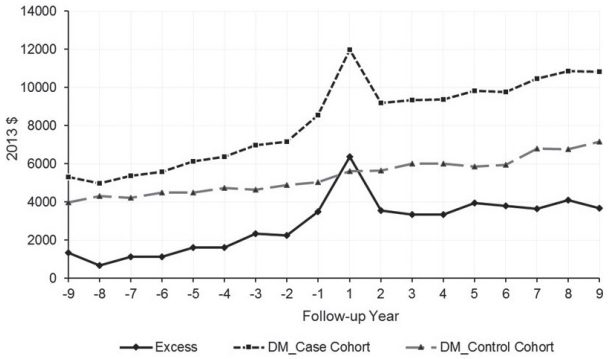
9 years before and after diagnosis with a matched cohort without diabetes (total persons years: 415,728). Diabetes incidence was defined by ≥ 2 outpatient claims 30 days apart or ≥1 inpatient claim with diabetes codes. We used 1:1 propensity score matching to select a matched cohort. We used two-part models to predict the total annual medical expenditures for each cohort, controlling for age, sex, residence, and insurance plan. Excess expenditures were the differences in predicted expenditures between the two cohorts.

Per capita medical expenditures for the diabetes and control cohorts increased annually by $382 and $177, respectively (Figure). The diabetes cohort had a 34% (95% CI, 33-34%; p<0.001) higher expenditure than the control cohort even 9 years before diagnosis. This excess expenditure increased with the time to and duration of diabetes, with the largest difference ($6845) occurring in the first year of diabetes diagnosis. Our results can be used to estimate the economic benefit of diabetes prevention programs.

Figure. Mean Estimated Total and Excess Medical Expenditures for Diabetes (DM) Cohort Compared with Matched Control Cohort by Follow-up Year, Before and After Diabetes Diagnosis.



110-OR

Increases in Expenditures on Glycemic Control Drugs among U.S. Adults with Diabetes, 1987-2013

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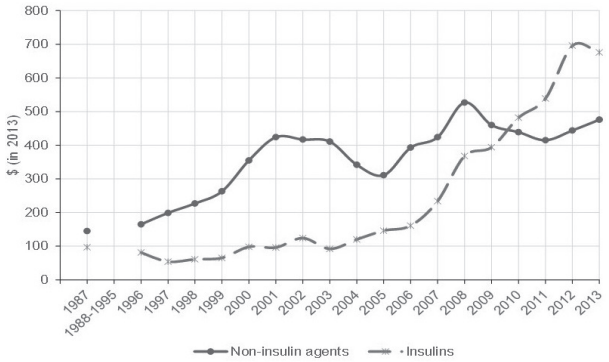
Spending on prescription medications for glycemic-control is one of the fastest growing components in medical expenditures associated with diabetes in the United States. However, little is known about the pattern of the increase over time. Using nationally representative data from the 1987 National Medical Expenditure Survey and the 1996-2013 Medical Expenditure Panel Survey, we examined the trend in per capita expenditures (in 2013$) on glycemic-control drugs in persons ≥18 years old who had self-reported diabetes (n=36,491). We used a piecewise regression to identify the inflection points for changes in growth rates over time. The glycemic-control drug expenditure per person with diabetes quintupled from $243 in 1987 to $1152 in 2013. The percentage of patients who took glycemic medications increased from 55% to 83% from 1987 to 2013. Annual spending on insulins increased by $11 (p<0.001) from 1987 to 2006, and by $81 (p<0.001) from 2007 to 2013 (Figure). In contrast, the pattern of annual spending on non-insulin glucose-lowering agents was more irregular with up-and-down inflections occurred in 2001, 2005, 2008 and 2011. Further research is needed to understand the underlying reasons associated with the substantial increase in total medication expenditure on glycemic-control drugs, as well as different expenditure patterns exhibited by insulin and non-insulin glucose-lowering agents.

Figure. Per Capita Expenditures on Glycemic Control Drugs among Adults with Diabetes, 1987-2013.



111-OR

Results from the Natural Experiments for Translation in Diabetes Study: Comparing Medical and Prescription Costs in Disease-specific and Standard Benefit Plans Over Time

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The Diabetes Health Plan (DHP) is an innovative disease-specific health plan for patients with diabetes and prediabetes which enhances access to medications, primary care, chronic disease management and patient clinical care reminders. We compared changes in total, out-of-pocket (OOP) and plan, medical, and prescription costs between employer groups offering the DHP and concurrent control employers offering standard benefit plans.

We conducted an interrupted time series (ITS) analysis of mean employer-level costs per member per month (PMPM) between 2009-2013. We included data from all employees/dependents who were continuously enrolled over 4 years, 19-62 years old, with diabetes or prediabetes at baseline. To identify comparable control employers offering standard benefit plans, we conducted an employer-level propensity match. Separate ITS models were estimated for total, OOP, and plan prescription costs and for total, OOP, and plan medical costs, all reported on a PMPM basis.

After propensity score matching, the DHP (N=8 groups, 2454 enrollees) and control employers (n=37-45 groups) balanced on all baseline employer-level characteristics. Averaged over 3 years of follow-up, DHP was associated with significantly lower monthly changes in prescription costs (total = -$1.64, p<.0001, OOP = -$0.20, p<.0001 and plan = -$1.33, p<.0001). DHP was also associated with significantly lower monthly changes in medical costs (total = -$9.20, p = 001, OOP = -$0.73, p=0.003, and plan = -$9.07, p = 0.002).

We found that DHP employer groups had lower monthly changes in PMPM total, OOP and plan prescription and medical costs over 3 years of follow-up, compared with concurrent controls offering standard benefit plans. These findings suggest that disease-specific insurance benefit designs that enhance access to care may play an important role in decreasing prescription and medical costs over time.

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112-OR

Comparing Direct and Indirect Costs of Type 2 Diabetes across Three Age Ranges in the U.S.

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The requirements for health technology assessment (HTA) vary between countries with respect to considering indirect costs associated with the loss of productivity. Failure to account for these costs in economic evaluations may significantly underestimate total disease burden, particularly in type 2 diabetes (T2D) where epidemiological studies show age at onset continues to decrease, whereas retirement age is increasing. The study objective was to assess the direct and indirect cost burden of T2D individuals in the U.S. for selected age groups.

The IMS Core Diabetes Model was used to project the direct and indirect costs (lifetime and annual) for three newly diagnosed T2D populations of ages ranges: 35-44, 45-54 and 55-64 years. Patient characteristics were obtained from NHANES. Indirect costs were assessed using human capital approach. The cohorts were projected over a 60-year time horizon. Overall annual costs were assessed as the ratio of lifetime costs and age-specific life expectancy. Discounting was applied at 3%.

Projecting the younger T2D cohort (35-44 years) led to a per capita estimation of $45,094 direct lifetime costs and $59,697 indirect lifetime costs. This compared to $46,500 (direct lifetime costs) and $40,567 (indirect lifetime costs) in the 45-54 years cohort, and $39,112 (direct lifetime costs) and $9,046 (indirect lifetime costs) in the 55-64 years cohort. Overall annual per capita direct and indirect costs were assessed at $2,090 and $2,767, respectively, for the 35-44 years cohort, $2,554 and $2,228 for the 45-54 years cohort, and $2,693 and $623 for the 55-64 years cohort.

The consideration of indirect costs is especially relevant in younger T2D populations. Failing to include indirect cost considerations in economic evaluations leads to an underestimation of the total disease burden.

For author disclosure information, see page A696.