

# The Emergence of Gabapentin as a Drug of Abuse in a Cohort of Rural Appalachian Drug Users

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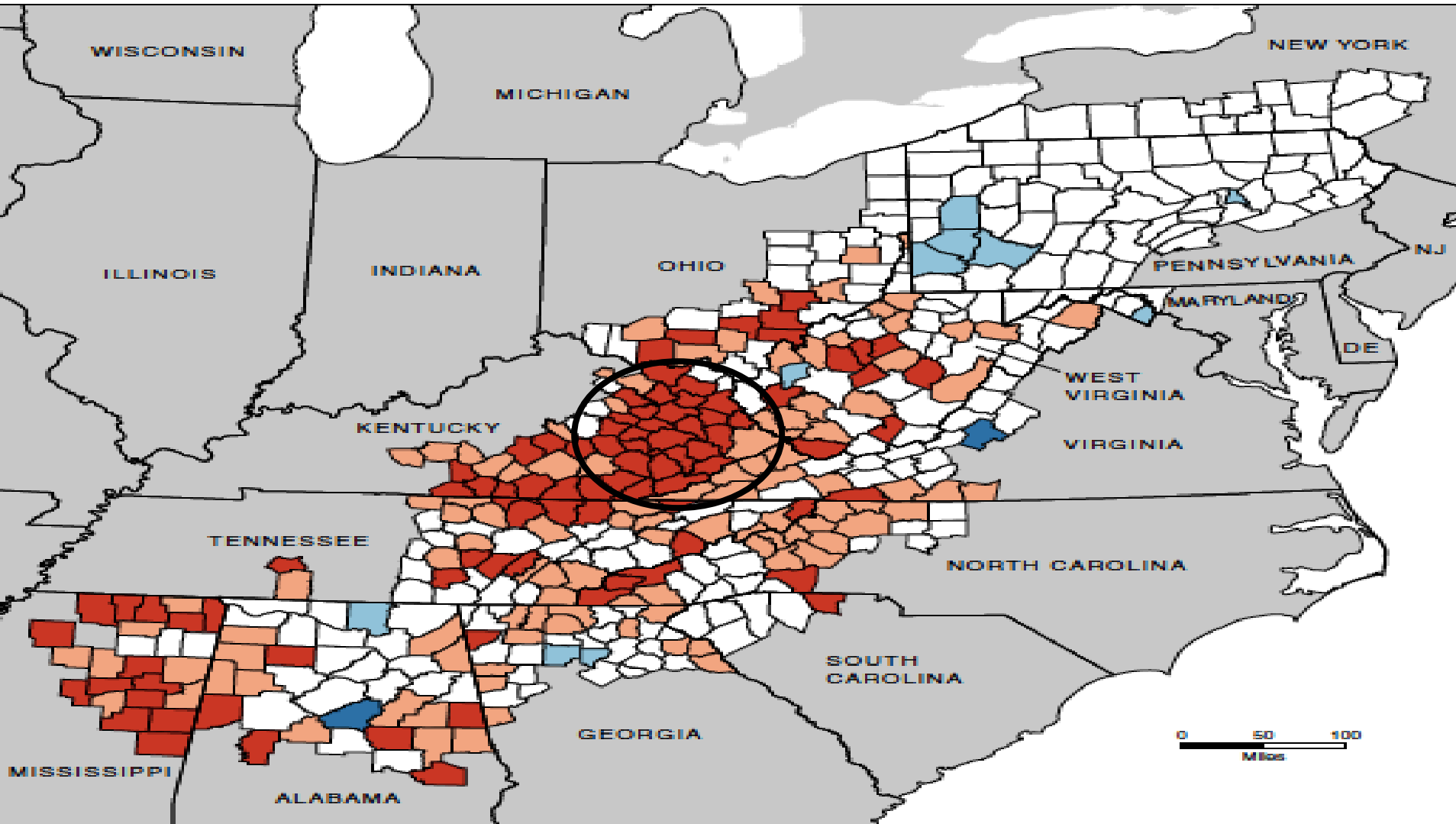
# Goals

- Describe the epidemiology of gabapentin abuse/misuse
- Examine gabapentin abuse/misuse in a cohort of rural Appalachian drug users
- Determine next steps



# County Economic Status in Appalachia, Fiscal Year 2015

(Effective October 1, 2014 through September 30, 2015)



The Appalachian Regional Commission uses an Index-based county economic classification system to identify and monitor the economic status of Appalachian counties. See the reverse side for a description of each economic level.

| County Economic Levels   |                    |
|--|--------------------|
| <span style="display:inline-block; width:15px; height:15px; background-color:darkred; border:1px solid black;"></span>   | Distressed (90)    |
| <span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span>    | At-Risk (108)      |
| <span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span>     | Transitional (210) |
| <span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> | Competitive (10)   |
| <span style="display:inline-block; width:15px; height:15px; background-color:darkblue; border:1px solid black;"></span>  | Attainment (2)     |

Map Created: March 2014  
 Data Sources:  
 Unemployment data: U.S. Bureau of Labor Statistics, LAUS, 2010–2012  
 Income data: U.S. Bureau of Economic Analysis, REIS, 2012  
 Poverty data: U.S. Census Bureau, American Community Survey, 2008–2012



# Review of Studies Noting Gabapentin Misuse/Abuse

- Literature searched for peer-reviewed manuscripts describing misuse/abuse of gabapentin
  - *Misuse/abuse*: taking larger doses than prescribed, taking without a prescription, and diversion
- 23 case studies and 11 epidemiological studies met inclusion criteria



# Review of Studies Noting Gabapentin Misuse/Abuse

- Papers from US, UK, Germany, Finland, India, South Africa and France
- Only 1 study estimated national prevalence (in the UK) at 1.1%
- Prevalence higher in samples also abusing other prescription or illicit drugs



# Review of Studies Noting Gabapentin Misuse/Abuse

- Lower than expected prevalence of gabapentin abuse in those with alcohol dependence; higher in those with opioid dependence
- A study conducted in Scotland found that more than 1% of deaths were attributable to gabapentin; 0.3% of post-mortem toxicology results positive for gabapentin in Finland
- Toxicological results from a study of U.S. drivers found 0.6% to be positive for gabapentin



## **Longitudinal Study to Determine Vulnerabilities to Prescription Opioid Abuse and Associated Harms in Rural Appalachia**

- Social Networks among Appalachian People (SNAP) study
- Purpose: determine prevalence and incidence of HCV, HIV and HSV-2 in relation to social network characteristics among rural drug users
- 500 rural out-of-treatment PWID/non-PWID recruited using RDS and followed at 6-, 12-, 18-, 24-, 30-, and 36-, 42-months post-baseline (still actively following 430 participants from original cohort)







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Hazard, KY



# Eligibility Criteria

- Age 18+
- English-speaking
- PWID (initial seeds)
- Use of at least 1 of the following drugs to get high in prior 30 days:
  - Rx Opiates (illicit use)
  - Cocaine
  - Heroin
  - Methamphetamine



# Data Collection Procedures

- Interviewer-administered questionnaire
  - Computer-assisted personal interview (CAPI) via tablet PC
- Serologic testing (with pre- and post-test counseling – all rapid tests)
  - HIV
  - HCV
  - HSV-2 (through 2016)
  - Syphilis (2017 – on)



# Measures

- Expanded (additional prescription drugs) *Addiction Severity Index* to measure drug use (including gabapentin specifically) and demographics
- *Name generating questionnaire* to measure drug, sex, support networks (sociocentric)
- *Risk Behavior Assessment* to determine sex and injection-risk behaviors



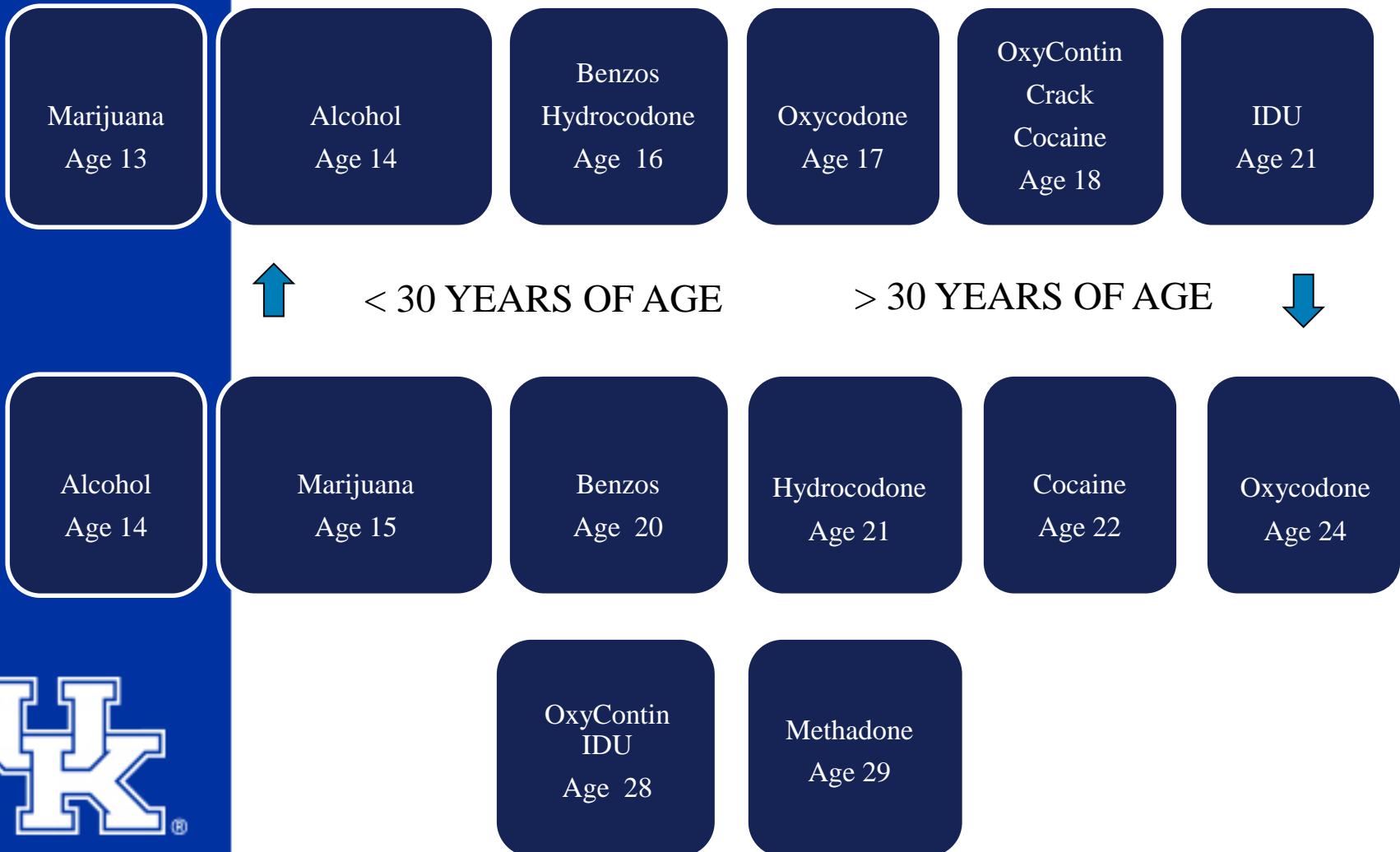
# Participant Characteristics

## N=503




|                             | n           | %    |
|-----------------------------|-------------|------|
| Male                        | 286         | 56.7 |
| Age, median (IQR)           | 31 (26 ,38) |      |
| Caucasian                   | 474         | 94.2 |
| Employed Full-Time          | 173         | 34.4 |
| Lifetime Injection Drug Use | 394         | 78.3 |



# Age of Onset – Comparison of Older and Younger Users



# Drug Use – 2008, 2014, 2016

|                         | Past 30 Days<br>(2008) | Past 30 Days<br>(2014) | Past 30 Days<br>(2016)   |
|-------------------------|------------------------|------------------------|--|
| Buprenorphine (illicit) | Not queried            | 26.5                   | 19.2    |
| Methadone (illicit)     | 60.8                   | 11.0                   | 7.9  |
| Heroin                  | 4.4                    | 0.1                    | 1.4     |
| OxyContin               | 69.8                   | 0.1                    | 1.1  |
| Roxicodone              | 72.4                   | 18.6                   | 17.3   |
| Hydrocodone             | 81.3                   | 28.1                   | 23.3   |
| Benzodiazepines         | 85.3                   | 27.1                   | 28.8   |
| Methamphetamine         | 3.4                    | 4.0                    | 4.6  |
| Cocaine                 | 22.5                   | 7.2                    | 9.8  |
| Gabapentin              | 0                      | 14.7                   | 47.7  |



<sup>1</sup>Lofwall and Havens. *Drug and Alcohol Depend*, 2012

<sup>2</sup>Hall, Leukefeld, Havens. *Am J Drug Alcohol Abuse*, 2013

<sup>3</sup>Jonas, Young, Oser, Leukefeld, Havens. *Soc Sci Med*, 2012

<sup>4</sup>Smith, Lofwall, Havens. *Am J Psychiatry*, 2015



# Emerging Trends in Prescription Drug Abuse

- Neurontin (gabapentin)
  - 165% increase in abuse between 2013 and 2014
  - 2950% increase in abuse between 2008 and 2014
  - Participants reporting a mean of 25 days of use in past 30
  - More likely ( $p < 0.05$ ) to also be abusing IR oxycodone, buprenorphine and benzodiazepines



# Qualitative Analysis of Gabapentin Abuse

- Data collected from two active cohorts in Appalachian Kentucky
- Eligibility criteria: recent (< 1 year) gabapentin abuse
- 33 participants (5 males, 27 females) across four focus groups conducted at field site in Hazard, KY
- March – September 2015



Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018

# Qualitative Analysis of Gabapentin Abuse

- **Initiation:** 5-10 years since first use
- **Source:** prescription for nerve-related pain, mental health disorders  
*“That’s how everybody got introduced to gabapentin, it’s through doctors”*
- Family/friends also mentioned as initial source of gabapentin



Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018

# Qualitative Analysis of Gabapentin Abuse

- **Reasons for First Use:** legitimate medical concern and hearing about it from peers

*“I mean, its like more and more and more...as years went on, people just started gabapentin. You’d hear other people talking about taking them, and I was like “well let me try it” and it went from there”*



Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018

# Qualitative Analysis of Gabapentin Abuse

- **Physical experience:** muscle relaxation, pain reduction, hallucinations, sleepiness, feeling drunk or high
- Participants likened high to that of opiates
- Some described stimulant-like effects

*“[like a] shot of cocaine”*



Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018

# Qualitative Analysis of Gabapentin Abuse

- **Motivations for continued use:** primarily for pharmacodynamic effects (getting high)
  - Other reasons for continued use:
    - Pain relief
    - Withdrawing from other substances such as cocaine, buprenorphine and oxycodone
- Getting high with gabapentin is “cheap” and “always available”



Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018



# Qualitative Analysis of Gabapentin Abuse

- **Characteristics of Abuse:** use of tolerance to enhance high  
*“You wait a few days and don’t take any, then you take some – you feel good”*
- **Route of administration:** primarily oral, some snorting
  - Effect enhanced with concomitant use of caffeine
  - Used as a way to come down from cocaine



# Qualitative Analysis of Gabapentin Abuse

- **Physical Effects:** reports of both stimulant-like effects  
*“Just keeps you wanting to move”*
- Reports of depressant effects consistent with side effect profile  
*“Relaxes your body” and “helps with rest”*



Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018

# Qualitative Analysis of Gabapentin Abuse

- **Longitudinal Trends:** long-standing awareness of drug, but noted increases in popularity in community starting in 2012-13
- More use among younger drug users
- Concern about becoming scheduled (which did occur in July, 2017)

*“And that why they gonna make them scheduled...cause everybody’s getting them”*

Smith, Boland, Young, Lofwall, Quiroz, Staton and Havens.  
*Psychology of Addictive Behaviors*, 2018



# Changes in Laws to Curb Opioid Abuse – Unintended Consequences?

- Changes in opioid epidemic – prescription drugs to heroin; mitigated by changes in laws and practices increasing scarcity of prescription opioids
- Similarly, changes in laws around opioid prescribing/PDMP may be driving use of gabapentin in rural areas
- Now scheduled in Kentucky as of 7/2017 – will have data to demonstrate how this affected use longitudinally



# Next Steps

- Examine longitudinal trends gabapentin in abuse/misuse
  - Effect of changes in scheduling
    - Policy implications for other states with PDMPs contemplating scheduling
  - Drug co-usage with opioids, stimulants
  - Motivations for use and source



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