<table>
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<th><strong>Title</strong></th>
<th>The aggregate effect of diabetes on economic development</th>
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Theoretical Framework & Methodology

In this study, we first conduct some detailed comparisons on diabetes patient’s demographic backgrounds (education, income, occupation etc.) in both countries from year 2000-2011 by using datasets from U.S. National Health Interview Survey (NHIS) and China Health and Nutrition Survey (CHNS) for China sample. In 2000, prevalence rate of diabetes in 2000 is 4.63%, and it rose to 7.32% in 2011. Rising in prevalence rate of diabetes is consistent with China data, with a 1.05% in 2000 and 3.10% in 2011.

Our model can theoretical establish the interaction between economic development level and diabetes prevalence rate, and quantify how diabetes epidemic may affect labor productivity, unemployment rate and other aggregate economic outcome. Moreover, by using U.S. as a benchmark, the paper also predicts the trend of future diabetes prevalence rates among different demographic groups in China. Our results suggest that diabetes prevalence rate in top 10 percentile income group and college education group may decline moderately in the future China as the economy grows.

And the transition matrix is as below:

\[
P_t = \begin{pmatrix}
(1 - \gamma_t) & 0 & 0 & 0 \\
\pi_t (1 - \gamma_t) & (1 - \delta + \gamma_t) & 0 & 0 \\
0 & \pi_t (1 - \gamma_t) & (1 - \delta + \gamma_t) & 0 \\
0 & 0 & \pi_t (1 - \gamma_t) & (1 - \delta + \gamma_t)
\end{pmatrix}
\]

Where \(N_t^i\) is the number of agent \(i\) in time \(t\), \(\pi_t\) is the probability that youth agent turning old, \(\gamma_t\) is the mortality rate of agent \(i\) in period \(t\), \(c\) is consumption, \(\eta\) is the percentage of young agent in household, \(\beta\) is subjective discount factor, \(K_t\) is capital stock in period \(t\), \(L_t\) is labor supply in period \(t\), \(A\) is productivity, \(\delta\) is capital depreciation rate, \(\theta\) is capital share, \(p\) is probability of not getting diabetes and \(q\) is probability of recovering from diabetes.

Finding

Our model can theoretical establish the interaction between economic development level and diabetes prevalence rate, and quantify how diabetes epidemic may affect labor productivity, unemployment rate and other aggregate economic outcome. Moreover, by using U.S. as a benchmark, the paper also predicts the trend of future diabetes prevalence rates among different demographic groups in China. Our results suggest that diabetes prevalence rate in top 10 percentile income group and college education group may decline moderately in the future China as the economy grows.

Figure 2

From figure 2, we can clearly see that average working hours of diabetic group and non-diabetic group is similar, but diabetic group suffers more work-loss day.

Figure 3 shows the growth rate of income level in China. Growth rate at period \(t\) is calculated as \((\text{mean of income in period } t - \text{mean of income in period } t-1) / \text{mean income in period } t-1\). We can see that personal income level of diabetic group decline sharply since 2009, and growth of household income in non-diabetic group is catching up in 2011.