Supplemental material:

Decomposing the growth in diabetes medicine spending

We decomposed the growth in total diabetes medicine spending (GT) into contributions attributable to the changes in the number of users (NU), cost-per-user (CPU), and the simultaneous effect of the NU and CPU.

The decomposition used the following formula:

$$GT=\sum\_{i=1}^{n}[\left(NU\_{i}^{t}-NU\_{i}^{0}\right)\*CPU\_{i}^{0}+\left(CPU\_{i}^{t}-CPU\_{i}^{0}\right)\*NU\_{i}^{0}+\left(NU\_{i}^{t}-NU\_{i}^{0}\right)\*\left(CPU\_{i}^{t}-CPU\_{i}^{0}\right)]$$

Where the subscript i represents medication groups, the superscript 0 and t represent the beginning and the end time points.

For each medication group i, the first term indicates the magnitude of the contribution of the number of users to the total increase; the second term represents the magnitude of the contribution of cost-per-user to the total increase, and the last term estimates the combined effect where both factors change simultaneously. The contribution of a medication group to the growth in total expenditure is the summation of the three terms within this medication group.

Supplemental Table S1. Sample characteristics in 2005-2007 and 2015-2017\*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **2005-2007** | **2015-2017** | ***p*-value**† |
| **Characteristics** | **(N=5,219)** | **(N=6,791)** |  |
| Age (years) (%) |  |  | <0.001 |
| 18–44 | 12.1 | 9.4 |  |
| 45–64 | 47.6 | 45.6 |  |
| >65 | 40.3 | 45.0 |  |
| Female (%) | 51.3 | 48.8 | <0.001 |
| Race/ethnicity (%) |  |  | <0.001 |
| Non-Hispanic white | 64.8 | 61.3 |  |
| Non-Hispanic black | 15.4 | 14.7 |  |
| Hispanics | 13.4 | 15.0 |  |
| Other races | 6.3 | 9.0 |  |
| Married (%) | 60.6 | 58.0 | <0.001 |
| Education (%) |  |  | <0.001 |
| Less than high school | 24.5 | 16.8 |  |
| High school graduate | 50.8 | 52.2 |  |
| Some college or higher | 24.7 | 31.0 |  |
| Census region (%) |  |  | 0.244 |
| Northeast | 18.5 | 16.1 |  |
| Midwest | 21.2 | 22.0 |  |
| South | 39.7 | 41.7 |  |
| West | 21.2 | 20.7 |  |
| Health insurance coverage (%) |  |  | <0.001 |
| Any private | 62.3 | 59.6 |  |
| Public only | 31.3 | 36.0 |  |
| Uninsured | 6.5 | 4.3 |  |

\* Data were from the 2005-2007 and 2015-2017 Medical Expenditure Panel Survey.

† T-test was used to test the mean difference between the two time periods; χ-square test was used to test the distribution difference of categories between the two time periods.

Supplemental Table S2. Decomposing analog insulin spending by insulin acting, 2005–2007 to 2015–2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total | Number of users | Cost-per-user | Combined effect\* |
| Analog Insulin | 156% | 36% | 40% | 80% |
| Rapid-acting  | 63.9% | 16.3% | 12.9% | 34.6% |
| Basal | 87.3% | 20.8% | 20.2% | 46.3% |
| Premixed | 4.9% | -1% | 9.0% | -3.1% |

\* Combined effect represents the interaction of the changes in the number of users and cost-per-user.