STEVENS
INSTITUTE OF TECHNOLOGY
1870

Analyzing Market Dynamics and Revitalizing Brand Strategy

BIA 810
Health Care Data & Analytics
Final Project

[Team 2]

Fall 2025

Meet the Team!

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Agenda

- Executive Summary
- Market Landscape
- Key Drivers
- Strategic Roadmap
- Future Outlook

Executive Summary

PROBLEM STATEMENT:

The company operates a market-leading anesthetic (Ketorolac) and has launched a variant (Midazolam) intended to internally cannibalize the declining legacy brand. By design, Midazolam was expected to absorb Ketorolac's volume decline, thereby preserving overall franchise share.

However, claims evidence indicates that this intended cannibalization has not materialized. While Ketorolac continues to decline, Midazolam has failed to capture this volume, allowing the main competitor (Fentanyl) to gain share instead. As a result, the franchise is experiencing net market share erosion, driven by ineffective internal substitution rather than external market contraction.

BUSINESS SOLUTION

We propose a post-trial conversion–focused commercial strategy for Midazolam that shifts emphasis from new-writer acquisition to repeat usage, protocol anchoring, and targeted territory execution, leveraging insights from high-performing territories and salvageable prescribers.

Executive Summary

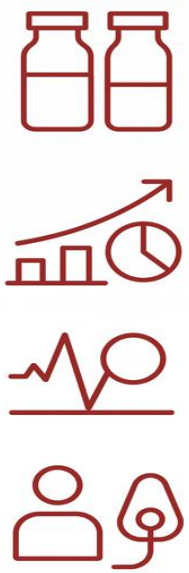
BUSINESS IMPACT

- Arrest “One-and-done” prescribing behavior for Midazolam
- Enhance conversion of Midazolam from first prescription to repeat and habitual use
- Increase Effectiveness of sales force execution in declining territories
- Reduce Leakage of Midazolam triers to the main competitor (Product 3)

Support key Sales & Marketing initiatives by

- Re-aligning KPIs from new writer count to repeat writer conversion
- Enabling targeted follow-up after first Midazolam prescription
- Deploying differentiated messaging centered on replacement and protocol fit, not trial

Market Basket



	Product	HCPCS Code	Role in Market
Company Products	Product 1 – Ketorolac	J1885	Market Leader (or Declining)
Company Products	Product 2 – Midazolam	J2250	Variant Brand (Target)
Competition	Product 3 – Fentanyl	J3010	Main Competitor (Growing)
Competition	Product 4 – Propofol	J2704	Alternative Competitor

Anesthesia Drug Market

Protocol-driven, not preference-driven

- Anesthetic choice is governed by established clinical protocols, anesthesia workflows, and institutional norms rather than individual physician experimentation.
- Brands that gain share typically do so by anchoring themselves into standard-of-care pathways, not by out-promoting competitors.

High switching cost after adoption

- Once an anesthetic is embedded into perioperative protocols, switching requires workflow changes, retraining, and risk reassessment—making post-trial conversion significantly harder than initial trial.

Anesthesia Drug Market

Depth of use matters more than breadth

- Market leaders win by achieving repeat, habitual use across procedures, not by maximizing the number of one-time trials.
- In absence of a clear replacement narrative, HCPs default back to the incumbent product even after trying a newer variant.

Trial does not equal adoption

- Initial usage often reflects availability or sampling, but sustained use reflects confidence in efficacy, safety, and operational fit.
- **Territory-level execution drives outcomes:** Variation in adoption across territories is driven by differences in sales execution, follow-up discipline, and local clinical culture—rather than product differences.

In anesthesiology, behavior changes only after confidence is established

Product	Average Years of usage
Ketorolac (old product)	2.97
Midazolam (new variant)	1.83
Fentanyl	2.48
Propofol	1.44

Steps taken for data cleaning

Initial Data Quality Assessment:

- Audited dataset structure, data types
- Completeness to establish baseline data quality and identify issues early
- Missing Records
- Duplicate Records

Identifier & Structural Consistency

- Standardized key identifiers (Provider NPI, Patient ID)
- Normalized ZIP codes for reliable joins and aggregation

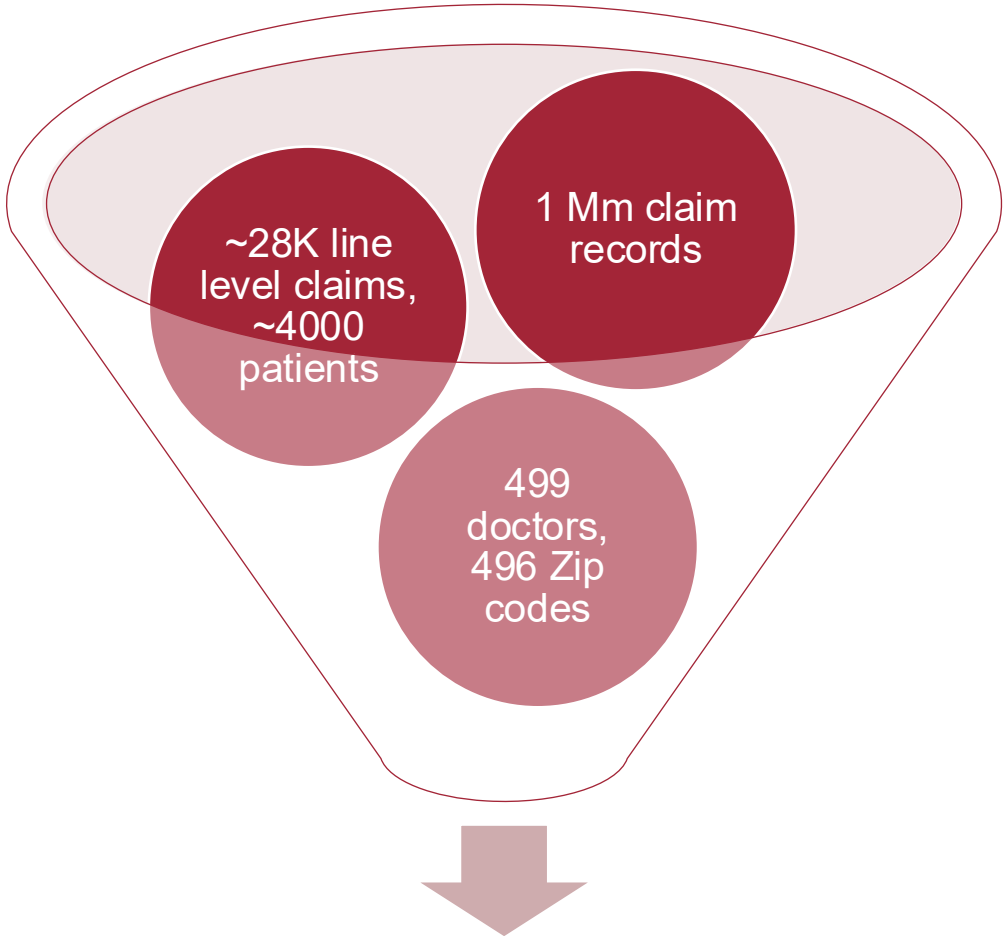
Categorical Data Harmonization

- Cleaned and standardized categorical fields (for example: gender)
- Eliminated formatting inconsistencies

Date & Time Standardization

Dataset

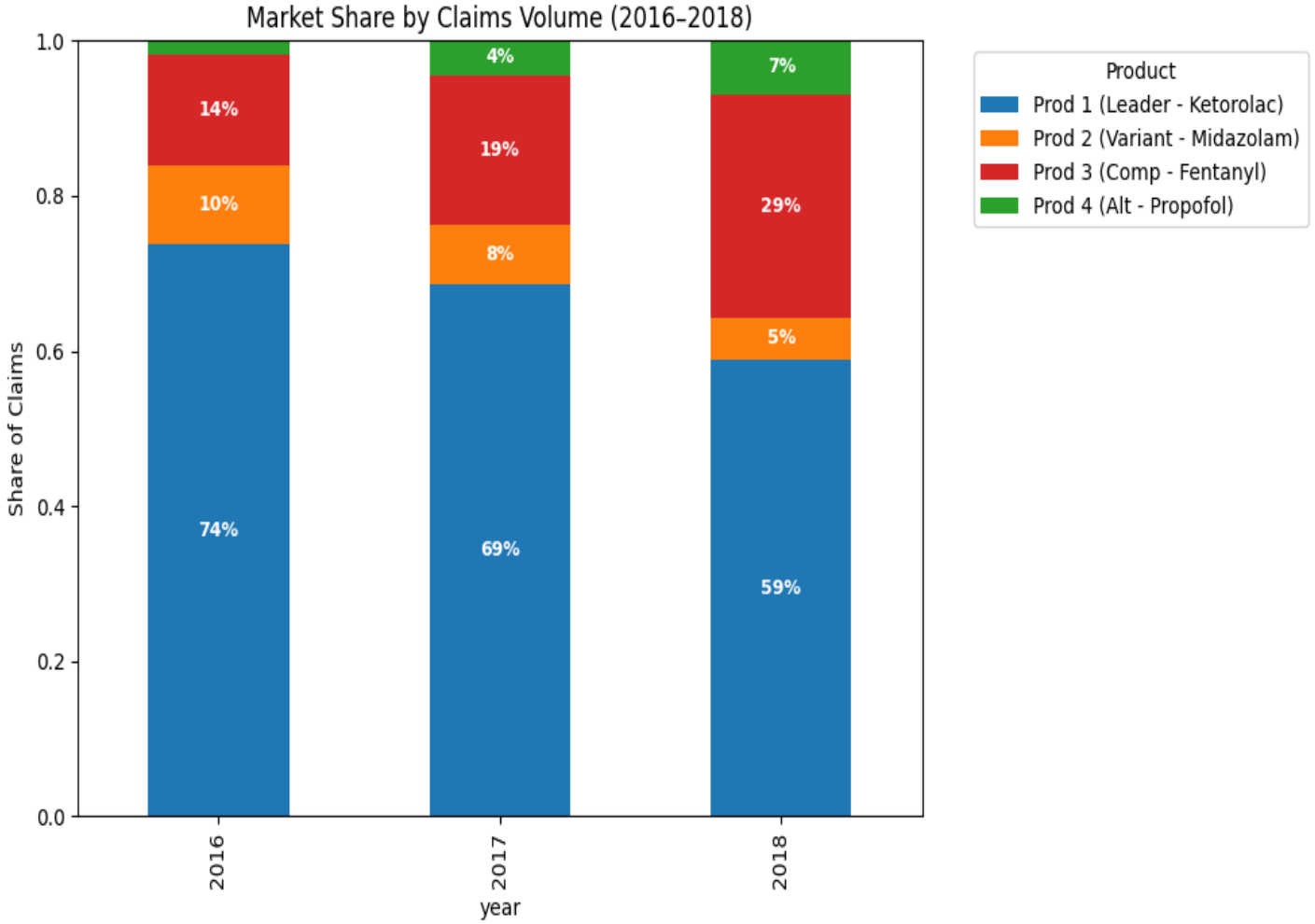
- Data Sources
  - Medicare CCLF Claims (2016–2018)
    ~1M raw line-level claims consolidated into 28,368 market-relevant claims
  - HCP Demographics (NPI, specialty, geography)
  - Patient Demographics (age, gender)
  - Diagnosis Code Mapping (ICD-10) → disease specialty
  - ZIP → Territory Mapping → commercial geography



Dataset being analyzed

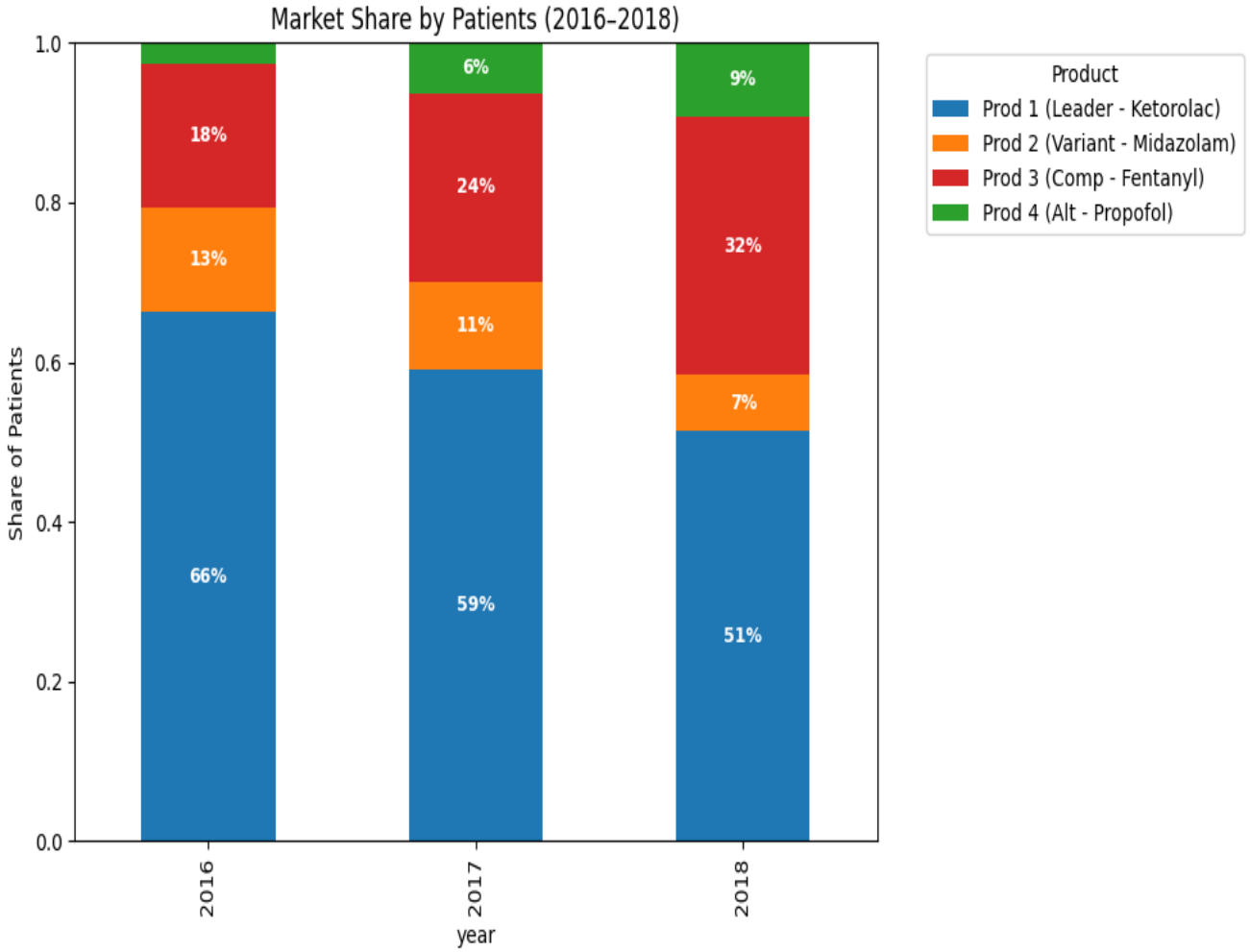
Market leadership remains intact, but competitive forces are actively reshaping prescribing behaviour

- Ketorolac remains widely used, but its market share declined from 74% in 2016 to 59% in 2018, while the primary competitor increased its share from 14% to 29%.
- The variant product is tried by doctors but not consistently continued and also selective use of alternatives is gradually increasing.
- The overall trend reflects doctors switching products rather than a drop in demand.



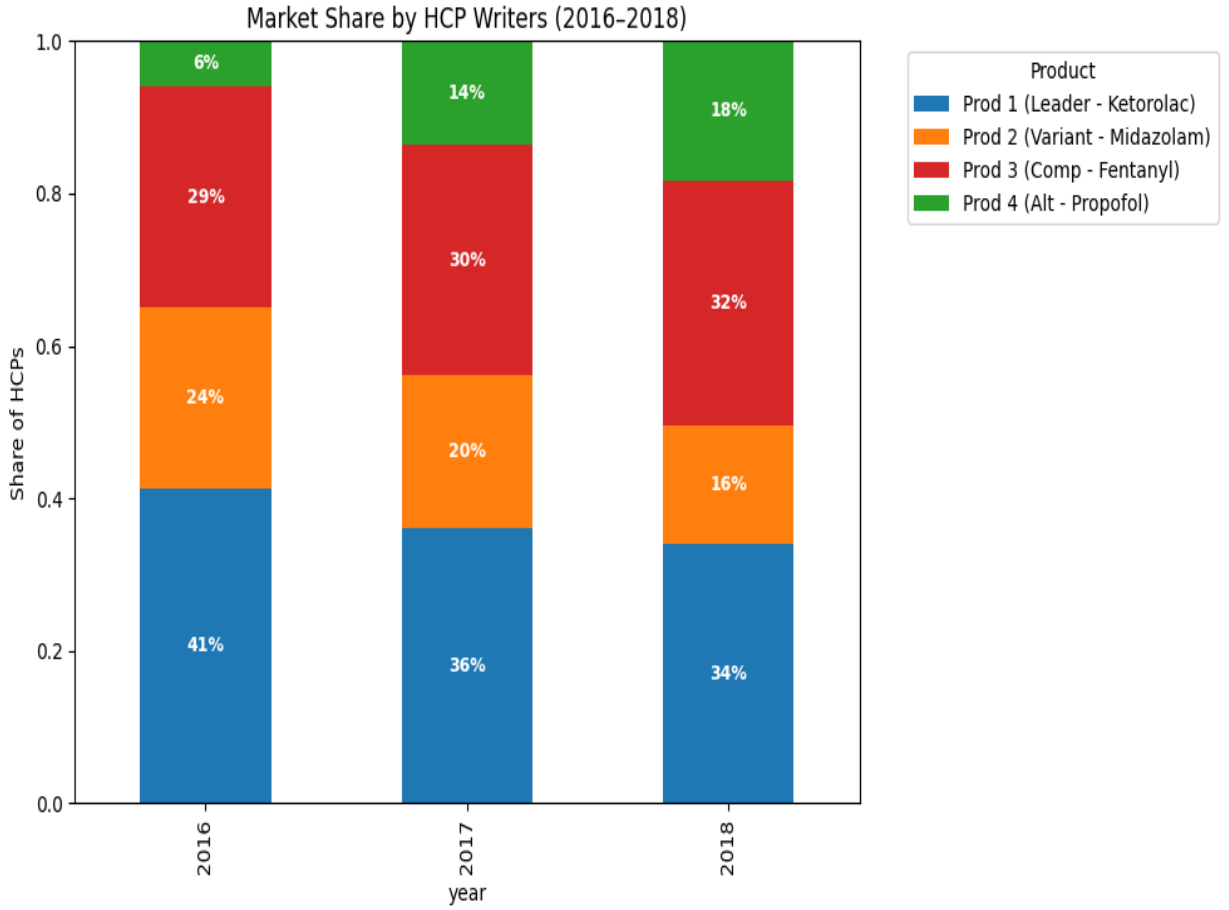
Patient reach remains concentrated, but competitive expansion is accelerating

- Ketorolac remains the leading product, but its patient share steadily declined from 66% in 2016 to 51% in 2018, showing a consistent loss in patient reach over time.
- The primary competitor gained significant patient adoption, increasing from 18% to 32%, while the variant product declined from 13% to 7%, indicating stronger preference for the main competitor.



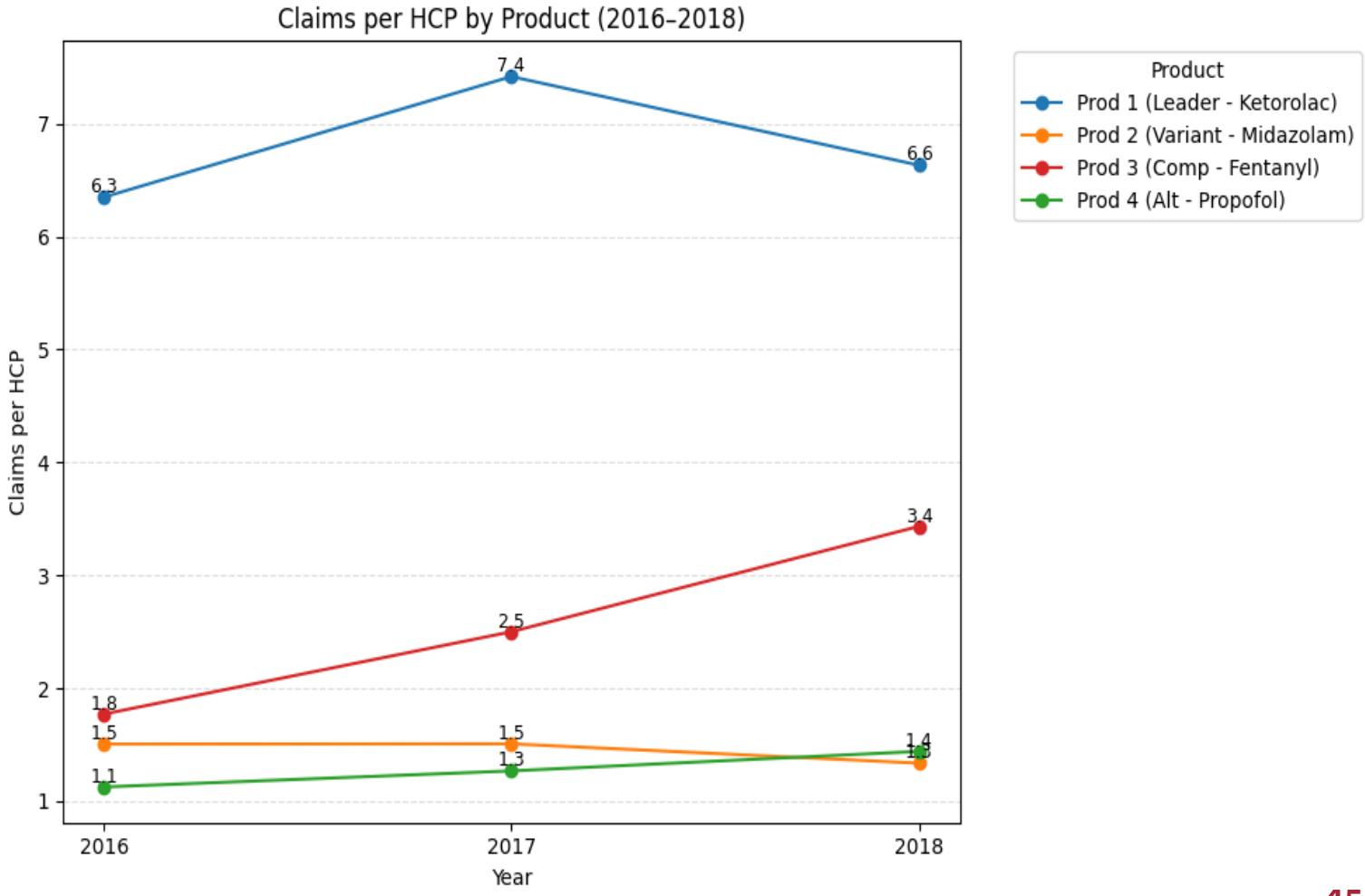
Competitive encroachment is progressively reshaping the prescriber landscape

- Ketorolac is still prescribed by the most doctors, but its HCP share declined from 41% in 2016 to 34% in 2018, meaning fewer doctors rely on it exclusively.
- Competing products expanded their prescriber base, with the primary competitor increasing from 29% to 32% of HCP writers, while the variant product declined from 24% to 16%.

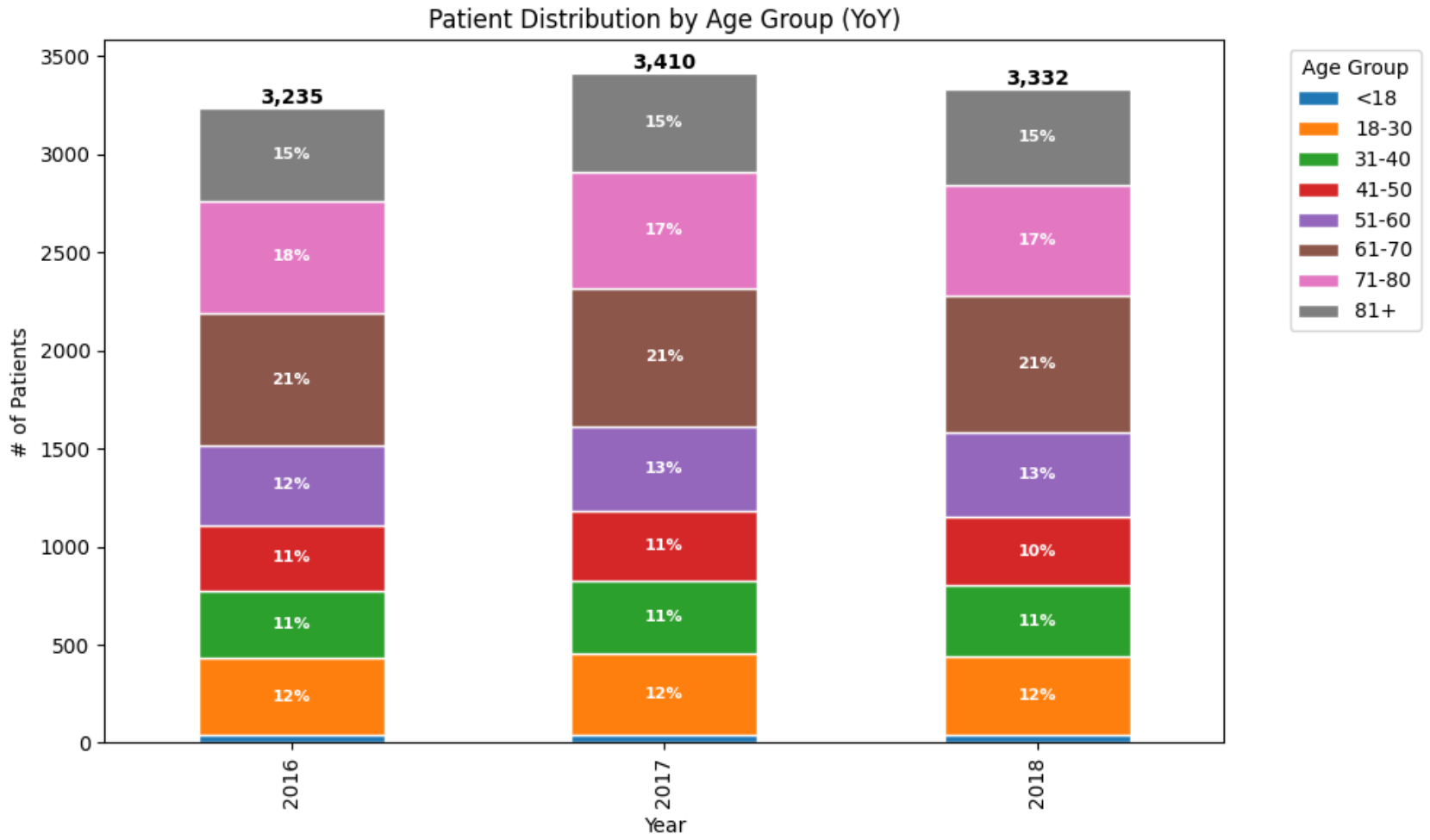


Prescribing intensity is shifting as competitive products gain traction

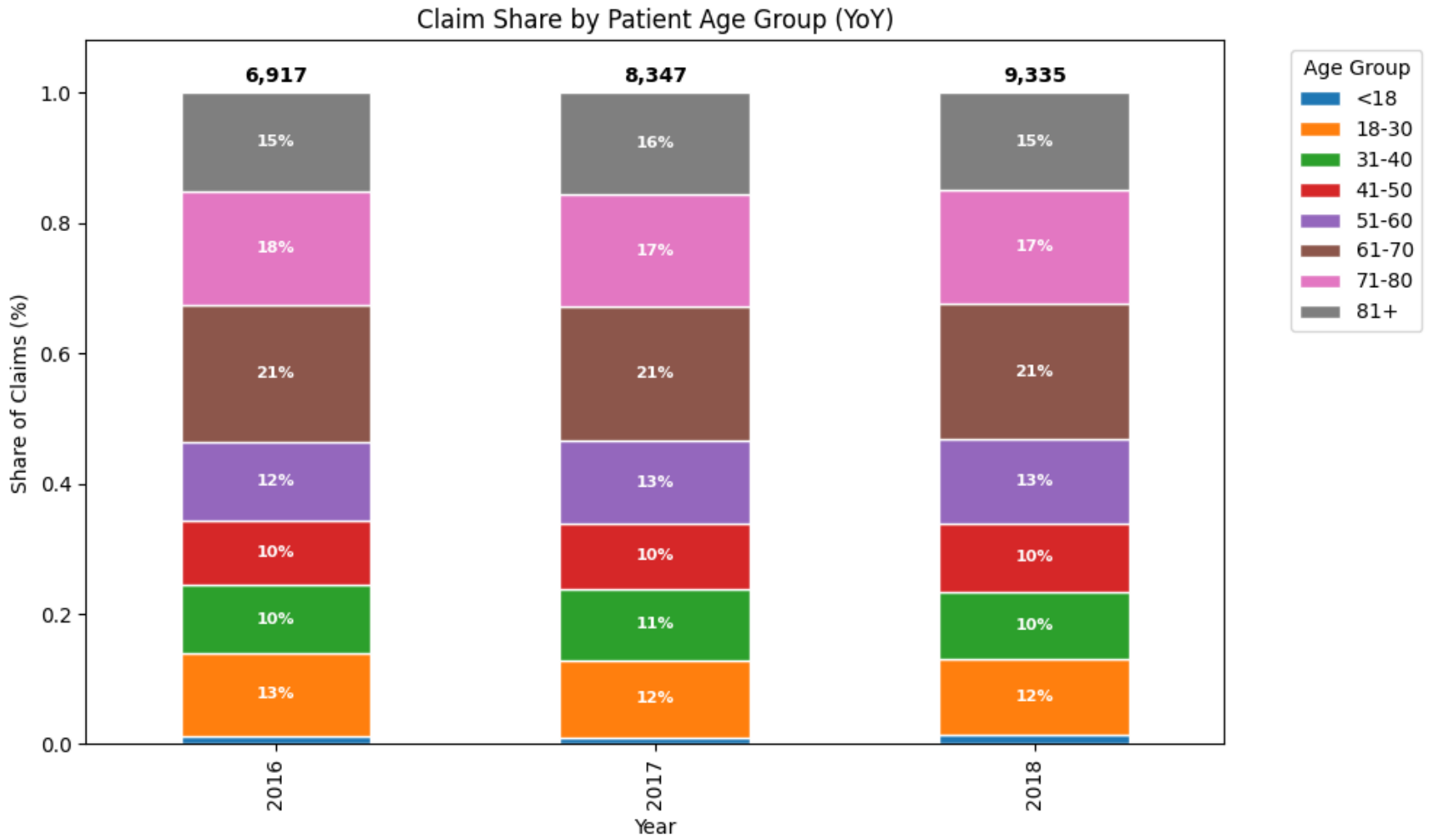
- Ketorolac is still used most per doctor, but growth has flattened, moving from 6.3 claims per HCP in 2016 to 7.4 in 2017 and then dropping to 6.6 in 2018.
- The main competitor shows steadily deeper use, with claims per HCP rising from 1.8 to 2.5 to 3.4, indicating stronger repeat prescribing by existing doctors.
- Overall, prescribing depth is shifting across products, meaning doctors are switching across products rather than increasing total prescribing volume.



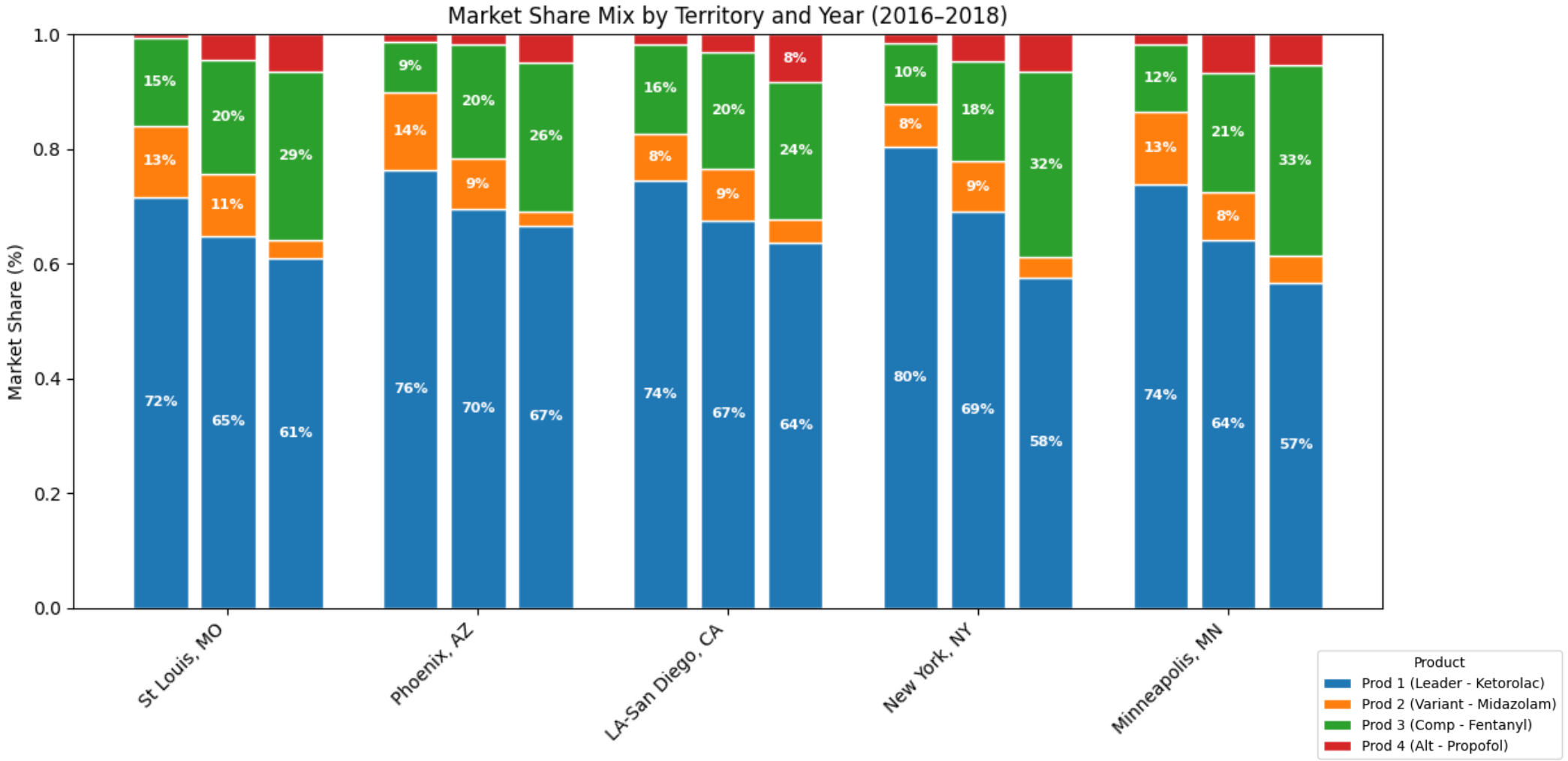
We do not see any major shifts in the patient population



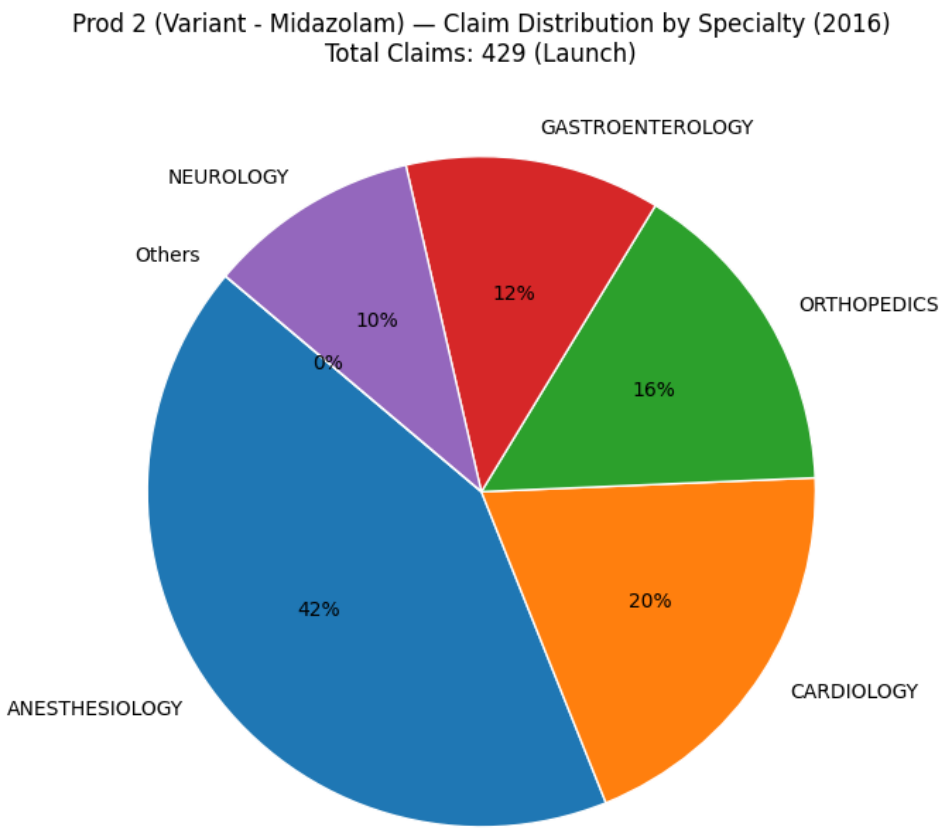
Claim share by patient age seems consistent across years

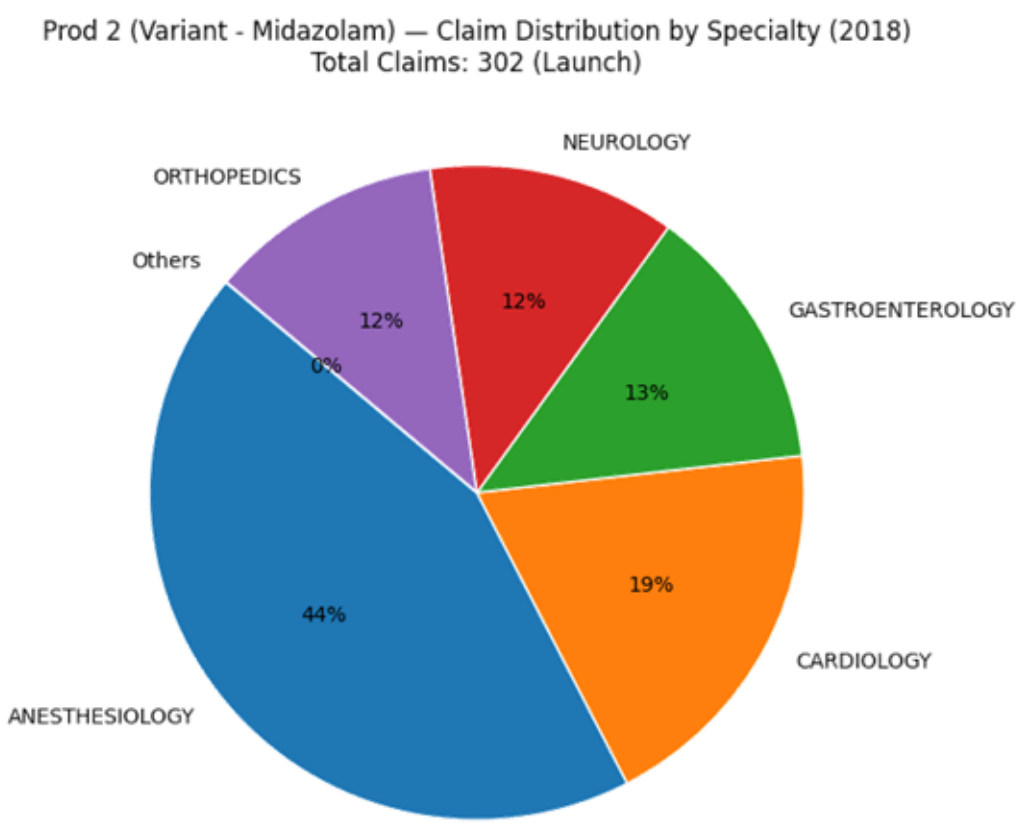


Top 5 market share erosion territories

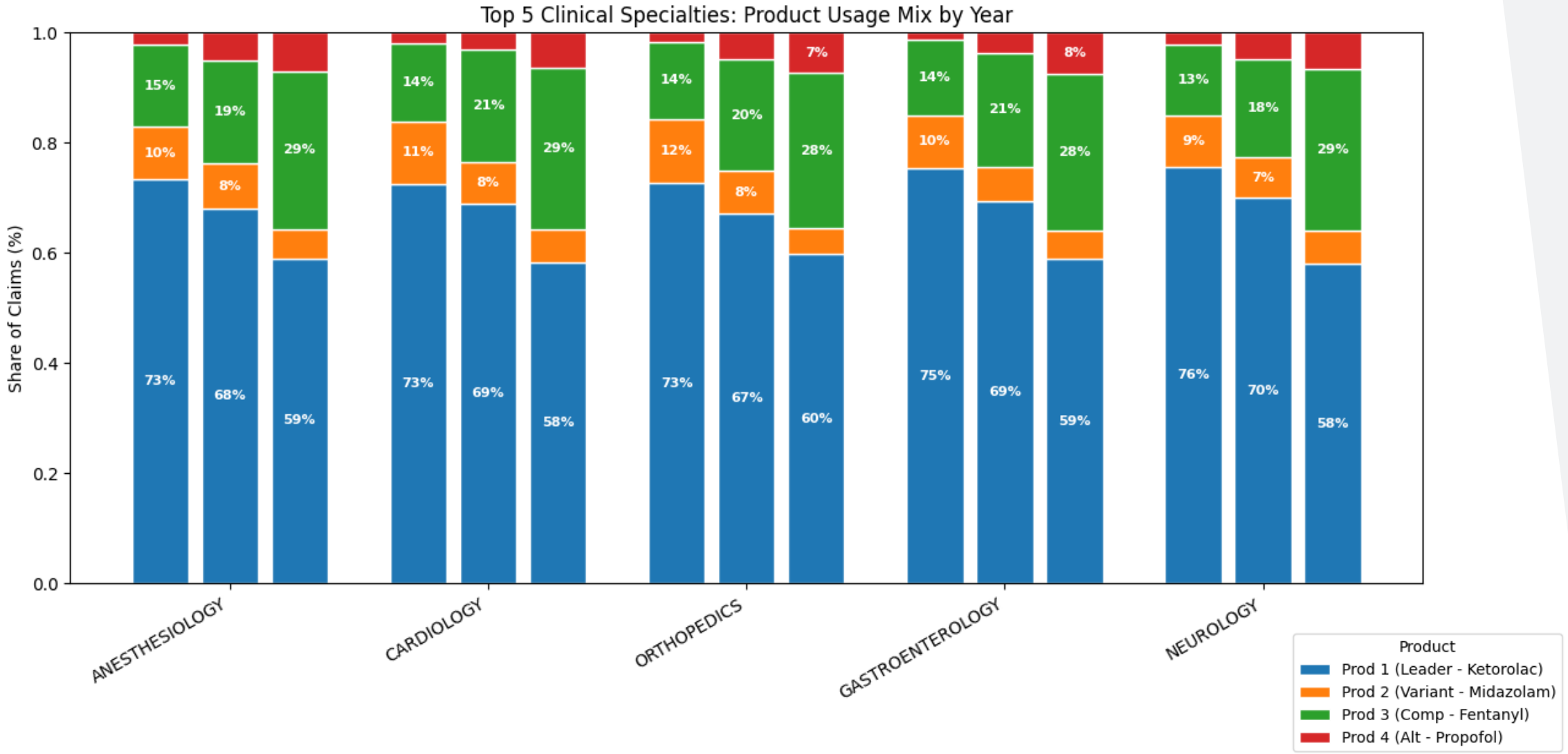


Usage by specialty - Midazolam

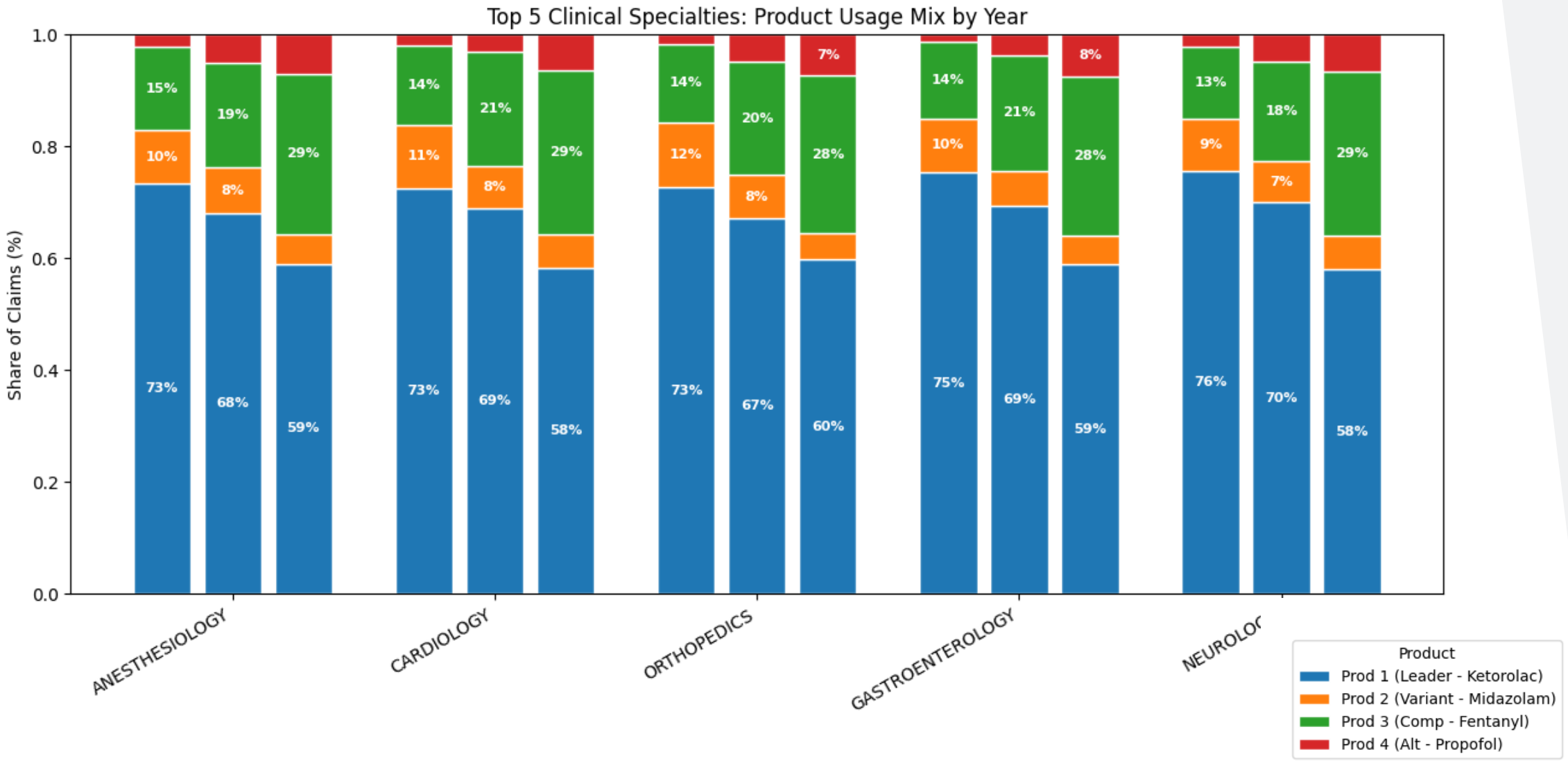




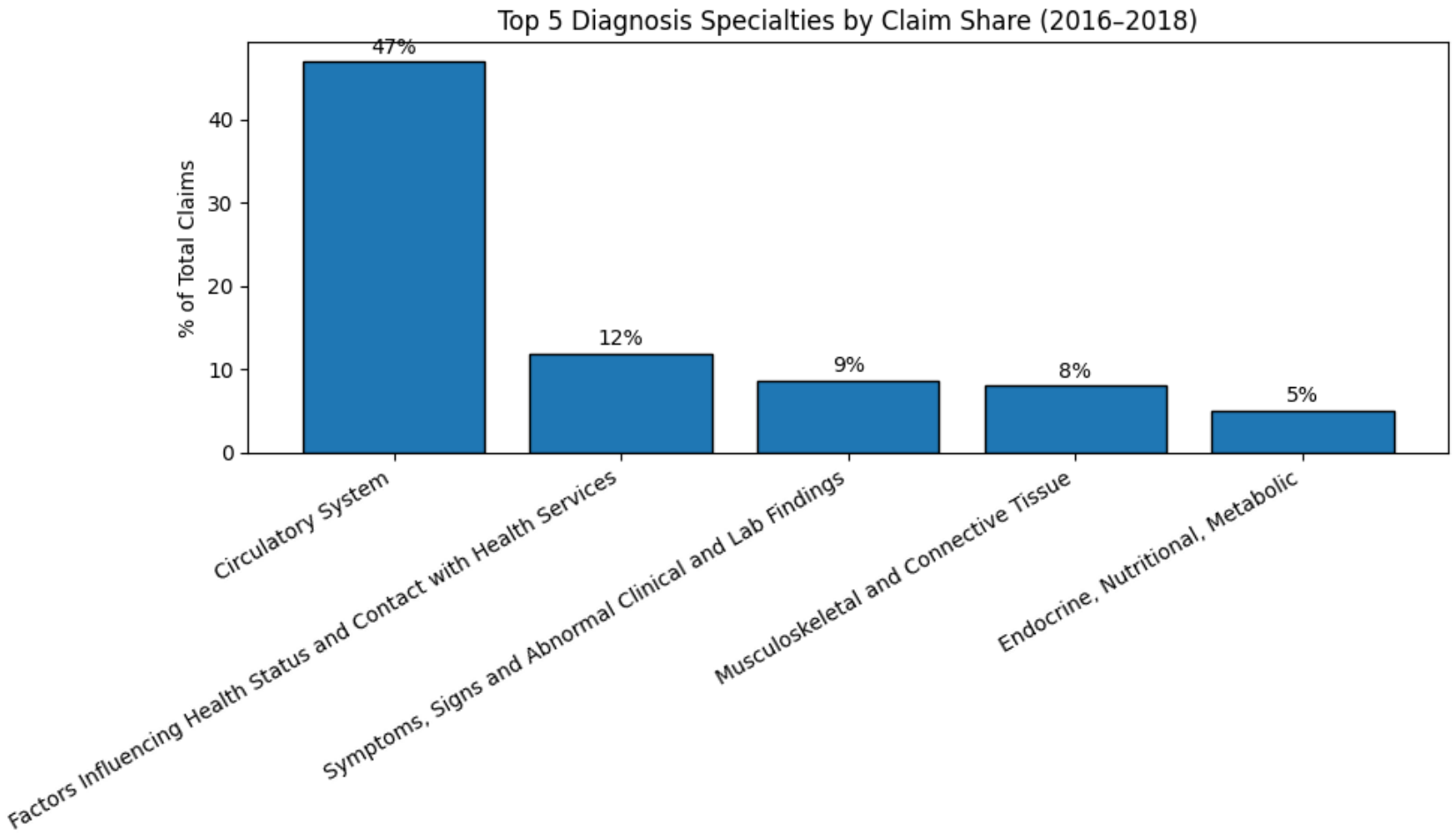
Usage by specialty



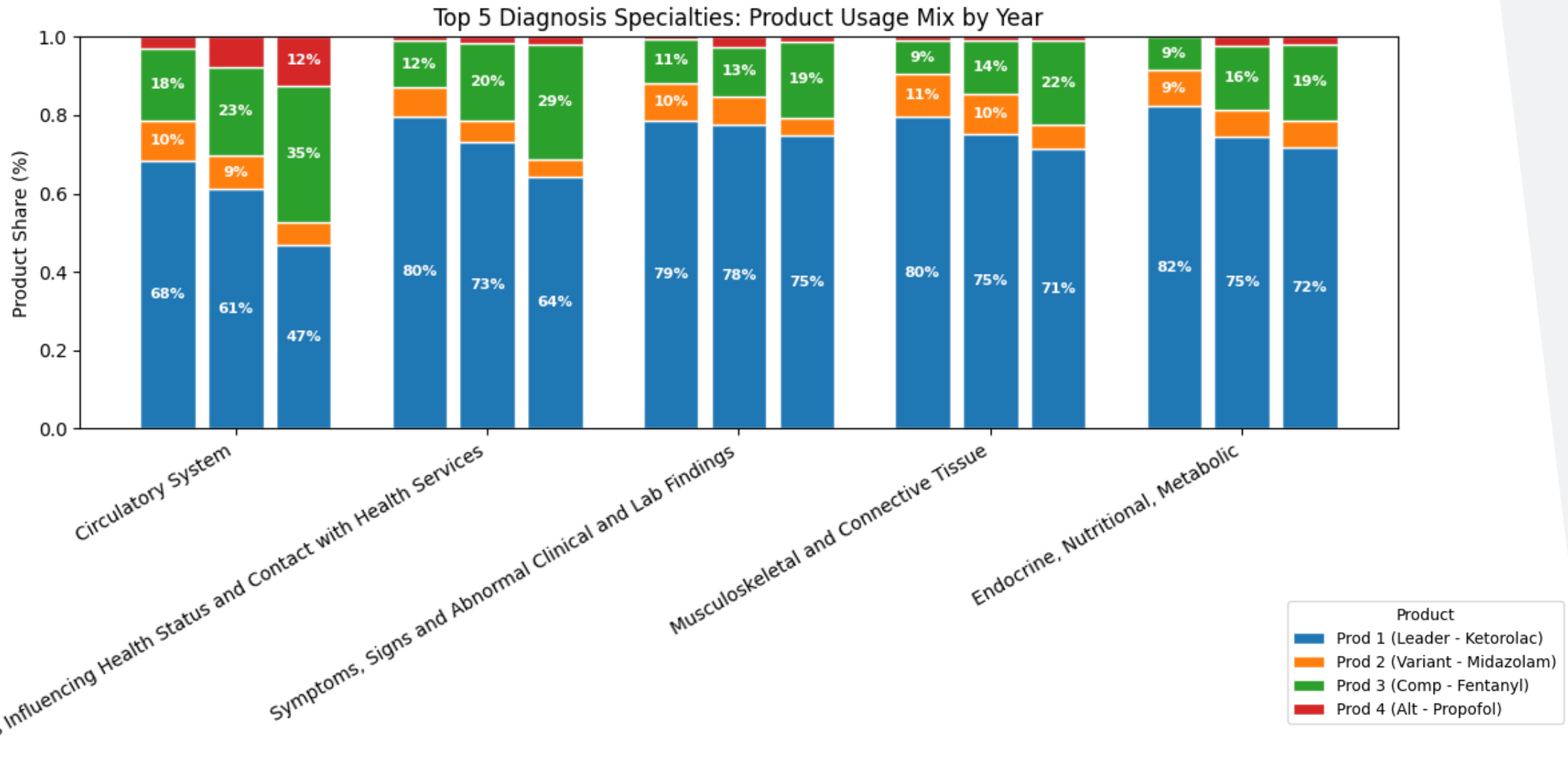
Usage by specialty – top 5 market share losing territories



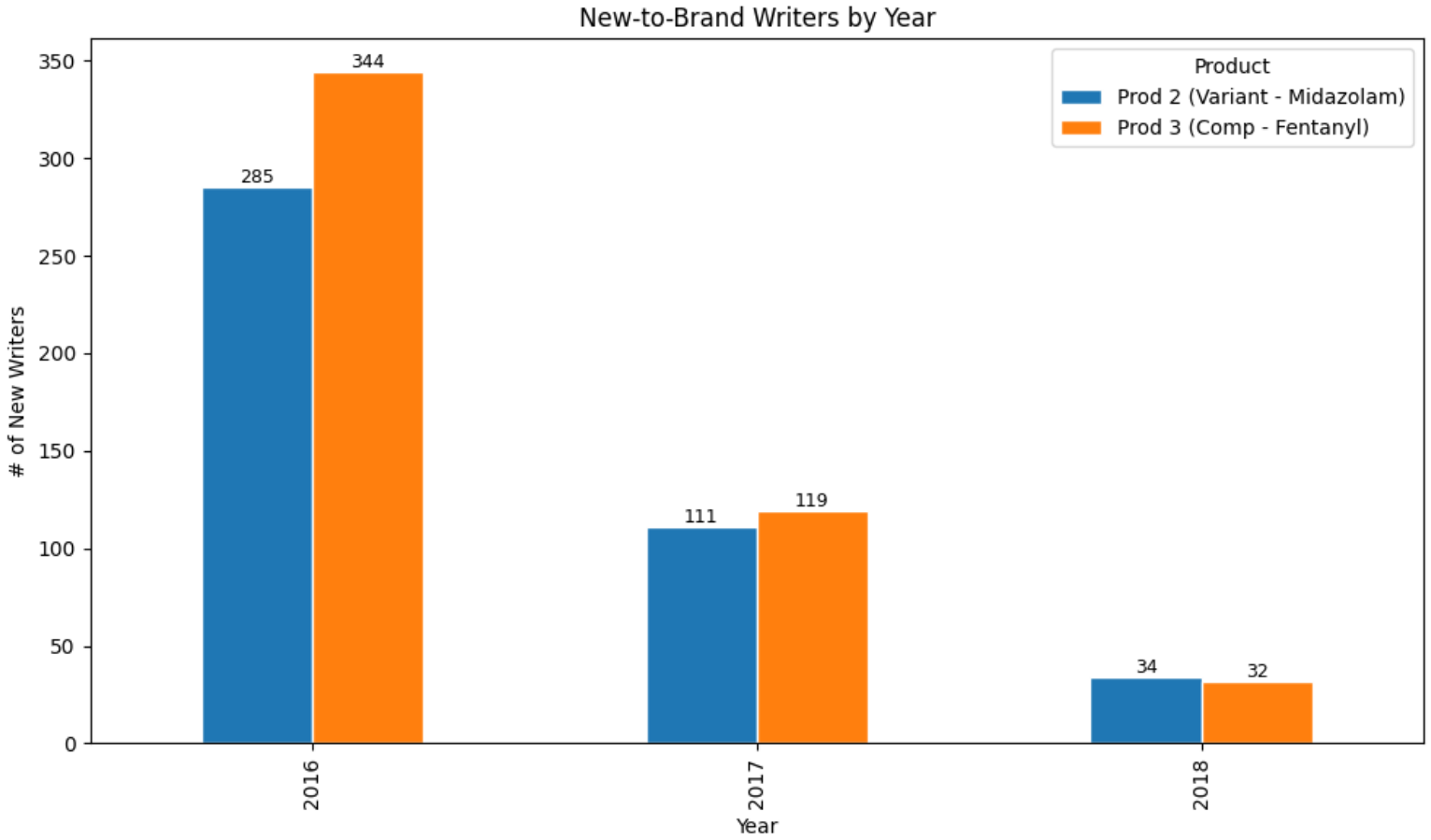
Circulatory system ICD procedures see highest usage of anesthesia products over the years



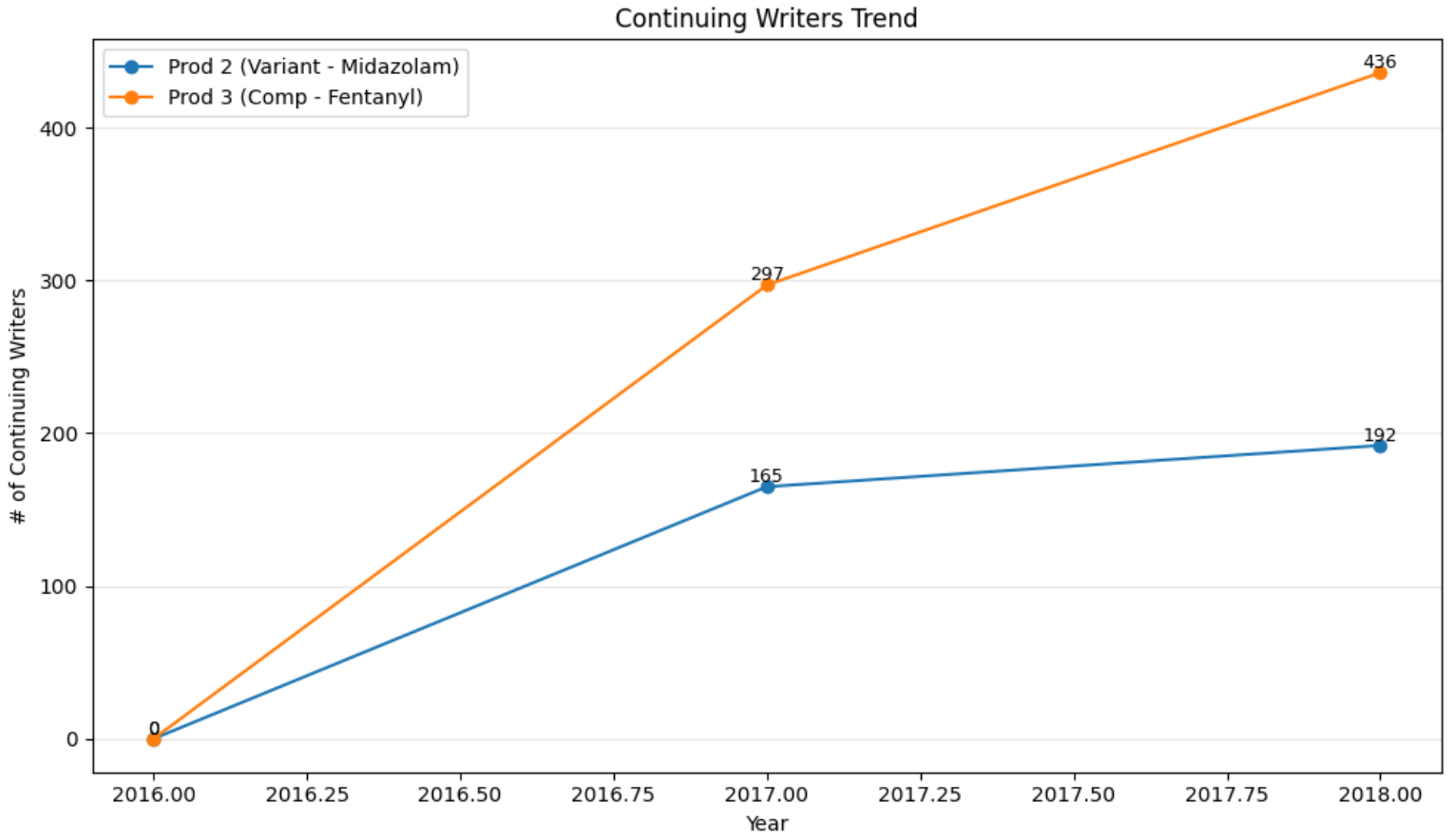
There is high erosion of market share to fentanyl and propofol across ICD codes



We see almost similar new to brand rx by hcps for both midazolam and fentanyl

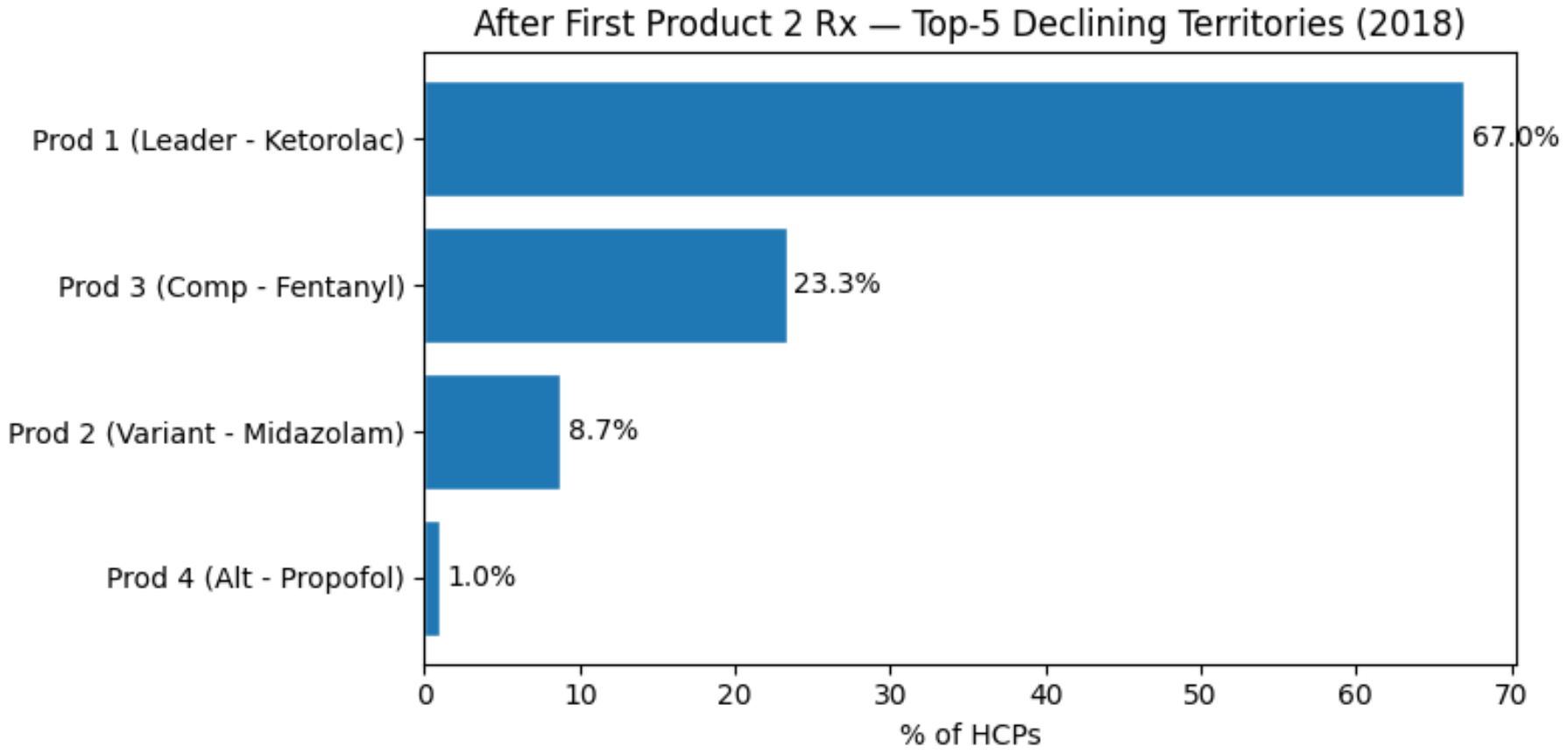


… however, we see that continuing writers of Fentanyl are higher



Product 2 continues to generate new-to-brand writers, but fails to retain them as continuing prescribers. In contrast, Product 3's growth is driven by stronger writer retention rather than acquisition

Product 2 is losing not because of awareness, but because of post-trial abandonment:

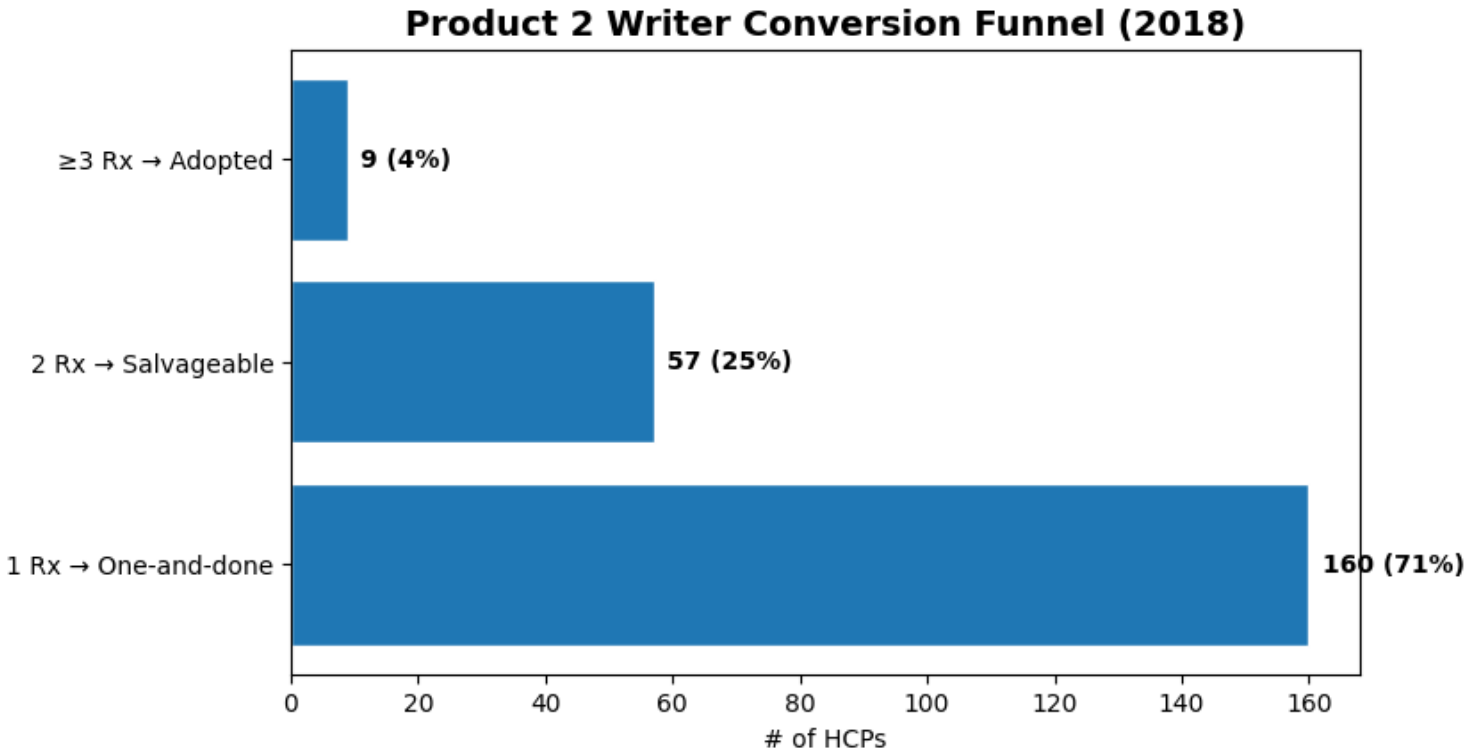


..however, we believe with the right interventions, this can be salvaged

1 claim → “one-and-done” (trial failure)

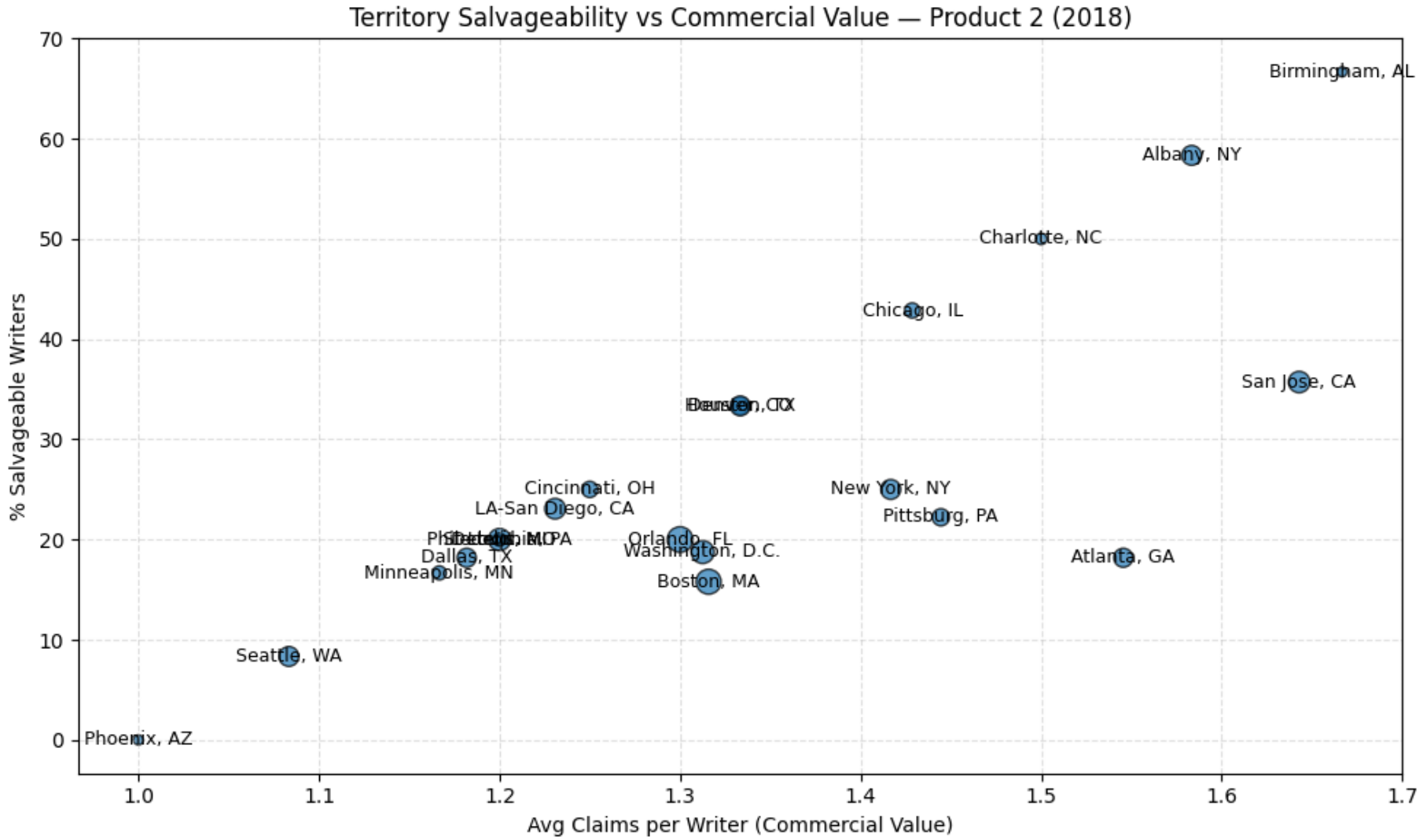
2 claims → partial conversion, still recoverable / Salvageable

≥3 claims → already adopted



In 2018, ~25% of Product 2 writers are salvageable — representing the highest-ROI conversion opportunity.

Territory execution diagnostic (2018)



Recommendations

Recognize that trial ≠ adoption - Current performance indicates Product 2 is being sampled but not integrated into routine practice; commercial success must be redefined around sustained prescribing, not first use.

Shift sales KPIs from acquisition to conversion - Move primary field metrics from “new writers” to repeat writers, explicitly tracking 2nd prescription within 45 days and 3rd prescription within 90 days.

Enforce structured post-trial follow-up - Mandate rep follow-up for every new Product 2 writer, supported by CRM alerts flagging “one-and-done” prescribers for immediate intervention.

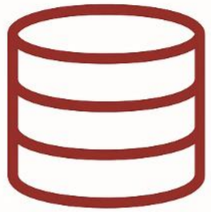
Reallocate effort toward high-value, salvageable segments - Prioritize high-volume, salvageable writers and focus execution in the most commercially attractive yet declining territories where recovery impact is highest.

Evolve messaging from trial to protocol replacement - Evaluate whether current promotion over-indexes on “Try Product 2” and pivot toward positioning Product 2 as a replacement anesthetic in clearly defined use cases, aligning with real-world prescribing decisions.

Data exploration opportunities & limitations

Promotion Response & Sales Force Effectiveness (Calls Data) – understand whether low conversion is due to insufficient follow-up, ineffective messaging, or misallocated sales effort.

Payer reimbursements - claims data does not show coverage restrictions, or copay burden.



HCP-Level Switching & Protocol Barriers – clinical hindrances to switch

Patient Flow & Therapy Depth (DDD)

Channel Dynamics & Site-of-Care Behavior - Claims do not reveal whether prescribing decisions differ by site of care (hospital, ASC, outpatient)

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Thank you!