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# ISSUE BRIEF

## The Biosimilar Opportunity: A State Breakdown

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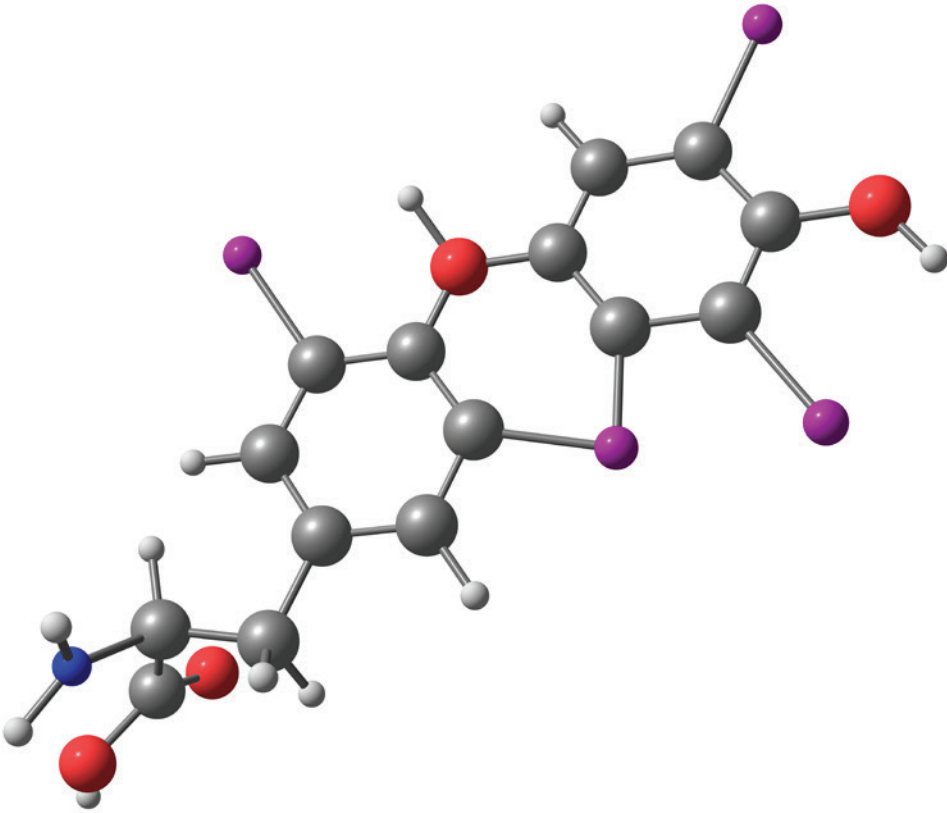
The Biosimilar Opportunity: A State Breakdown  
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## Introduction

The federal government enforces patents and data exclusivity rights in order to provide innovator companies with an opportunity to recoup their capital costs. And, since developing a new medicine is risky, requires up to \$2.9 billion, and takes up to 10 to 15 years to bring to market, the development of innovative medicines would cease without these opportunities.<sup>1</sup>

Once the opportunity to recoup the costs of capital has been provided, competitors to the original innovator should be empowered. This competition drives down the costs for patients and promotes widespread affordability of medicines. The combination of a set period of exclusivity followed by a competitive market promotes what would otherwise be incompatible objectives – incenting the development of new innovative drugs and enabling widespread affordability.

While this careful balance exists for traditional chemical based medicines, it does not yet exist for biologic medicines. Biologics are cutting-edge medicines derived from living organisms that treat conditions such as cancer, arthritis, and autoimmune diseases.

The innovative medicines in this space, referred to as originator biologics, are highly valued treatments for patients. As such, the innovation part of the biologic space is working as intended. But, a robust market that includes lower-cost competitors to the innovative medicines, known as biosimilars, has been slow to develop. Thus, unlike traditional (chemical based) medicines, competitive pressures are not driving down the costs sufficiently in the biologics market.

Biosimilars are only approved to compete in nine biologic drug classes in the U.S., and biosimilars are only available in four of these drug classes currently. Europe, for comparison, has approved more than three times as many biosimilars as the U.S.<sup>2</sup> Another problem, except for the Filgrastim drug class (the biosimilar Zarxio), biosimilars have not gained a meaningful share of the market even where they are available. Solving the obstacles preventing wider adoption of biosimilars is imperative because the potential savings to the health care system that could be gained if biosimilars were widely adopted are significant.

In a previous study,<sup>3</sup> I estimated the total systemic health care savings that are possible from expanding the use of biosimilars in just the nine drug classes where biosimilar competitors are already approved. The study found that the current use of biosimilars saves the national health care system \$253.8 million annually relative to an “all originator biologics” scenario. More promising, biosimilars could generate significantly more annual savings. Annual total health care savings of \$2.5 billion, \$4.8 billion, and \$7.2 billion are possible, if their market share grew to 25 percent, 50 percent, or 75 percent of the market, respectively.

The estimated savings in the previous study were estimated on a national basis, however. There is value in understanding how these savings are distributed by state. Of particular interest are the estimated savings from expanding the use of biosimilars for state Medicaid programs and the commercial market. The objective of this study is to allocate the national savings estimates across the 50 states and further estimate the potential savings to state Medicaid programs and the commercial market.

When allocating the savings by state, it is important to note two issues upfront. First, since the national assessment, new pricing data has become available. This study relies on the updated pricing data, which slightly alters the national savings totals referred to above. Second, since this is a deeper examination of the original study, this study does not provide an in-depth description of the data and sources. Readers interested in a more in-depth description of the data and sources should refer to the previous study, which can be downloaded at [www.medecon.org](http://www.medecon.org).

Tables 1 through 3 summarize the state level results of the analysis. Table 1 presents the total potential savings across the nine drug classes by state; Table 2 presents the potential savings for state Medicaid programs; and, Table 3 presents the potential savings for the commercial sector.

**Table 1**  
**Total Annual Biosimilar Generated Savings by State (in millions)**

	Current Market	25% Market Share	50% Market Share	75% Market Share
Alabama	\$1.75	\$32.72	\$64.61	\$97.18
Alaska	\$0.21	\$4.06	\$8.02	\$12.04
Arizona	\$6.70	\$63.16	\$120.42	\$177.79
Arkansas	\$2.76	\$21.47	\$41.28	\$61.08
California	\$26.95	\$180.08	\$340.20	\$511.48
Colorado	\$4.38	\$41.68	\$80.29	\$118.55
Connecticut	\$3.79	\$23.74	\$44.48	\$64.93
D.C.	\$0.90	\$5.59	\$10.44	\$15.37
Delaware	\$0.80	\$5.80	\$11.09	\$16.45
Florida	\$20.16	\$210.22	\$402.40	\$598.95
Georgia	\$7.71	\$52.64	\$99.09	\$146.31
Hawaii	\$2.19	\$10.63	\$19.87	\$28.89
Idaho	\$0.65	\$8.12	\$15.96	\$23.76
Illinois	\$9.63	\$69.47	\$134.27	\$200.01
Indiana	\$6.44	\$39.80	\$77.33	\$115.94
Iowa	\$3.51	\$25.48	\$48.37	\$71.12
Kansas	\$4.83	\$17.33	\$31.15	\$44.36
Kentucky	\$3.01	\$32.87	\$63.73	\$95.05
Louisiana	\$1.78	\$28.43	\$55.86	\$84.21
Maine	\$0.56	\$12.63	\$25.02	\$37.49
Maryland	\$4.61	\$47.73	\$92.40	\$138.24
Massachusetts	\$4.43	\$69.53	\$137.20	\$205.92
Michigan	\$9.40	\$56.51	\$110.05	\$165.11
Minnesota	\$1.95	\$58.25	\$115.32	\$175.63
Mississippi	\$0.86	\$26.64	\$52.64	\$78.99
Missouri	\$4.51	\$49.38	\$95.56	\$143.44
Montana	\$1.60	\$8.62	\$16.82	\$24.97
Nebraska	\$1.50	\$21.46	\$41.85	\$62.96
Nevada	\$2.15	\$10.31	\$19.16	\$28.60
New Hampshire	\$1.02	\$11.03	\$21.48	\$31.92
New Jersey	\$5.21	\$41.61	\$78.88	\$116.68
New Mexico	\$0.98	\$15.10	\$29.60	\$44.20
New York	\$16.40	\$143.53	\$274.66	\$411.12
North Carolina	\$4.89	\$71.86	\$141.05	\$211.45
North Dakota	\$1.82	\$11.38	\$21.44	\$31.28
Ohio	\$6.20	\$94.05	\$184.60	\$277.99
Oklahoma	\$1.26	\$19.11	\$37.87	\$57.22
Oregon	\$5.75	\$71.51	\$140.04	\$208.09
Pennsylvania	\$6.04	\$133.77	\$264.85	\$400.46
Puerto Rico	\$0.80	\$47.33	\$94.32	\$144.10
Rhode Island	\$0.82	\$6.57	\$12.60	\$18.56
South Carolina	\$4.17	\$27.10	\$52.04	\$77.30
South Dakota	\$0.44	\$13.45	\$26.57	\$39.64
Tennessee	\$3.65	\$67.81	\$133.42	\$200.95
Texas	\$20.21	\$146.64	\$278.66	\$414.16
Utah	\$1.03	\$40.99	\$81.48	\$123.10
Vermont	\$0.33	\$6.66	\$13.07	\$19.46
Virginia	\$4.53	\$59.85	\$116.95	\$174.53
Washington	\$6.16	\$43.87	\$84.04	\$124.93
West Virginia	\$1.49	\$14.11	\$27.24	\$40.89
Wisconsin	\$7.18	\$94.65	\$186.75	\$280.06
Wyoming	\$0.29	\$2.10	\$3.98	\$5.86
<b>TOTAL</b>	<b>\$240.4</b>	<b>\$2,418.4</b>	<b>\$4,680.5</b>	<b>\$6,998.8</b>

Source: Author calculations

**Table 2**  
**Total Annual Biosimilar Generated savings for State Medicaid Programs by State**  
**(in millions)**

	CURRENT MARKET	25% MARKET SHARE	50% MARKET SHARE	75% MARKET SHARE
Alabama	\$0.33	\$5.26	\$10.35	\$15.58
Alaska	\$0.05	\$0.85	\$1.67	\$2.50
Arizona	\$1.49	\$12.08	\$22.82	\$33.58
Arkansas	\$0.68	\$4.52	\$8.60	\$12.67
California	\$6.95	\$42.31	\$79.30	\$119.26
Colorado	\$0.85	\$7.42	\$14.22	\$20.94
Connecticut	\$0.72	\$3.94	\$7.29	\$10.58
D.C.	\$0.25	\$1.40	\$2.60	\$3.81
Delaware	\$0.13	\$0.69	\$1.28	\$1.89
Florida	\$3.93	\$32.37	\$61.14	\$90.78
Georgia	\$1.37	\$8.03	\$14.93	\$21.97
Hawaii	\$0.36	\$1.63	\$3.02	\$4.38
Idaho	\$0.11	\$1.16	\$2.27	\$3.37
Illinois	\$1.78	\$11.99	\$23.05	\$34.29
Indiana	\$1.06	\$5.94	\$11.45	\$17.17
Iowa	\$0.58	\$3.76	\$7.06	\$10.34
Kansas	\$0.64	\$2.04	\$3.59	\$5.05
Kentucky	\$0.76	\$7.30	\$14.06	\$20.95
Louisiana	\$0.47	\$6.69	\$13.11	\$19.78
Maine	\$0.09	\$1.61	\$3.19	\$4.77
Maryland	\$0.79	\$7.48	\$14.41	\$21.55
Massachusetts	\$0.94	\$13.26	\$26.10	\$39.18
Michigan	\$1.83	\$9.74	\$18.84	\$28.27
Minnesota	\$0.31	\$8.22	\$16.25	\$24.82
Mississippi	\$0.21	\$5.21	\$10.26	\$15.39
Missouri	\$0.64	\$5.88	\$11.28	\$16.93
Montana	\$0.27	\$1.29	\$2.49	\$3.69
Nebraska	\$0.19	\$2.38	\$4.61	\$6.94
Nevada	\$0.40	\$1.72	\$3.15	\$4.70
New Hampshire	\$0.12	\$1.20	\$2.33	\$3.46
New Jersey	\$0.87	\$5.97	\$11.20	\$16.52
New Mexico	\$0.32	\$4.40	\$8.59	\$12.81
New York	\$4.14	\$31.53	\$59.83	\$89.52
North Carolina	\$0.83	\$10.77	\$21.05	\$31.54
North Dakota	\$0.19	\$1.09	\$2.02	\$2.94
Ohio	\$1.20	\$16.17	\$31.61	\$47.65
Oklahoma	\$0.21	\$2.91	\$5.74	\$8.70
Oregon	\$1.22	\$13.66	\$26.62	\$39.48
Pennsylvania	\$1.03	\$21.17	\$41.81	\$63.33
Puerto Rico	\$0.35	\$15.10	\$30.03	\$46.29
Rhode Island	\$0.18	\$1.25	\$2.37	\$3.47
South Carolina	\$0.75	\$4.25	\$8.06	\$11.94
South Dakota	\$0.06	\$1.54	\$3.03	\$4.51
Tennessee	\$0.72	\$11.53	\$22.59	\$34.05
Texas	\$3.75	\$23.81	\$44.82	\$66.49
Utah	\$0.11	\$4.25	\$8.44	\$12.76
Vermont	\$0.08	\$1.37	\$2.66	\$3.96
Virginia	\$0.51	\$6.07	\$11.80	\$17.59
Washington	\$1.22	\$7.63	\$14.48	\$21.49
West Virginia	\$0.38	\$2.40	\$4.53	\$6.81
Wisconsin	\$1.06	\$12.80	\$25.19	\$37.78
Wyoming	\$0.04	\$0.23	\$0.43	\$0.64
<b>TOTAL</b>	<b>\$47.5</b>	<b>\$417.3</b>	<b>\$801.6</b>	<b>\$1,198.9</b>



**Table 3**  
**Total Annual Biosimilar Generated Savings for the Commercial Market by State**  
**(in millions)**

	CURRENT MARKET	25% MARKET SHARE	50% MARKET SHARE	75% MARKET SHARE
Alabama	\$0.88	\$13.48	\$26.51	\$39.91
Alaska	\$0.11	\$1.90	\$3.74	\$5.61
Arizona	\$3.66	\$28.68	\$54.06	\$79.50
Arkansas	\$1.29	\$8.30	\$15.75	\$23.20
California	\$15.30	\$90.94	\$170.18	\$255.97
Colorado	\$2.66	\$22.49	\$43.05	\$63.38
Connecticut	\$2.28	\$12.33	\$22.78	\$33.05
D.C.	\$0.55	\$3.10	\$5.74	\$8.43
Delaware	\$0.45	\$2.32	\$4.34	\$6.40
Florida	\$10.96	\$87.28	\$164.51	\$244.17
Georgia	\$4.77	\$27.63	\$51.31	\$75.47
Hawaii	\$1.24	\$5.47	\$10.11	\$14.61
Idaho	\$0.36	\$3.82	\$7.48	\$11.10
Illinois	\$5.58	\$36.78	\$70.62	\$105.05
Indiana	\$3.61	\$19.84	\$38.25	\$57.34
Iowa	\$2.13	\$13.34	\$25.04	\$36.64
Kansas	\$3.03	\$9.49	\$16.68	\$23.46
Kentucky	\$1.53	\$14.19	\$27.31	\$40.67
Louisiana	\$0.89	\$12.33	\$24.12	\$36.41
Maine	\$0.28	\$5.15	\$10.17	\$15.23
Maryland	\$2.87	\$26.56	\$51.12	\$76.45
Massachusetts	\$2.50	\$34.00	\$66.87	\$100.38
Michigan	\$4.95	\$25.76	\$49.77	\$74.67
Minnesota	\$1.20	\$31.27	\$61.77	\$94.39
Mississippi	\$0.45	\$10.64	\$20.92	\$31.41
Missouri	\$2.67	\$23.90	\$45.78	\$68.74
Montana	\$0.79	\$3.71	\$7.17	\$10.61
Nebraska	\$0.98	\$11.99	\$23.25	\$35.00
Nevada	\$1.22	\$5.12	\$9.36	\$13.96
New Hampshire	\$0.59	\$5.60	\$10.82	\$16.05
New Jersey	\$3.35	\$22.91	\$42.96	\$63.36
New Mexico	\$0.41	\$5.43	\$10.60	\$15.80
New York	\$9.28	\$68.96	\$130.69	\$195.52
North Carolina	\$2.58	\$32.73	\$63.90	\$95.77
North Dakota	\$1.24	\$6.79	\$12.64	\$18.34
Ohio	\$3.44	\$45.13	\$88.17	\$132.91
Oklahoma	\$0.62	\$8.54	\$16.87	\$25.54
Oregon	\$3.03	\$32.51	\$63.31	\$93.84
Pennsylvania	\$3.18	\$62.94	\$124.25	\$188.30
Puerto Rico	\$0.25	\$10.35	\$20.57	\$31.76
Rhode Island	\$0.46	\$3.09	\$5.86	\$8.59
South Carolina	\$2.14	\$11.86	\$22.48	\$33.29
South Dakota	\$0.28	\$6.83	\$13.45	\$20.02
Tennessee	\$1.96	\$30.34	\$59.41	\$89.59
Texas	\$12.61	\$78.41	\$147.35	\$218.55
Utah	\$0.73	\$26.97	\$53.55	\$80.99
Vermont	\$0.16	\$2.54	\$4.96	\$7.36
Virginia	\$2.75	\$31.73	\$61.66	\$91.92
Washington	\$3.57	\$21.92	\$41.57	\$61.66
West Virginia	\$0.68	\$4.14	\$7.79	\$11.71
Wisconsin	\$4.17	\$48.17	\$94.70	\$142.01
Wyoming	\$0.18	\$1.09	\$2.05	\$3.00
<b>TOTAL</b>	<b>\$136.8</b>	<b>\$1,160.8</b>	<b>\$2,227.4</b>	<b>\$3,327.1</b>

Source: Author calculations

Tables 1 through 3 demonstrate that the potential savings to commercial insurers and state Medicaid programs are magnitudes higher than the actual savings currently being realized. On average, commercial insurers and state Medicaid programs can save tens of millions of dollars a year by simply expanding biosimilars' market share for the nine drug classes examined. Importantly, these potential savings exist in every state.

These estimated savings are conservative for several reasons. The annual savings could be even larger should biosimilars gain an even higher market share than analyzed here – biosimilars have reached 90 percent (or more) of the market in several EU nations.<sup>4</sup> Greater savings are also achievable from promoting biosimilar competition in more biologic drug classes.

The estimated savings are also conservative because savings are measured on a relative basis (e.g. the savings enabled by biosimilars' lower sales price vis-à-vis the originator biologics). As in all markets, greater competition often drives down prices for all competitors. In the biologics market, this means that the introduction of biosimilars incentivizes the originator biologics to also reduce their prices. Biosimilar competition creates additional systemic savings when the originator biologic lowers its price due to the presence of stronger competition from a biosimilar product.

The savings created by these competitive pressures are not captured by the previous savings estimates, or the main results reported here. To demonstrate that these potential savings exist in the current health care system, these savings are quantified in the section, "The Additional Benefits from Competition – The Impact on Originator Prices".

It should also be noted upfront that the estimated savings for the state Medicaid programs are based on the Average Sales Price (ASP) data, and do not include the impact from the Medicaid Drug Rebate program. The impact from the Medicaid Drug Rebate program on actual prices is not publicly available, therefore any difference between Medicaid prices and ASP, to the extent they exist, are unknown.

The state-by-state perspective provided in this study enhances our understanding of the potential benefits from expanded biosimilar use. These results strengthen the conclusion from the previous study that reforms are necessary to ensure biosimilars can more effectively compete against originator biologics.

## **Distributing the Savings by State and Payer**

As with the previous study, the estimated savings enabled by expanding the use of biosimilars are based on the current sales volumes of the originator biologic and biosimilar medicines, the most recent pricing data for the originator biologic and biosimilar medicines, and alternative market share scenarios.

### **Sales Volume Data**

The sales volume data used in this analysis are the same rolling 12-month data through February 2019 that were used in the previous study. Unlike the previous study that only used the national volume data, this study leverages the state-level data. The sum of the volumes in all states (including Puerto Rico) equals the national volume data used in the previous study. While the total volumes for each originator biologic and biosimilar medicine are actual data, the distribution of the sales volume between the alternative payers are estimates. The methodology for this distribution is described below.

## Pricing Data

Before discussing how the sales volumes are distributed between the alternative payers, it is beneficial to discuss the pricing data.

The pricing data for the seven drugs covered under Medicare Part B are the national average sales price (ASP) data that were effective from July through September 2019, which are updated from the previous study that used the average national ASP data that were effective from April through June 2019. The updated data slightly modifies the total and relative price savings (see Tables 1 through 3), but the changes do not alter the magnitude of the conclusions.

The pricing data for the two drugs covered under Medicare Part D (Humira and Enbrel) have not been updated, so the pricing data for these drug classes remain the same as the previous study.<sup>5</sup>

## Estimating Expenditures by State and Payer

From a state perspective, it is important to divide the volumes between those covered by the federal government (primarily Medicare), those covered by state Medicaid programs, and those covered by the private sector (referred to as the commercial market) before estimating the current expenditures on originator biologics and biosimilars.

Estimating Medicare's share of volumes by state must account for two realities. First, the Medicare population primarily consists of older Americans who will disproportionately use biologic medicines relative to other age groups. Second, Medicare's share of the insured population varies widely across the states. For instance, Medicare's share of expenditures on biologic drugs in states like Florida, which has a higher share of Medicare beneficiaries, should be higher than Medicare's share of expenditures on biologic drugs in states like Alaska, which has a lower share of Medicare beneficiaries.

As in the previous study, a December 2017 Government Accountability Office (GAO) study that estimated Medicare's national share of total expenditures on the most expensive biologic drugs was used to account for Medicare's share of the total volume for the nation as a whole.<sup>6</sup> As with the previous report, Medicare's share of the market is equal to the GAO's findings for Infliximab, Pegfilgrastim, Filgrastim, Epoetin Alfa, Bevacizumab, Trastuzumab, and Rituximab. Since the GAO did not evaluate Etanercept nor Adalimumab, the average market share for Medicare according to the GAO was used for these two drug classes.

Unlike the previous study, Medicare's national share estimates needs to be adjusted to account for the variation in Medicare's share of the insured population across the states. To account for these differences, the national share of Medicare's total expenditures for each biologic drug class is adjusted based on Medicare's share of the insured population in each state. Medicare's share of the insured population was based on data from the Kaiser Family Foundation.<sup>7</sup>

To estimate Medicare's current volumes for the nine biologic drug classes in each state, Medicare's estimated share for each biologic drug, which is adjusted for each state's relative share of the Medicare population, is multiplied by the reported total volumes for each state. Total Medicare expenditures are estimated by multiplying these volumes by the reported prices, adjusted to reflect Medicare's statutory mark-up of 6 percent of the price of the originator biologic medicine.

In addition to Medicare recipients, the federal government also funds the cost for patients covered under the military and Veterans Affairs programs. It is important to allocate the savings from these insured populations to the federal government, not the respective state Medicaid programs or commercial market. The Kaiser Family Foundation categorizes people covered by these federal programs under the “other public” category.

Multiplying the share of people covered under the other public category by the total state volumes for each originator biologic and biosimilar yields each state’s estimated volumes for the patients covered by these federal programs. Total expenditures are estimated by multiplying these volumes by the reported prices, adjusted to reflect a 6 percent mark-up.

The other public expenditures are added to the Medicare expenditures to obtain a “total federal” expenditures category. The federal expenditures are included in the calculation for “total state expenditures”, but are excluded for the estimated savings potential for the state Medicaid programs, and the potential savings available for the commercial markets in each state.

The remaining volumes (the total volumes by state minus the federal volumes) are categorized into the commercial market (employer-based health insurance plus non-group health insurance) and the state Medicaid program. The commercial market volumes for each state are estimated by multiplying the remaining volumes by the commercial market’s coverage rates relative to Medicaid’s coverage rate as reported by the Kaiser Family Foundation. Each state’s Medicaid volumes are estimated by multiplying the remaining volumes by Medicaid’s coverage rate relative to the commercial market as reported by the Kaiser Family Foundation. These volumes are multiplied by the reported prices, adjusted to reflect a 6 percent mark-up, to estimate the total expenditures for the commercial markets and Medicaid programs by state.

The total current expenditures for each state are simply the sum of the expenditures across all of the payers.

### Creating an All Biologics Baseline

As in the previous study, these expenditures were then compared to a hypothetical “all originator biologic” baseline. This baseline is calculated by multiplying the volume breakdowns described above by the relevant originator biologic price (e.g., the baseline assumes that all biologic medicines prescribed are the originator biologic medicine). The savings reported in Tables 1 through 3 are the differences between the four biosimilar market scenarios and this all originator biologic baseline.

### Savings Scenarios

The first scenario, the “Current Market” scenario, compares the actual expenditures for each biologic drug class to the baseline expenditures. The estimated savings are calculated as the difference between the actual expenditures and the baseline expenditures. The estimated savings are broken down by the different insured categories as described above. Table 4 presents these results breaking out the total savings, savings for Medicaid, and savings for commercial payers. Table 4 also presents the distribution of the savings between the state Medicaid programs and the commercial sector (the remainder of the savings accrue to the federal government through Medicare or other public health insurance programs).

**Table 4**  
**Current Annual Biosimilar Generated Savings by State: Total, Medicaid, and Commercial Sector Savings (in millions)**

	TOTAL	MEDICAID	COMMERCIAL	MEDICAID SAVINGS % OF TOTAL	COMMERCIAL SAVINGS % OF TOTAL
Alabama	\$1.75	\$0.33	\$0.88	19.1%	50.2%
Alaska	\$0.21	\$0.05	\$0.11	22.7%	52.4%
Arizona	\$6.70	\$1.49	\$3.66	22.2%	54.7%
Arkansas	\$2.76	\$0.68	\$1.29	24.8%	46.7%
California	\$26.95	\$6.95	\$15.30	25.8%	56.8%
Colorado	\$4.38	\$0.85	\$2.66	19.4%	60.8%
Connecticut	\$3.79	\$0.72	\$2.28	18.9%	60.1%
D.C.	\$0.90	\$0.25	\$0.55	27.3%	61.0%
Delaware	\$0.80	\$0.13	\$0.45	16.3%	55.7%
Florida	\$20.16	\$3.93	\$10.96	19.5%	54.4%
Georgia	\$7.71	\$1.37	\$4.77	17.7%	61.9%
Hawaii	\$2.19	\$0.36	\$1.24	16.3%	56.5%
Idaho	\$0.65	\$0.11	\$0.36	16.7%	56.0%
Illinois	\$9.63	\$1.78	\$5.58	18.5%	57.9%
Indiana	\$6.44	\$1.06	\$3.61	16.4%	56.1%
Iowa	\$3.51	\$0.58	\$2.13	16.6%	60.6%
Kansas	\$4.83	\$0.64	\$3.03	13.4%	62.7%
Kentucky	\$3.01	\$0.76	\$1.53	25.3%	50.7%
Louisiana	\$1.78	\$0.47	\$0.89	26.3%	49.8%
Maine	\$0.56	\$0.09	\$0.28	15.3%	50.4%
Maryland	\$4.61	\$0.79	\$2.87	17.0%	62.2%
Massachusetts	\$4.43	\$0.94	\$2.50	21.3%	56.5%
Michigan	\$9.40	\$1.83	\$4.95	19.5%	52.6%
Minnesota	\$1.95	\$0.31	\$1.20	15.7%	61.5%
Mississippi	\$0.86	\$0.21	\$0.45	24.8%	52.6%
Missouri	\$4.51	\$0.64	\$2.67	14.2%	59.3%
Montana	\$1.60	\$0.27	\$0.79	16.6%	49.0%
Nebraska	\$1.50	\$0.19	\$0.98	12.5%	65.0%
Nevada	\$2.15	\$0.40	\$1.22	18.8%	56.7%
New Hampshire	\$1.02	\$0.12	\$0.59	12.2%	58.3%
New Jersey	\$5.21	\$0.87	\$3.35	16.6%	64.2%
New Mexico	\$0.98	\$0.32	\$0.41	32.8%	41.9%
New York	\$16.40	\$4.14	\$9.28	25.2%	56.6%
North Carolina	\$4.89	\$0.83	\$2.58	16.9%	52.7%
North Dakota	\$1.82	\$0.19	\$1.24	10.6%	68.2%
Ohio	\$6.20	\$1.20	\$3.44	19.3%	55.5%
Oklahoma	\$1.26	\$0.21	\$0.62	16.4%	49.1%
Oregon	\$5.75	\$1.22	\$3.03	21.2%	52.7%
Pennsylvania	\$6.04	\$1.03	\$3.18	17.1%	52.5%
Puerto Rico	\$0.80	\$0.35	\$0.25	43.9%	31.7%
Rhode Island	\$0.82	\$0.18	\$0.46	22.1%	55.7%
South Carolina	\$4.17	\$0.75	\$2.14	18.1%	51.4%
South Dakota	\$0.44	\$0.06	\$0.28	13.4%	62.1%
Tennessee	\$3.65	\$0.72	\$1.96	19.7%	53.8%
Texas	\$20.21	\$3.75	\$12.61	18.5%	62.4%
Utah	\$1.03	\$0.11	\$0.73	10.7%	71.3%
Vermont	\$0.33	\$0.08	\$0.16	25.6%	49.4%
Virginia	\$4.53	\$0.51	\$2.75	11.3%	60.7%
Washington	\$6.16	\$1.22	\$3.57	19.8%	57.8%
West Virginia	\$1.49	\$0.38	\$0.68	25.7%	45.8%
Wisconsin	\$7.18	\$1.06	\$4.17	14.8%	58.0%
Wyoming	\$0.29	\$0.04	\$0.18	13.0%	62.7%
<b>TOTAL</b>	<b>\$240.4</b>	<b>\$47.5</b>	<b>\$136.8</b>	<b>19.8%</b>	<b>56.9%</b>

Source: Author calculations

As Table 4 illustrates, relative to the current cost of the originator biologics, the current use of biosimilars saves the health care system over \$240.4 million. Of these savings, 19.8 percent (or \$47.5 million) is being realized by the state Medicaid programs and 56.9 percent (or \$136.8 million) is being realized by the commercial market. The remainder of the savings are being realized by Medicare or other federal health insurance programs.

It is important to recognize that as of the data evaluated, there was only biosimilar competition in four biologic drug classes – Infliximab, Pegfilgrastim, Filgrastim, and Epoetin Alfa. Of these, the savings are driven by biosimilar sales in the Filgrastim and then Infliximab drug classes.

Tables 5, 6, and 7 present the projected savings under three alternative biosimilar share scenarios – the savings if biosimilars were 25 percent of total sales (Table 5), 50 percent of total sales (Table 6), and 75 percent of total sales (Table 7).

As these scenarios demonstrate, every state would experience significant savings in the state Medicaid programs from expanding the use of biosimilars compared to the more expensive originator biologics. The same benefits will also accrue to patients covered in the commercial market.

**Table 5**  
**Biosimilar Generated Savings by State Under the 25 Percent Market Share Scenario:**  
**Total, Medicaid, and Commercial Sector Savings (in millions)**

	TOTAL	MEDICAID	COMMERCIAL	MEDICAID SAVINGS % OF TOTAL	COMMERCIAL SAVINGS % OF TOTAL
Alabama	\$32.72	\$5.26	\$13.48	16.1%	41.2%
Alaska	\$4.06	\$0.85	\$1.90	20.8%	46.7%
Arizona	\$63.16	\$12.08	\$28.68	19.1%	45.4%
Arkansas	\$21.47	\$4.52	\$8.30	21.1%	38.7%
California	\$180.08	\$42.31	\$90.94	23.5%	50.5%
Colorado	\$41.68	\$7.42	\$22.49	17.8%	54.0%
Connecticut	\$23.74	\$3.94	\$12.33	16.6%	51.9%
D.C.	\$5.59	\$1.40	\$3.10	25.1%	55.4%
Delaware	\$5.80	\$0.69	\$2.32	11.8%	40.1%
Florida	\$210.22	\$32.37	\$87.28	15.4%	41.5%
Georgia	\$52.64	\$8.03	\$27.63	15.3%	52.5%
Hawaii	\$10.63	\$1.63	\$5.47	15.4%	51.5%
Idaho	\$8.12	\$1.16	\$3.82	14.3%	47.1%
Illinois	\$69.47	\$11.99	\$36.78	17.3%	52.9%
Indiana	\$39.80	\$5.94	\$19.84	14.9%	49.9%
Iowa	\$25.48	\$3.76	\$13.34	14.7%	52.4%
Kansas	\$17.33	\$2.04	\$9.49	11.8%	54.8%
Kentucky	\$32.87	\$7.30	\$14.19	22.2%	43.2%
Louisiana	\$28.43	\$6.69	\$12.33	23.5%	43.4%
Maine	\$12.63	\$1.61	\$5.15	12.8%	40.8%
Maryland	\$47.73	\$7.48	\$26.56	15.7%	55.7%
Massachusetts	\$69.53	\$13.26	\$34.00	19.1%	48.9%
Michigan	\$56.51	\$9.74	\$25.76	17.2%	45.6%
Minnesota	\$58.25	\$8.22	\$31.27	14.1%	53.7%
Mississippi	\$26.64	\$5.21	\$10.64	19.6%	39.9%
Missouri	\$49.38	\$5.88	\$23.90	11.9%	48.4%
Montana	\$8.62	\$1.29	\$3.71	14.9%	43.0%
Nebraska	\$21.46	\$2.38	\$11.99	11.1%	55.9%
Nevada	\$10.31	\$1.72	\$5.12	16.7%	49.6%
New Hampshire	\$11.03	\$1.20	\$5.60	10.9%	50.8%
New Jersey	\$41.61	\$5.97	\$22.91	14.3%	55.1%
New Mexico	\$15.10	\$4.40	\$5.43	29.1%	36.0%
New York	\$143.53	\$31.53	\$68.96	22.0%	48.0%
North Carolina	\$71.86	\$10.77	\$32.73	15.0%	45.6%
North Dakota	\$11.38	\$1.09	\$6.79	9.5%	59.7%
Ohio	\$94.05	\$16.17	\$45.13	17.2%	48.0%
Oklahoma	\$19.11	\$2.91	\$8.54	15.2%	44.7%
Oregon	\$71.51	\$13.66	\$32.51	19.1%	45.5%
Pennsylvania	\$133.77	\$21.17	\$62.94	15.8%	47.0%
Puerto Rico	\$47.33	\$15.10	\$10.35	31.9%	21.9%
Rhode Island	\$6.57	\$1.25	\$3.09	19.0%	47.1%
South Carolina	\$27.10	\$4.25	\$11.86	15.7%	43.8%
South Dakota	\$13.45	\$1.54	\$6.83	11.4%	50.8%
Tennessee	\$67.81	\$11.53	\$30.34	17.0%	44.7%
Texas	\$146.64	\$23.81	\$78.41	16.2%	53.5%
Utah	\$40.99	\$4.25	\$26.97	10.4%	65.8%
Vermont	\$6.66	\$1.37	\$2.54	20.5%	38.2%
Virginia	\$59.85	\$6.07	\$31.73	10.1%	53.0%
Washington	\$43.87	\$7.63	\$21.92	17.4%	50.0%
West Virginia	\$14.11	\$2.40	\$4.14	17.0%	29.3%
Wisconsin	\$94.65	\$12.80	\$48.17	13.5%	50.9%
Wyoming	\$2.10	\$0.23	\$1.09	11.0%	52.2%
<b>TOTAL</b>	<b>\$2,418.4</b>	<b>\$417.3</b>	<b>\$1,160.8</b>	<b>17.3%</b>	<b>48.0%</b>

Source: Author calculations

**Table 6: Annual Biosimilar Generated Savings by State Under the 50 Percent Market Share Scenario: Total, Medicaid, and Commercial Sector Savings (in millions)**

	TOTAL	MEDICAID	COMMERCIAL	MEDICAID SAVINGS % OF TOTAL	COMMERCIAL SAVINGS % OF TOTAL
Alabama	\$64.61	\$10.35	\$26.51	16.0%	41.0%
Alaska	\$8.02	\$1.67	\$3.74	20.8%	46.6%
Arizona	\$120.42	\$22.82	\$54.06	18.9%	44.9%
Arkansas	\$41.28	\$8.60	\$15.75	20.8%	38.2%
California	\$340.20	\$79.30	\$170.18	23.3%	50.0%
Colorado	\$80.29	\$14.22	\$43.05	17.7%	53.6%
Connecticut	\$44.48	\$7.29	\$22.78	16.4%	51.2%
D.C.	\$10.44	\$2.60	\$5.74	24.9%	55.0%
Delaware	\$11.09	\$1.28	\$4.34	11.6%	39.2%
Florida	\$402.40	\$61.14	\$164.51	15.2%	40.9%
Georgia	\$99.09	\$14.93	\$51.31	15.1%	51.8%
Hawaii	\$19.87	\$3.02	\$10.11	15.2%	50.9%
Idaho	\$15.96	\$2.27	\$7.48	14.2%	46.8%
Illinois	\$134.27	\$23.05	\$70.62	17.2%	52.6%
Indiana	\$77.33	\$11.45	\$38.25	14.8%	49.5%
Iowa	\$48.37	\$7.06	\$25.04	14.6%	51.8%
Kansas	\$31.15	\$3.59	\$16.68	11.5%	53.5%
Kentucky	\$63.73	\$14.06	\$27.31	22.1%	42.9%
Louisiana	\$55.86	\$13.11	\$24.12	23.5%	43.2%
Maine	\$25.02	\$3.19	\$10.17	12.7%	40.6%
Maryland	\$92.40	\$14.41	\$51.12	15.6%	55.3%
Massachusetts	\$137.20	\$26.10	\$66.87	19.0%	48.7%
Michigan	\$110.05	\$18.84	\$49.77	17.1%	45.2%
Minnesota	\$115.32	\$16.25	\$61.77	14.1%	53.6%
Mississippi	\$52.64	\$10.26	\$20.92	19.5%	39.8%
Missouri	\$95.56	\$11.28	\$45.78	11.8%	47.9%
Montana	\$16.82	\$2.49	\$7.17	14.8%	42.6%
Nebraska	\$41.85	\$4.61	\$23.25	11.0%	55.5%
Nevada	\$19.16	\$3.15	\$9.36	16.4%	48.9%
New Hampshire	\$21.48	\$2.33	\$10.82	10.9%	50.4%
New Jersey	\$78.88	\$11.20	\$42.96	14.2%	54.5%
New Mexico	\$29.60	\$8.59	\$10.60	29.0%	35.8%
New York	\$274.66	\$59.83	\$130.69	21.8%	47.6%
North Carolina	\$141.05	\$21.05	\$63.90	14.9%	45.3%
North Dakota	\$21.44	\$2.02	\$12.64	9.4%	59.0%
Ohio	\$184.60	\$31.61	\$88.17	17.1%	47.8%
Oklahoma	\$37.87	\$5.74	\$16.87	15.2%	44.5%
Oregon	\$140.04	\$26.62	\$63.31	19.0%	45.2%
Pennsylvania	\$264.85	\$41.81	\$124.25	15.8%	46.9%
Puerto Rico	\$94.32	\$30.03	\$20.57	31.8%	21.8%
Rhode Island	\$12.60	\$2.37	\$5.86	18.8%	46.5%
South Carolina	\$52.04	\$8.06	\$22.48	15.5%	43.2%
South Dakota	\$26.57	\$3.03	\$13.45	11.4%	50.6%
Tennessee	\$133.42	\$22.59	\$59.41	16.9%	44.5%
Texas	\$278.66	\$44.82	\$147.35	16.1%	52.9%
Utah	\$81.48	\$8.44	\$53.55	10.4%	65.7%
Vermont	\$13.07	\$2.66	\$4.96	20.4%	37.9%
Virginia	\$116.95	\$11.80	\$61.66	10.1%	52.7%
Washington	\$84.04	\$14.48	\$41.57	17.2%	49.5%
West Virginia	\$27.24	\$4.53	\$7.79	16.6%	28.6%
Wisconsin	\$186.75	\$25.19	\$94.70	13.5%	50.7%
Wyoming	\$3.98	\$0.43	\$2.05	10.9%	51.5%
<b>TOTAL</b>	<b>\$4,680.5</b>	<b>\$801.6</b>	<b>\$2,227.4</b>	<b>17.1%</b>	<b>47.6%</b>



**Table 7: Annual Biosimilar Generated Savings by State Under the 75 Percent Market Share Scenario: Total, Medicaid, and Commercial Sector Savings (in millions)**

	TOTAL	MEDICAID	COMMERCIAL	MEDICAID SAVINGS % OF TOTAL	COMMERCIAL SAVINGS % OF TOTAL
Alabama	\$97.18	\$15.58	\$39.91	16.0%	41.1%
Alaska	\$12.04	\$2.50	\$5.61	20.8%	46.6%
Arizona	\$177.79	\$33.58	\$79.50	18.9%	44.7%
Arkansas	\$61.08	\$12.67	\$23.20	20.7%	38.0%
California	\$511.48	\$119.26	\$255.97	23.3%	50.0%
Colorado	\$118.55	\$20.94	\$63.38	17.7%	53.5%
Connecticut	\$64.93	\$10.58	\$33.05	16.3%	50.9%
D.C.	\$15.37	\$3.81	\$8.43	24.8%	54.8%
Delaware	\$16.45	\$1.89	\$6.40	11.5%	38.9%
Florida	\$598.95	\$90.78	\$244.17	15.2%	40.8%
Georgia	\$146.31	\$21.97	\$75.47	15.0%	51.6%
Hawaii	\$28.89	\$4.38	\$14.61	15.1%	50.6%
Idaho	\$23.76	\$3.37	\$11.10	14.2%	46.7%
Illinois	\$200.01	\$34.29	\$105.05	17.1%	52.5%
Indiana	\$115.94	\$17.17	\$57.34	14.8%	49.5%
Iowa	\$71.12	\$10.34	\$36.64	14.5%	51.5%
Kansas	\$44.36	\$5.05	\$23.46	11.4%	52.9%
Kentucky	\$95.05	\$20.95	\$40.67	22.0%	42.8%
Louisiana	\$84.21	\$19.78	\$36.41	23.5%	43.2%
Maine	\$37.49	\$4.77	\$15.23	12.7%	40.6%
Maryland	\$138.24	\$21.55	\$76.45	15.6%	55.3%
Massachusetts	\$205.92	\$39.18	\$100.38	19.0%	48.7%
Michigan	\$165.11	\$28.27	\$74.67	17.1%	45.2%
Minnesota	\$175.63	\$24.82	\$94.39	14.1%	53.7%
Mississippi	\$78.99	\$15.39	\$31.41	19.5%	39.8%
Missouri	\$143.44	\$16.93	\$68.74	11.8%	47.9%
Montana	\$24.97	\$3.69	\$10.61	14.8%	42.5%
Nebraska	\$62.96	\$6.94	\$35.00	11.0%	55.6%
Nevada	\$28.60	\$4.70	\$13.96	16.4%	48.8%
New Hampshire	\$31.92	\$3.46	\$16.05	10.8%	50.3%
New Jersey	\$116.68	\$16.52	\$63.36	14.2%	54.3%
New Mexico	\$44.20	\$12.81	\$15.80	29.0%	35.8%
New York	\$411.12	\$89.52	\$195.52	21.8%	47.6%
North Carolina	\$211.45	\$31.54	\$95.77	14.9%	45.3%
North Dakota	\$31.28	\$2.94	\$18.34	9.4%	58.6%
Ohio	\$277.99	\$47.65	\$132.91	17.1%	47.8%
Oklahoma	\$57.22	\$8.70	\$25.54	15.2%	44.6%
Oregon	\$208.09	\$39.48	\$93.84	19.0%	45.1%
Pennsylvania	\$400.46	\$63.33	\$188.30	15.8%	47.0%
Puerto Rico	\$144.10	\$46.29	\$31.76	32.1%	22.0%
Rhode Island	\$18.56	\$3.47	\$8.59	18.7%	46.3%
South Carolina	\$77.30	\$11.94	\$33.29	15.4%	43.1%
South Dakota	\$39.64	\$4.51	\$20.02	11.4%	50.5%
Tennessee	\$200.95	\$34.05	\$89.59	16.9%	44.6%
Texas	\$414.16	\$66.49	\$218.55	16.1%	52.8%
Utah	\$123.10	\$12.76	\$80.99	10.4%	65.8%
Vermont	\$19.46	\$3.96	\$7.36	20.3%	37.8%
Virginia	\$174.53	\$17.59	\$91.92	10.1%	52.7%
Washington	\$124.93	\$21.49	\$61.66	17.2%	49.4%
West Virginia	\$40.89	\$6.81	\$11.71	16.6%	28.6%
Wisconsin	\$280.06	\$37.78	\$142.01	13.5%	50.7%
Wyoming	\$5.86	\$0.64	\$3.00	10.8%	51.2%
<b>TOTAL</b>	<b>\$6,998.8</b>	<b>\$1,198.9</b>	<b>\$3,327.1</b>	<b>17.1%</b>	<b>47.5%</b>

Source: Author calculations

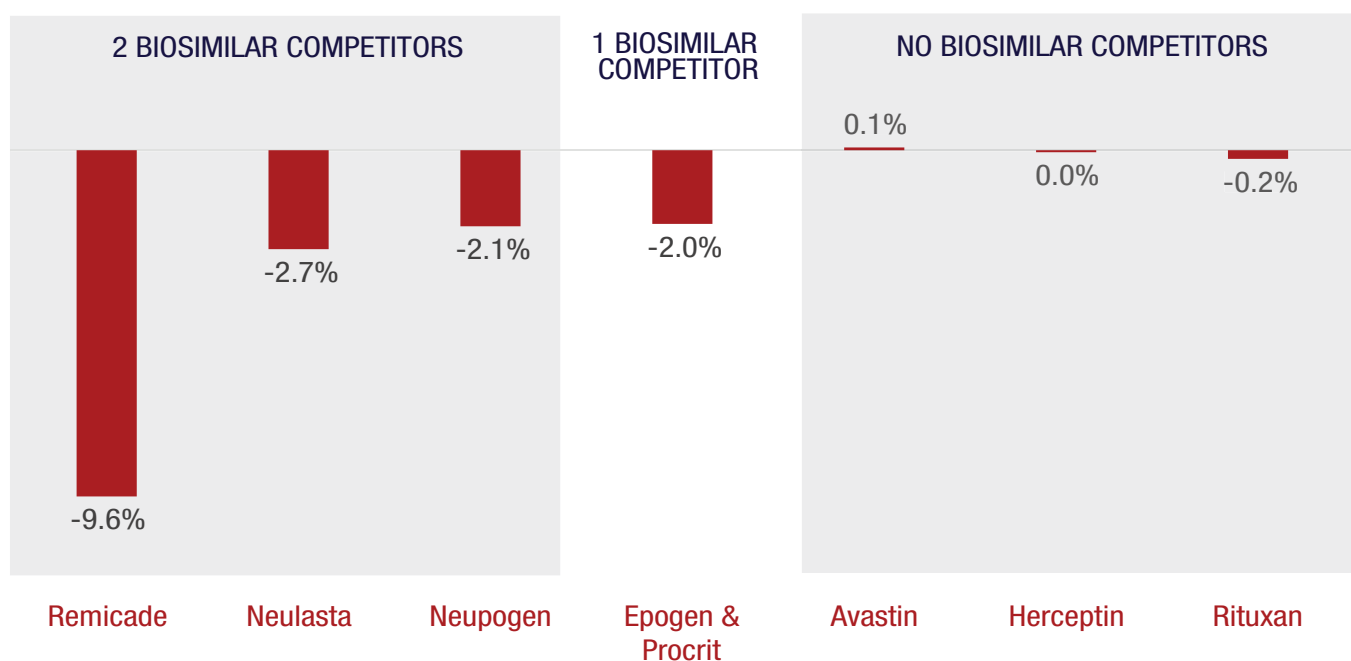
Tables 5 through 7 also illustrate that, initially, Medicare can expect to reap a larger share of the savings. This arises because Zarxio (in the Filgrastim drug class) is driving the current realized savings, but, according to the GAO, Medicare's share of Filgrastim expenditures (18 percent) is the second lowest among the nine drug classes considered (Epoetin Alfa's share is 11 percent). It logically follows that Medicare will reap a larger portion of the savings as biosimilars gain market share in drug classes where Medicare is responsible for a larger proportion of the expenditures. However, this is a temporary impact. As the market share for biosimilars all reach similar levels (e.g. they approximate Zarxio's current 55 percent of the market), the distribution of the potential savings for each payer (Medicare, Medicaid, and the commercial sector) will reflect the payer's share of the expenditures.

It is important to emphasize, as noted in the previous study as well, the estimated savings are not one-time savings. The savings will accrue every year, and have the potential to expand should even more originator biologics face competition.

## The Additional Benefits from Competition – The Impact on Originator Prices

As mentioned earlier, biosimilar competition creates additional benefits that accrue to the commercial sector, Medicaid programs, and the federal government that the above estimates do not capture. As is typical in competitive markets, the prices of higher-priced goods often decline when faced with lower-priced goods of equal quality. As an indication that this incentive impacts the originator biologic market, Figure 1 compares the prices effective July through September 2019 to the prices effective April through June 2019 for the seven originator drug classes with updated pricing data.<sup>8</sup> Figure 1 illustrates that the originator biologics that face biosimilar competition reduced their prices, while the prices for originator biologics without biosimilar competition were generally unchanged.

**Figure 1: Change in Originator Biologic Prices: Prices Effective April through June 2019 - Compared to Prices Effective July through September 2019**

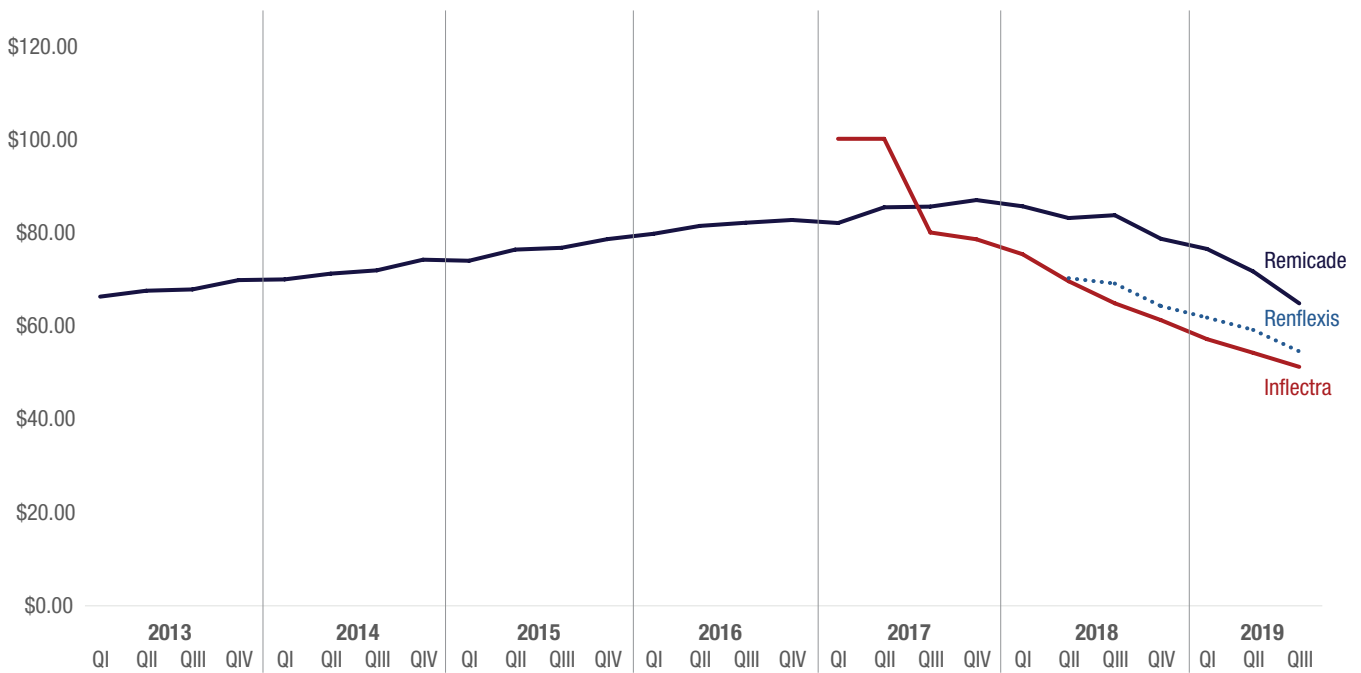


Source: Author calculations based on CMS data

Over a longer time period, the incentive for the originator biologic to decrease its price in the face of greater biosimilar competition has varied. Essentially, only two originator biologics – Remicade (Inflectra drug class) and Neupogen (Filgrastim drug class) – have faced biosimilar competition for a prolonged period of time. As Figures 2 and 3 demonstrate, the price response of the originator biologic differed between these two drug classes.

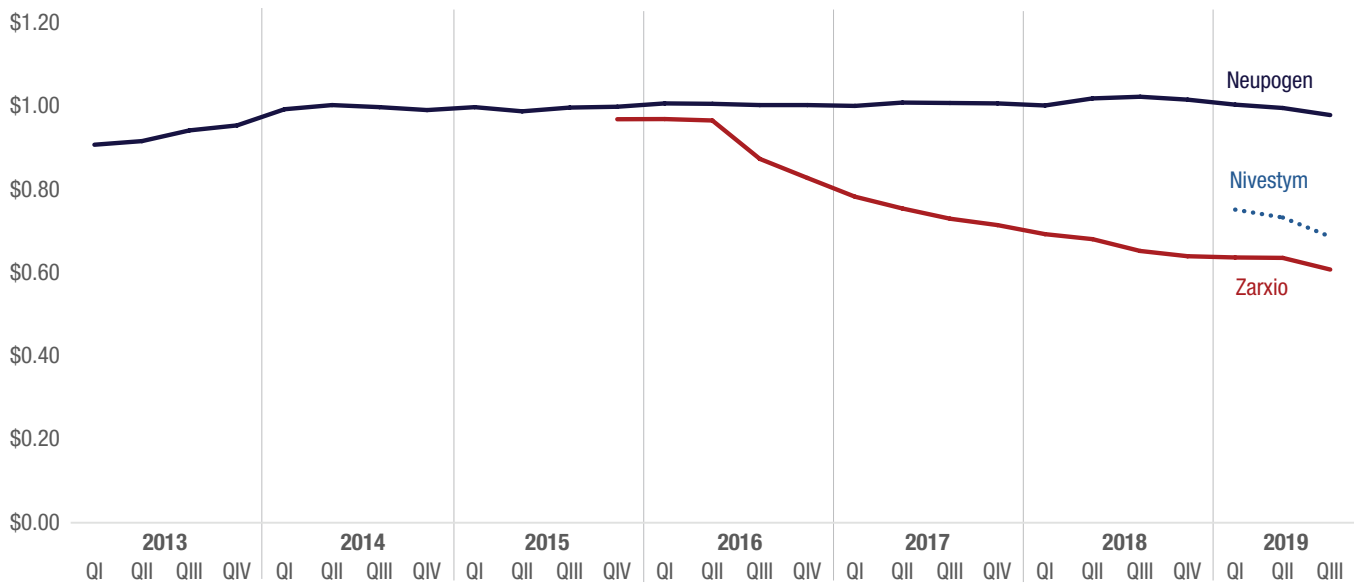
The introduction of Inflectra (a biosimilar competitor to Remicade) coincided with a noticeable decline in Remicade’s pricing despite limited market penetration for the biosimilars, indicating that the mere presence of a competitor can impact originator pricing. Remicade prices had been growing about 5.5 percent annually between 2013 and 2017 (prior to the introduction of Inflectra). Since the introduction of Inflectra, Remicade’s prices declined 25.5 percent. At Remicade’s current volumes, the decline in Remicade’s price has lowered overall expenditures by \$1.5 billion compared to the expenditures that would had occurred had Remicade’s peak price (2017 Q4) persisted. These savings are in addition to the savings enabled by the lower cost biosimilars (Inflectra and Renflexis). As Figure 3 illustrates, the introduction of Zarxio (a biosimilar competitor to Neupogen) did not incent the same price declines. Effectively, Neupogen’s price had been relatively stable both prior to and following the introduction of Zarxio.

**Figure 2**  
**Infliximab Prices: Remicade (originator), Inflectra, and Renflexis**  
**2013 Q1 through 2019 Q3**



Source: Author calculations based on CMS data

**Figure 3**  
**Filgrastim Prices: Neupogen (originator), Zarxio, and Nivestym**  
**2013 Q1 through 2019 Q3**



Source: Author calculations based on CMS data

As with most industries, the competitive process manifests itself differently across different products. Thus, while competition will sometimes incent declines in the originator prices, such impacts are not universal. Additionally, the price discount offered by low-cost competitors matters too. While the evidence is still developing, the current case studies support the notion that, because the biosimilars value proposition is offering patients the same quality medicine at lower prices, the initial price discount needs to be substantial in order to incent the health care system to switch to these medicines.

## Conclusion

Biologic medicines have enabled important medical advances that have improved the lives of millions of Americans. Biosimilars should be contributing to these advances by promoting greater affordability of these treatments. This study further documents the potential affordability benefits biosimilars could offer by estimating the potential savings for the nine drug classes with approved biosimilar competition by state, and by payer. Overall, state Medicaid programs can save tens of millions of dollars, and the potential savings for the commercial market are even greater.

These potential savings demonstrate that private sector firms and state governments all have an incentive to support reforms to the current system. These reforms must correct the current ineffective regulatory policies, promote greater education of the benefits biosimilars offer, and eliminate the adverse market incentives that discourage greater use of biosimilars. Eliminating these obstructions that are preventing the health care system from realizing the savings potential of biosimilars will increase the accessibility of high quality, affordable, health care for patients.

## Endnotes

- 1 DiMasi JA, Grabowski HG, and Hansen RW (2016) “Innovation in the pharmaceutical industry: New estimates of R&D costs” *Journal of Health Economics* Vol. 47, May; <https://www.sciencedirect.com/science/article/abs/pii/S0167629616000291?via%3Dihub>.
- 2 Hartson, A (2019) “How the U.S. Compares to Europe on Biosimilar Approvals and Products in the Pipeline” *Rothwell Figg*, May 7; <https://www.biosimilarsip.com/2019/05/07/how-the-u-s-compares-to-europe-on-biosimilar-approvals-and-products-in-the-pipeline-4/>.
- 3 Winegarden W (2019) “Incenting Competition to Reduce Drug Spending: The biosimilar opportunity” *Pacific Research Institute Center for Medical Economics and Innovation*, July; [https://www.pacificresearch.org/wp-content/uploads/2019/07/BiosimilarsCompetition\\_F.pdf](https://www.pacificresearch.org/wp-content/uploads/2019/07/BiosimilarsCompetition_F.pdf).
- 4 Mahl MA (2018) “Current Policy on Access to Medicines and Health in Europe: The role of Biosimilar Medicines” *Presentation: Association for Accessible Medicines Conference*, Baltimore, MD, September 5; [https://accessiblemeds.org/sites/default/files/2018-09/Marc\\_Alexander\\_Mahl.pdf](https://accessiblemeds.org/sites/default/files/2018-09/Marc_Alexander_Mahl.pdf).
- 5 Humira and Enbrel are covered under the Medicare Part D program, not Part B like the other drug classes, and may be self-administered at home. Since these medicines are not covered under Part B, there is no ASP data, which is the source for the pricing data for the other seven drug classes. CMS tracks the spending trends for Part B drugs including the total expenditures and expenditures per unit, which are used as the estimated pricing data for these medicines.
- 6 (2017) “MEDICARE PART B: Medicare Represented at Least Half of the Market for 22 of the 84 Most Expensive Drugs in 2015” *Government Accountability Office*, December, GAO-18-83; <https://www.gao.gov/assets/690/689082.pdf>.
- 7 Medicare’s share of coverage is adjusted to exclude the uninsured population. Therefore, the analyses assume that all biologic medicines are administered to patients covered by private or public health insurance. The base data are from: “Health Insurance Coverage of the Total Population: 2017 Data” *Kaiser Family Foundation*; <https://www.kff.org/other/state-indicator/total-population/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>.
- 8 Prices are defined as the ASP including a 6 percent mark-up.

## About the Author

### Wayne Winegarden, Ph.D.

Wayne H. Winegarden, Ph.D. is a Senior Fellow in Business and Economics at the Pacific Research Institute and director of PRI's Center for Medical Economics and Innovation. He is also the Principal of Capitol Economic Advisors.

Dr. Winegarden has 25 years of business, economic, and policy experience with an expertise in applying quantitative and macroeconomic analyses to create greater insights on corporate strategy, public policy, and strategic planning. He advises clients on the economic, business, and investment implications from changes in broader macroeconomic trends and government policies. Clients have included Fortune 500 companies, financial organizations, small businesses, state legislative leaders, political candidates and trade associations.

Dr. Winegarden's columns have been published in the *Wall Street Journal*, *Chicago Tribune*, *Investor's Business Daily*, *Forbes.com*, and *Townhall.com*. He was previously economics faculty at Marymount University, has testified before the U.S. Congress, has been interviewed and quoted in such media as CNN and Bloomberg Radio, and is asked to present his research findings at policy conferences and meetings. Previously, Dr. Winegarden worked as a business economist in Hong Kong and New York City; and a policy economist for policy and trade associations in Washington D.C. Dr. Winegarden received his Ph.D. in Economics from George Mason University.

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