

The effects of pay-for-performance programs for diabetes care in Taiwan

Along with the economic growth and innovation in medicine, the increase in the number of patients with chronic conditions and multiple chronic conditions (MCCs) has become a challenge for health care systems world wide. Diabetes mellitus is a chronic condition that is prevalent in Taiwan and many other industrialized nations. The clinical and economic consequences of diabetes, such as kidney dysfunction and dialysis, are burdensome.

Taiwan implemented a single-payer National Health Insurance (NHI) program in 1995. Approximately 94% of the hospitals and clinics nationwide have contracts with the NHI, and more than 99% of all Taiwanese residents are covered under the NHI. Health care services in Taiwan feature the freedom to choose health care providers and receive frequent physician visits, which amounts to approximately 15 visits per person per year. In 2015, diabetes mellitus was the fifth leading cause of death in Taiwan and directly accounted for 3.3%

of the total expenditure of the NHI program.

To promote comprehensive follow-up care and better treatment outcomes for diabetic patients, the Bureau of the NHI (renamed NHI Administration in 2013) implemented a pay-for-performance (P4P) program for diabetes care in 2001. The program is a payment design that provides financial incentives to health care providers based on specific predetermined quality benchmarks, such as evidence-based practices. Physicians who are endocrinology specialists or physicians who have participated in a training program for diabetes shared care can voluntarily apply to participate in the program. Participating physicians can then invite individual patients to enroll. This program was intended to promote guideline-based practices, such as annual laboratory tests/physical examinations and comprehensive health education, through enrollment and management fees, higher physician fees (reimbursement) and a bonus

payment for desired outcomes in addition to the regular fee-for-services payment scheme.

Whether the program worked is a question that deserves a scientific answer because the evidence would be an important reference for policymakers. Professor Shou-Hsia Cheng and his colleagues conducted a preliminary analysis and found that patients enrolled in the P4P program might have better health care outcomes in one year. The research team subsequently enhanced the study by analyzing the effects of the P4P program using a natural experimental design with propensity score matching to select more-comparable subjects. The results showed that patients enrolled in the program tended to spend less than non-enrollees in a 5-year follow-up observation period (Figure 1).

In the real world, many diabetic patients may have other chronic conditions. Therefore, does the P4P program for diabetes care work for patients with MCCs? Professor Cheng's research team conducted another study to answer this question. They selected diabetic patients with and without hypertension, which is the most prevalent chronic condition in Taiwan, for a comparative analysis. Using a comprehensive study design and advanced statistical analyses, they found that the P4P enrollees received more recommended laboratory tests and physical exams and were less likely to be hospitalized or have emergency department visits for diabetes-related conditions. The

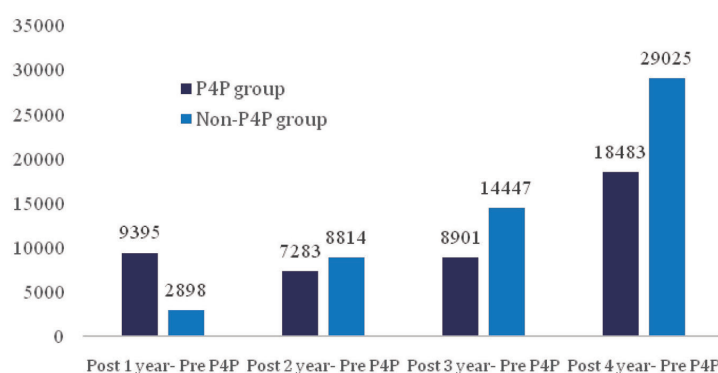


Figure 1. The long-term effects of the P4P program for diabetes care on health care spending.

positive effects existed for patients with and without hypertension (Figure 2). The results indicate that the P4P program works for patients with or without MCCs.

Although the effects of various P4P programs in Taiwan and other countries show different effects, the findings from Professor Cheng's team provide robust evidence for the NHI's P4P program for diabetes care. The findings support a further expansion of the coverage rate of the P4P program for diabetes care by the NHI Administration and encour-

age continuous improvement in healthcare outcomes for patients with MCCs in Taiwan. The success of Taiwan's P4P program for diabetes care might be a valuable example for health policymakers in other countries.

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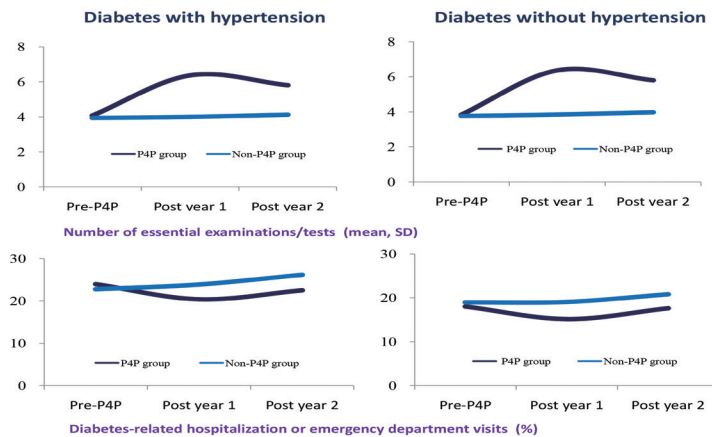


Figure 2. The effects of the P4P program for diabetes care on recommended care provisions and diabetes-related hospitalizations or emergency department visits for patients with and without hypertension.

Risk of hepatitis B virus-induced hepatocellular carcinoma: the influence of the progressive accumulation of viral mutations during chronic infection

NTU long-term follow-up study used viral whole-genome sequencing to identify a temporal mutation profile that can indicate which patients with HBV will develop HCC