

The Cost-Benefit Balance of Statins in Hawai'i: A Moving Target

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Abstract

Statins are lipid-lowering medications used for primary and secondary prevention of atherosclerotic disease and represent a substantial portion of drug costs in the United States. A better understanding of prescribing patterns and drug costs should lead to more rational utilization and help constrain health care expenditures in the United States.

The 2013 Medicare Provider Utilization and Payment Data: Part D Prescriber Public Use File for the State of Hawai'i was analyzed. The number of prescriptions for statins, total annual cost, and daily cost were calculated by prescriber specialty and drug. Potential savings from substituting the highest-cost statin with lower-cost statins were calculated. Over 421,000 prescriptions for statins were provided to Medicare Part D beneficiaries in Hawai'i in 2013, which cost \$17.6M. The three most commonly prescribed statins were simvastatin (33.4%), atorvastatin (33.4%), and lovastatin (13.9%). Although rosuvastatin comprised 5.4% of the total statin prescriptions, it represented 30.1% of the total cost of statins due to a higher daily cost (\$5.53/day) compared to simvastatin (\$0.25/day) and atorvastatin (\$1.10/day). Cardiologists and general practitioners prescribed the highest percentage of rosuvastatin (8% each). Hypothetical substitution of rosuvastatin would have resulted in substantial annual cost savings (Simvastatin would have saved \$1.3M for 25% substitution and \$5.1M for 100% substitution, while atorvastatin would have saved \$1.1M for 25% substitution and \$4.3M for 100% substitution). Among Medicare Part D beneficiaries in Hawai'i, prescribing variation for statins between specialties was observed. Substitution of higher-cost with lower-cost statins may lead to substantial cost savings.

Keywords

Statins, Cost-Benefit, Cost-Effective, Rosuvastatin, Healthcare Expenditure, Medicare

Introduction

In 2012, 2.8% of adults in Hawai'i had been told they have some form of coronary heart disease (CHD).¹ Statins are the most commonly prescribed lipid-lowering medications used for primary and secondary prevention of CHD.^{2,3} From 2003 to 2012, the use of statins among all adults aged 40 years and older increased from 18% to 26% in the United States.⁴ Also, in 2013, the American College of Cardiology (ACC) and the American Heart Association (AHA) released updated cholesterol guidelines that presented a landmark change in the recommended evaluation and medical management of patients with hyperlipidemia, greatly expanding the indications for statin therapy.⁵⁻⁷ Rather than low-density lipoprotein cholesterol (LDL-C) targeted therapy, the 2013 ACC/AHA guidelines suggested moderate- or high-intensity statin therapy based on coronary artery disease risk, a change estimated to increase the statin-eligible population by 12.8 million.⁸

Statin medications generated over \$16 billion in sales in the United States in 2012.⁹ Although statins comprise a substantial portion of drug costs in the United States, they are judged to be cost-effective, as they have been shown to reduce the risk

of acute coronary syndrome and stroke, which in turn reduce the costs of hospitalizations and the requirements for more expensive interventions, including coronary angiography and percutaneous coronary intervention.¹⁰ Over the past 2 years, as spending on prescription drugs has risen sharply in the United States, legislators are evaluating policies to reduce prescription drug spending.¹¹ A better understanding of prescribing patterns may produce strategies for reducing such costs, while maintaining adherence to evidence-based care. The goal of our study was to assess the prescribing patterns of statins among Medicare patients in the State of Hawai'i, with a specific focus on the use of generic and non-generic statins.

Methods

This was a retrospective, cross-sectional analysis of the 2013 Medicare Provider Utilization and Payment Data: Part D Prescriber Public Use File (PUF) for the State of Hawai'i. We analyzed the prescribing patterns by provider specialty, total costs of different statin medications, and the potential effect of substitution with lower cost statin medications. The structure and contents of the database are described in "A Methodological Overview"¹² from the Centers for Medicare and Medicaid Services. The PUF contains prescription drug event information for each prescriber by National Provider Identifier (NPI). The file does not contain beneficiary-level information or indication(s) for the drug prescribed. Only drugs covered under the outpatient Part D benefit are included in the database.

For each drug prescribed by a provider, payment (medication cost), claim count (if >10), day's supply, drug name, generic name, and provider specialty were available for analysis. Providers were characterized as cardiologists, family practitioners, general practitioners, internists, mid-level practitioners (nurse practitioners and physician assistants), and other specialists. The number of prescriptions, total annual cost, and daily costs were calculated according to provider specialty and for the most common prescribed statin medications. Daily costs were calculated using the total cost of a medication divided by the days supplied.

Hypothetical annual savings from substituting the highest-cost statin (rosuvastatin) with lower-cost, commonly-prescribed statins (simvastatin and atorvastatin) were estimated without correction for potential differences in efficacy. Atorvastatin is considered a "high-intensity" statin with anti-hypercholesterolemic efficacy similar to rosuvastatin,¹³ while simvastatin is considered a moderate-intensity drug. In sensitivity analyses, we varied the proportion of rosuvastatin that were substituted from 25% through 100%.

Results

The 2013 Medicare Part D PUF for Hawai'i had records from a total of 1075 providers (44% internists, 26% family practitioners, 12% other specialists, 9% mid-level providers, 5% cardiologists, and 4% general practitioners), and contained a total of 421,000 statin prescriptions, which generated a total of \$17.6M in drug costs. Figure 1 shows the distribution of statin drug prescriptions in Hawai'i in 2013. The three most commonly prescribed statins were simvastatin (33.4% of total statins), atorvastatin (33.4%) and lovastatin (13.9%). The three statin medications that comprised the greatest costs included atorvastatin (\$7.9M, 44.8% of total cost), rosuvastatin (\$5.3M, 30.1% of total cost) and simvastatin (\$1.9M, 10.9% of total cost) [Figure 2]. Although rosuvastatin comprised only 5.4% of the total statin prescriptions, it represented 30.1% of the total cost for statins. Rosuvastatin had the highest daily cost (\$5.53/day) and simvastatin had the lowest daily cost (\$0.25/day) [Figure 3].

The analyses of prescriptions by specialty showed that internists wrote 265,763 prescriptions for statins (63% of the total), family practitioners 85,850 prescriptions (20%), cardiologists 21,631 prescriptions (5%), general practitioners 17,833 prescriptions (4%), mid-level practitioners 11,292 prescriptions (3%), and other specialists were responsible for 18,631 prescriptions for statins (4% of the total). The proportion of each statin that was prescribed for each specialty is shown in Figure 4. Cardiologists prescribed much more atorvastatin than simvastatin (atorvastatin 52% vs simvastatin 22%) compared to all other practitioners (atorvastatin 28% to 33% vs. simvastatin 30% to 39%). Cardiologists and general practitioners prescribed a higher percentage of rosuvastatin (8% each) compared to internists (6%), family practitioners (4%), mid-level practitioners (3%), and other specialists (5%) [Figure 5].

Hypothetical substitution of rosuvastatin resulted in substantial annual cost savings using either simvastatin (\$1.3M for 25% substitution to \$5.1M for 100% substitution) or atorvastatin (\$1.1M for 25% substitution to \$4.3M for 100% substitution) [Figure 6].

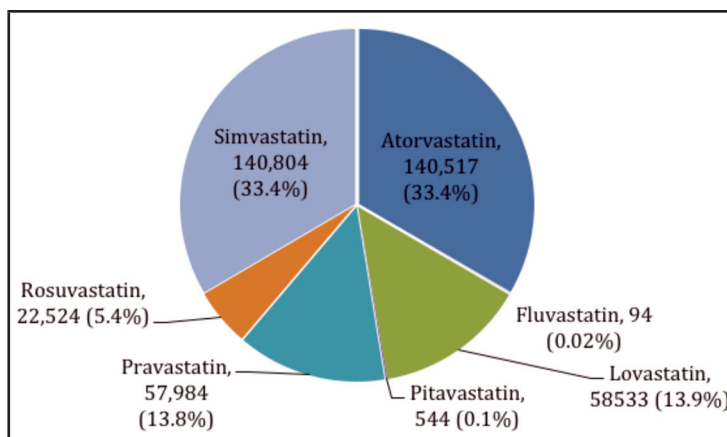


Figure 1. Distribution of statin prescriptions among Medicare part D recipients in Hawai'i in 2013 obtained from the Medicare Fee-For Service Provider Utilization & Payment Data Part D Prescriber Public Use File.

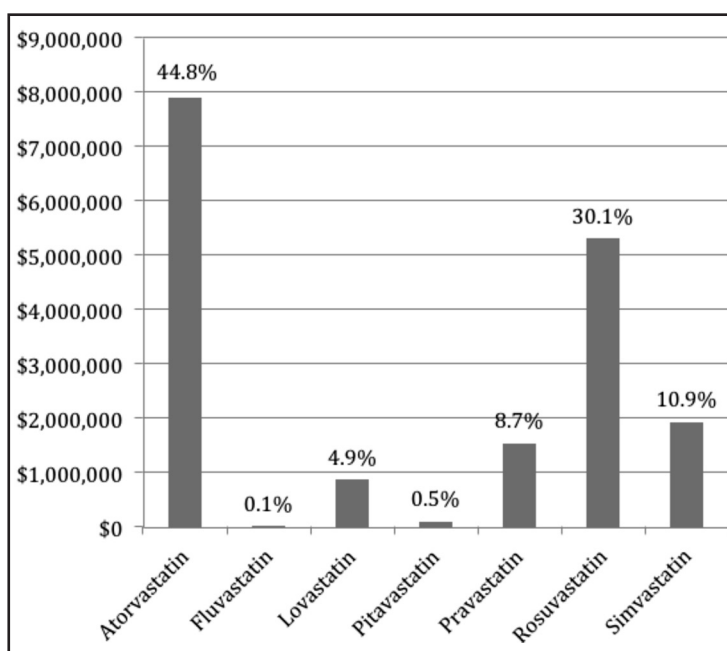


Figure 2. Total cost of statins prescribed for Medicare part D in Hawai'i in 2013.

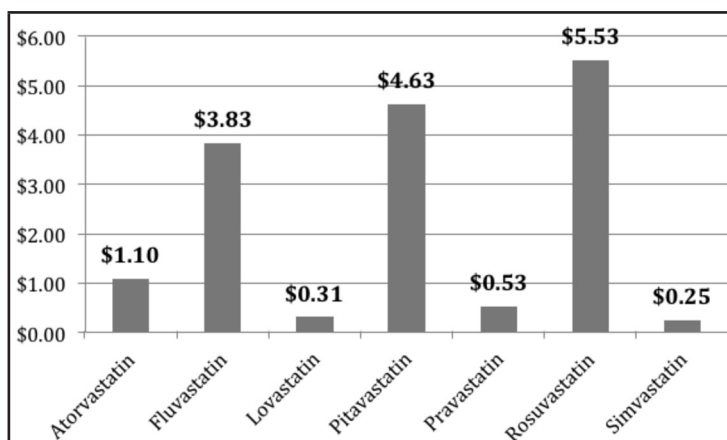
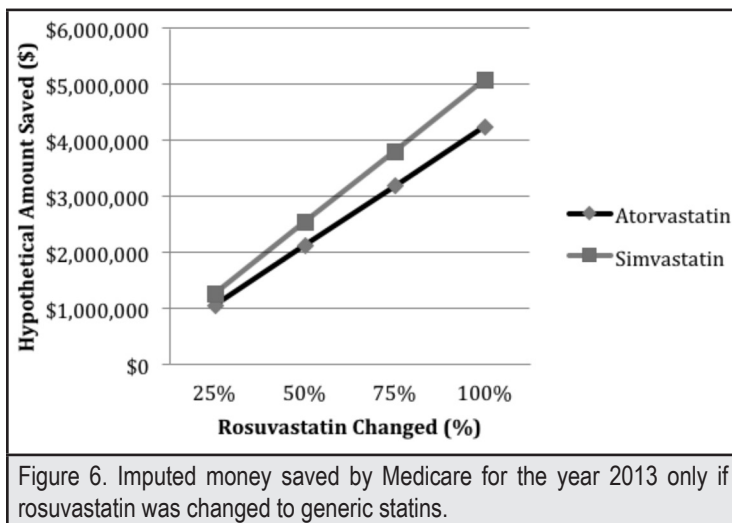
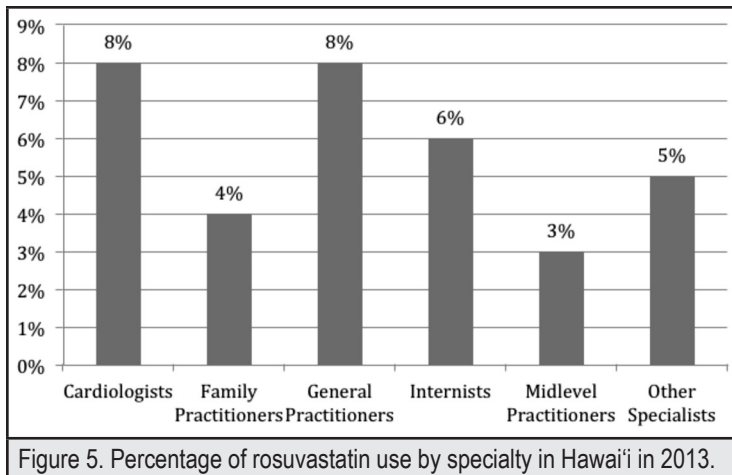
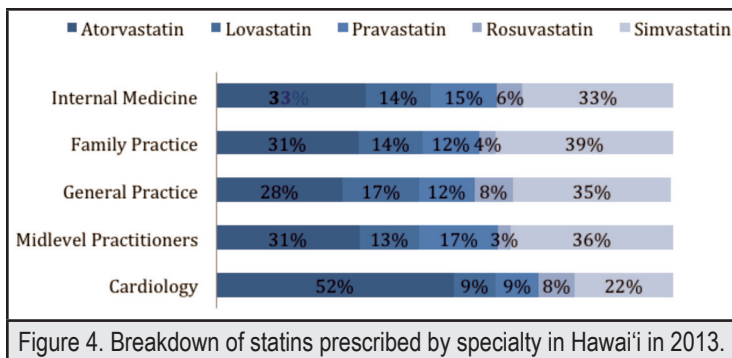


Figure 3. Cost per day of statin medications, calculated by the total cost of the drug divided by the days supply.



Discussion

Our study observed variation in the prescribing of statins between different provider specialties among Medicare Part D beneficiaries in Hawai'i in 2013. Cardiologists prescribed more atorvastatin compared to other specialties. Atorvastatin and simvastatin were the most commonly prescribed statins. Rosuvastatin made up a small portion of statin prescriptions but produced the second highest cost due to having the highest cost per day. Simvastatin, on the other hand, was the most prescribed statin but had the lowest cost per day.

One likely explanation for the variation in prescribing patterns is that cardiologists see a greater proportion of patients with established CHD so their prescription for a high-intensity statin, which is indicated for this diagnosis, may be greater than other specialty groups. Yet, General Practice physicians, who would be expected to care for a lower percentage of patients requiring intensive therapy, were found to be prescribing rosuvastatin as much as cardiologists (8%). One possible explanation could be differences in the effectiveness of pharmaceutical marketing to different specialties, another might be practice patterns that are formed early and could be "stickier" for general practitioners, who need to master a much broader palette of drugs.

The popularity of rosuvastatin among providers may be explained by previous studies suggesting it to be more cost-effective compared to other statins.¹⁴⁻¹⁷ However, when these papers were written, most statins were not yet generic. Since these analyses, most statins, including those comparable to rosuvastatin, have become generic. Another possible reason rosuvastatin is popular among providers may be the perception that it has superior clinical efficacy compared to other statins. However, this was disproven in the 2011 SATURN trial, where high dose atorvastatin and rosuvastatin resulted in a similar degree of regression of coronary atherosclerosis as measured via intravascular ultrasonography.¹³ In addition, the 2013 ACC/AHA guidelines have changed the approach to prescribing statin therapy for providers. Previous to the release of the 2013 ACC/AHA guidelines, providers prescribed statins based on guidelines released in 2001, when pharmacologic therapy was directed to reach specific LDL-C goals.⁷ If the goal LDL-C was not reached with the first therapy, then the patient was placed on additional agents until the goal LDL-C was achieved. This occasionally led to multiple lipid-lowering medications, including combinations of statins, fenofibrates, and bile acid sequestrants. With the 2013 ACC/AHA guidelines, although more patients have indications for statin therapy, fewer patients are likely to be on multi-drug lipid-lowering therapy for either primary or secondary prevention of cardiovascular disease, resulting in a marked shift in the cost-benefit balance such that rosuvastatin now has the

least economic efficiency for primary or secondary prevention of cardiovascular events.

However, as of April 2016, the United States Food and Drug Administration approved the first generic version of rosuvastatin, previously sold as “Crestor”. Currently, AstraZeneca is petitioning to overturn that decision, but if approved, the release of generic rosuvastatin may help alleviate some of the substantial costs of statin medications. However, repeat cost analyses will be needed to determine the effects this will have on medication costs.

The findings of this retrospective analysis could have considerable financial consequences. Among Medicare Part D beneficiaries in Hawai‘i, substitution of higher-cost statins with lower-cost statins could lead to substantial cost-savings. The release of generic medications, new clinical studies and new guidelines may alter the cost-effectiveness of statin therapy so that repeat cost-effective analyses of statin therapy are recommended. Our data could translate into public policy changes that could help produce a less expensive outcome including a statin-prescribing algorithm where less expensive statins are preferred over more expensive ones of equivalent efficacy. For example, a provider would prescribe atorvastatin over rosuvastatin if a high-intensity statin is required or simvastatin over rosuvastatin if a moderate-intensity statin is required. In addition, there should be more focused education for the parties responsible for inappropriately prescribing more expensive medications, not only statins. Our study includes statewide data on Medicare Part D recipients so our data can be generalized to this specific population in Hawai‘i. If applied on a national level, the potential cost-savings could help ameliorate a substantial amount of health care costs in the United States.

Limitations of this analysis include that our data reflect statin prescriptions prior to the broad dissemination of the 2013 ACC/AHA guidelines. Furthermore, the data does not include patient-level information or clinical characteristics including any adverse effects to previous medications, to evaluate the appropriateness of statin selection, nor does it contain cholesterol data to demonstrate any objective measure of drug efficacy. Another limitation of our study includes the assumption that different doses of the same medication were the same price due to the lack of drug dose data.

Conclusion

Despite the availability of generic statins that are less costly compared to brand name statins, there are a considerable number of prescriptions for expensive, brand name statins in our community. Prescribing providers often get into prescribing habits or patterns without a consideration for cost. Providers should be evaluating and evolving their clinical practice and prescribing patterns based on updated guidelines, recent studies, and availability of generic medications.

Furthermore, the cost-benefit balance of a particular drug class is a dynamic process based on the approval or disapproval of new medications or generic versions of medications. As our understanding of medicine progresses, therapies and guide-

lines for the treatment of diseases change. For these reasons, repeat cost-benefit analyses following drug cost and therapy-recommendation changes are recommended to provide a more thoughtful approach to the expense of prescription medications.

Conflict of Interest

None of the authors identify any conflicts of interest.

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