

Background and Objective

In China, the number of people with dyslipidemia has exceeded 400 million. Atorvastatin calcium tablets and rosuvastatin calcium tablets, as widely used lipid-lowering agents in clinical practice, have long dominated the Chinese retail market with a market share of several billion RMB.

However, due to the competitive market environment, retail drug prices in China are often non-transparent and inflated, imposing a heavy financial burden on patients with hyperlipidemia who require long-term medication. In response, the government has disclosed retail pharmacy prices online and set reference prices for certain medications to regulate the retail sector. Therefore, this study aims to analyze the gap between retail pharmacy prices and reference prices using commonly prescribed statins as examples, providing evidence for price governance.

Methods

- Data sources:** Retail and reference price data on best-selling specifications of commonly used statin drugs were obtained from the Sichuan Provincial Health Insurance Administration platform.
- Selection criteria for drugs under evaluation:** The generic name of the drug must be either rosuvastatin calcium tablets or atorvastatin calcium tablets, and the number of retail pharmacies selling the product in Sichuan Province must exceed 500.
- Sampling:** The Sichuan Provincial Health Insurance Administration platform provides the retail prices of all pharmacies selling each drug in Sichuan Province. For analysis, we focused on Chengdu and obtained 50 sample prices for each drug specification. Pharmacies were first numbered in descending order of retail prices, and then 50 were drawn using Python’s random number generator within the range from 1 to the total number of pharmacies selling the drug.
- Price Comparison Index (PCI):** The PCI was defined as the ratio of the retail price to the reference price, used to assess the extent of retail price inflation. An independent samples *t*-test was conducted to compare the PCI between brand-name and generic drugs, and an OLS regression was performed to examine the relationship between the average PCI of different drugs and their normalized reference prices.

Results

Table 1. Basic information and price characteristics of drugs under evaluation

Drugs	Specification	Number of Pharmacies	Reference Price(¥)	Mean Price(¥)	Mean PCI
Rosuvastatin Calcium Tablets					
Brand Name Drugs					
A	10 mg × 28	952	155.20	122.14	0.79
A	10 mg × 7	752	38.80	49.50	1.28
Generic Drugs					
B	10 mg × 28	808	5.50	23.32	4.24
C	10 mg × 28	2008	7.52	22.10	2.94
D	10 mg × 28	2537	5.50	19.13	3.48
E	10 mg × 28	322	65.16	80.37	1.23
F	10 mg × 7	685	36.86	51.86	1.41
F	10 mg × 28	1363	147.44	143.84	0.98
Atorvastatin Calcium Tablets					
Brand Name Drugs					
G	10 mg × 7	1779	22.64	30.86	1.36
G	20 mg × 7	2853	38.49	45.27	1.18
G	10 mg × 28	1670	90.56	89.90	0.99
G	20 mg × 28	3286	153.96	157.95	1.03
Generic Drugs					
H	10 mg × 14	1183	2.73	24.29	8.90
H	20 mg × 7	764	2.38	22.54	9.47
I	10 mg × 28	8473	3.36	6.16	1.83
J	20 mg × 14	1555	2.86	13.25	4.63
J	10 mg × 14	1280	1.68	8.90	5.30
J	20 mg × 7	1876	27.65	19.07	0.69
J	10 mg × 7	2003	16.25	13.81	0.85

- Overview:** A total of 11 products were analyzed in this study, comprising 8 specifications of brand-name drugs (4 rosuvastatin calcium tablets and 4 atorvastatin calcium tablets) and 11 specifications of generic drugs (4 rosuvastatin calcium tablets and 7 atorvastatin calcium tablets), as shown in Table 1. The average number of pharmacies selling each product was 1,902.58, the average reference price was 43.40 RMB, the average retail price was 49.70 RMB, and the mean PCI was 2.77.
- Distribution of PCI: Generic vs. Brand Name:** The *t*-test results indicate that the PCI of brand name drugs is significantly higher than that of generic drugs (Mean of generic drugs: 3.96; brand name drugs: 1.13, *t* = 17.28, *p* < 2.2e-16). The histogram and kernel density curves show that the PCI of brand name drugs is more concentrated around 1, whereas that of generic drugs is more dispersed.

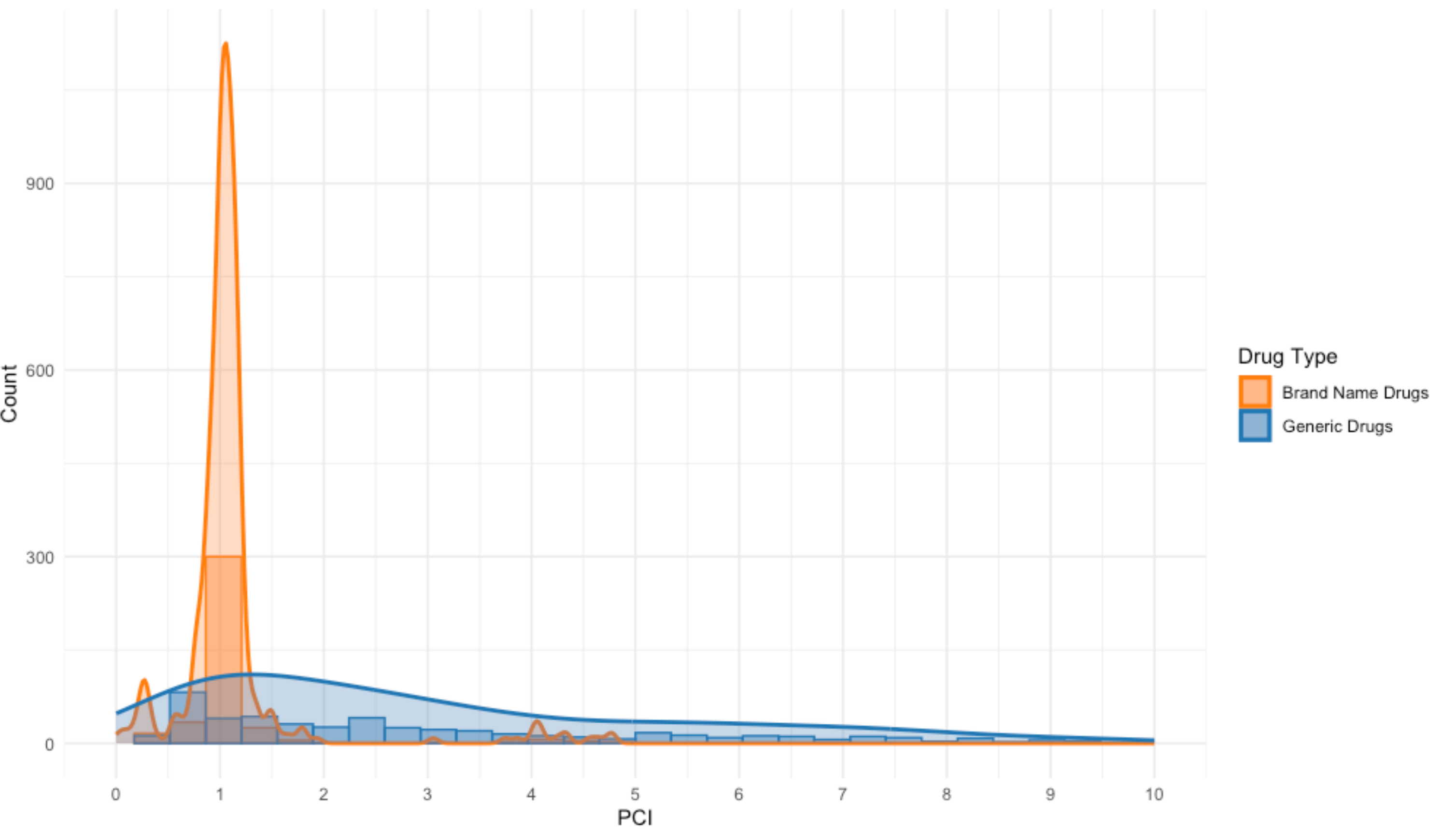


Figure 1. Distribution of PCI, Mean of generic drugs: 3.96; brand name drugs: 1.13, *t*=17.28 (*p* < 2.2e-16***).

- Relationship between PCI and Reference Price:** The univariable linear regression model showed a significant negative correlation between PCI and Reference Price. For every 10-yuan decrease in Reference Price, PCI increased by approximately 0.26 (Figure 2).

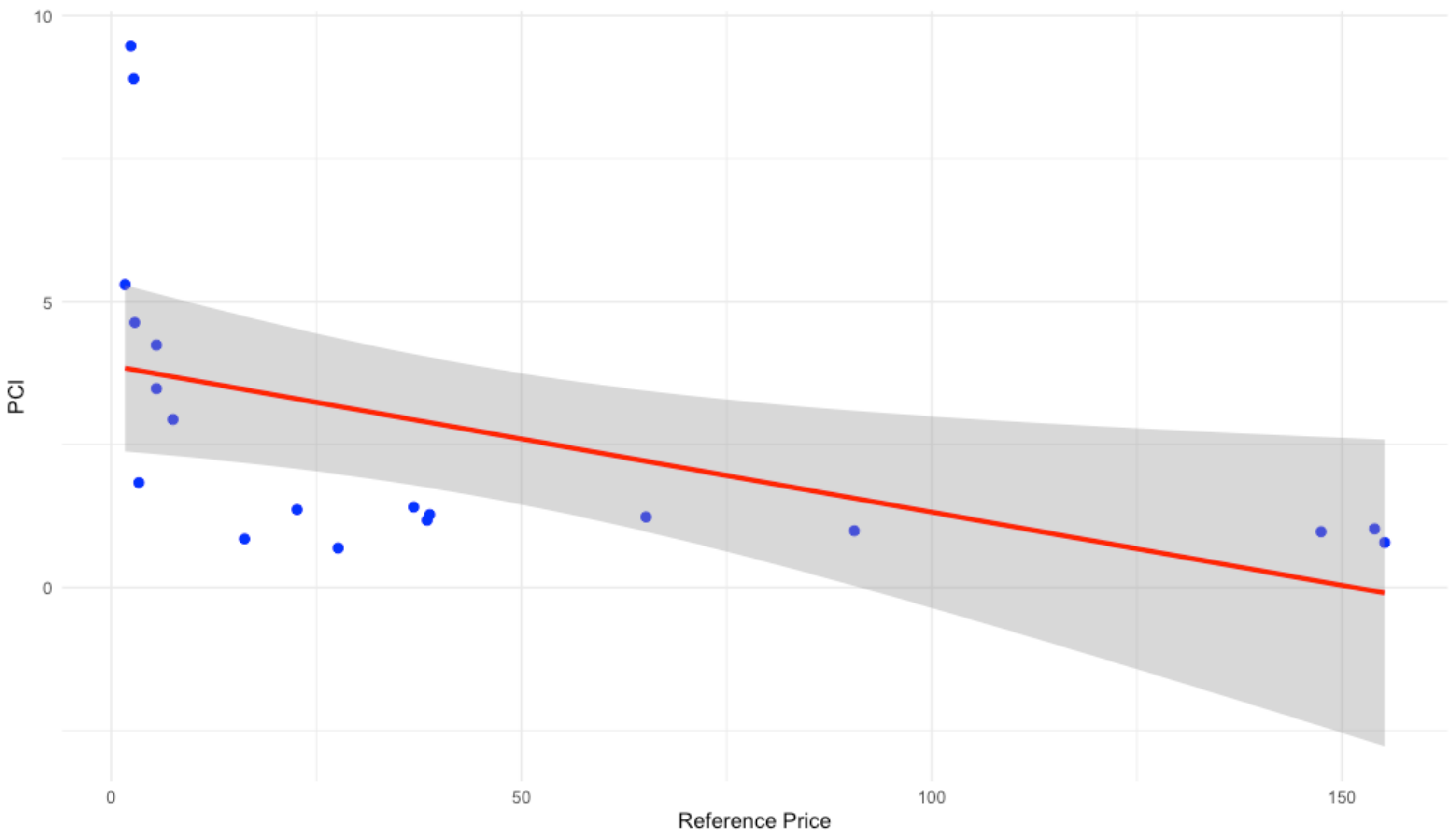


Figure 2. Fitted curve of the univariable linear regression model between Reference and Price Comparison Index, with a regression coefficient = -0.02560(*p* < 0.05*).

Conclusion and Suggestions

This study used the ratio of retail price to the government reference price (PCI) to assess the extent of retail price inflation. We found that the problem of inflated prices is more severe among generic drugs and low-priced products. Regulatory efforts should therefore focus on standardizing and supervising the sales practices of generic drugs and small-packaged products.