

Prescription Opioid Death Rates are Greater for Females than Males

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Background

- In July 2013, the Centers for Disease Control and Prevention (CDC) showed prescription opioid deaths increased 400% for females compared to 265% for males from 1999-2010
- We examined data from the Researched Abuse, Diversion and Addiction-Related Surveillance (RADARS®) System Poison Center Program for similar trends

Methods

- Data from the RADARS System Poison Center Program between January 1, 2006 and June 30, 2014 were used
- Inclusion criteria:
 - Individuals greater than 12 years old
 - Known gender
 - Involved at least one fentanyl, hydrocodone, hydromorphone, morphine, oxycodone, oxymorphone, tapentadol, or tramadol product
 - Resulted in direct death
- Quarterly rates were calculated by summing the death cases and dividing by the sum of the gender-specific population and prescriptions dispensed in covered areas.
- Poisson regression was used to model these rates
 - Covariates included were gender, linear and quadratic terms for quarter, and linear and quadratic terms for quarter by gender interactions
- The trend in number of prescriptions per population was examined by gender using linear polynomial regression
- Average quarterly changes in the prescriptions per population were compared for males and females

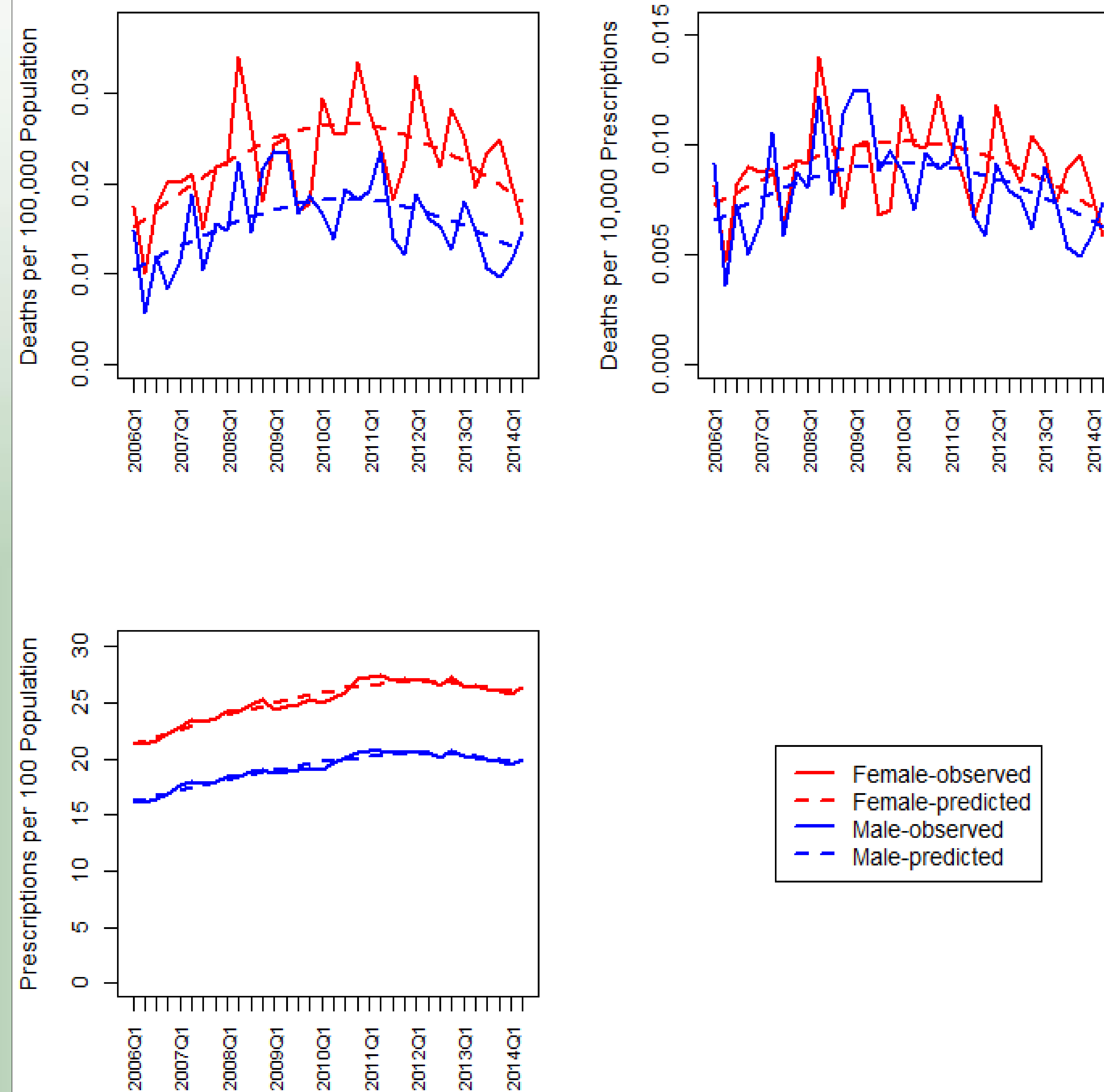
Results

- Population adjusted death rates increased for both genders until July 2010 then declined.
- Prescription adjusted death rates increased until October 2009 then declined
- The death rates were higher for women than men in any given quarter, with the population adjusted death rate 45.2% higher for females than males ($p < 0.001$), and the prescription adjusted death rate 10.5% higher for females ($p = 0.069$)
- There were significant quadratic trends for population and prescriptions rates
- Prescriptions per population increased for both genders from 2006- 2011 then leveled out
- On average, females were dispensed 31.5% more opioid prescriptions per population than males ($p < 0.001$)
- There was a significant cubic trend for prescriptions per population
- Trends were similar between males and females in all three models, but intercepts differed by gender

Table 1. The RADARS® System Poison Center Program Death rate ratios by gender from January 1, 2006 to June 30, 2014

| Rate | Female to Male Rate Ratio (95% CI) | p-value |
|----------------------------------|------------------------------------|---------|
| Deaths per 100,000 Population | 1.452 (1.304,1.616) | <0.001 |
| Deaths per 10,000 Prescriptions | 1.105 (0.992,1.230) | 0.069 |
| Prescriptions per 100 Population | 1.315 (1.304,1.326) | <0.001 |

Figure 1. The RADARS® System Poison Center Program Death rates by gender and quarter from January 1, 2006 to June 30, 2014



Conclusions

- While trends in prescription opioid deaths are similar between genders, population and prescription adjusted rates of prescription opioid deaths were higher for females than males
- These results may be due to greater drug availability for females

The RADARS® System is part of Denver Health and Hospital Authority, a division of the state of Colorado. It is supported by subscriptions from pharmaceutical manufacturers.

