MSR145

Do Data Sources Matter? Comparing Market Cost and Payer Cost Approaches to Calculating Medical Spending Measures in Real-World Data

Timothy W. Smith[1], Caitlin Curnyn[1], Veronica Ansolabehere[1], Laura A. Weber[1], Teresa B. Gibson[2]
[1] HealthVerity, Philadelphia, PA, USA; [2] Hyvold Consulting, Rochester, NY, USA.

Key takeaway

In RWD studies where payer costs are unavailable or incomplete, market costs may be used as an appropriate substitute to estimate direct medical spending.

Background

- Direct medical spending measures from closed claims sources are commonly used for cost-focused real world data (RWD) studies. However, generalizability may be limited by the concentration of insurance plans in a given dataset, incompatible reimbursement rates, and missing or obfuscated payer costs.
- Relying on published Medicare rates to fill in cost gaps is unreliable as research has found that spending on privately insured beneficiaries is not well-correlated with Medicare spending.[1]
- Direct medical spending measures from open claims sources may be used in conjunction with closed claims sources to improve generalizability when payer cost data is limited.

Objective

This research aims to determine whether market-derived cost estimates are consistent with and translatable to payer-derived cost estimates for commercially insured patients.

Methods

- Identified patients in the HealthVerity taXonomy closed claims dataset with continuous commercial medical and pharmacy enrollment throughout 2024 who had both market and payer costs available. Excluded patients >65 years of age to eliminate those with Medicare coverage and excluded patients with >$29M annual spend to eliminate atypical spending patterns and outliers.
- Calculated total annual direct medical spending and employed agreement methodologies on the medical and prescription drug experiences of a random sample of the patients.
- Market costs measure allowed amount per unit, and unit costs are stratified by year, payer type, and geography. Unit costs from open claims can be multiplied by units (procedure units for medical and quantity dispensed for pharmacy) from closed claims to provide standardized costs.
- Two complementary methods were used to assess the extent of agreement between market and payer costs[2,3]:
  - Linear regression was used to assess predictive accuracy of market-derived spending.
  - Equivariant Passing-Bablok regression, a non-parametric technique to compare two methods when both measures contain error, was used to estimate translation coefficients between measures.

Figure 1: Medical - Linear Regression

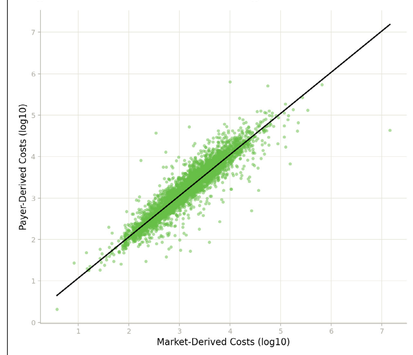


Figure 4: Medical - Passing Bablok

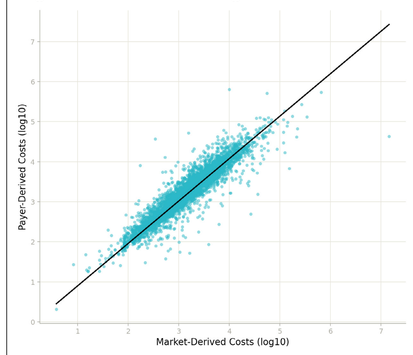


Figure 2: Prescription - Linear Regression

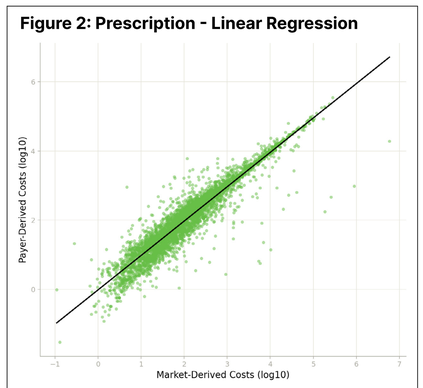


Figure 5: Prescription - Passing Bablok

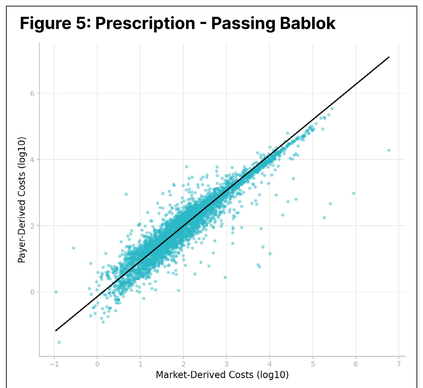


Figure 3: Total - Linear Regression

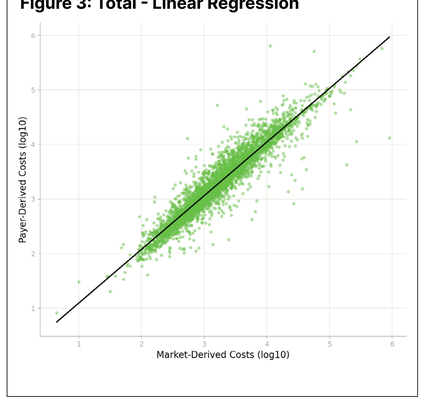
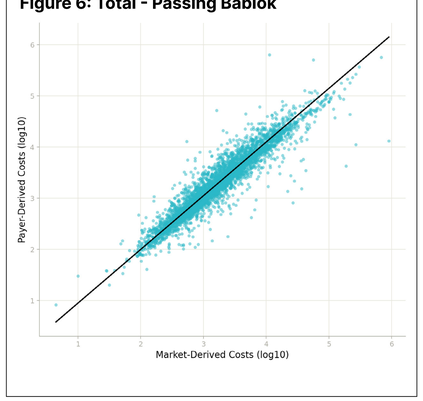


Figure 6: Total - Passing Bablok



Results

- 12,067,174 patients met the full inclusion / exclusion criteria in 2024. A random sample of the qualified patients was used to assess each spending type.
- **Medical Spending** (n=5,362): Linear regression (slope=0.99; 95% CI: 0.98, 1.00) confirms market-derived spending highly predicts payer-derived spending. Passing-Bablok regression (slope=1.06; 95% CI: 1.05, 1.07) provides the payer-to-market spending translation coefficient.
- **Prescription Spending** (n=4,414): Linear regression (slope=0.99; 95% CI: 0.98, 1.00) confirms market-derived spending highly predicts payer-derived spending. Passing-Bablok regression (slope=1.07; 95% CI:1.06, 1.08) provides the payer-to-market spending translation coefficient.
- **Total Spending** (n=4,384): Linear regression (slope=0.98; 95% CI: 0.97, 0.99) confirms market-derived spending highly predicts payer-derived spending. Passing-Bablok regression (slope=1.05; 95% CI: 1.04, 1.05) provides the payer-to-market spending translation coefficient.

Table 1: Distribution

Group	n	Market Cost Mean	Market Cost SD	Market Cost Median	Payer Cost Mean	Payer Cost SD	Payer Cost Median
Medical	5,362	3.12	0.57	3.10	3.17	0.61	3.15
Prescription	4,414	2.03	0.93	1.95	2.00	0.99	1.95
Total	4,384	3.23	0.60	3.20	3.29	0.62	3.25

Table 2: Linear and Passing-Bablok Regressions

Group	n	PB Intercept	PB Slope	LM Intercept	LM Slope
Medical	5,362	-0.16 (-0.18, -0.13)	1.06 (1.05, 1.07)	0.07 (0.04, 0.11)	0.99 (0.98, 1.00)
Prescription	4,414	-0.15 (-0.18, -0.13)	1.07 (1.06, 1.08)	-0.02 (-0.04, 0.01)	0.99 (0.98, 1.00)
Total	4,384	-0.10 (-0.13, -0.08)	1.05 (1.04, 1.05)	0.11 (0.08, 0.14)	0.98 (0.97, 0.99)

Discussion / conclusion

- Total market-derived medical spending demonstrated strong agreement with total payer-derived medical spending at the person-year level for 2024, indicating the potential of utilizing market costs when payer costs are limited.
- Limitations of the market cost approach include that market costs are derived from open claims using median unit costs at the US Census region level which may not fully capture sub-regional or nuanced plan pricing variation, as well as the potential for mismatch between units in open and closed claims sources to introduce error.

References

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2. CLSI. Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline—Second Edition (Interim Revision). CLSI document EP09-A2-IR. Wayne, PA: Clinical and Laboratory Standards Institute; 2010.
3. Raymaekers J, Dufey F. Equivariant Passing-Bablok regression in quasilinear time. arXiv [preprint]. 2022. doi:10.48550/arXiv.2202.08060

Connect with our corresponding author:
Timothy Smith, Lead Data Product Designer | tsmith@healthverity.com

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