The prevalence of diabetes is estimated to be 11.6% in the Chinese adult population, which represents up to 113.9 million Chinese adults with diabetes or a third of the world’s diabetes population. The prevalence of diabetes is higher in older age groups, in urban residents and in persons living in economically developed regions. Among people with diabetes, only 25.8% received treatment for diabetes and only 39.7% of those treated had adequate glycaemic control.1,2 These numbers suggest that China has overtaken India as the epicentre of the global diabetes epidemic.3

Worldwide censuses have shown an increasing role of general practitioners (GPs) in diabetes care.4 While the role of GPs in diabetes care should and must be increased in China, an urgent issue is whether the quality of diabetes care will be compromised as care shifts from the specialist to the primary level. Due to the relatively short history of GP practice in China, and overall GP inexperience with diabetes management, people with diabetes choose specialist care over primary care. However, GPs from the local healthcare community remain a relatively untapped resource pool. Once organised, GPs could deliver better care for a broader base of people living with diabetes in China. There is a growing realisation that integrated efforts between specialists and GPs may be the ideal way to ensure optimal outcomes of management for diabetes.

The study
This ongoing BRIDGES supported project is implementing and evaluating a community-hospital integrated management system for type 2 diabetes in Beijing, China. The quality and efforts of the community-hospital integrated model for diabetes care will be assessed by analysing group changes in the primary outcome: principally the proportion of participants reaching optimal control of blood glucose, blood pressure and lipids, as well as clinical outcomes, such as the incidence and progress of diabetes-related microvascular complications.

Current data
It is well established that intensive glycaemic control, blood pressure (BP), lipid management and aspirin usage in people with diabetes reduce

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the risk of microvascular and macrovascular complications. However, translation of these interventions to real-life settings remains a major challenge in China. In the 2006 nationwide Diabcare-China surveys, only 26.8% of patients with type 2 diabetes reached \( \text{HbA}_1c \leq 6.5\% \) (International Diabetes Federation criteria) and 41.1% of people with diabetes reached an \( \text{HbA}_1c < 7\% \) (American Diabetes Association criteria). The proportion of patients with “poor control” (\( \text{HbA}_1c > 8\% \)) was 28.3%. In addition, only 22.4% of patients achieved a BP goal of below 130/80 mmHg and the proportion of patients achieving high density lipoprotein (HDL) levels >1.1 mmol/L and triglyceride (TG) levels <1.5 mmol/L was 60.9% and 40.7% respectively.

The quality of diabetes management in Beijing is similar to data collected nationwide. National reports from community centres show diabetes care status is even worse with approximately 10% of people with type 2 diabetes having achieved an \( \text{HbA}_1c \leq 6.5\% \). More importantly, only 2.7% of people with diabetes obtained optimal glycaemic, blood pressure, and serum lipid control in Shanghai, the largest city (by population) in the world. It is evident that more intensive care is required for people living with diabetes in China. More specifically, the following issues require attention:

- GPs need further expert guidance, including training on updated diabetes guidelines in practice.
- Preventive measures are required for controlling multiple risk factors associated with diabetes.
- Proactive systems for surveillance and support are needed to enhance current diabetes management.

### General practitioner training

Training for community GPs is provided by tertiary hospital specialists and developed by the project’s principal investigators along with an Expert Committee. The Expert Committee consists of ten experts from relevant professional fields including Endocrinology, Cardiology, and Ophthalmology as well as 20 endocrinologists from tertiary hospitals. Training modules include group training class, interactive workshops and specialist outpatient services in the community. Specialists assist GPs in
clinical practice twice per week for the entire trial. A total of 150 GPs are participating in the training programme. Specialists supervise a specific community and a fixed number of GPs, who in turn are responsible for a fixed number of participants. All levels of the trial organisation are linked via a web-based electronic monitoring platform, allowing participant records (such as HbA1c data) to be shared quickly and easily. The web-based platform also facilitates the rapid flow of information and professional feedback from specialists to GPs and patient participants.

**Patient recruitment**
Greater Beijing is divided into two regions, one urban and the other rural. Each of these regions consists of eight districts. Out of five districts in the urban region, 15 communities with their health-care centres were selected by a multi-stage random sampling approach, resulting in a total of 4,080 participants with type 2 diabetes. Five urban districts were chosen over suburban regions because the urban economic conditions offer a sufficiently stronger medical infrastructure to carry out the study. Participants were randomised into either the intensive-care group or the control group.

**Trial management**
To achieve good target control, management adjustment strategies on guidelines, continued to be applied by a collaborative team consisting of participating tertiary hospital specialists and the programme’s community GPs. Further, to ensure the integrity and quality of data collection, a supervision team consisting of four trained specialists has been checking study progress and data records in every community centre twice yearly. Data checks result in a quality score and ranking issued in report form to corresponding researcher meetings. The researcher meetings consist of 150 researchers including the specialists and GPs. These are held
every four months. The researcher meetings provide: updated follow-up data, summary of endpoint events, lectures by the principal investigators, and GP generated oral presentations.

**Preliminary results**

By analysis, 9.4% in the intensive-care group and 8.4% in the control group met all the HbA1c, BP, and LDL-C target values at the baseline (p=0.35). People with diabetes who were treated by community GPs in training showed a significant improvement after 18 months intervention (14.6% vs. 12%, p=0.03) compared to the control group, as well as a significant increase compared with the baseline.

To date, the community-based care system has proved to be an effective approach, although results will not be complete until the study ends in December 2014.

**Public health significance**

Optimal target control of glycaemia, BP and lipids should significantly reduce the risk of chronic complications, improve quality of life for people living with diabetes and lessen the financial burden for diabetes care. However, the challenge to maintain continuous optimal diabetes management during the long-term is considerable.

**Sustainability plan**

Results and experiences gained in this study will be used on a wider scale in Beijing and in more regions in China. Further exploration and follow-up studies across larger communities will continue for the next five years, ten years or longer.

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**BRIDGES project**

Promotion of community-hospital integrated model for diabetes management in Beijing

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**References**


