# Using IMS data to identify doctor shoppers

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# Outline

- Shopping behavior definition
- Shoppers
  - Which drugs
  - What payment method
  - How far they travel
  - How often cross state lines
- How often prescribers have shoppers
- Relation between opioid shopping and abuse
- How we used IMS data to learn about  it
- Plans for the future

# Opioid shopping behavior

- Overlapping prescriptions from two or more prescribers

and

- Dispensed by three or more pharmacies

Cepeda MS, Fife D, Chow W, et al. Drug Saf 35:325, 2012

# Opioid Shopping: Prevalence and risk factors

| Group | Number of subjects on opioids | Number (%) of shoppers |
|---|---|---|
| Total | 25,161,024 | 75,215 (0.30) |
| Age, years | | |
| ≤18 | 1,860,919 | 379 (0.02) |
| 19-40 | 7,903,063 | 27,361 (0.35) |
| 41-64 | 10,535,348 | 41,587 (0.39) |
| ≥65 | 4,750,887 | 5,876 (0.12) |
| Gender | | |
| Female | 15,202,977 | 43,527 (0.29) |
| Male | 9,834,192 | 31,614 (0.32) |

# Opioid prescriptions in subjects with and without shopping behavior

**Percent of opioid prescriptions by schedule type**
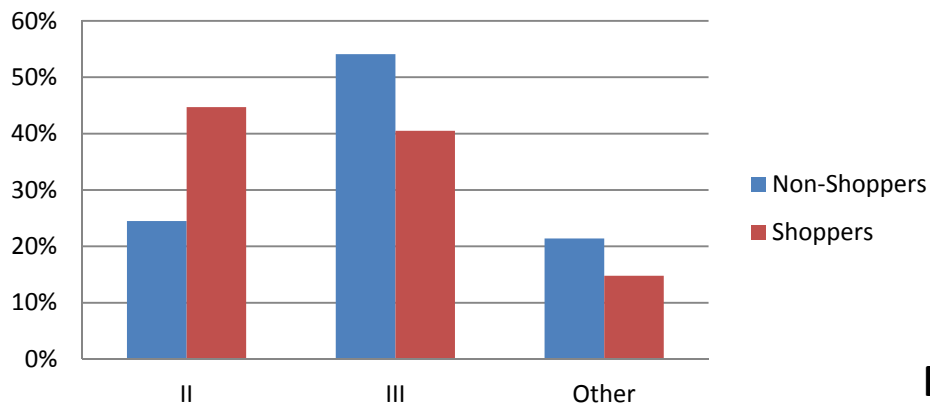


- Shoppers more often paid in cash (44.8%) than non-shoppers (18.5%)

**Percent of opioid prescriptions by formulation type**
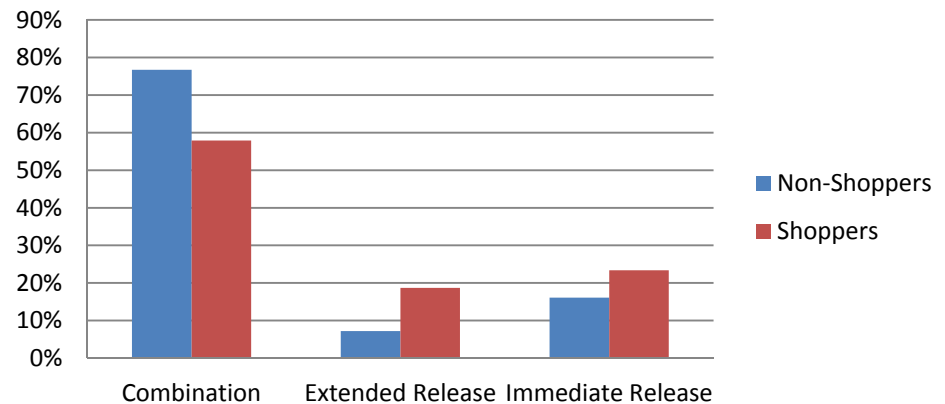


Cepeda MS, Fife D, et al J Clin Pharmacol. 53:112, 2012

# Distance travelled and number of states visited in non-shoppers and shoppers

| | Non-shoppers | Shoppers |
|---|---|---|
| Median opioid dispensings [25th-75th] | 6 (4-13) | 39 (24-72) |
| Median miles travelled in a year [25th-75th] | 0 (0-4.3) | 83.8 (34.5-287.1) |
| Number of states visited n (%) | | |
| 1 | 10,380,283 (95.8) | 53,071 (80.7) |
| 2 | 427,948 (3.9) | 10,620(16.1) |
| 3 | 24,419 (0.2) | 1,730(2.6) |
| 4 | 2,166 (0.02) | 279 (0.4) |
| ≥5 | 420 (0.0) | 80 (0.12) |

Cepeda MS, Fife D, et al J Pain 2013;14:1158

# Frequency of shoppers by prescriber

| Number of shoppers | Number of prescribers (%) with this number of shoppers |
|---|---|
| None | 745,256 (86.83) |
| 1 | 73,783 (8.60) |
| 2 | 20,308 (2.37) |
| 3 to 6 | 15,271 (1.77) |
| 7 to 23 | 3,403 (0.40) |
| 24 to 39 | 199 (0.02) |
| 40 to 201 | 70 (0) |

Cepeda MS, Fife D, et al J Opioid Manag 8:285, 2012

# Distribution of shoppers by prescribers' patient volume

| Number of patients receiving opioid prescriptions, per prescriber | Number of prescribers (%) | Number of shoppers (%) |
| --- | --- | --- |
| 1 - 17 | 427,086 (49.76) | 8,717 (4.00) |
| 18 - 35 | 111,918 (13.04) | 10,743 (4.93) |
| 36 - 65 | 103,914 (12.11) | 18,942 (8.69) |
| 66 - 149 | 128,899 (15.02) | 52,069 (23.9) |
| 150 - 227 | 43,403 (5.06) | 36,252 (16.64) |
| 228 - 457 | 34,453 (4.01) | 55,504 (25.48) |
| 458 - 915 | 7,907 (0.92) | 29,327 (13.46) |
| 916 - 1,831 | 691 (0.08) | 5,895 (2.71) |

# Association between shopping behavior and opioid abuse

| | Shopper n (%) | Non-shopper n (%) | Total |
|---|---|---|---|
| **Subjects** | 1,656 | 275,745 | |
| **Abuse** | 108 (6.5) | 1,978 (0.7) | 2,086 |
| **No abuse** | 1,548 (93.5) | 273,767 (9.3) | 275,315 |

OR = 9.6  95% CI (7.9 to 11.8)

+Likelihood ratio = 9.2

Cepeda MS, Fife D, et al. Clin J Pain. 2014;30:1051

# How do I know all of this?

## What did we need?

# Source

- Capture dispensings
- Follow a patient
- Identify the pharmacy
- Capture cash transactions

# Data source and study design

- IMS LRx database
    - Longitudinal pharmacy dispensing database
    - Data on:
        - De-identified subject
        - Pharmacy
        - Prescriber
    - 85% of all retail dispensing in US
    - All types of pharmacies -- chains, food stores, mass merchandisers, or independent stores
    - All prescriptions dispensed, regardless of payment
        - Cash, commercial insurance, Medicare, Medicaid

# How do we get the definition?

- Retrospective cohort study
- Definition had to discriminate drugs with potential abuse from drugs with no abuse
- Compared distributions of overlapping prescriptions, number of prescribers and number of pharmacies
  - Opioids
  - Diuretics
  - Benzodiazepines

# Risk of shopping behavior depending on definition

| Rule | Opioids 25,161,024 | Benzodia-zepines 8,595,179 | Diuretics 8,433,456 |
|---|---|---|---|
| **Overlapping prescriptions by different prescribers (1-day overlap)** | 13.1% | 9.8% | 13.8% |
| **Overlapping prescriptions by different prescribers (4-day overlap)** | 7.7% | 6.8% | 11.1% |
| **Overlapping prescriptions (1- day overlap) by different prescribers, dispensed in ≥3 pharmacies – ADOPTED** | 0.18% | 0.10% | 0.03% |

Cepeda MS, Fife D, Chow W, et al. Drug Saf 35:325, 2012

# Other capabilities of LRx

| | |
|---|---|
| Captures cash transactions | More often pay in cash |
| Pharmacy geographic location | Distance traveled |
| Not limited to 1 state | Number of states visited |
| Unique ID for prescribers | Who has the shoppers |
| Links to other databases | Association with abuse using ICD-9 codes |

# Linking databases to see association of shopping behavior with opioid abuse

- Retrospective cohort study
- Linked LRx and Diagnosis databases (IMS DX)
- IMS DX is a physician claims database
  - Captures claims from 505,000 AMA office-based practitioners in US --87% of all AMA office-based practitioners
  - Independent of specialty
  - Captures all claims from approximately 15% of all AMA office-based practitioners on a monthly basis
  - At least one claim from approximately 71% of all AMA office-based practitioners on a monthly basis

Cepeda MS, Fife D, et al. Clin J Pain. 2014;30:1051

# Linking with other databases

- LRx and IMS Pharmetrics Plus

- Shopping behavior association with abuse beyond ICD-9 codes

- PharMetrics Plus database holds pharmacy, provider and facility claims for 75 million patients in US

- 36 million linked between LRx and PharMetrics Plus
  - 48% of the patients in PharMetrics Plus
  - 15% of the patients in LRx

- Definition of shopping behavior using practice vs prescriber

# Same definition for stimulants

## Shopping behavior

- Overlapping prescriptions from two or more prescribers

and

- Dispensed by three or more pharmacies

Cepeda MS, Fife D, et al. Drugs R D. 2014;14:205