Data-Driven Multidisciplinary Approaches to Reduce Prescription Drug Abuse in Kentucky

Kentucky State Drug Overdose Prevention Advisory Group Meeting

April 26, 2017

KIPRC is a bona fide agent for the Cabinet for Health and Family Services, Department for Public Health
Submitted Proposal: “Data-Driven Responses to Prescription Drug Misuse in Kentucky”

A multi-disciplinary research team from the Kentucky Injury Prevention and Research Center (KIPRC), the Institute for Pharmaceutical Outcomes and Policy (IPOP), and the Center on Drug and Alcohol Research (CDAR), University of Kentucky, in collaboration with state and local agencies, organizations and other stakeholders, will work on the following major goals:

**Goal 1:** Evaluate the impact of Kentucky’s SB32 (2017) on prescriber/dispenser behaviors and patient health outcomes (Kentucky SB32, effective June 30, 2017, amended KRS 218A.202 to require the AOC to forward drug conviction data to CHFS for inclusion in KASPER).

**Goal 2:** Develop and provide continuing education for prescribers and dispensers on the content and interpretation of drug conviction data within KASPER.

**Goal 3:** Evaluate changes in gabapentin prescribing, co-prescribing of CS, and gabapentin diversion after gabapentin scheduling as a Schedule V Controlled Substance in Kentucky. Amended 902 KAR 55:035 §1(e), effective July 1, 2017, reclassified gabapentin as a Schedule V Controlled Substance reportable to KASPER.

**Goal 4:** Sustain and expand the multi-agency multidisciplinary work of the current Action Team, build new practitioner-researcher collaborations.
Recent Drug Overdose Mortality and Morbidity Data
Drug Overdose Deaths for Kentucky Residents, by Drug(s) Involved, 2014-2016*


Data for year 2014 - 2016 are preliminary and will change.
*Data for year 2016 represent the time period from Jan 1, 2016 to Sept 30, 2016.

Drug categories are not mutually exclusive. A drug overdose death that involved two drugs from different categories (e.g. heroin and fentanyl) was counted under each relevant category.
Opioid-related Drug Overdose Emergency Department Visits,
by Type of Opioid, Jan 1, 2010 – Sept 30, 2016.

Produced by the Kentucky Injury Prevention and Research Center, a bona fide agent for the Kentucky Department for Public Health. April 2017. Data source: Kentucky Outpatient Claims, 2010-2016, Office of Health Policy, Cabinet for Health and Family Services. Data are provisional and subject to change.
Comparison between the numbers of overdose deaths and overdose-related emergency department visits, by drug category, October 2015 – Jun 2016.

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Number of heroin and fentanyl submissions to Kentucky State Policy crime labs, by county, 2013-2016.

Acknowledgements:
The authors would like to thank Jeremy Triplett for providing data on fentanyl submissions to Kentucky State Police crime laboratories.
Monthly counts of emergency department visits for treatment of opioid overdoses, by drug involved (heroin vs all other opioids) and by rural/urban status of resident county, Jan 1, 2008 – Sep 30, 2016.

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Study:
Trends and Disparities of Opioid Prescribing in Kentucky
(preliminary results)
Research Questions:

1) Are there any positive changes in opioid prescribing in Kentucky in recent years?
   • Decline in the number/rate of patients with opioid prescriptions?
   • Decline in the number/rate of patients with high daily dose of morphine milligram equivalent?

2) Are there significant differences in opioid prescribing for Appalachian vs. Non-Appalachian Kentucky residents?
Method: Repeated Measures Regression
Negative Binomial Generalized Estimating Equations (GEE) Modeling

<table>
<thead>
<tr>
<th>Variables</th>
<th>Data Sources</th>
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<tr>
<td><strong>Count Outcome Variables (unit of analysis: county-quarter)</strong></td>
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<tr>
<td>(1) Number of patients with opioid prescriptions* (Offset=Log of population)</td>
<td>KASPER/Office of Inspector General (OIG), 2012 – 2015</td>
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<tr>
<td>(2) Number of patients receiving more than three days with 100 MME or more* (Offset=Log of population)</td>
<td>KASPER/OIG, 2012 - 2015</td>
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<tr>
<td>(3) Number of patients receiving more than three days with 100 MME or more* (Offset=Log of patients with opioid prescriptions*)</td>
<td>KASPER/OIG, 2012 - 2015</td>
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<td><strong>Covariates:</strong></td>
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<td>(1) Region: Appalachian vs. Non-Appalachian</td>
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<td>(2) Rate of ED visits due to injury excluding poisoning per 1,000 population</td>
<td>Outpatient Claims Data, Office of Health Policy, 2012 - 2015</td>
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<td>(3) Age-adjusted rate of invasive cancer incidence per 100,000 population (average rate over previous two years)</td>
<td>Kentucky Cancer Registry, 2010 - 2014</td>
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<td>(4) Rate of buprenorphine prescriptions (per 1,000 population)</td>
<td>KASPER/OIG, 2012 - 2015</td>
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<td>(5) Percent of persons ages 55+ with opioid prescriptions*</td>
<td>KASPER/OIG, 2012 - 2015</td>
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* Excluding prescriptions of buprenorphine or buprenorphine/naloxone combination
Rate of Patients with Opioid Prescriptions* by County
Kentucky, 2012 and 2015

*The data excludes prescriptions for buprenorphine and buprenorphine/naloxone combination.

Produced by the Kentucky Injury Prevention and Research Center, a bona fide agent for the Kentucky Department for Public Health. March 2017.
GEE model: Number of patients with opioid prescriptions
Offset: Log of population

Rate of patients with opioid prescriptions by region

$RR_{Q1-12} = 1.25$
$\text{(1.16 - 1.36)}$

$RR_{Q4-15} = 1.23$
$\text{(1.14 - 1.32)}$
GI* Maps: Rates of Patients with Opioid Prescriptions per 1,000 Population, Kentucky 2012 and 2015

Hot and cold spots identified by Getis-Ord Gi* Analysis, 2012

Top three counties with the highest rates:
(1) Whitley, (2) Owsley, and (3) Wolfe

Hot and cold spots identified by Getis-Ord Gi* Analysis, 2015

Top three counties with the highest rates:
(1) Whitley, (2) Owsley, and (3) Floyd

Cold Spot - 99% Confidence
Cold Spot - 90% Confidence
Cold Spot - 95% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 99% Confidence
Hot Spot - 95% Confidence
Appalachian region

Note: The data excludes prescriptions for buprenorphine and buprenorphine/naloxone combination.

Produced by the Kentucky Injury Prevention and Research Center, a bona fide agent for the Kentucky Department for Public Health. March 2017.
Rate of Patients with More than Three Days (in a Quarter) Receiving >=100 Morphine Milligram Equivalents per Day by County, Kentucky 2012 and 2015

* The data excludes prescriptions for buprenorphine and buprenorphine/naloxone combination.

Produced by the Kentucky Injury Prevention and Research Center, a bona fide agent for the Kentucky Department for Public Health. December 2016.
GEE model: Number of patients with high daily MME dose
Offset: Log of population

Rate of patients with more than three days receiving 100 daily MME or more in a quarter by region

\[ \text{RR}_{Q1-12} = 1.35 \ (1.20 \ - \ 1.52) \]

\[ \text{RR}_{Q4-15} = 1.09 \ (0.96 \ - \ 1.23) \]
GI* Maps: Rates of Patients with More than Three Days per Quarter Receiving 100 Daily Morphine Milligram Equivalents or More per 1,000 Population, Kentucky 2012 and 2015

Hot and cold spots identified by Getis-Ord Gi* Analysis, 2012

Top three counties with the highest rates:
(1) Powell, (2) Clay, and (3) Estill

- Cold Spot - 99% Confidence
- Cold Spot - 90% Confidence
- Cold Spot - 95% Confidence
- Not Significant

Hot and cold spots identified by Getis-Ord Gi* Analysis, 2015

Top three counties with the highest rates:
(1) Powell, (2) Crittenden, and (3) Livingston

- Hot Spot - 99% Confidence
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence

Note: The data excludes prescriptions for buprenorphine and buprenorphine/naloxone combination.

Produced by the Kentucky Injury Prevention and Research Center, a bona fide agent for the Kentucky Department for Public Health. March 2017.
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