# A Comparison of Drug Utilization Metrics for Two Drug Classes with Nationally Projected Sales and Patient-level Data from the Sentinel Database

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## BACKGROUND

- Obtaining accurate medication use estimates is a vital component of post-marketing surveillance.
- Nationally projected sales data and patient-level data from population-based administrative claims databases are widely used to estimate medication use.
- It is unclear which of the different units of measurement available in nationally projected sales data are comparable to patient-level data.

## OBJECTIVE

- To compare U.S. drug utilization estimates of relative percent market share for two drug classes between nationally projected sales data from IQVIA National Sales Perspectives™ (NSP) database and patient-level data from the Sentinel Distributed Database (SDD). (https://www.sentinelinitiative.org)

## METHODS

### Data Source:

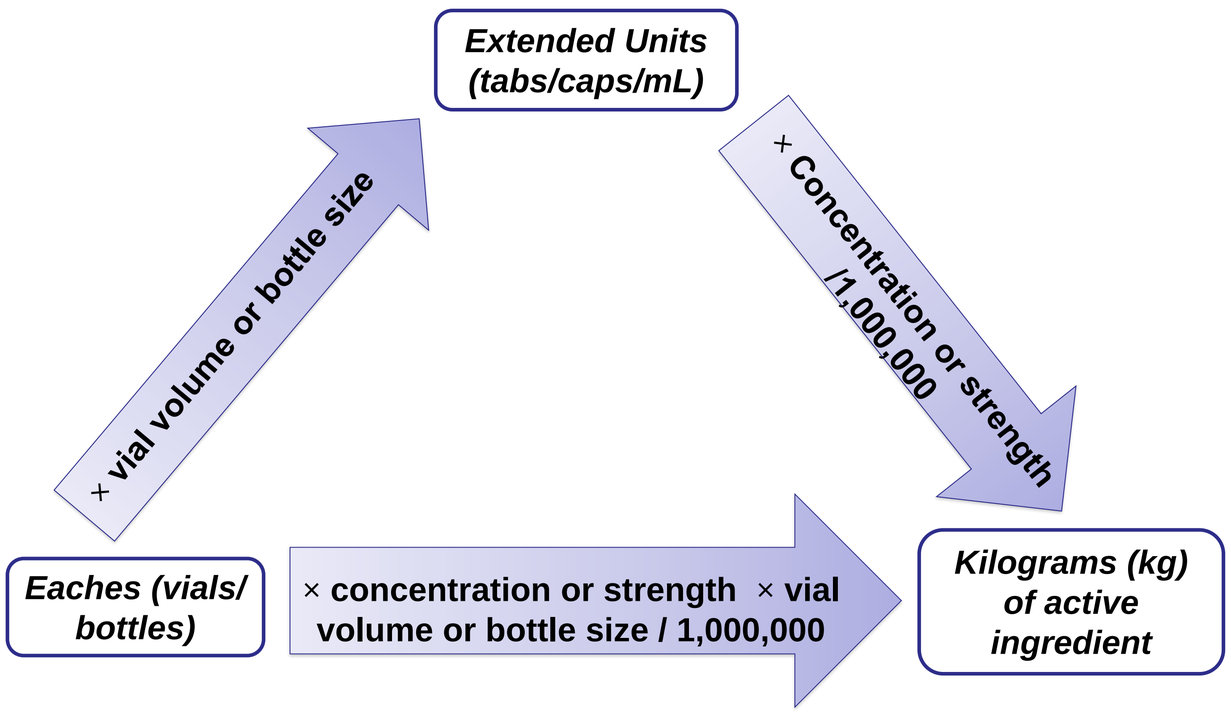
- IQVIA NSP database
  - Provides national estimates of the volume of all products sold directly from manufacturers and indirectly through wholesalers into retail and non-retail channels of distribution in the U.S.
- SDD
  - Consists of claims data from a distributed network of 15 Data Partners, mostly U.S. commercial health insurers

### Study Design and Analysis:

- Cross-sectional study
- Time period: 2011-2015
- Selected medications from two drug classes
  - Fixed daily dosing
    - Statins (oral)
  - Weight-based dosing
    - Iron products (IV)

•From NSP, we extracted the amount sold of each medication using three different metrics, i.e., *Eaches, Extended Units (EU), Kilograms (Kg)* (**Figure 1**)

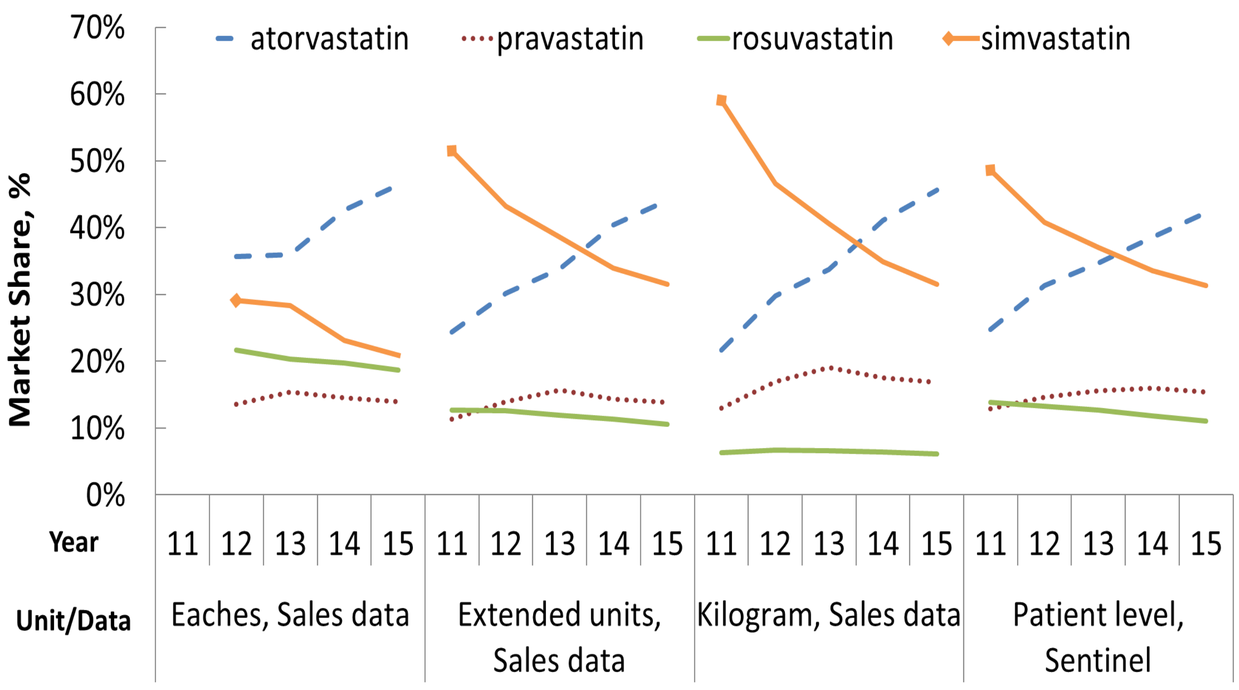
**Figure 1. The Underlying Relationships Between The Three IQVIA National Sales Perspectives™ Measurement Units**




- For each sales-based and patient-level estimation, we calculated the percent market share across all sales distribution channels by calendar year for selected products within each class; in SDD, each patient with ≥1 dispensing in a year was counted once.
- We compared each sales-based metric with patient-level data in SDD using Mahalanobis distance by drug across years and correlation (r) for all drugs across years.

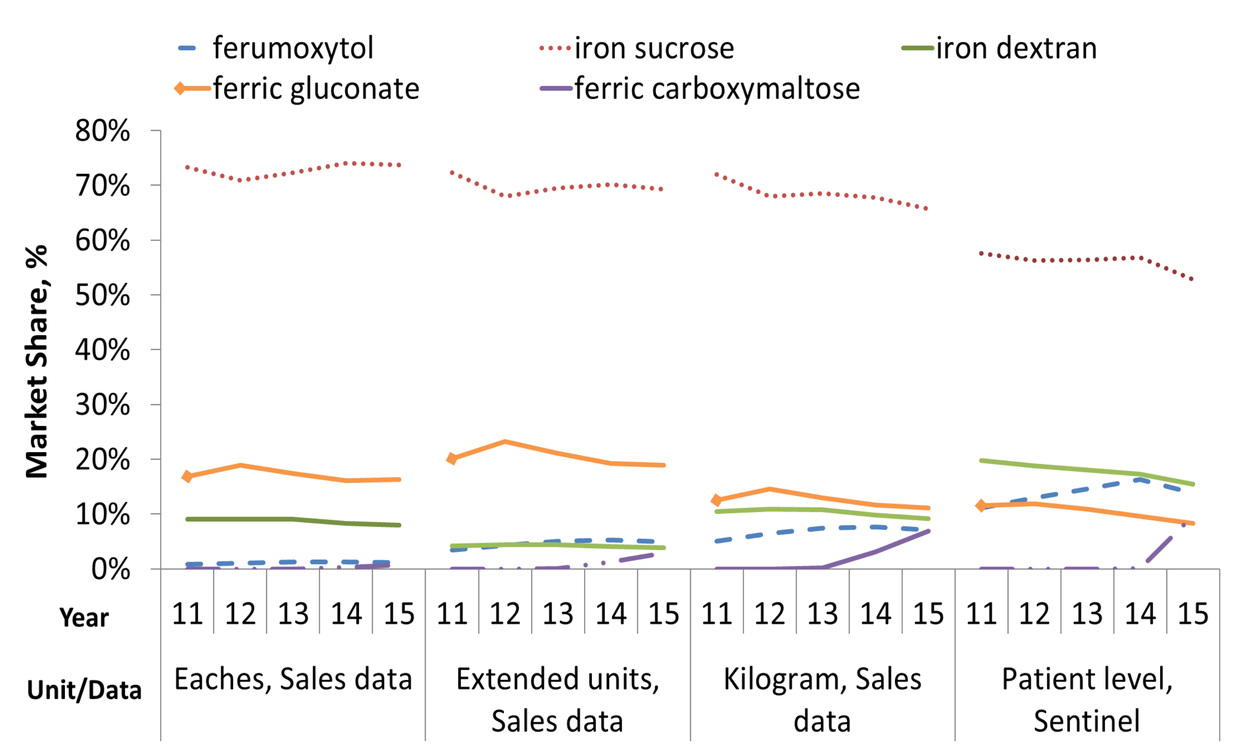
## RESULTS

**Figure 2. Market Share of Selected Statin Products in IQVIA National Sales Perspectives™ and Sentinel Distributed Database**




- Across all sales data metrics, atorvastatin and simvastatin were the most sold statins
- Simvastatin was the best selling product across *EU* and *Kg* until 2013, when it was surpassed by atorvastatin
- The proportions of sales of rosuvastatin and pravastatin ranked 3rd and 4th respectively in *Eaches*; the ranking of the two products switched in *EU* and the differences became more pronounced in *Kg*
- *EU* showed the closest agreement with Sentinel patient-level data (r: among all sales based metrics (*EU* - 1.00, with Kg - 0.98, with *Eaches* - 0.83). The Mahalanobis distance for IQVIA *EU* vs. Sentinel was lowest compared to *Kg* and *Eaches* (Sentinel with *EU:* 6, with *Kg:*121, with *Eaches*: 230)

**Figure 3. Market Share of IV Iron Products in IQVIA National Sales Perspectives™ and Sentinel Distributed Database**




- Across all sales data metrics, iron sucrose and ferric gluconate were 1st and 2nd best-selling products, and ferric carboxymaltose was the least sold product
- The proportions of sales of iron dextran and ferumoxytol ranked 3rd and 4th respectively in *Eaches* and *Kg*, the ranking of the two products switched in *EU*
- The *Kg* sales-based metric showed the closest agreement with patient-level data for all IV iron products (r: Sentinel with *Kg* - 0.98; with Eaches - 0.95; with *EU* - 0.95 ). The Mahalanobis distance for IQVIA *Kg* vs. Sentinel for all products was lowest compared to *EU* and *Eaches (*Sentinel with *kg:*393, with *EU*:2051, with *Eaches*: 5225)

## CONCLUSIONS

- Estimates of drug utilization using nationally projected sales-based metrics largely depend on the measurement unit selection, as well as the characteristics of the product in consideration (e.g., vial/bottle size, oral vs. IV, concentration/strength, recommended dose/potency)
- For statins, a product with fixed daily dosing, the *EU* sales-based metric may be an adequate proxy measure for estimates of percent market share based on patient-level data
- For IV iron, a product with weight-based dosing, the *Kg* sales-based metric may be an adequate proxy measure for estimates of percent market share based on patient-level data
- Nationally projected sales data and their agreement with patient-level data can vary considerably between selected metrics, in part driven by product characteristics
- When comparing nationally projected sales to patient-level data, it may be useful to evaluate multiple sales data metrics to better understand medication use

## LIMITATIONS

- The cross-sectional nature of the study limits our conclusions to the time period examined.
- IQVIA NSP provides national estimates of units sold to all U.S. channels of distribution, while SDD is limited to reimbursed drugs

**The authors have no conflicts of interest to disclose. The opinions expressed in this poster are those of the authors and not necessarily of the U.S. FDA. Many thanks are due to the Data Partners who provided data used in the analysis.**