyzed was that of each federal agency. Data sources for costs and outcomes included the published literature, epidemiologic data, administrative data, market prices, and expert opinion. Outcome measures included the number of true positive cases of proliferative diabetic retinopathy detected, the number of patients treated with panretinal laser photocoagulation, and the number of cases of severe vision loss averted. In the base-case analyses, the Joslin Vision Network was the dominant strategy in all but two of the nine modeled scenarios, meaning that it was both less costly and more effective. In the active duty Department of Defense population, the Joslin Vision Network would be more effective but cost an extra 1,618 dollars per additional patient treated with panretinal laser photo-coagulation and an additional 13,748 dollars per severe vision loss event averted. Based on our economic model, the Joslin Vision Network has the potential to be more effective than clinic-based ophthalmoscopy for detecting proliferative diabetic retinopathy and averting cases of severe vision loss, and may do so at lower cost.