Reviewer’s report

**Title:** Implementation and first-year screening results of an ocular telehealth system for diabetic retinopathy in China

**Version:** 1  **Date:** 9 May 2011

**Reviewer:** Ingrid Zimmer-Galler

**Reviewer’s report:**

The authors describe their one-year results with a telemedicine diabetic retinopathy screening program in a community in China. They should be congratulated on their work and its public health implications for underserved populations in China.

**Major Compulsory Revisions**

1) There are a few major concerns with the methods used in the study. The authors acknowledge that a validation study for diabetic retinopathy assessment should be compared to the gold standard - namely seven-field stereo fundus photography. They also explain why this may be logistically difficult in some areas in China. However, they have chosen a gold-standard which is completely unverified. Their gold standard is "several" ophthalmologists in the community. How many ophthalmologists? Were the ophthalmologists validated? At a minimum at least 2 ophthalmologists should independently examine each patient if this is to be considered a validation study. Similarly, the image grading is best done by 2 independent readers for a validation study. As it stands it is best to describe this as a demonstration project.

2) In this study, no cases without diabetic retinopathy were evaluated by an ophthalmologist. It is equally important to verify that the patients with normal fundus photographs indeed do not have diabetic retinopathy on examination.

3) The use of the term prevalence rates is probably not appropriate in the context of this study. Prevalence rate is the total number of cases of the disease in the population at risk at a given time. This study consists of 471 patients with diabetes out of a community of approximately 40,500 population. What is the total number of patients with diabetes in the PCP practice? Clearly only a small percentage of patients with diabetes in this community were included in the study - but prevalence rate implies prevalence of diabetic retinopathy in the entire population (or community in this case - rather than numbers of patients that were actually screened who had diabetic retinopathy).

4) As the authors point out, the number of patients included in the study is very small. In particular, the small numbers are concerning for identification of abnormalities that may be difficult to detect such as IRMA, NVD, or NVE. For example, did the cases of proliferative diabetic retinopathy have neovascularization (more difficult to detect) or was preretinal/vitreous...
hemorrhage (easy to detect) the abnormality leading to the classification of proliferative disease? The manuscript should include number of patients with the various abnormalities of diabetic retinopathy.

5) Discussion section, last paragraph: patient reporting that they will return for screening in one year is not the same as "patient compliance." Compliance with follow-up screening can only be measured when they actually return (or do not return) the following year.

Minor Essential Revisions:

6) What happened to the 23 patients with ungradeable images? Did they undergo evaluation by an ophthalmologist? If so, what were the findings?

7) The ungradeable rate of less than 5% seems unusually low for a non-mydriatic system. Previous studies have shown consistently higher ungradeable rates with undilated fundus photography. Also, it has previously been shown that for patients 70 years and older, approximately 25% of non-mydriatic images are unreadable (Scanlon, et al, Diabetes Care, 2005). The average age of participants in this study was greater than 71 years. How is this difference explained? What are the criteria for gradeable versus ungradeable images? Further comment should be included in the discussion section.

8) Since the images in this study are taken without stereo fields, how is macular edema identified?

Discretionary Revisions:

9) It would also be useful to report the number of patients with fundus abnormalities other than diabetic retinopathy - especially if they were considered significant enough to warrant evaluation by an ophthalmologist. Clearly other abnormalities are expected when imaging 471 patients.

10) This study provides information from 2009. Why are results from 2010 not included?

11) Background section, first paragraph, last sentence: Should this state "the current number of Chinese diabetics without (rather than with) regular eye fundus examination?"

12) Methods section, third paragraph: What are "non-graduate" photographs? Does this mean ungradeable?

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a
statistician.

Declaration of competing interests:

I have no financial competing interests to disclose.
I have in the past and am currently receiving NIH funding for research on telemedicine diabetic retinopathy assessment. My employer, Johns Hopkins University, receives research funds and royalties from a commercial entity (EyeTel Imaging, Inc.) involved in telemedicine diabetic retinopathy assessment.