



The VISN 2
Center of Excellence
at Canandaigua



U of R Center for the Study and Prevention of Suicide

The relationship between chronic pain & suicide-related outcomes

Lisham Ashrafioun, PhD^{1,2}

Robert Bossarte, PhD³⁻⁵

Sara Warfield, PhD(c)^{4,5}

¹ VA VISN 2 Center of Excellence for Suicide Prevention

² Department of Psychiatry University of Rochester

³ ³ WVU Department of Psychiatry

⁴ WVU Injury Control Research Center

⁵ WVU School of Public Health



VA
HEALTH
CARE | Defining
EXCELLENCE
in the 21st Century

Disclosures

- Lisham Ashrafioun has no conflicts of interest to report
- Dr. Ashrafioun's work was supported, in part, by resources and use of the Advanced Fellowship Program in Mental Health Illness Research and Treatment, and the VISN 2 Center of Excellence for Suicide Prevention at the Canandaigua VA Medical Center
- Rob Bossarte has no conflicts of interest to report
- Sara Warfield has no conflicts of interest to report
- Dr. Bossarte and Sara's work was supported by WVU's Clinical and Translational Science Institute (NIH: U54GM104942) as well as WVU's Injury Control Research Center (CDC: 5-R49-CE002109)

Overview

- Review literature regarding the relationship between pain and suicidal thoughts and behavior
- Present findings from the Behavioral Health Autopsy Program as it relates to pain among Veteran suicide decedents
- Present preliminary analyses on suicide attempts among Veterans seeking VHA specialty pain services
- Review chronic pain and suicide in West Virginia
- Present findings from WVU hospital system predicting suicide attempts among patients who have chronic pain

Poll #1

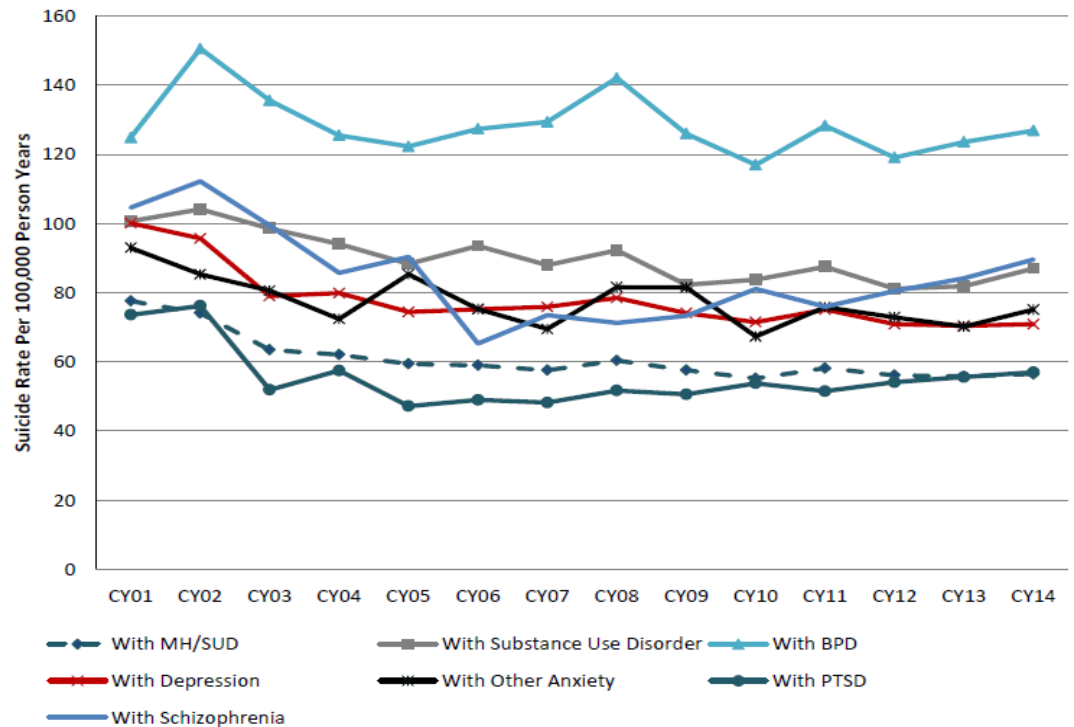
- What is your primary role in VA?
 - Student, trainee, or fellow
 - Clinician
 - Researcher
 - Manager or policy-maker
 - Other

Poll #2

- What is your area of expertise in the following areas?
 - Pain
 - Suicide
 - Neither
 - Both
 - I dabble in both

Suicide

- Over 42,000 suicides across the United States
- Veterans die by suicide at a higher rate compared to civilians



CDC; Department of Veterans Affairs, 2016;

Pain

- Veterans are at-risk of developing chronic pain
- Estimated cost of chronic pain is over \$500 billion
- MSD cohort – 5,237,763 (55%) Veterans w/ at least 1 MSD diagnosis

Proportion of veterans with select comorbid medical and mental health diagnoses and body mass index (BMI), by the year of cohort entry.

	Year											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Hypertension, %	45.3	48.7	49.4	50.7	50.7	50.4	49.8	48.8	47.5	47.0	46.3	45.9
Diabetes, %	18.6	19.6	19.8	20.2	20.3	20.4	20.0	19.7	18.8	18.6	18.5	18.8
Coronary artery disease, %	17.3	19.1	18.3	17.9	17.2	16.7	15.9	14.7	13.3	12.7	12.4	12.4
COPD, %	11.0	10.5	9.7	9.2	9.1	8.8	8.4	8.2	7.7	7.4	7.2	7.2
Stroke, %	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	1.1
HCV, %	1.9	2.4	2.6	2.9	3.1	2.8	2.8	2.9	2.8	2.6	2.4	2.3
Depressive disorders, %	13.6	13.3	13.5	14.4	15.1	15.3	15.6	17.2	18.6	19.3	19.9	19.9
PTSD, %	6.7	5.2	5.2	5.4	6.4	7.6	8.2	10.2	11.7	11.8	12.1	12.2
Anxiety (non-PTSD), %	5.1	5.0	4.9	5.0	5.4	5.8	5.9	6.6	7.5	8.0	8.6	9.0
Schizophrenia, %	2.0	1.8	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.8	0.8
Alcohol disorders, %	6.0	6.8	6.4	6.5	6.9	7.1	7.2	7.9	8.4	8.5	8.6	8.6
Drug use disorders, %	3.0	3.5	3.3	3.3	3.4	3.5	3.5	3.8	4.0	3.9	3.9	3.8
BMI*, %												
Underweight	1.3	1.3	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0
Normal	22.4	22.8	22.3	21.9	22.3	22.3	22.2	21.9	21.6	20.7	20.4	20.4
Overweight	39.1	40.0	39.8	39.9	39.5	39.1	38.7	38.4	38.2	37.8	37.5	37.2
Obese	37.2	36.0	36.7	37.1	37.0	37.5	38.1	38.6	39.1	40.5	41.1	41.4

* Among those with available height and weight data.

COPD, chronic obstructive pulmonary disorder; HCV, hepatitis C virus; PTSD, posttraumatic stress disorder.

IOM, 2011; Goulet et al., 2016

Pain is associated with increased risk of suicidal thoughts and behaviors

- Pain included as an indication for assessment of risk for suicide in the VA/DoD guidelines
- Among Veterans, pain conditions are associated with increased risk of suicide
- Meta-analysis: Death wishes ($z = 3.47$), suicidal ideation ($z = 5.77$), suicide planning ($z = 3.36$), suicide attempts ($z = 4.29$), suicide ($z = 2.34$)
- Among National VA Crisis Line callers, pain was the perceived reason for calling in 10% of over 35,000 calls

Pain-related factors associated with suicide risk

- Pain catastrophizing
- Pain severity and pain interference
- Perceived burdensomeness
- Opioid Therapy
 - Risk factors - higher doses, sedative co-prescriptions,
 - Protective factors – facilities increased follow-up after initiating prescriptions

Edwards et al., 2006; Ilgen et al., 2016; Im et al., 2015; Kowal et al., 2014; Tang & Crane, 2006;

Behavioral Health Autopsy Program

- Implemented in 2012 by VHA's Suicide Prevention program
- Collects information on all Veteran deaths by suicide reported to VHA clinicians and suicide prevention coordinators (SPCs)
 - Standardized chart reviews
 - Interviews of family members of Veteran suicide decedents
 - Review of care completed by SPCs at local facilities
- Report was generated in November 2015 from information collected from December 2012 to June 2015

Department of Veterans Affairs, 2015

VETERANS HEALTH ADMINISTRATION

Behavioral Health Autopsy Program

- Family Interviews (144 interviews representing 139 Veterans)
 - Over two-thirds reported the Veteran suicide decedent experienced pain

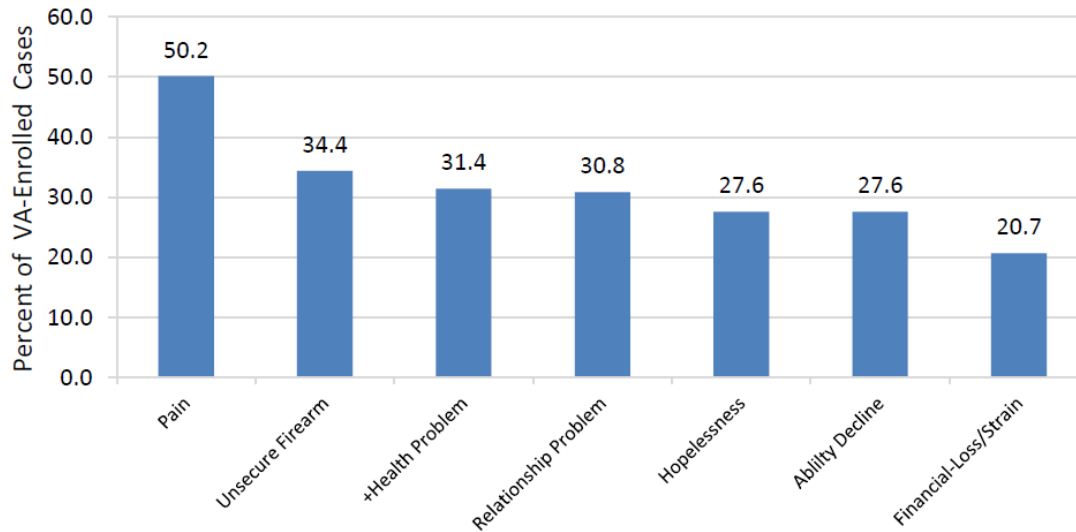
Table 3. Respondent's Knowledge of Veterans' Physical Health

	Total (n=135) N (%)	18-39 years (n=44) N (%)	40-59 years (n=37) N (%)	60+ years (n= 54) N (%)
Veteran's general health				
Poor	55 (40.7)	6 (4.4)	13 (9.6)	36 (26.7)
Fair	40 (29.6)	14 (10.4)	14 (10.4)	12 (8.9)
Good	40 (29.6)	24 (17.8)	10 (7.4)	6 (4.4)
Veteran had physical challenges or mobility issues				
Yes	79 (58.5)	20 (14.8)	19 (14.1)	40 (29.6)
No	56 (41.5)	24 (17.8)	18 (13.3)	14 (10.4)
Veteran had problems with pain				
Yes	93 (68.9)	28 (20.7)	26 (19.3)	39 (28.9)
No	37 (27.4)	15 (11.1)	11 (8.2)	11 (8.2)
Not indicated ¹	5 (3.7)	1 (0.7)	0 (0.0)	4 (3.0)

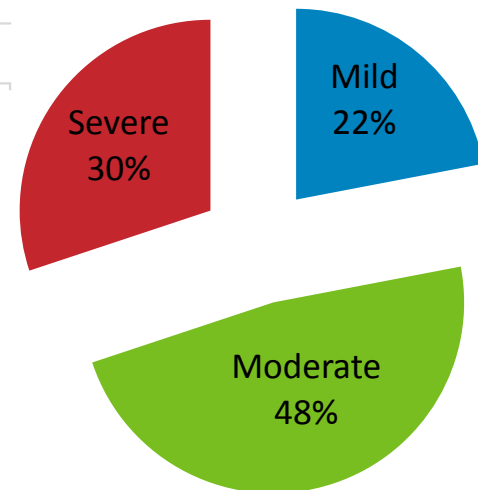
Behavioral Health Autopsy

- Chart reviews

Figure 5: Risk Factors



Pain level

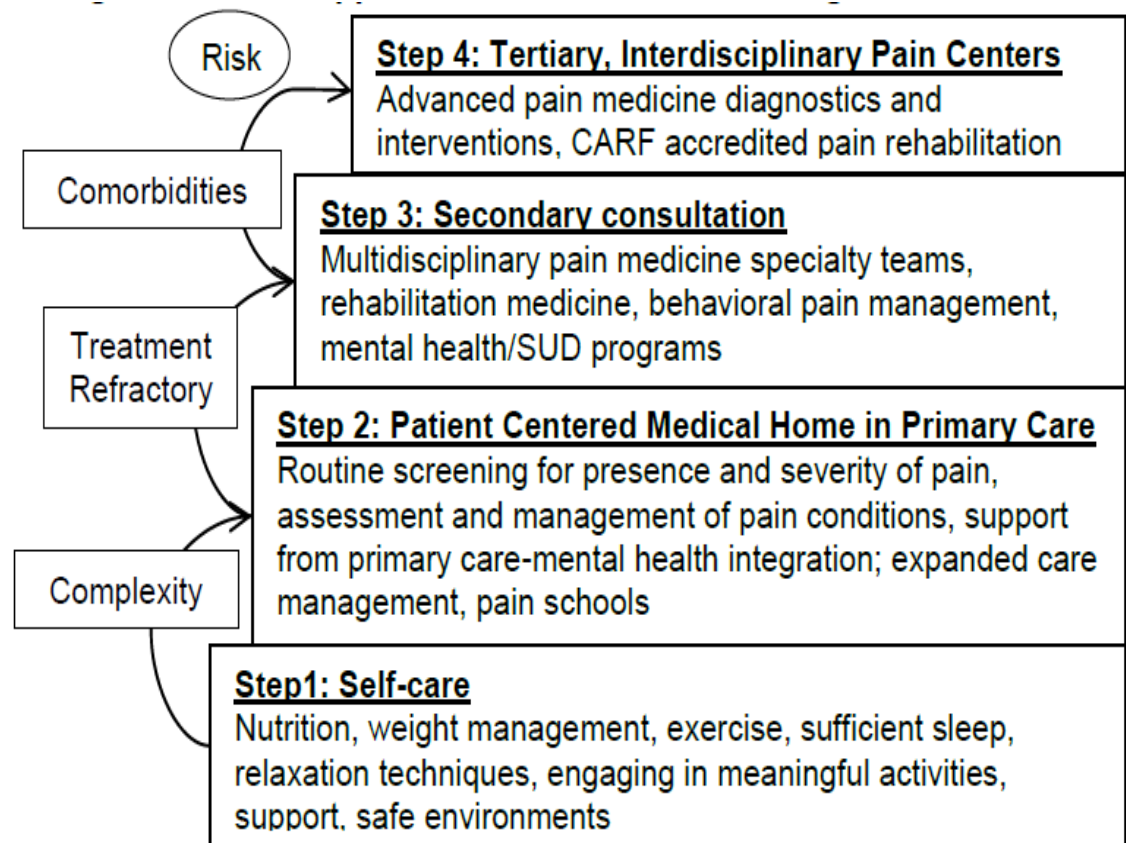


BHAP Recommendations

- Effective assessment and treatment of pain involves close collaboration and open communication between providers and Veterans across settings
- Clinicians should consider benefits of behavioral management techniques for pain management and to collaborate with pain clinics when available
- Carefully consider pros and cons of pharmacological treatments for pain during treatment planning, particularly in Veterans with past or current alcohol or substance use disorders

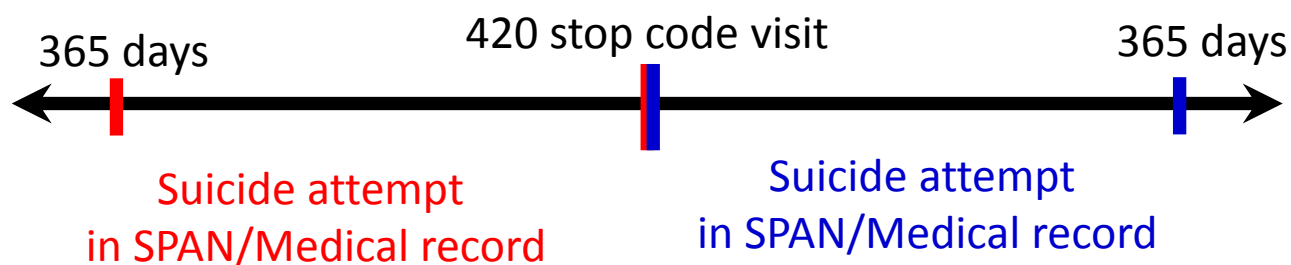
Veterans seeking VHA specialty pain services

- Step 3 – Veteran continues experiencing significant impairment and disability due to pain
 - ↑ medical and/or psychiatric comorbidity and complexity
- Specialty pain services - Arout et al. (2017)
 - Comparable levels of medical conditions
 - Higher rates of psychiatric disorders
 - Greater number of opioid prescriptions



Suicide attempts among Veterans seeking VHA specialty pain services

- Cohort – all Veterans with a 420 stop code alive during FY 2012 to FY 2014 (n = 231,729)
- Corporate Data Warehouse
 - Diagnoses
 - Age, gender
 - Pain Numeric Rating Scale scores
- Suicide Prevention Application Network (SPAN) database



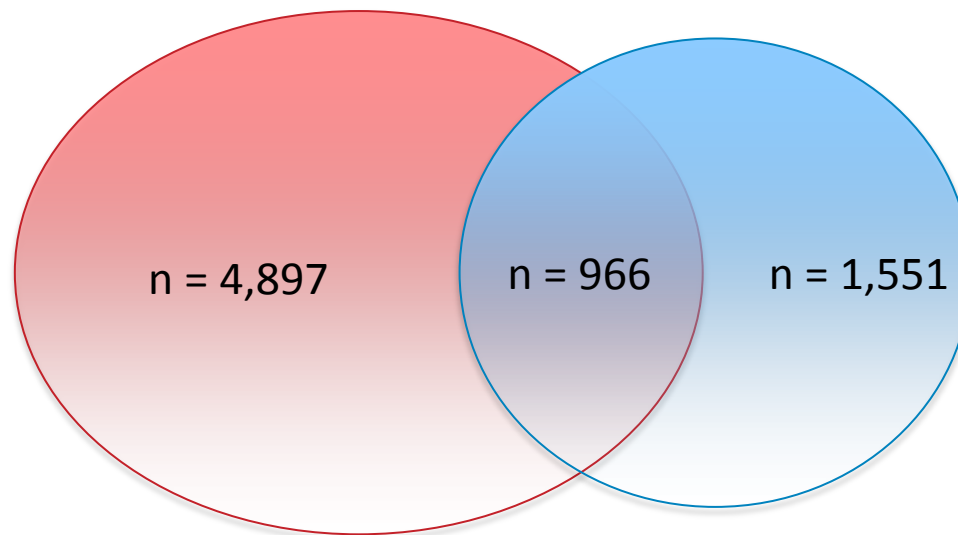
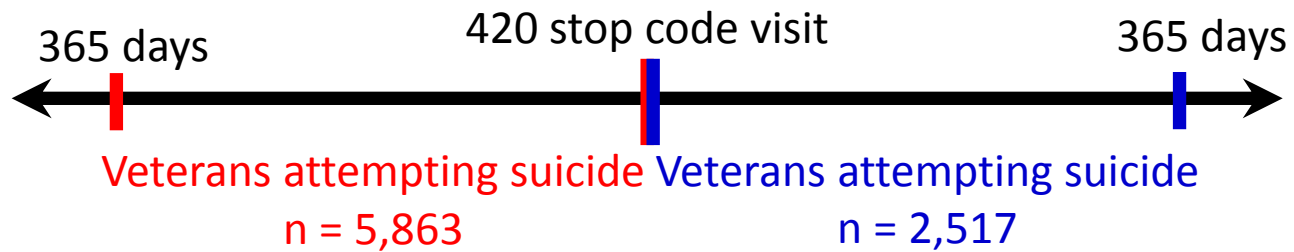
Suicide attempts among Veterans seeking VHA specialty pain services

Conditions	n (%)	Conditions	n (%)
Depression	97,674 (42.2)	Migraines	16,592 (7.2)
Alcohol Use Disorder	30,701 (13.2)	Other headaches	25,507 (11.0)
Drug Use Disorder	29,998 (12.9)	Psychogenic	6,202 (2.7)
PTSD	45,733 (19.7)	Neuropathy	7,524 (3.2)
Arthritis	152,614 (65.9)	Fibromyalgia	19,317 (8.3)
Back pain	188,721 (81.4)		

- Pain scores – 5.2% reporting no pain; 47.7% reporting score of 7 or higher

Suicide attempts

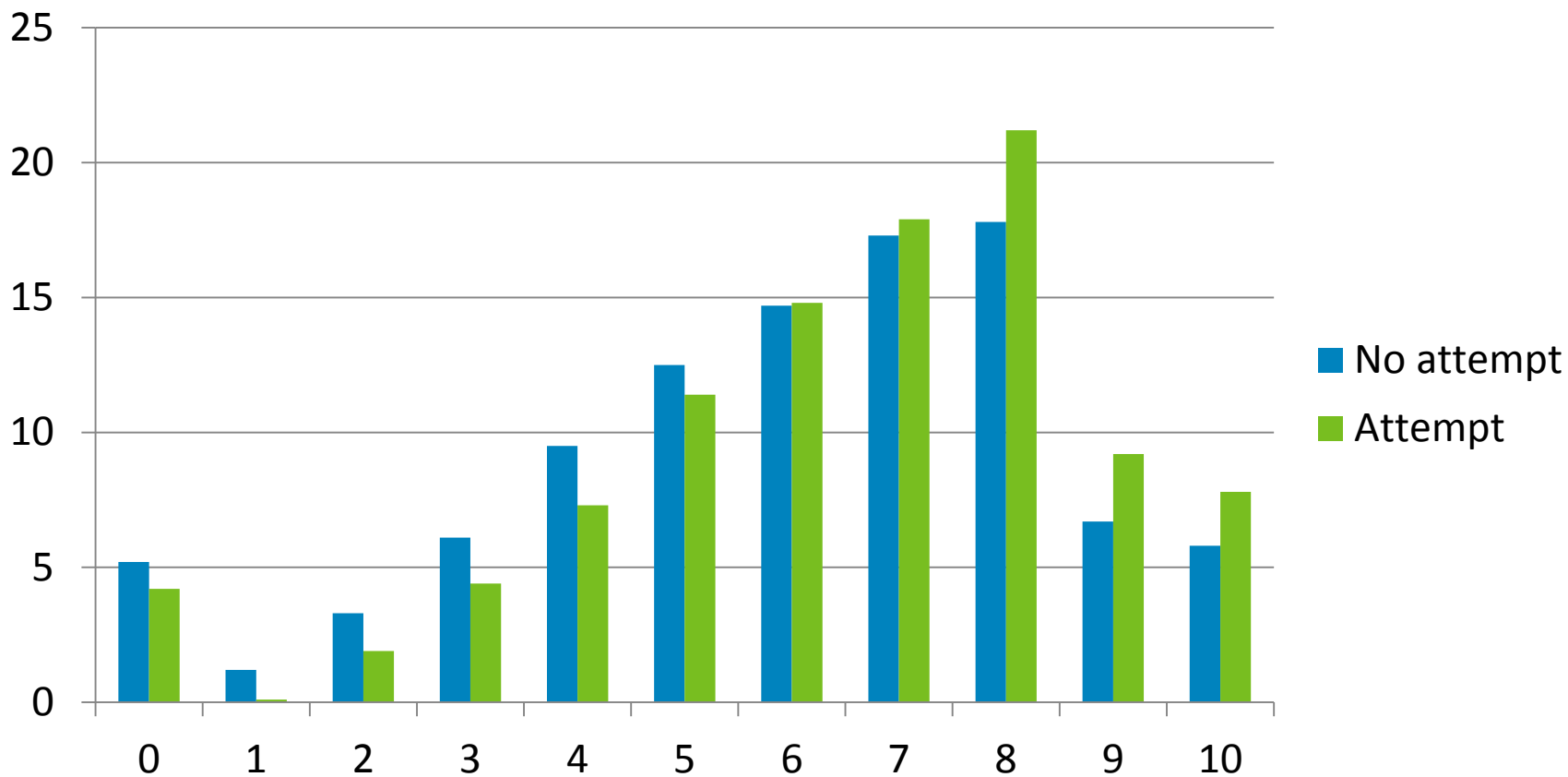
- Rate – 1,086/100,000



Risk factors of suicide attempts

	Adjusted odds ratios	95% CI
Male	0.80	0.67-0.94
Age	0.97	0.97-0.98
Max pain intensity score on index visit	1.05	1.02-1.08
Depression	2.20	1.90-2.51
Alcohol use disorder	2.19	1.90-2.51
Drug use disorder	2.24	1.95-2.57
PTSD	1.40	1.22-1.59
Other anxiety disorder	1.41	1.24-1.59
Medical comorbidity	1.07	1.02-1.08

Pain scores by attempt status



Pain scores and pain conditions

Time period of max pain score	n	Adjusted OR	95% CI
Index	111,068	1.05	1.02-1.08
Previous week	127,907	1.07	1.05-1.09
Previous 30 days	169,385	1.08	1.06-1.10
Previous 90 days	210,642	1.11	1.09-1.13
Previous 180 days	225,762	1.16	1.14-1.19

	Adjusted OR	95% CI		Adjusted OR	95% CI
Arthritis	0.84	0.77-0.92	Psychogenic	1.08	0.89-1.31
Back pain	0.65	0.58-0.72	Neuropathy	0.99	0.77-1.27
Migraine	1.12	0.98-1.27	Fibromyalgia	1.06	0.93-1.22
Headaches	1.08	0.96-1.21			

Next steps and limitations

Next steps

- Treatment utilization
- Medication use
- Suicide deaths

Limitations

- Suicide attempt data
- Medical record diagnoses
- Challenging to know exactly what treatment patients are receiving at their index visit

Take home points

- Public health approach to suicide prevention includes addressing pain
- Communication is key – with other providers, with Veterans, and about suicide risk
- Assessing the effect of pain management strategies on suicide risk
 - Not excluding individuals experiencing suicidal ideation
 - Including suicide risk outcomes
- Explicitly addressing suicide in psychosocial interventions

The relationship between chronic pain & suicide-related outcomes in West Virginia

Robert Bossarte, PhD¹⁻³

Sara Warfield, PhD(c)^{2,3}

¹ WVU Department of Psychiatry

² WVU Injury Control Research Center

³ WVU School of Public Health

West Virginia

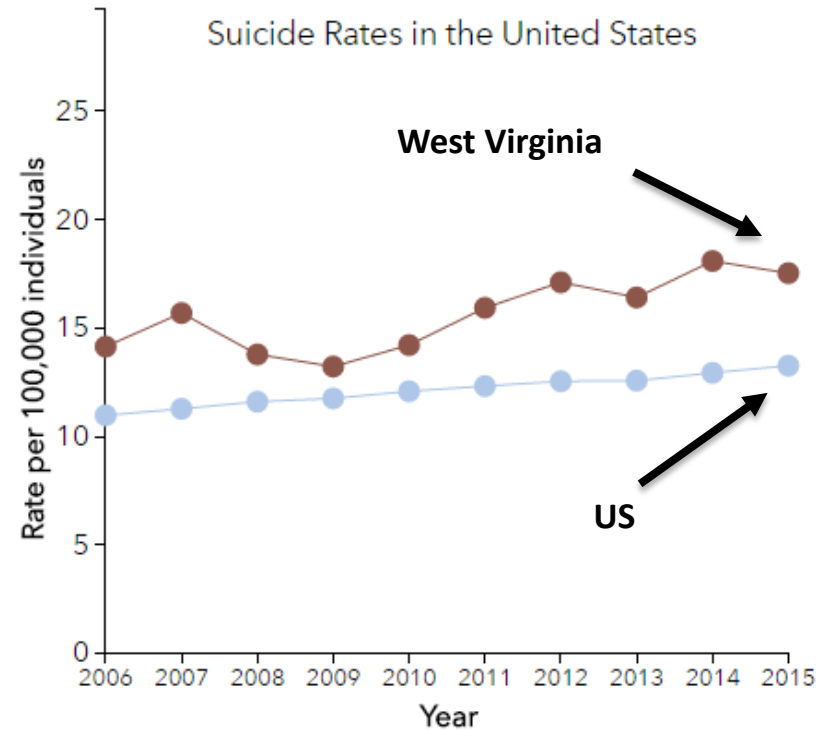
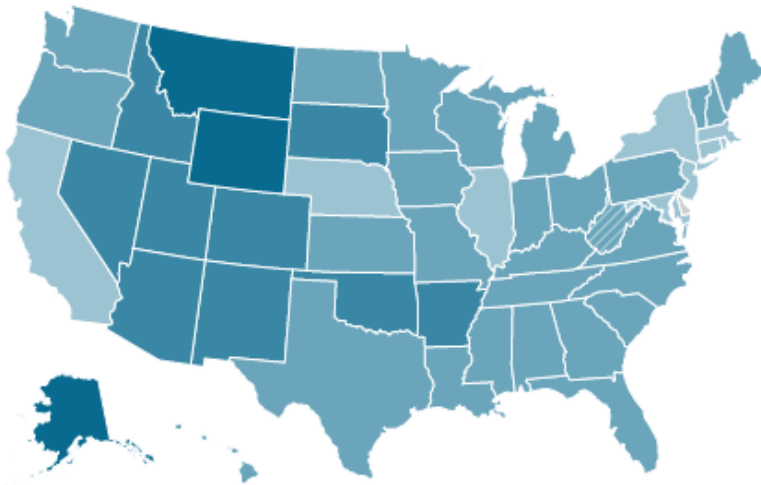
- Population of WV is around 1.85 million
- Approximately 13.6% of homes in WV are occupied by veterans ¹
- WV is the second most elderly state in the country ²
 - 1 in 3 elder West Virginians is in fair or poor health
 - Approximately 45% of WV elders have a disability compared to 37% nationally
- Suicide rates are higher in West Virginia than national rates ³
 - Ranked 12th

1. Housing Assistance Council Tabulations of the Census Bureau's 2010-2014 American Community Survey (ACS) and 2013 Home Mortgage Disclosure Act (HMDA) Data.

2. Paulhus E, Pore R. The State of Older Adults in West Virginia: Economic Security and the Over 65 population. July 2012. Retrieved from <http://www.wvpel.org/downloads/State%20of%20Older%20Adults%20Ec%20Sec%20in%20WV%20July%202012.pdf>

3. America's Health Rankings: Annual Report. United Health Foundation. A call to action for individuals and their communities. 2016.

Suicide Rates



Source: American Foundation for Suicide Prevention
Retrieved from <https://afsp.org/about-suicide/suicide-statistics/>

Chronic pain

- The prevalence of chronic pain in the US is estimated to be 11.2% ⁶
- Experts on pain recommend opioid therapy for people with chronic pain, since it has been recognized to relieve pain and improve functioning ⁷⁻⁸
- Recommended that less than 100 MMEs/day are prescribed to reduce the risk of overdosing ⁹

6. Nahin RL. Estimates of pain prevalence and severity in adults: United States, 2012. *J Pain*. 2015; 16(8):769-780.

7. Portenoy RK, Foley KM. Chronic use of opioid analgesics in non-malignant pain: report of 38 cases. *Pain* 1986;25:171-86.

8. McQuay H. Opioids in pain management. *Lancet* 1999;353:2229-32

9. Dowell, D., Haegerich, T. M., & Chou, R. (2016). CDC guideline for prescribing opioids for chronic pain—United States, 2016. *Jama*, 315(15), 1624-1645.

Chronic pain and public health

- Medical schools devote 9 hours to pain management
 - veterinarians receive roughly 87 hours ¹⁰
- Pain 5th vital sign → increase in opioid pain relievers (OPRs)
- In 2012, health care providers wrote enough OPR for every American adult to have a bottle of pills ¹¹
- From 1997 to 2007 the milligram per person of OPR increased from 74 milligrams to 369 milligrams ¹²
 - Increased more than 4x

10. Mezei, L., Murinson, B. B., & Johns Hopkins Pain Curriculum Development Team. (2011). Pain education in North American medical schools. *The Journal of Pain*, 12(12), 1199-1208.

11. Centers for Disease Control and Prevention. (2014) *CDC Vital Signs. Opioid Painkiller Prescribing: Where you Live Makes a Difference*. Retrieved from <https://www.cdc.gov/vitalsigns/pdf/2014-07-vitalsigns.pdf>

12. Manchikanti L, Fellow B, Ailinani H, Pampati V. Therapeutic Use, Abuse, and Nonmedical Use of Opioids: A Ten Year Perspective. *Pain Physician*. 13:401-435. 2010

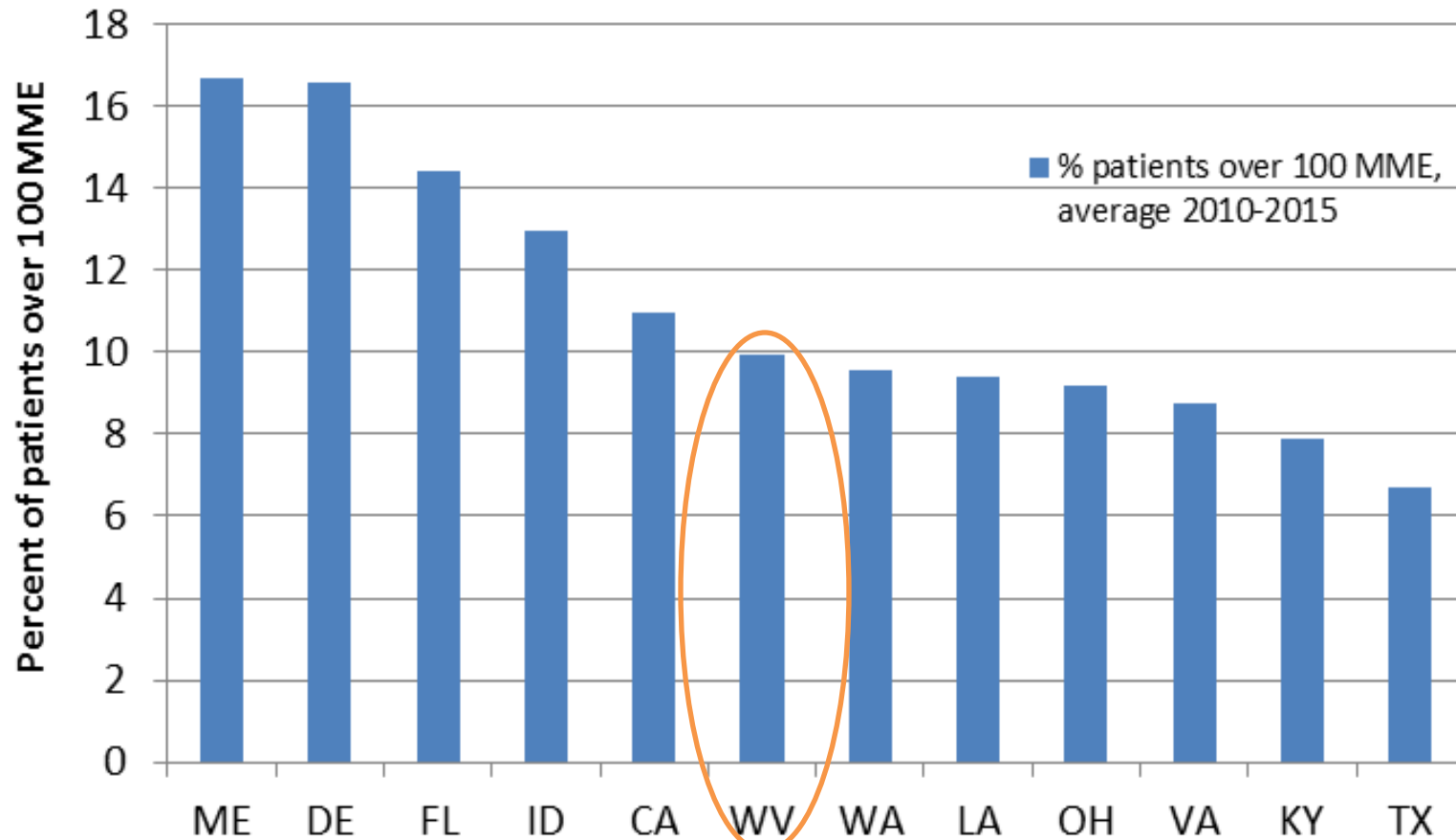
Opioids in West Virginia

- In 2013, **10.3%** of West Virginia residents received a prescription for **more than 100 MMEs** a day ¹³
- In West Virginia there were **929.3** OPR prescriptions for every **1,000** residents in West Virginia (including those used for MAT) in 2013 ⁸
- WV continues has the highest opioid overdose death in the nation at a rate of **19.8** per 100,000 ¹⁴

13. Paulozzi L, Strickler G, Kreiner P, Koris C. Controlled Substance Prescribing Patterns- Prescription Behavior Surveillance System, Eight States, 2013. MMWR Morb Mortal Wkly Rep 2015; 64: 1-14.

14. Rudd RA, Seth P, David F, Scholl L. Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015. MMWR Morb Mortal Wkly Rep 2016;65:1445–1452.

Percent of Patients Receiving Over 100 MME Daily, 2010-2015 Average, PBSS States



Source: 2016 West Virginia Controlled Substances Monitoring Program Report

Methods

- Data obtained from WVU's state-wide integrated data repository (IDR) hosted by West Virginia Clinical and Translational Science Institute (CTSI)
 - 6 hospitals
 - 61 outpatient facilities
 - 1,960,090 patients 18+
- Connects with other hospital systems
 - University of Kentucky
 - University of Cincinnati
 - Mount Sinai

Measures

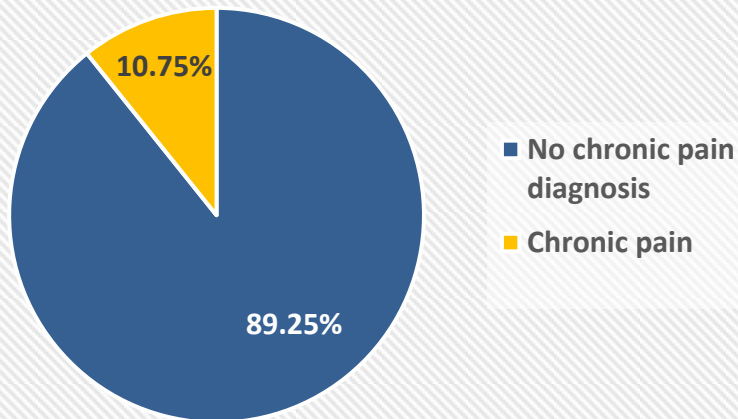
Patients with identified ICD-9/10 codes that met inclusion criteria:

- Patient from 2014-2016
- 18+ years old
- Suicide attempt
 - E950-E959
- Chronic pain
 - **Back pain:** 720.0-724.9
 - **Arthritis:** 710.0-739.9
 - **Migraines:** 346.0-346.9
 - **Headaches:** 784.0 and 307.81
 - **Psychogenic Pain:** 307.80 and 307.89
 - **Neuropathy:** 256.60, 355.0, 355.9, 356.0, 357.2, and 357.9
 - **Fibromyalgia:** 729.1

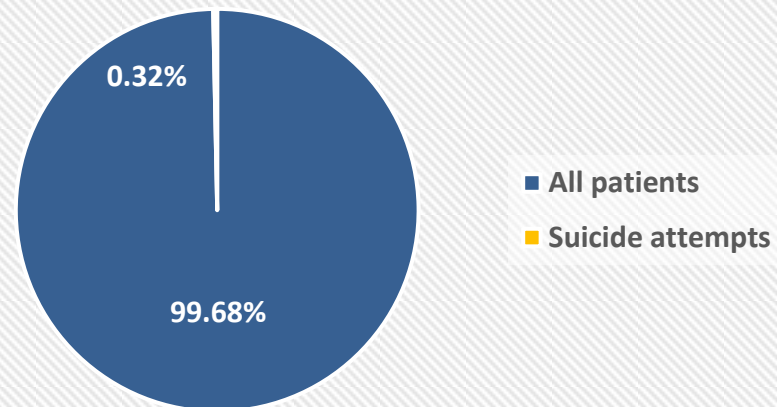
Analysis

- Conducted chi-square tests and correlation using R 3.3.1
- Tested trends and annual percent change in suicide among WVU patient population with chronic pain
 - Used JoinPoint to conduct analysis
- Analyzed three previous years of hospital data to predict subsequent year of suicide attempts among chronic pain patients

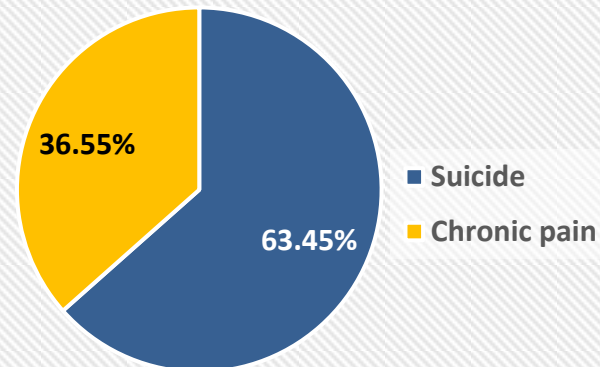
Patients in WVU Hospital System



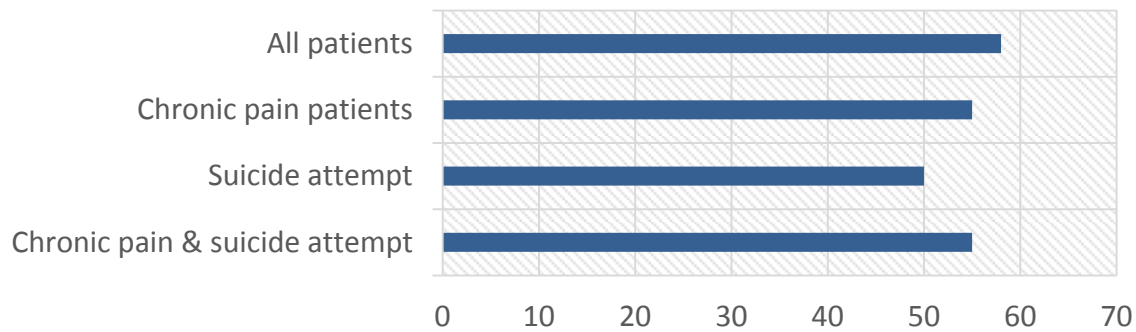
Suicide attempts among all WVU Hospital Patients



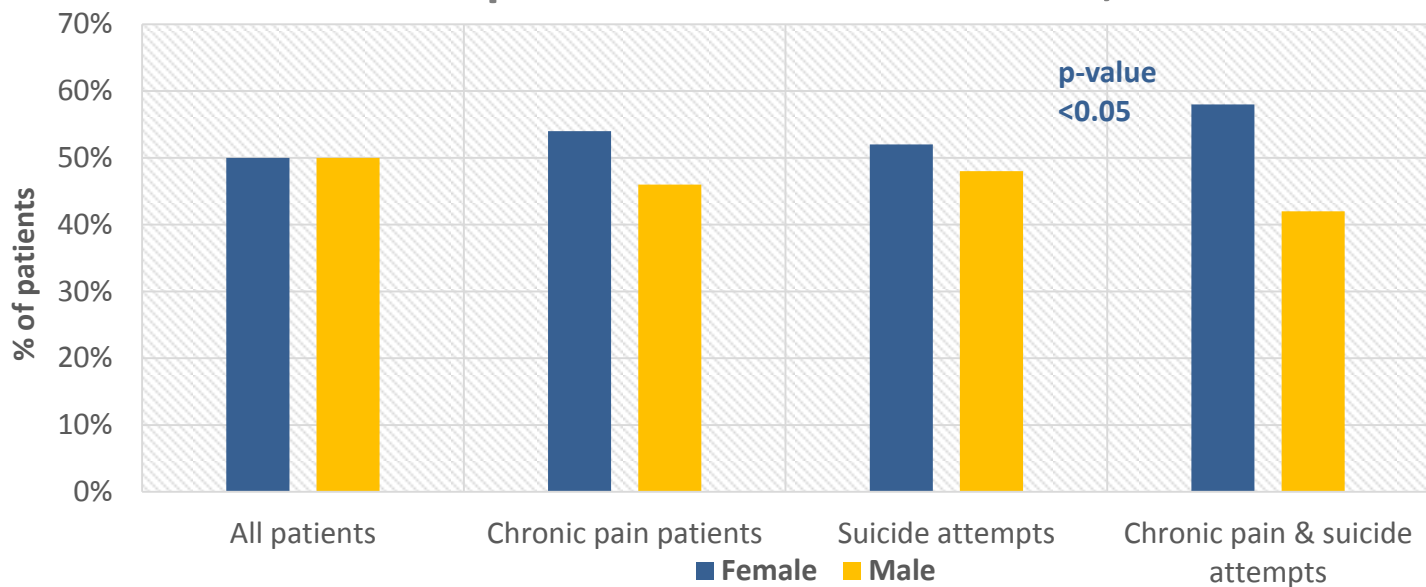
Suicide attempts among patients with chronic pain



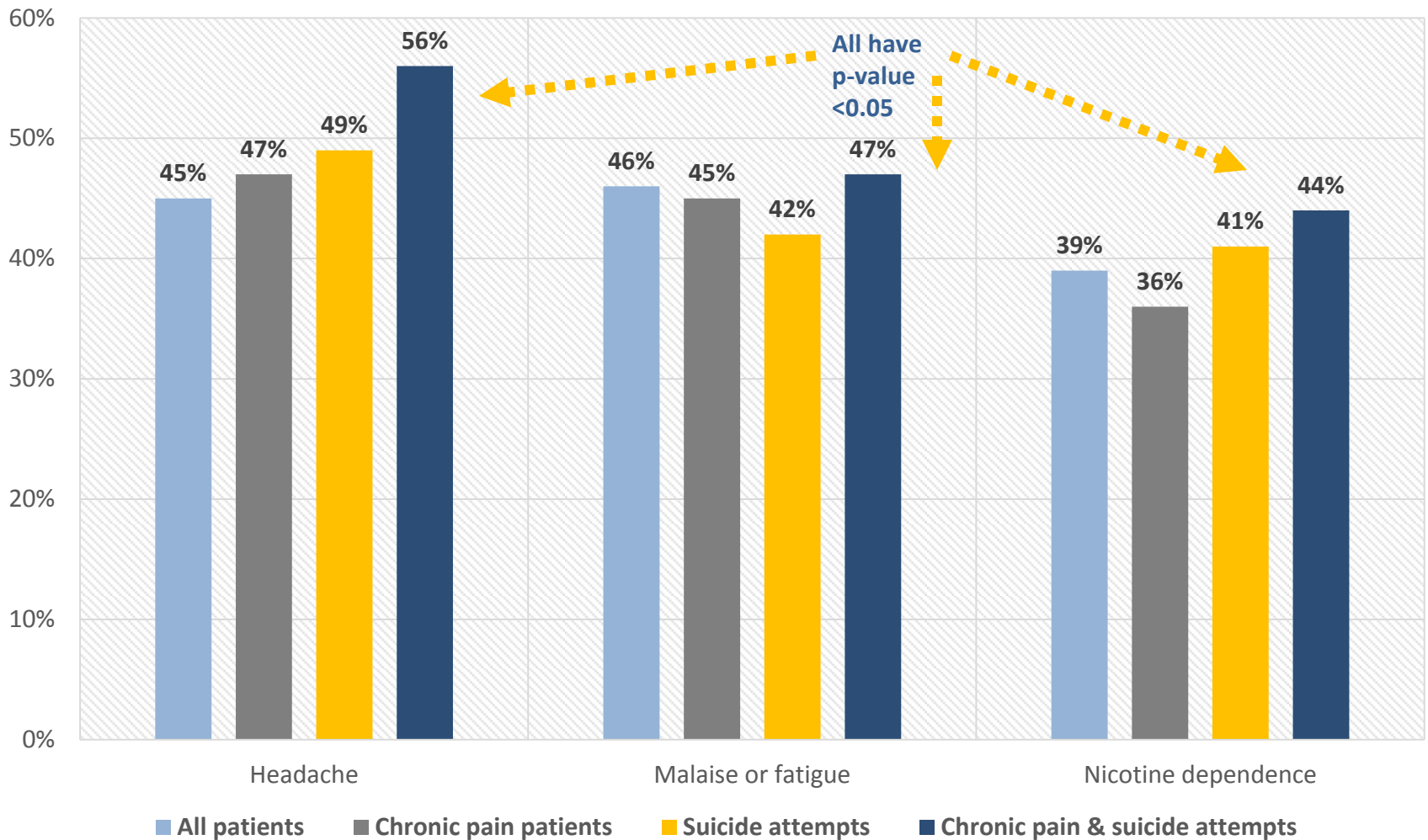
Average age of patient in WVU Database, 2014-2016



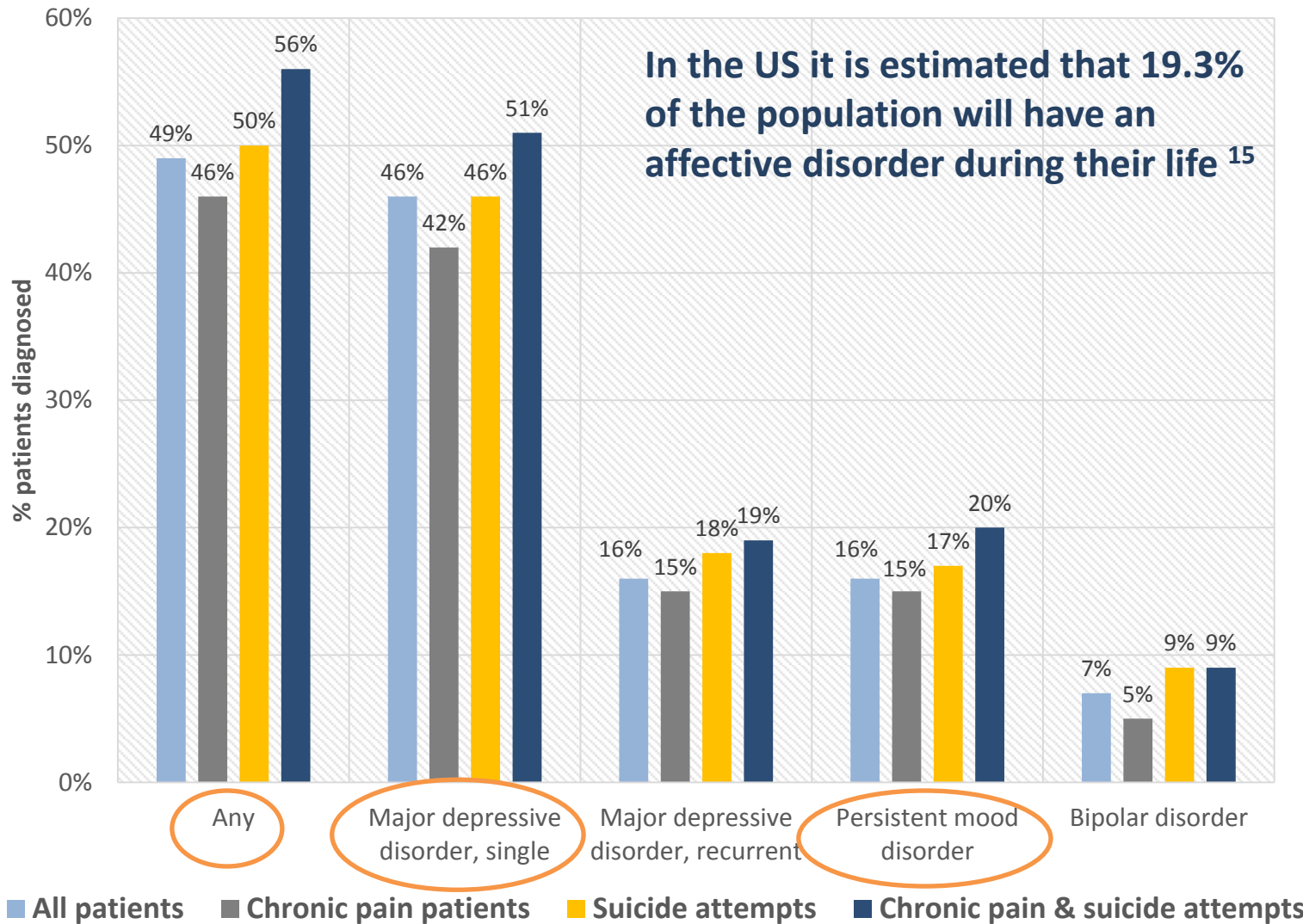
Gender of patients in WVU Database, 2014-2016



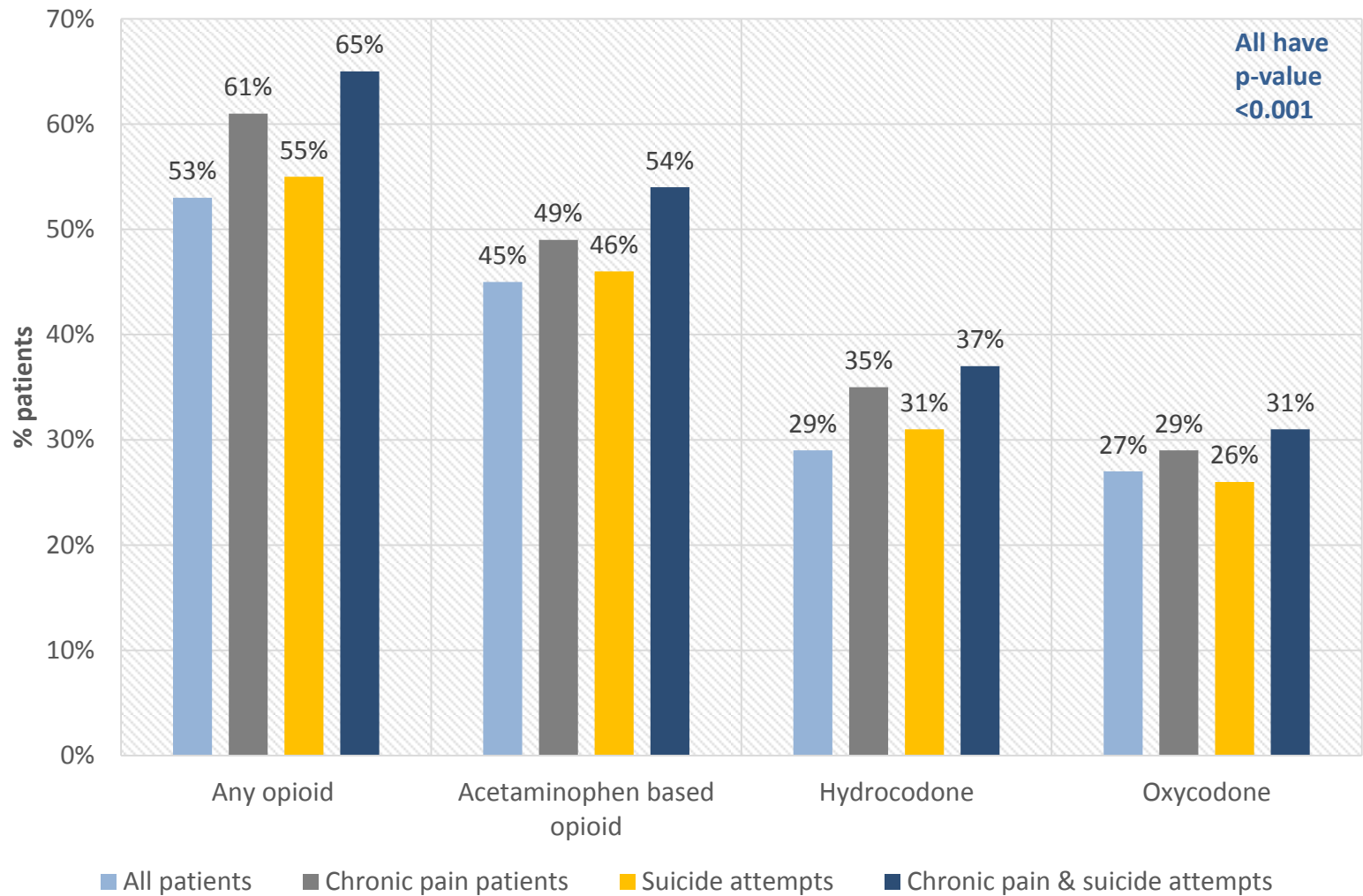
Comparison of select symptoms/conditions among WV patients, 2014-2016



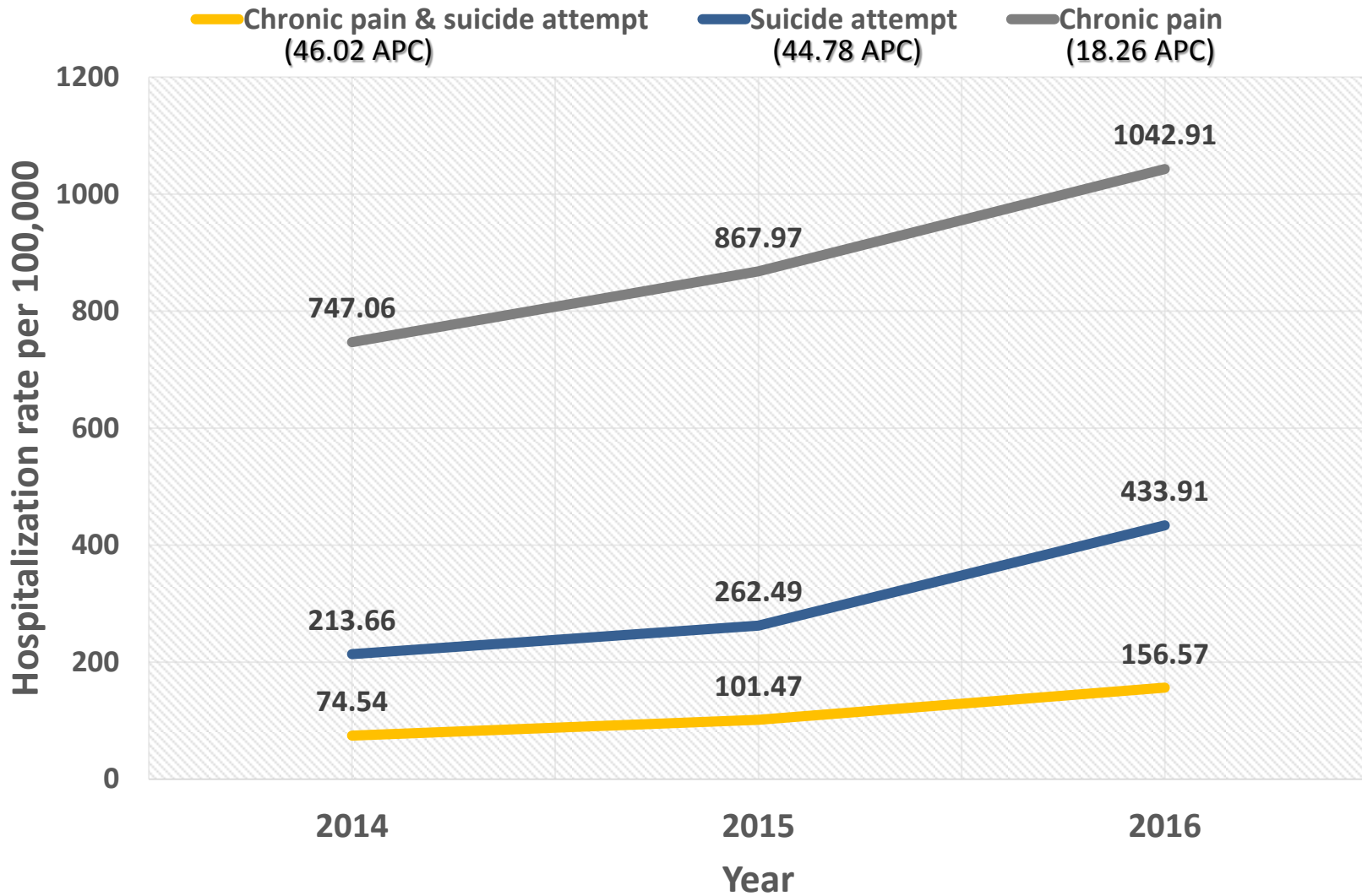
WVU Patients with mood affective disorders, 2014-2016



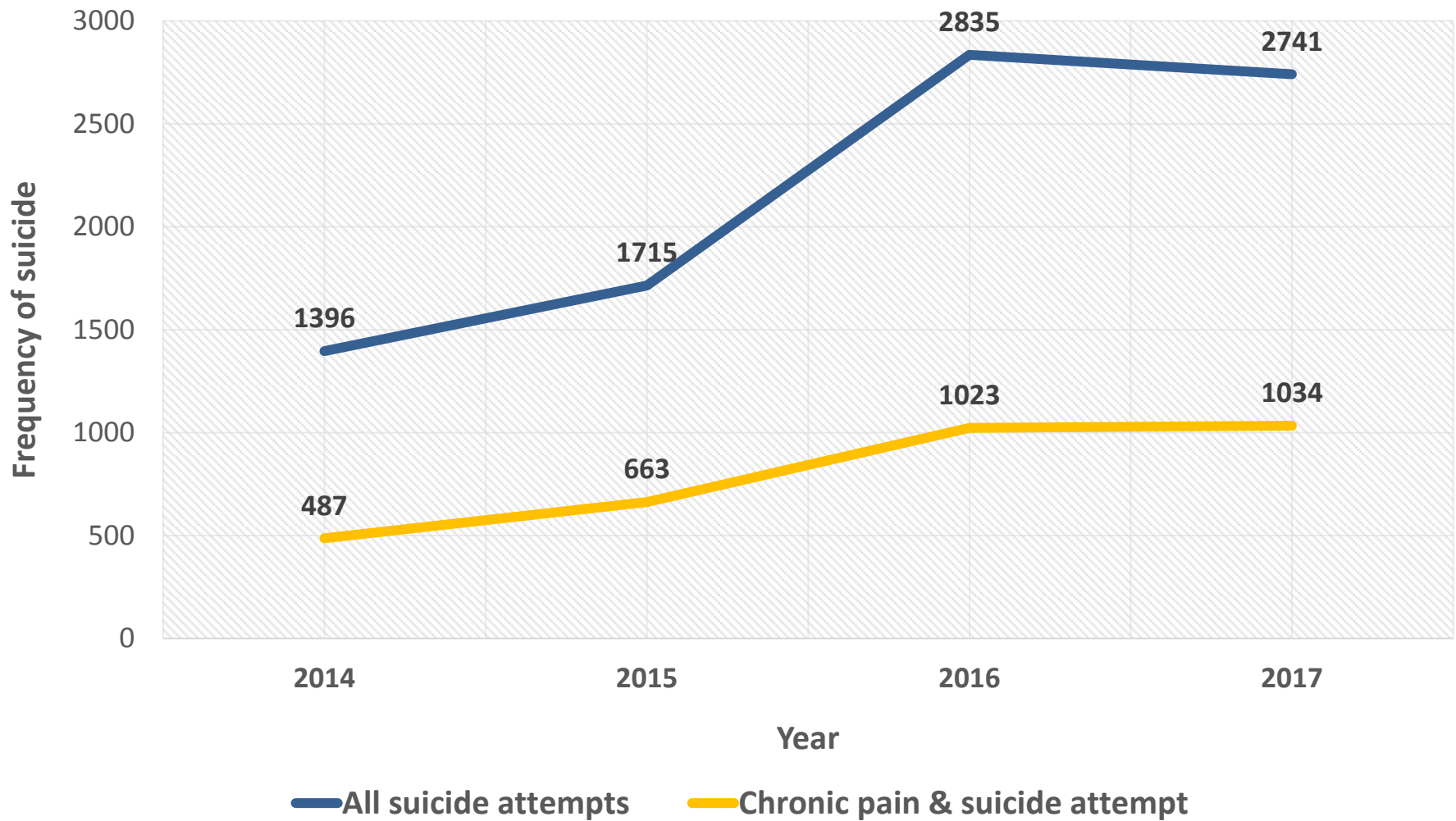
Opioid medications prescribed to WVU patients, 2014-2016



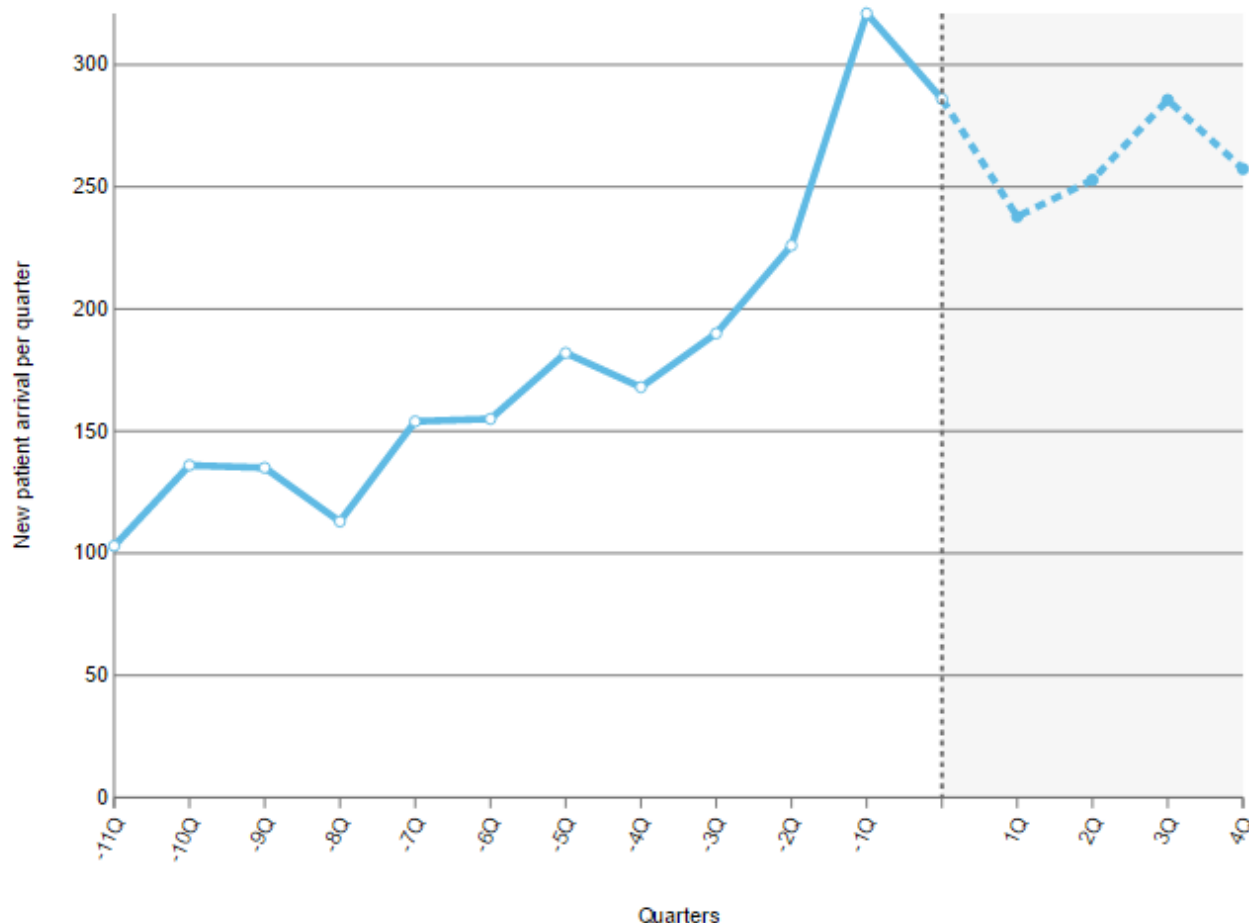
Hospitalization Rate in West Virginia, 2014-2016



Suicide attempts among WVU patients, 2014-2016



Suicide attempts among WVU hospital patients diagnosed with Chronic Pain



Predicted number of suicide attempts among chronic pain patients in the next year is approximately 1034.

Discussion

- There is a statistically significant correlation between the number opioids dispensed in WV and rate of suicide attempt (-0.97).
- These findings underscore the importance of routine screening for associated risk factors like mood disorders among chronic pain patients
- However, pain management strategies should be balanced by awareness of risk and mental health services.
- Tools for health care providers, such as the SEMP guidelines, should address what to do when patients may be identified to be at risk.

Next steps

- The relationships between suicide attempt, chronic pain and opioid use are unclear.
- Future research should investigate the complex relationships between chronic pain, psychiatric comorbidities, and suicide risk.
- Examine gender differences among chronic pain patients and suicide.

Questions/comments

Lisham Ashrafioun, PhD

Lisham.Ashrafioun@va.gov

Rob Bossarte, PhD

rbossarte@hsc.wvu.edu

Sara Warfield, MPH

scwarfield@hsc.wvu.edu

Backup slides

Suicide in WV

- On average, one person dies every day in this state
- In 2010 it cost WV over \$307 million of combined lifetime medical and work lost
 - Average of \$1.1 million per suicide death
- Suicide is the 11th leading cause of death overall in West Virginia
 - 2nd leading cause of death for ages 10-34
 - 4th leading cause of death for ages 35-44
- 3x as many people die by suicide in WV annually than by homicide

4. America's Health Rankings: Annual Report. United Health Foundation. A call to action for individuals and their communities. 2016

5. American Foundation for Suicide Prevention. Retrieved from <https://afsp.org/about-suicide/suicide-statistics/>

Public health initiatives

Chronic Pain

- Public health initiatives such as the Chronic Pain Guidelines – CDC
 - West Virginia: Safe & Effective Management of Pain Guidelines (2016)
- Access to Opioid Antagonists Bill in 2015
 - Increases the number of patients treated with controlled substances for the clinic to be designated pain management clinic (50%-60%)

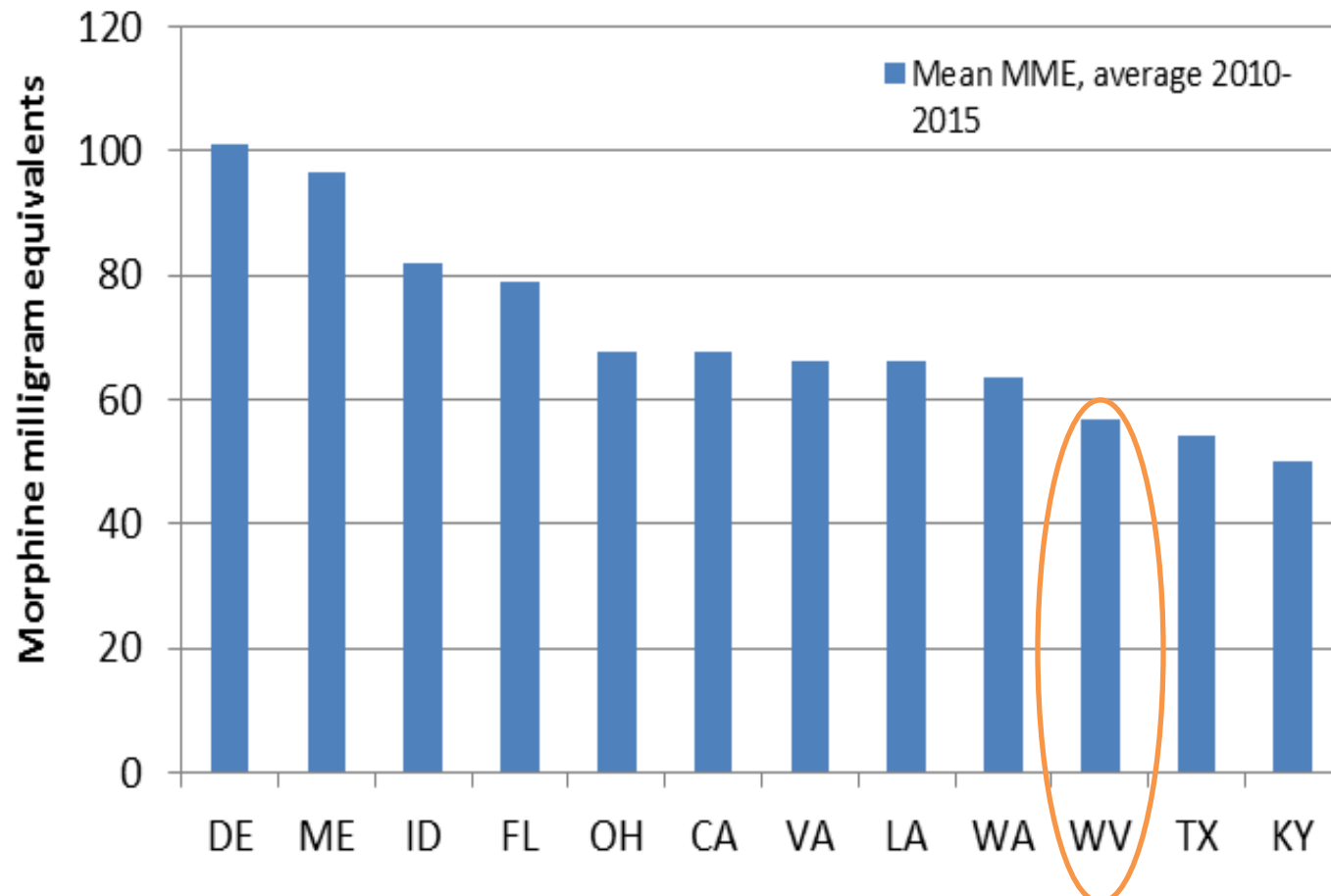
Suicide

- WV Council for the Prevention of Suicide
 - Develop and implement public awareness of suicide
- Adolescent Suicide Prevention and Early Intervention (ASPEN): 3-year project
 - Focus on suicide awareness, prevention, and early intervention
- Prevent Suicide WV
 - Collaborative program between WVCPS and ASPEN

WEST VIRGINIA 2016 CONTROLLED SUBSTANCE DOSES

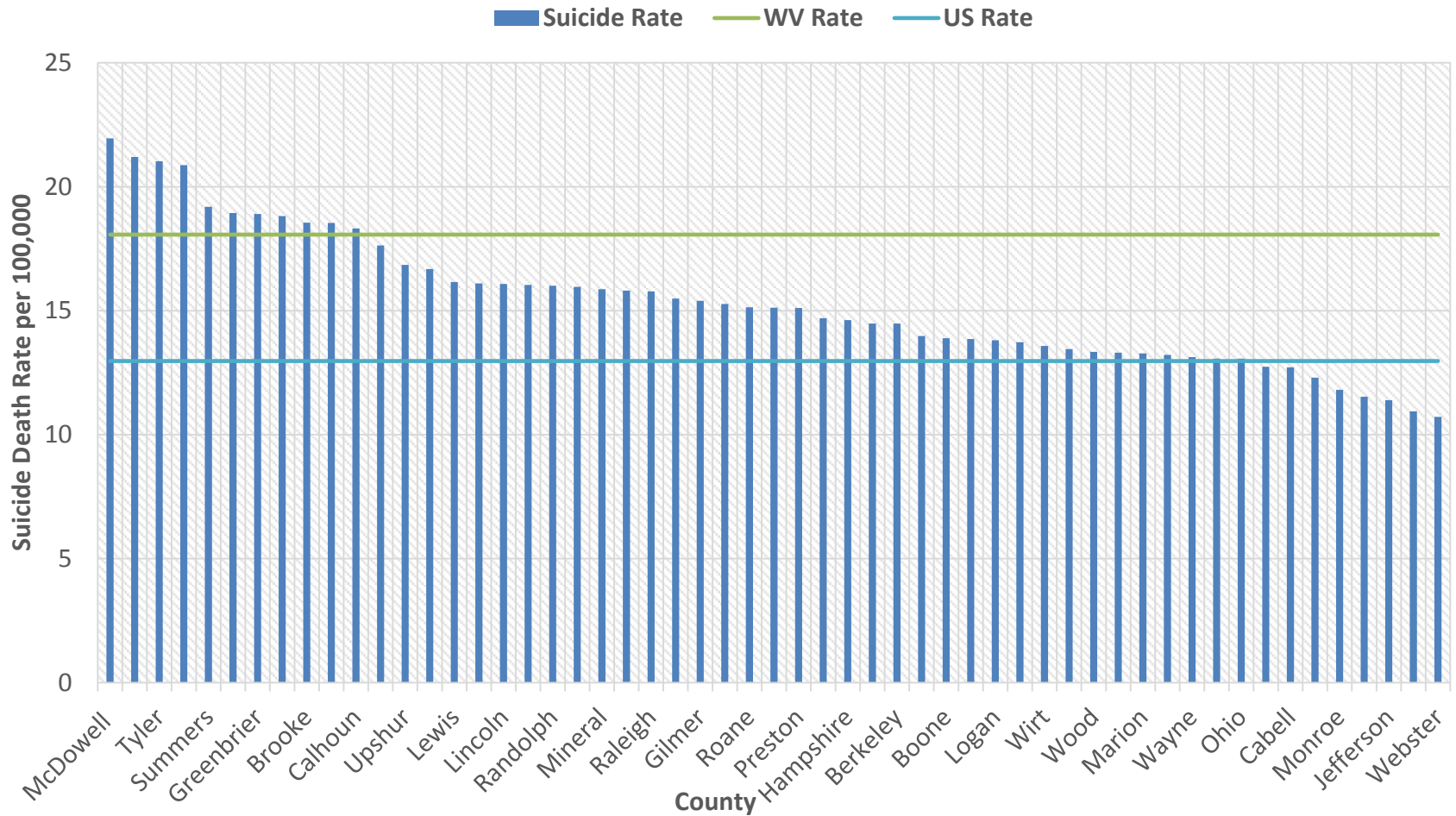
<u>Rank</u>	<u>Drug Category</u>	<u>Schedule</u>	<u>No.</u>
1.	Hydrocodone Products	II	60.15 Million
2.	Oxycodone Products	II	36.18 Million
3.	Tramadol Products	IV	35.68 Million
4.	Alprazolam Products	IV	32.14 Million
5.	Clonazepam Products	IV	17.39 Million
6.	Lorazepam Products	IV	15.83 Million
7.	Diazepam Products	IV	8.83 Million
8.	Zolpidem Products	IV	8.22 Million
9.	Amphetamine Products	II	7.82 Million
10.	Buprenorphine Products	III	7.12 Million
11.	Methylphenidate Products	II	4.74 Million
12.	Codeine Products	III	4.56 Million
	All Other Products	II-IV	28.54 Million
	TOTAL	II-IV	267.2 Million

Mean Daily MMEs per Opioid Prescription, 2010-2015 Average, PBSS States



WV is one of 12 states that participate in the Prescription Behavior Surveillance System (PBSS) conducted by Brandeis PDMP Center of Excellence.

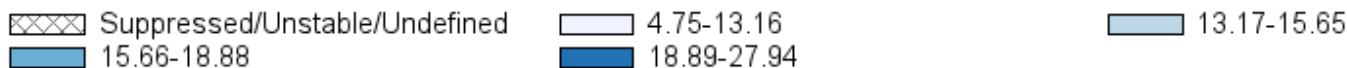
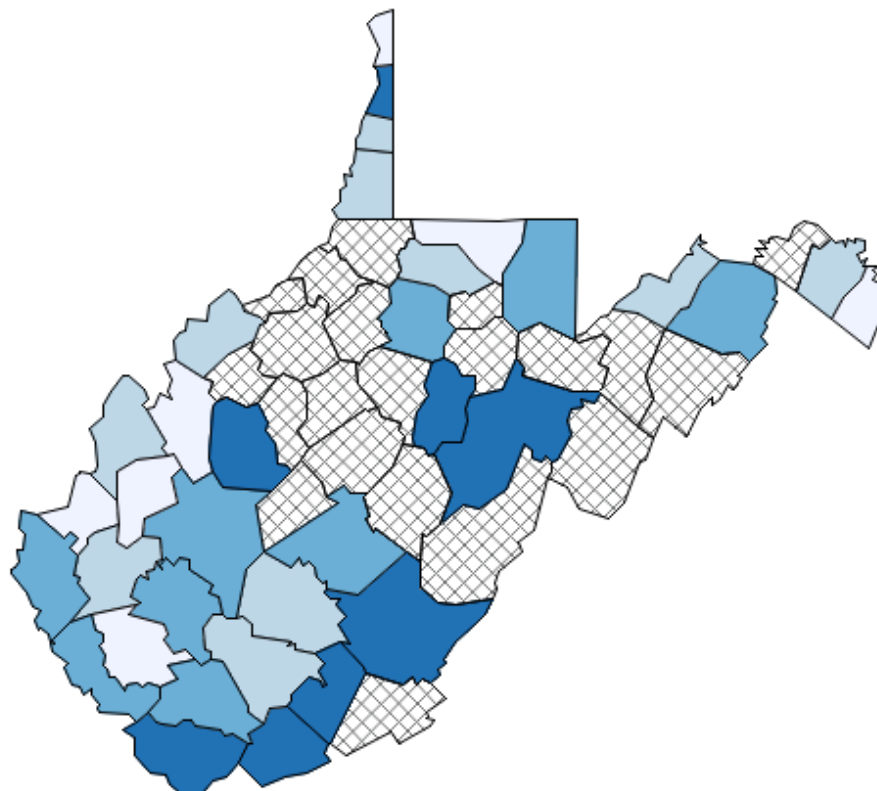
Suicide Death Rate in West Virginia By County, 1999-2014



*CDC data used from multiple years were used (1999-2014) in order to get enough data to display county rankings

During this time, 85% of all counties in WV had a higher rate of suicide than the national average.

2008-2014, West Virginia
Age-adjusted Death Rates per 100,000 Population
 All Injury, Suicide, All Races, All Ethnicities, Both Sexes, All Ages
 Annualized Age-adjusted Rate for West Virginia: 15.54

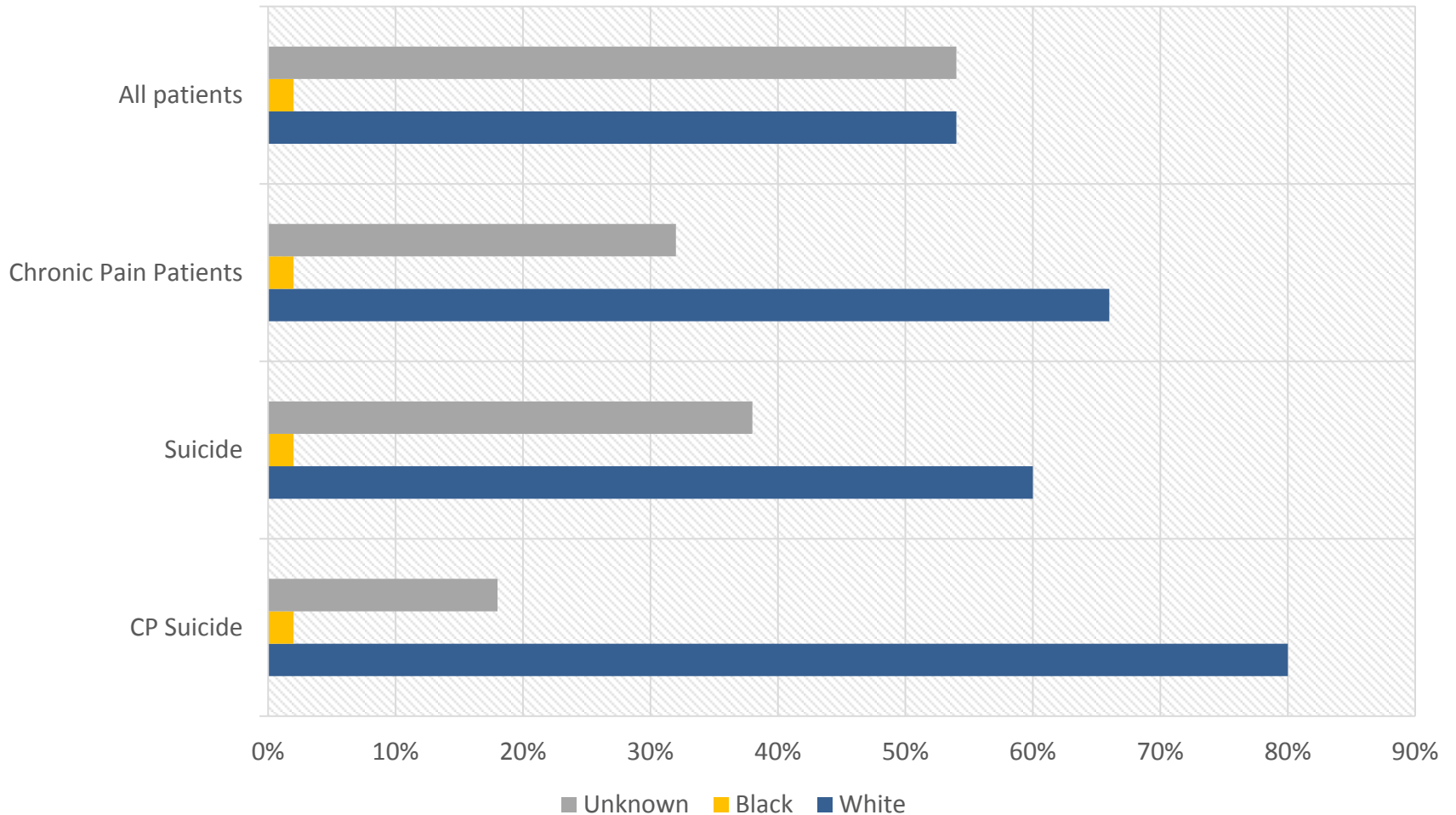


Reports for All Ages include those of unknown age.

*Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above); such rates in the title have an asterisk.
 The standard population for age-adjustment represents the year 2000, all races, both sexes.



Race of Patients in WVU Hospital Database, 2014-2016



Suicide attempts among WVU patient population

