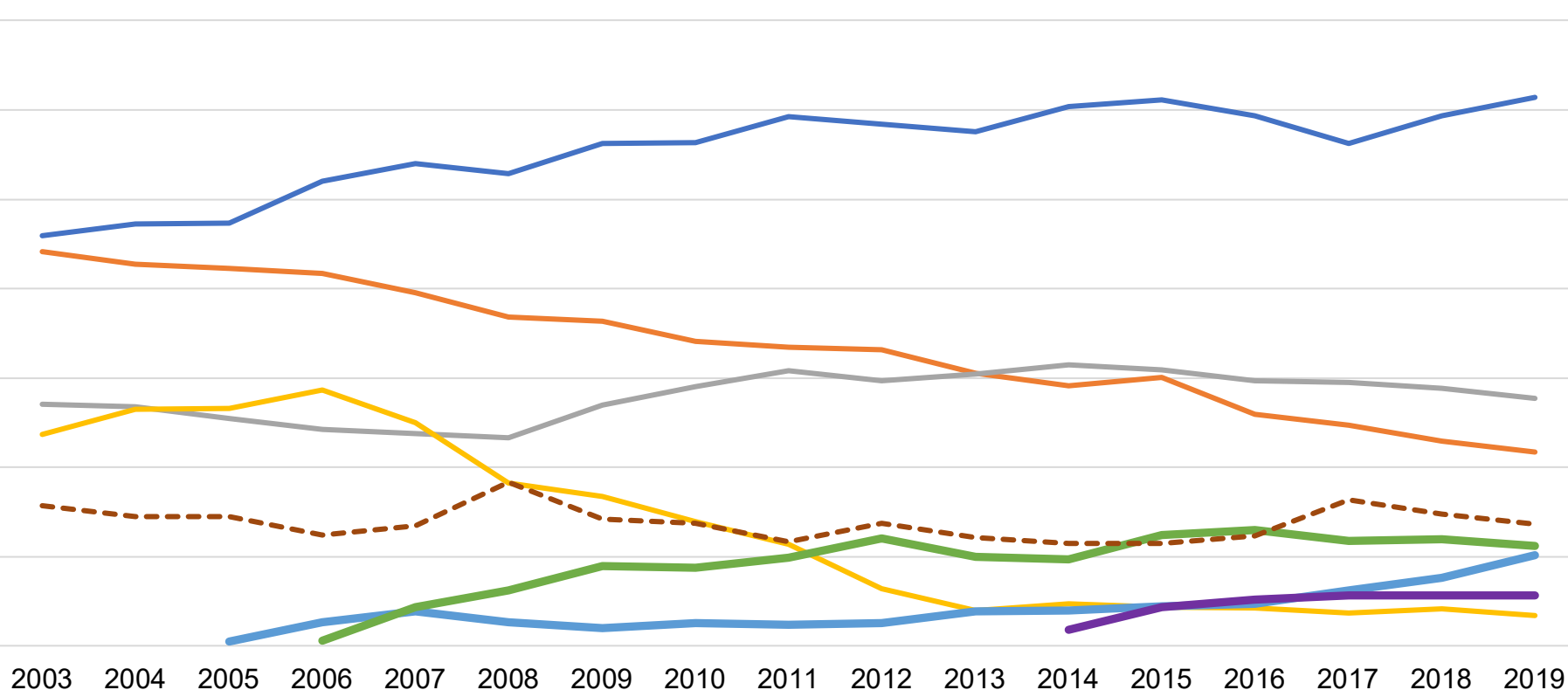# Unadjusted Use Rate of Diabetes Medications Among U.S. Adults with Diabetes, 2003–2019 (percent weighted)

Use rate (percent)

Legend: Metformin — Sulfonylureas — Insulin — Thiazolidinediones — GLP1-RA — DPP4-i — SGLT2-i — No diabetes medication

The Commonwealth Fund

Marginal Effects on New Diabetes Medications Utilization

	2003–2006		2007–2009		2010–2013		2014–2016		2017–2019	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Race										
White	Reference		Reference		Reference		Reference		Reference	
Black	-1.276	0.001***	-1.823	0.156	-3.692	0.001***	-5.792	0.000***	-4.362	0.013**
Latinx/Hispanic	0.096	0.772	-1.696	0.148	-2.111	0.117	-2.108	0.180	-2.263	0.283
Other	0.118	0.831	-1.495	0.492	0.2848	0.867	-0.823	0.730	0.899	0.722
Insurance										
Private	Reference		Reference		Reference		Reference		Reference	
Medicaid	-1.128	0.019**	-5.869	0.000***	-4.44	0.074*	-7.275	0.002***	-3.388	0.232
Medicare without other coverage	-0.729	0.369	-4.825	0.016**	-6.518	0.002***	-6.0045	0.013**	-7.662	0.002***
Medicare with other coverage	-1.212	0.105	-3.389	0.033**	-2.801	0.105	-4.979	0.018**	-4.161	0.053*
Uninsured	-0.965	0.052*	-6.16	0.000***	-10.28	0.000***	-7.519	0.001***	-7.802	0.001***
All others	-1.916	0.021**	-11.63	0.000***	-10.199	0.000***	2.826	0.754	-6.190	0.303
Education level										
Less than high school graduate	-0.987	0.115	-4.031	0.044**	-1.299	0.523	-8.169	0.001***	-3.931	0.108
High school graduate or higher	-0.454	0.518	-2.557	0.171	-1.452	0.388	-6.819	0.003***	-3.424	0.093
Bachelor's degree or higher	Reference		Reference		Reference		Reference		Reference	
Poverty level										
<125% FPL	-0.283	0.473	-2.425	0.085*	-0.158	0.927	-0.321	0.881	-2.544	0.203
125%–199% FPL	0.001	0.999	-3.483	0.018**	-1.474	0.438	-5.704	0.006***	-3.943	0.037**
200%–399% FPL	0.048	0.914	-1.157	0.385	-0.019	0.990	-3.902	0.043**	-2.351	0.151
≥400% FPL	Reference		Reference		Reference		Reference		Reference	

Notes: OLS regression controls for year period, race, ethnicity, education level, poverty level, insurance coverage, sex, age, region, and chronic conditions, as well as interaction terms between year period and race, ethnicity, insurance coverage, poverty level, and education level. Estimates are weighted using the survey weights provided by the MEPS. (In the MEPS, people are asked whether they describe themselves as being of Hispanic ethnicity.) New diabetes medications are GLP-1 RA, DPP4-i, and SGLT2-i. FPL = federal poverty level. N=38,920. *p<0.1, **p<0.05, ***p<0.01.

Data: Authors' analysis of Medical Expenditure Panel Survey (MEPS), 2003–2019.

The Commonwealth Fund

Marginal Effects on All Diabetes Medications Expenditure

	2003–2006		2007–2009		2010–2013		2014–2016		2017–2019	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Race										
White	Reference		Reference		Reference		Reference		Reference	
Black	-51.675	0.364	-61.394	0.414	-275.646	0.000***	-741.488	0.000***	-672.777	0.003***
Latinx/Hispanic	-113.652	0.061*	-165.560	0.054*	-61.832	0.492	-183.779	0.333	-514.531	0.014**
Other	-53.838	0.565	-162.347	0.141	-292.086	0.002***	-523.238	0.011**	-491.907	0.057*
Insurance										
Private	Reference		Reference		Reference		Reference		Reference	
Medicaid	148.850	0.121	82.981	0.583	102.628	0.501	-372.049	0.101	-476.905	0.101
Medicare without other coverage	99.914	0.180	-78.987	0.460	-46.741	0.745	-352.998	0.098*	-911.930	0.000***
Medicare with other coverage	186.834	0.002***	158.931	0.072*	143.999	0.172	430.369	0.034**	177.648	0.462
Uninsured	-209.076	0.000***	-239.989	0.017**	-590.183	0.000***	-920.487	0.000***	-1667.319	0.000***
All others	-346.297	0.013**	-575.022	0.001***	-765.434	0.000***	-613.700	0.290	-2194.519	0.000***
Education level										
Less than high school graduate	24.865	0.760	-32.777	0.815	-0.268	0.998	-762.002	0.007***	-507.939	0.087*
High school graduate or higher	13.017	0.851	-117.836	0.344	-36.369	0.671	-476.984	0.067*	-341.944	0.166
Bachelor's degree or higher	Reference		Reference		Reference		Reference		Reference	
Poverty level										
<125% FPL	-48.669	0.331	-49.218	0.627	78.793	0.419	393.711	0.101	341.861	0.211
125%–199% FPL	-8.910	0.868	-39.491	0.706	-71.268	0.520	-8.851	0.964	-184.307	0.424
200%–399% FPL	22.969	0.660	25.769	0.763	-104.979	0.208	-151.778	0.393	-189.113	0.350
≥400% FPL	Reference		Reference		Reference		Reference		Reference	

Notes: OLS regression controls for year period, race, ethnicity, education level, poverty level, insurance coverage, sex, age, region, and chronic conditions, as well as interaction terms between year period and race, ethnicity, insurance coverage, poverty level, and education level. Estimates are weighted using the survey weights provided by the MEPS. (In the MEPS, people are asked whether they describe themselves as being of Hispanic ethnicity.) New diabetes medications are GLP-1 RA, DPP4-i, and SGLT2-i. FPL = federal poverty level. N=38,920. *p<0.1, **p<0.05, ***p<0.01.

Data: Authors' analysis of Medical Expenditure Panel Survey (MEPS), 2003–2019.

The Commonwealth Fund

Marginal Effects on Older Noninsulin Diabetes Medications Expenditure

	2003–2006		**2007–2009**		**2010–2013**		**2014–2016**		**2017–2019**	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Race										
White	Reference		Reference		Reference		Reference		Reference	
Black	-53.702	0.278	-43.447	0.324	-24.870	0.511	-77.757	0.047**	4.681	0.935
Latinx/Hispanic	-33.243	0.535	80.015	0.146	90.235	0.027**	-16.189	0.739	102.019	0.170
Other	29.823	0.748	102.429	0.202	-12.067	0.760	-22.755	0.744	105.904	0.189
Insurance										
Private	Reference		Reference		Reference		Reference		Reference	
Medicaid	211.444	0.017**	64.895	0.494	1.601	0.976	-87.299	0.338	-115.065	0.152
Medicare without other coverage	-86.734	0.158	-106.644	0.079*	6.902	0.873	-221.006	0.001***	-130.614	0.058*
Medicare with other coverage	38.593	0.511	36.644	0.531	65.596	0.100	-173.406	0.010**	-98.051	0.134
Uninsured	-173.393	0.000***	-220.760	0.000***	-137.502	0.000***	-180.578	0.021**	-189.350	0.004***
All others	-385.975	0.015**	-351.920	0.001***	-39.309	0.633	-171.749	0.086*	-262.761	0.001***
Education level										
Less than high school graduate	143.398	0.025**	10.436	0.885	35.988	0.388	-32.917	0.722	-27.181	0.680
High school graduate or higher	87.479	0.101	-7.953	0.890	-2.453	0.94	-118.708	0.153	-5.796	0.904
Bachelor's degree or higher	Reference		Reference		Reference		Reference		Reference	
Poverty level										
<125% FPL	-24.298	0.586	58.775	0.317	-14.360	0.695	-66.122	0.264	-75.042	0.266
125%–199% FPL	7.941	0.871	11.554	0.830	-80.823	0.016**	-115.222	0.049**	-129.411	0.031**
200%–399% FPL	70.129	0.124	38.045	0.382	2.059	0.945	-102.895	0.056*	-87.649	0.116
≥400% FPL	Reference		Reference		Reference		Reference		Reference	

Notes: OLS regression controls for year period, race, ethnicity, education level, poverty level, insurance coverage, sex, age, region, and chronic conditions, as well as interaction terms between year period and race, ethnicity, insurance coverage, poverty level, and education level. Estimates are weighted using the survey weights provided by the MEPS. (In the MEPS, people are asked whether they describe themselves as being of Hispanic ethnicity.) FPL = federal poverty level. N=38,920. *p<0.1, **p<0.05, ***p<0.01.

Data: Authors' analysis of Medical Expenditure Panel Survey (MEPS), 2003–2019.

The Commonwealth Fund

Marginal Effects on New Diabetes Medications Expenditure

	2003–2006		2007–2009		2010–2013		2014–2016		2017–2019	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Race										
White	Reference		Reference		Reference		Reference		Reference	
Black	-11.282	0.045**	-22.122	0.396	-76.134	0.009***	-211.095	0.001***	-351.099	0.001***
Latinx/Hispanic	-17.076	0.000***	-43.043	0.107	-64.286	0.057*	-136.958	0.091*	-159.449	0.295
Other	-13.470	0.011**	-76.046	0.007***	3.292	0.936	-174.765	0.054*	-161.706	0.279
Insurance										
Private	Reference		Reference		Reference		Reference		Reference	
Medicaid	-26.231	0.003***	-130.012	0.001***	-56.830	0.353	-214.861	0.120	-71.715	0.716
Medicare without other coverage	-18.454	0.094*	-117.308	0.001***	-131.758	0.010**	-250.937	0.009***	-511.943	0.000***
Medicare with other coverage	-23.585	0.005***	-64.603	0.061*	-19.803	0.643	-94.737	0.291	-54.020	0.707
Uninsured	-25.529	0.004***	-135.265	0.000***	-225.708	0.000***	-306.069	0.001***	-634.282	0.000***
All others	-20.964	0.009***	-205.360	0.000***	-233.878	0.000***	122.313	0.769	-791.158	0.000***
Education level										
Less than high school graduate	-22.342	0.094*	-88.427	0.065*	-8.984	0.845	-303.497	0.008***	-141.829	0.385
High school graduate or higher	-16.324	0.211	-63.639	0.164	-3.845	0.915	-302.248	0.004***	-211.257	0.084*
Bachelor's degree or higher	Reference		Reference		Reference		Reference		Reference	
Poverty level										
<125% FPL	0.029	0.997	-20.611	0.512	43.716	0.260	18.140	0.865	-179.920	0.193
125%–199% FPL	10.014	0.422	-55.821	0.056*	-24.882	0.526	-248.289	0.002***	-348.757	0.003***
200%–399% FPL	5.629	0.330	0.717	0.981	6.563	0.841	-127.336	0.115	-171.211	0.132
≥400% FPL	Reference		Reference		Reference		Reference		Reference	

Notes: OLS regression controls for year period, race, ethnicity, education level, poverty level, insurance coverage, sex, age, region, and chronic conditions, as well as interaction terms between year period and race, ethnicity, insurance coverage, poverty level, and education level. Estimates are weighted using the survey weights provided by the MEPS. (In the MEPS, people are asked whether they describe themselves as being of Hispanic ethnicity.) New diabetes medications are GLP-1 RA, DPP4-i, and SGLT2-i. FPL = federal poverty level. N=38,920. *p<0.1, **p<0.05, ***p<0.01.

Data: Authors' analysis of Medical Expenditure Panel Survey (MEPS), 2003–2019.

The Commonwealth Fund