# Prevention of Diabetes in Rural India with a Telemedicine Intervention

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# Abstract

#### Background:

Diabetes care is not presently available, accessible, or affordable to people living in rural areas in developing countries, such as India. The Chunampet Rural Diabetes Prevention Project (CRDPP) was conceived with the aim of implementing comprehensive diabetes screening, prevention, and treatment using a combination of telemedicine and personalized care in rural India.

#### Methods:

This project was undertaken in a cluster of 42 villages in and around the Chunampet village in the state of Tamil Nadu in southern India. A telemedicine van was used to screen for diabetes and its complications using retinal photography, Doppler imaging, biothesiometry, and electrocardiography using standardized techniques. A rural diabetes center was set up to provide basic diabetes care.

## Results:

Of the total 27,014 adult population living in 42 villages, 23,380 (86.5%) were screened for diabetes, of which 1138 (4.9%) had diabetes and 3410 (14.6%) had prediabetes. A total of 1001 diabetes subjects were screened for complications (response rate of 88.0%). Diabetic retinopathy was detected in 18.2%, neuropathy in 30.9%, microalbuminuria in 24.3%, peripheral vascular disease in 7.3%, and coronary artery disease in 10.8%. The mean hemoglobin A1c levels among the diabetes subjects in the whole community decreased from  $9.3 \pm 2.6\%$  to  $8.5 \pm 2.4\%$  within 1 year. Less than 5% of patients needed referral for further management to the tertiary diabetes hospital in Chennai.

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Abbreviations: (ABPI) ankle/brachial pressure index, (BMI) body mass index, (CAD) coronary artery disease, (CBG) capillary blood glucose, (CRDPP) Chunampet Rural Diabetes Prevention Project, (DME) diabetic macular edema, (DR) diabetic retinopathy, (ECG) electrocardiogram, (ETDRS) Early Treatment Diabetic Retinopathy Study, (HbA1c) hemoglobin A1c, (ICMR-INDIAB) Indian Council of Medical Research-India Diabetes, (ISRO) Indian Space Research Organization, (NCD) noncommunicable disease, (NGO) National Agro Foundation, (NPDR) nonproliferative diabetic retinopathy, (OGTT) oral glucose tolerance test, (PDR) proliferative diabetic retinopathy, (PVD) peripheral vascular disease, (SD) standard deviation, (STDR) sight-threatening diabetic retinopathy, (VHW) Village Health Workers, (VPT) vibratory perception threshold, (WDF) World Diabetes Foundation

Keywords: Asian Indians, diabetes, prevention, rural, south Asians, telemedicine

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#### Abstract cont.

## Conclusions:

The Chunampet Rural Diabetes Prevention Project is a successful model for screening and for delivery of diabetes health care and prevention to underserved rural areas in developing countries such as India.

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