Section 3

Monitoring Possible Marijuana-Related Health Effects in Colorado

Chapter 2

Colorado Hospital Association (CHA) Data, 2000-September 2015

Retail Marijuana Public Health Advisory Committee

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Introduction

The Colorado Hospital Association (CHA) collects data on hospitalizations (HD) and emergency department (ED) discharges from participating hospitals in the state of Colorado. The data include patient demographics, admit and discharge dates, and discharge diagnoses/billing codes and procedure codes. There are roughly 100 member hospitals of CHA which includes the vast majority of hospitals in Colorado. However, the database does not include inpatient mental health facilities, ambulatory surgical centers, long term care facilities, military hospitals, and other outpatient treatment settings. The CHA dataset was used to investigate rates of HD and ED visits associated with possible marijuana exposures, diagnoses, and billing codes.

Methods

Marijuana-related billing codes

To determine HD and ED visits that were possibly associated with marijuana, four marijuana-related billing codes were used. The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) is a U.S. Centers for Disease Control and Prevention modification of a set of codes established by the World Health Organization.[1,2] These billing codes are used to assign alphanumeric codes to patient diagnoses. On October 1, 2015 the nation updated its administrative coding from the ICD-9-CM system to ICD-10-CM. This analysis spans HD and ED visits from 2000 (2011 for ED visits) through September 2015. Analysis of the ICD-10-CM coded HD and ED visits will be completed once a full year of ICD-10-CM data is available. The four marijuana-related billing codes used were 305.20-305.23, 304.30-304.33, 969.6, and E854.1 and details about these codes can be found in Appendix S.

We examined HD and ED visit data in three different ways:

1. **Poisonings possibly due to marijuana in children under 9 years of age:** These data were chosen to represent unintentional use of marijuana by children and consisted of HD or ED visits that were coded with discharge codes related to poisoning by psychodysleptics.[3,4] Though psychodysleptic drugs include more than just marijuana, other drugs in this class have a low prevalence of use among children under 9 years of age. In addition, the age cut-off of 9 years was chosen to represent children who were unlikely to be intentionally using marijuana. This applies to Figure 1 and Map 1.
2. **Marijuana-related billing codes in listed diagnosis codes:** These data were chosen to represent the HD and ED visits where marijuana could be a causal, contributing, or coexisting factor noted by the physician during the HD or ED visit. HD and ED visits were included if they had a marijuana-related billing code in one or more of the up to 30 listed codes provided, but marijuana may not be a causal reason for the HD or ED visit. This applies to Figures 2-6 and Maps 2-6.
3. **Primary diagnoses:** Primary diagnoses were examined and compared for HD and ED visits with and without marijuana-related billing codes for all Colorado HD and ED visits from 2000 through September 2015 (2011 through September 2015 for ED visits). See Appendix S, Table S.7 for details. This applies to Figures 7 and 8.

Marijuana legalization eras

Rates of HD and ED visits were described over time by year. To evaluate the impact of changes in marijuana laws in Colorado, four marijuana legalization eras were chosen to display and compare these findings.

- 2000 – Prior to Legalized Medical Marijuana
- 2001-2009 – Medical Marijuana Legalized[5]
- 2010-2013 – Medical Marijuana Commercialized[6,7]
- 2014- September 2015 – Retail (Recreational) Marijuana Legalized[8]

Rates of HD and ED visits were calculated with the number of HD or ED visits with marijuana-related billing codes for a time period in the numerator and total number of HD or ED visits during that time period in the denominator. This proportion was multiplied by 100,000 (1,000 for county level data) to obtain a rate (Appendix S, Figure S.2). Rates of HD and ED visits were compared across years and marijuana legalization eras, and stratified by gender, age, race/ethnicity, and county (Appendix S). Prevalence of primary diagnosis categories were calculated for HD and ED visits with marijuana-related billing codes and for HD and ED visits without marijuana-related billing codes. Prevalence ratios and 95% confidence intervals were calculated comparing the prevalence of primary diagnosis categories by HD or ED visits with marijuana-related billing codes to HD or ED visits without marijuana-related billing codes for the top ten primary diagnosis categories (Appendix S, Figure S.3).

Results

The rates of HD and ED visits with poisonings possibly due to marijuana in children under 9 years old have increased over time since medical marijuana legalization in 2000 (Figure 1). However, this trend was only significant from medical marijuana legalization (2001-2009) to medical marijuana commercialization (2010-2013) (Figure 1). The number of HD and ED visits with poisonings possibly due to marijuana among children under 9 years was higher in urban areas compared to rural areas in Colorado (Map1).

When examining the rates of HD and ED visits with marijuana-related billing codes across years, there was an increasing trend in HD from 2001 to January through September 2015 with the highest rate of 1,260 per 100,000 in January through September 2015. There was also an increasing trend in ED visits from 2012 to 2014 with the highest rate of 1,039 per 100,000 in 2014. However, in January through September 2015 there was a decline in ED visits to 754 per 100,000 (Figure 2). When viewing the annual rates collapsed into marijuana legalization eras, the rate of HD with marijuana-related billing codes increased significantly from the legalization of medical marijuana (2001-2009) to the legalization of retail marijuana (2014-September 2015) (Figure 3). Furthermore, the decrease in ED visits observed in January through September of 2015 was no longer apparent when collapsed to marijuana legalization eras, and a significantly increasing trend was observed from the commercialization of medical marijuana (2011-2013) of 739 per 100,000 to the legalization of retail marijuana (2014-September 2015) of 913 per 100,000 (Figures 3).

The rates of HD with marijuana-related billing codes was highest in males (Figures 4.b), ages 9-24 years (Figures 5.b), and blacks (Figures 6.b). The rates of ED visits with marijuana-related billing codes was highest in males (Figures 4.a), ages 18-24 years (Figures 5.a), and black and unknown races (Figures 6.a).

Rates of HD marijuana-related billing codes have increased throughout most counties in Colorado since 2004, with the highest rates in Crowley county in 2014 (Maps 2, 3, & 4). Rates of ED visits marijuana-related billing codes have increased in throughout Colorado from 2011-2013 to 2014 (Maps 5 & 6). In 2014, the highest rates of ED visits with marijuana-related billing codes were in Summit County, while the highest numbers of ED visits were in Pueblo County (Map 6).

Examination of the 18 broad primary diagnosis categories for HD and ED visits revealed a nine-fold and five-fold increased prevalence of *mental illness* among HD and ED visits respectively with marijuana-related billing codes compared to HD and ED visits without marijuana-related billing codes (Figures 7 & 8). Also, there was a higher prevalence of *injuries and poisonings*, *diseases of the skin and subcutaneous tissue*, *diseases of the nervous system and sense organs, endocrine, nutritional, and metabolic diseases and immunity*, and *infectious and parasitic diseases* among HD with marijuana-related billing codes compared to HD without marijuana-related billing codes (Figure 8). The prevalence of *unclassified codes and E codes* was higher among ED visits with marijuana-related billing codes (Figure 7).

A summary of the results can be found with the following figures and detailed results can be found in Appendix S.

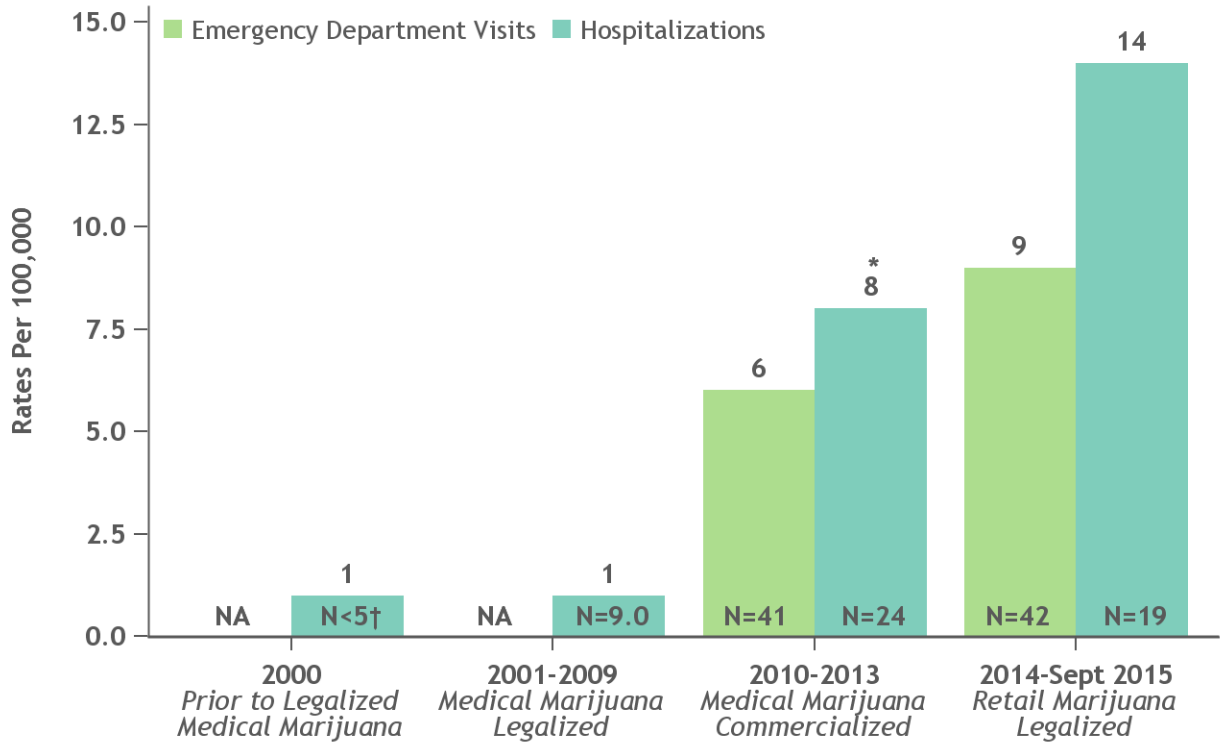
Limitations

The use of marijuana-related ICD-9-CM billing codes is not fully standardized and there may be differences in coding from hospital to hospital. This summary does not account for confounders like increases or changes in marijuana-related discharge coding by the hospitals. Changes in coding could have occurred due to an overall increased awareness regarding marijuana, changes in physician care or reporting related to marijuana, an increased honesty in patients reporting marijuana use to health care providers, or changes in coding practices by hospitals and emergency departments. Changes in marijuana coding could result in an over or underestimate HD and ED visit rates depending on the marijuana legalization era.

A major limitation is the inability to determine whether a discharge code is an exposure or diagnosis or if it is merely for billing. Furthermore, use of these billing codes does not necessarily indicate marijuana was the primary (or even secondary) reason for the HD or ED visit, rather the presence of a marijuana-related code reflects that marijuana use was noted by the treating physician. Therefore, this summary quantifies HD and ED visits with marijuana-related billing codes and does not quantify HD and ED visits due to marijuana. We hypothesize that this summary reflects marijuana use despite the limitations; however, it does not necessarily show the health care burden of marijuana use. Transition to ICD-10 coding may help clarify this issue.

In examining the 18 broad primary diagnosis categories in HD and ED visits with any mention of marijuana, causal associations between marijuana use and the diagnosis categories cannot be made. Furthermore, temporality between the associations found cannot be assessed; meaning it is unclear whether marijuana use preceded the primary diagnosis or the primary diagnosis preceded marijuana use. The associations found between HD and ED visits with marijuana coding and primary diagnosis categories point to specific health outcomes to direct future investigation and resources.

Figure 1. Children under 9 years of age; Rates of hospitalizations (HD) and emergency department (ED) visits with poisoning possibly due to marijuana in Colorado



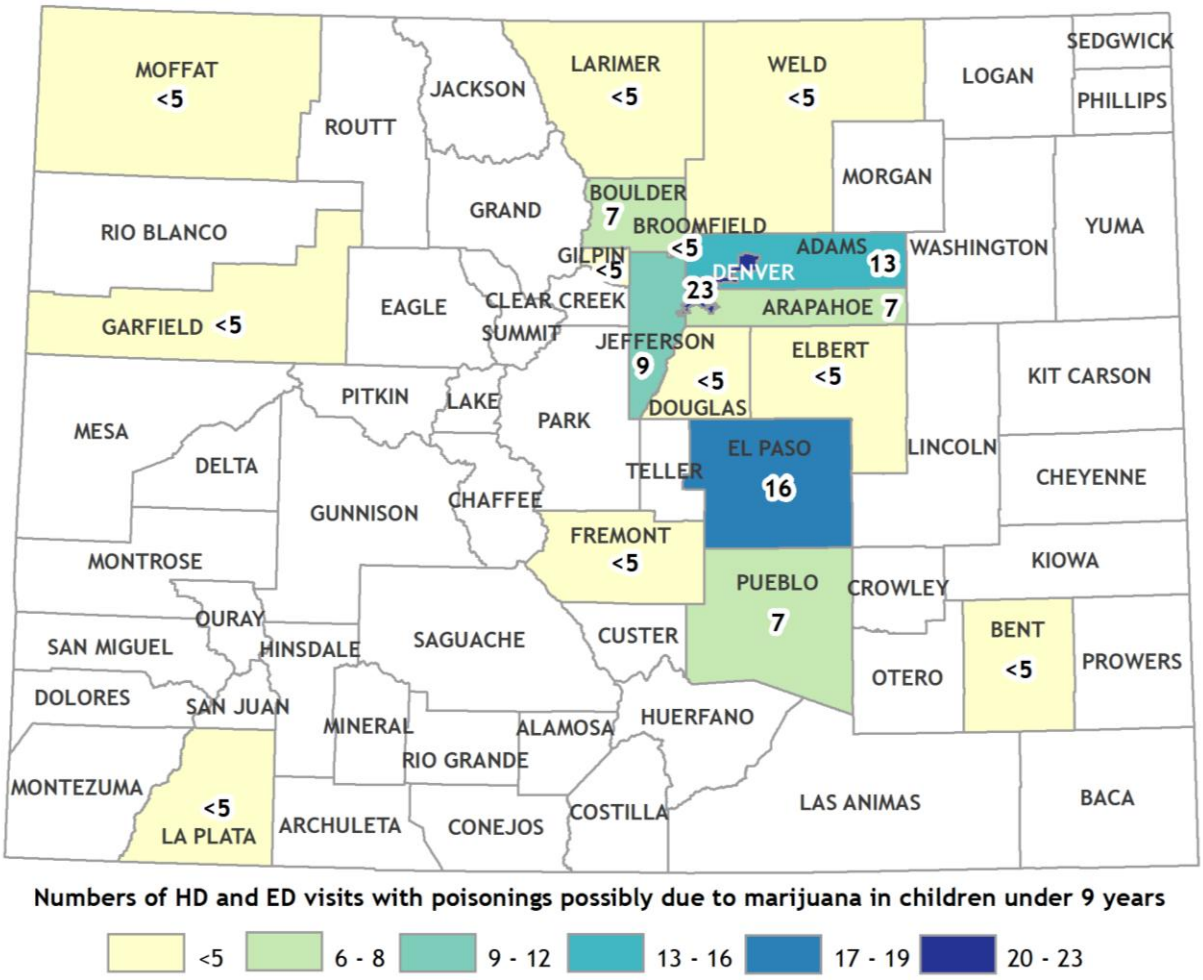
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1, poisoning and accidental poisoning by psychodysleptics, were used to determine HD and ED visits with poisonings possibly due to marijuana.
‡The Ns are the total number of HD or ED visits with poisoning possibly due to marijuana in the specified time period.
§Data Source: Colorado Hospital Association 2000-Sept 2015 (2011-Sept 2015 for ED visits).

Major findings:

- For children under 9 years old, rates of HD and ED visits had an increasing trend across legalization eras.
- Rates of HD with poisonings possibly due to marijuana in children under 9 years old increased eight-fold from 2001-2009 to 2010-2013.[a]
- The highest rates for both HD and ED visits in children under 9 years old were in 2014 through September 2015, though these rates were not significantly different from the previous time period.[b]

[a] HD rate per 100,000 2001-2009: 1 2010-2013: 8: X^2= 30.0, p<0.001
[b] 2014 to Sept 2015: HD rate per 100,000 (14), ED rate per 100,000 (9)
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S Table S.1.

Map 1. Numbers of hospitalizations (HD) and emergency department (ED) Visits with poisonings possibly due to marijuana in children Under 9 Years of age in Colorado, 2004-2014 by county.

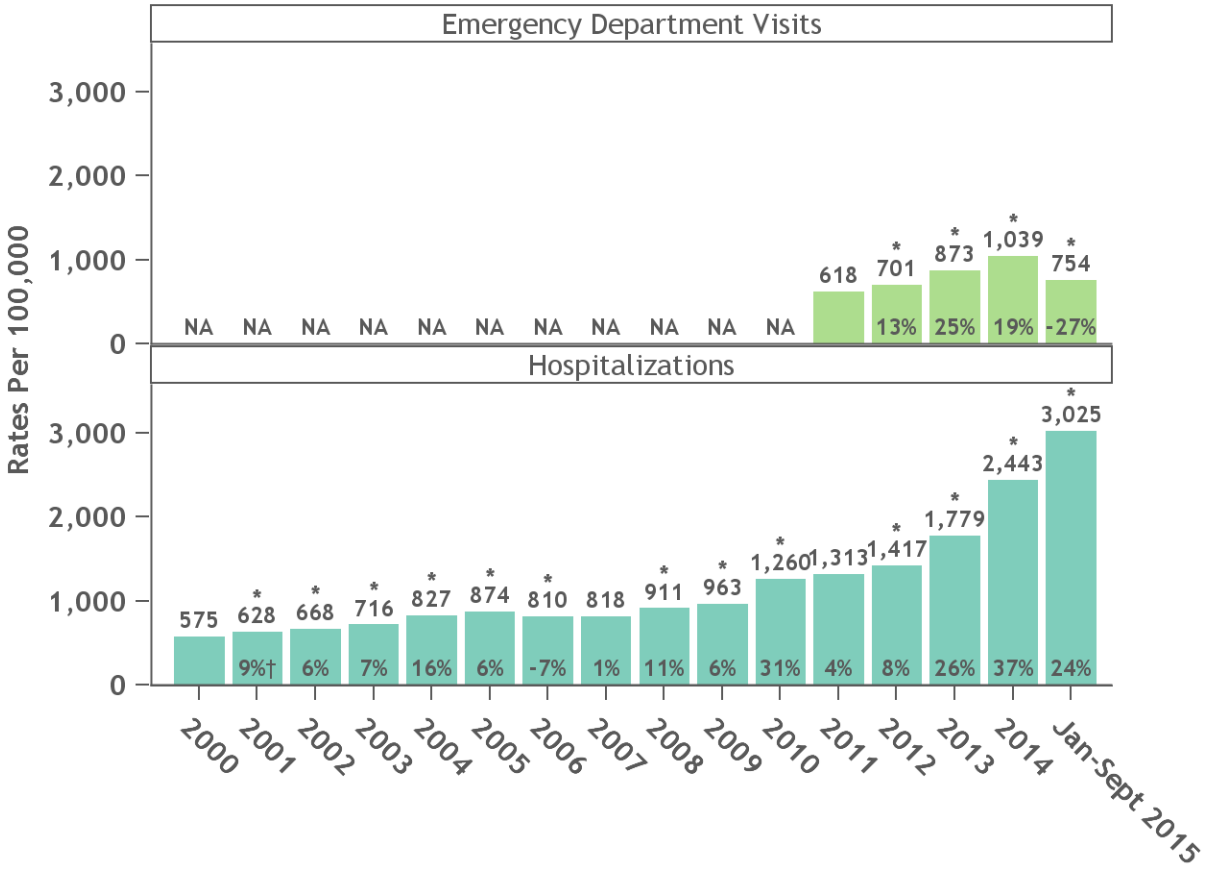


Produced by: EEOHT, CDPHE 2016
*Counties shown in white have no reported HD or ED visits with poisonings possibly due to marijuana in children under 9 years.
†ICD-9-CM codes 969.6 and E854.1 were used to determine HD and ED visits with poisonings possibly due to marijuana.
‡Data source: Colorado Hospital Association (CHA).

Major findings:

- Numbers of HD and ED visits were highest in Denver, El Paso, and Adams counties.
- Higher numbers of HD and ED visits were in urban areas compared to rural.

Figure 2. Rates of hospitalizations (HD) and emergency department (ED) visits with marijuana-related billing codes in Colorado.



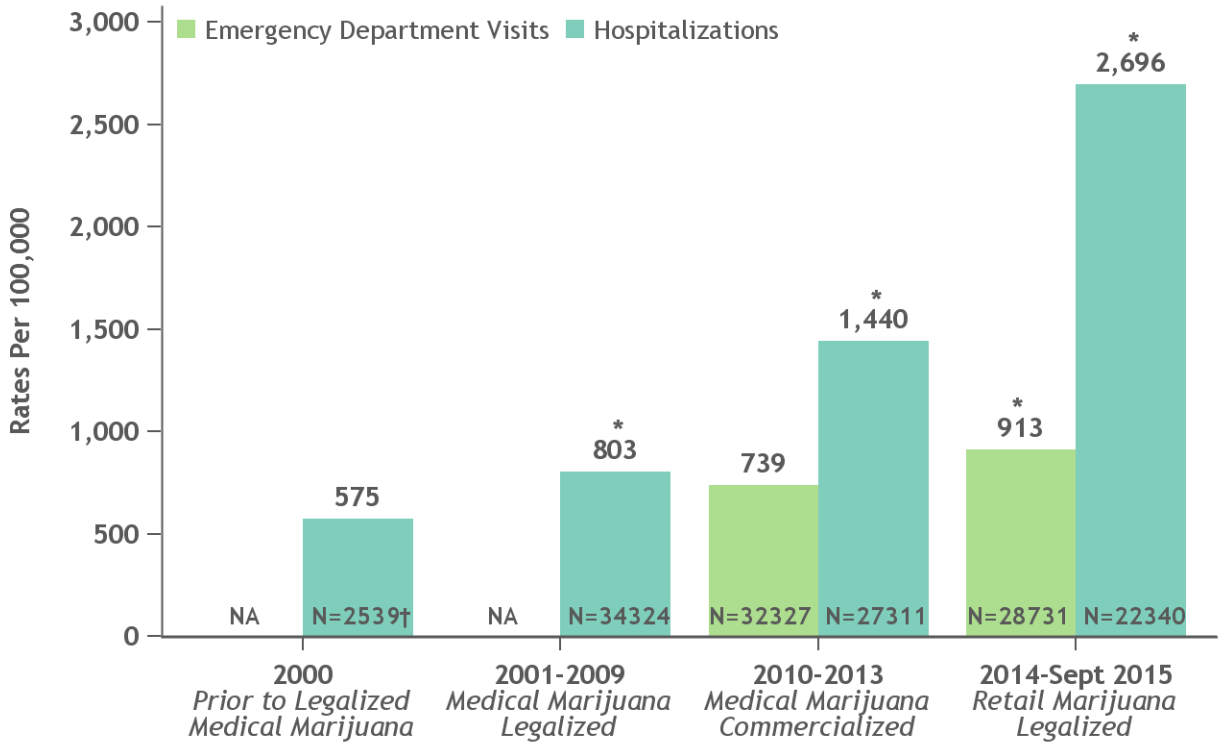
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†The percent change in rates of HD and ED visits compared to the previous year.
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine HD and ED visits with marijuana-related billing codes.
§Data Source: Colorado Hospital Association 2000-Sept 2015 (2011-Sept 2015 for ED visits).

Major findings:

- Rates of ED visits with marijuana-related billing codes showed an increasing trend from 2012 to 2014 and then decreased from 2014 to January through September of 2015 by 27%.[c]
- Rates of HD with marijuana-related billing codes showed an increasing trend beginning in 2001 with the highest rate of HD in January through September 2015.[d]
- The largest increases in rates were from 2013 to 2014 of 37% for HD[e] and 2012 to 2013 of 25% for ED visits.[f]

[c] Rate of ED visits per 100,000 : 2012 (701), 2013 (873), 2014 (1039), Jan- Sept 2015 (754) increase 27%
[d] Rate of HD per 100,000: Jan- Sept 2015 (3025)
[e] Rate of HD per 100,000: 2013 (1779), 2014 (2443) Increase 37%
[f] Rate of ED per 100,000: 2012 (701), 2013 (873) Increase 25%
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S Table S.2.

Figure 3. Rates of hospitalizations (HD) and emergency department (ED) visits with marijuana-related billing codes in Colorado.



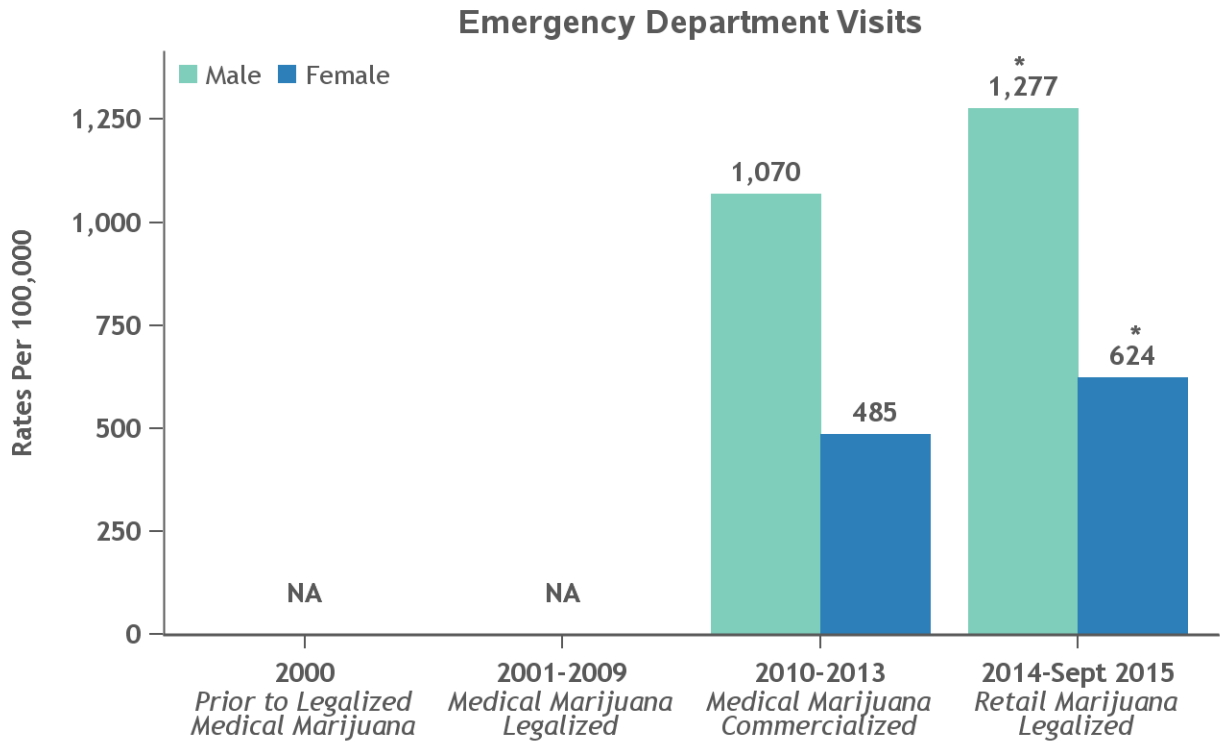
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†The Ns are the total number of HD or ED visits with marijuana-related billing codes in the specified time period.
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine HD and ED visits with marijuana-related billing codes.
§Data Source: Colorado Hospital Association 2000-Sept 2015 (2011-Sept 2015 for ED visits).

Major findings:

- Rates of HD with marijuana-related billing codes significantly increased by each time period from 2000 to 2014 through September 2015 with the largest increase of 87.2% from 2010-2013 to 2014 through September 2015.[g]
- Rates of ED visits significantly increased by 23.5% from 2010-2013 to 2014 through September 2015.[h]
- The highest rates for both HD and ED visits with marijuana-related billing codes were in 2014 through September 2015.[i]

[g] Rates of HD per 100,000: 2000 (575) vs 2001-2009 (803) X^2= 686.5, p<0.001; 2001-2009 (803) vs 2010-2013 (1440) X^2= 5384.4, p<0.001; 2010-2013 (1440) vs 2014-Sept 2015 (2696) X^2= 5084.9, p<0.001
[h] Rates of ED per 100,000: 2010-2013 (739) vs 2014-Sept 2015 (913) : X^2= 686.5, p<0.001
[i] Highest rates per 100,000: HD 2014-Sept 2015 (2696), ED: 2014-Sept 2015 (913)
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S table S.3.

Figure 4.a Rates of emergency department (ED) visits with marijuana-related billing codes by gender.



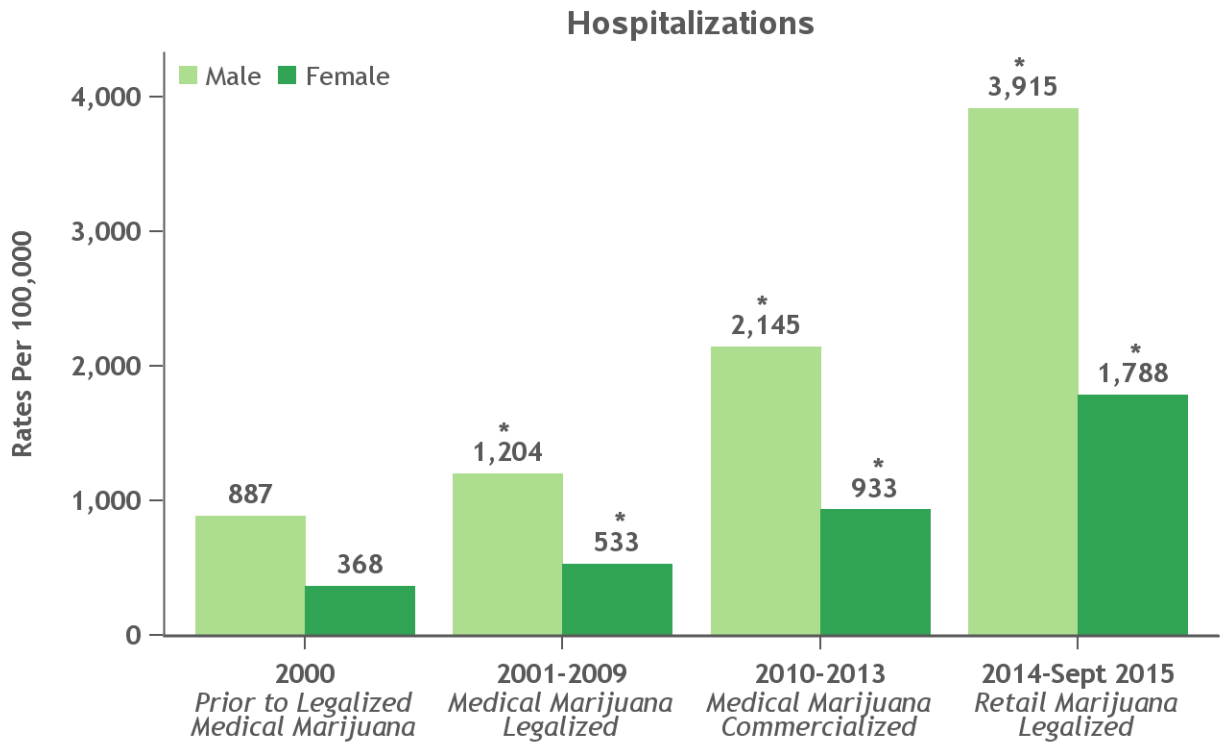
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1 were used to determine ED visits with marijuana-related billing codes.
‡Data Source: Colorado Hospital Association 2011-Sept 2015.

Major findings:

- Rates of ED visits significantly increased from 2011-2013 to 2014 through September 2015 for both males and females.[j]
- Males had consistently higher rates of ED visits with marijuana-related billing codes across time periods.

[j] Rate ED visits per 100,000: male 2011-2013 (1070) vs 2014-Sept 2015 (1277), X^2= 303.2, p<0.001;
female 2011-2013 (485) vs 2014-Sept 2015 (624), X^2= 364.7, p<0.001
For an explanation of statistical comparisons used, see Appendix S. data, see Appendix S table S.4.

Figure 4.b Rates of hospitalizations (HD) with marijuana-related billing codes by gender.



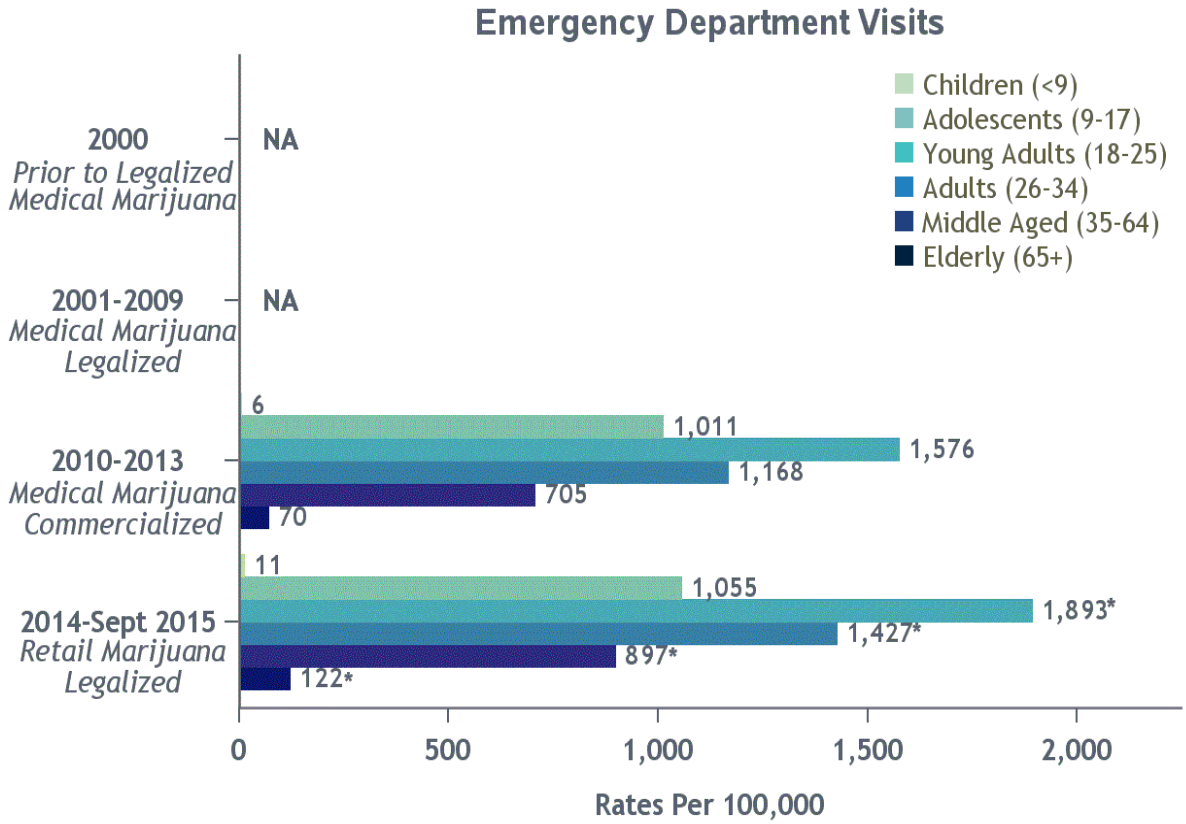
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1 were used to determine HD with marijuana-related billing codes.
‡Data Source: Colorado Hospital Association 2000-Sept 2015.

Major findings:

- Rates of HD with marijuana-related billing codes significantly increased each time period from year 2000 to 2014 through September 2015 for both males[k] and females.[l]
- Males had consistently higher rates of HD with possible marijuana exposures, diagnoses, or billing codes across time periods.

[k] Rate of male HD visits per 100,000: 2000 (887) vs 2001-2009 (1204), X^2= 138.7, p<0.001; 2001-2009 (1204) vs 2010-2013 (2145), X^2= 3252.5, p<0.001; 2010-2013 (2145) vs 2014-Sept 2015 (1277), X^2= 2926.8, p<0.001
[l] Rate of female HD visits per 100,000: 2000 (368) vs 2001-2009 (533), X^2= 128.0, p<0.001; 2001-2009 (533) vs 2010-2013 (933), X^2= 1895.8, p<0.001; 2010-2013 (933) vs 2014-Sept 2015 (1788), X^2= 2065.0, p<0.001
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S table S.4.

Figure 5.a Rates of emergency department (ED) visits with marijuana-related billing codes by age categories.



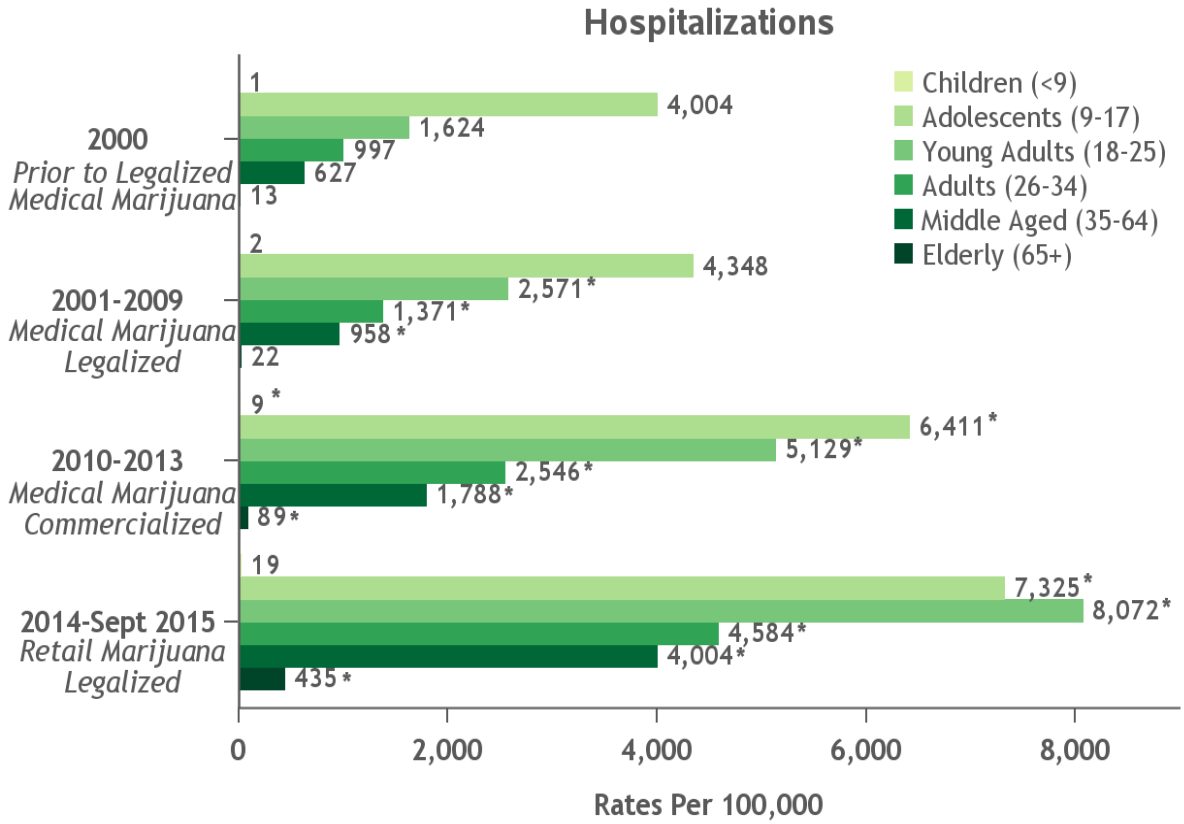
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1 were used to determine ED visits with marijuana-related billing codes.
‡Data Source: Colorado Hospital Association 2011-Sept 2015.

Major findings:

- Rates of ED visits with marijuana-related billing codes significantly increased for all age groups except children and adolescents from 2011-2013 to 2014 through September 2015.[m]

[m] Rate of ED visits per 100,000: YA 2010-2013 (1576) vs 2014-Sept 2015 (1893), X^2= 154.3, p<0.001; adult 2010-2013 (1168) vs 2014-Sept 2015 (1427), X^2= 153.1, p<0.001; middle aged 2010-2013 (705) vs 2014-Sept 2015 (897), X^2= 289.5, p<0.001; elderly 2010-2013 (70) vs 2014-Sept 2015 (122), X^2= 64.4, p<0.001
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S table S.5.

Figure 5.b Rates of hospitalizations (HD) with marijuana-related billing codes by age categories.



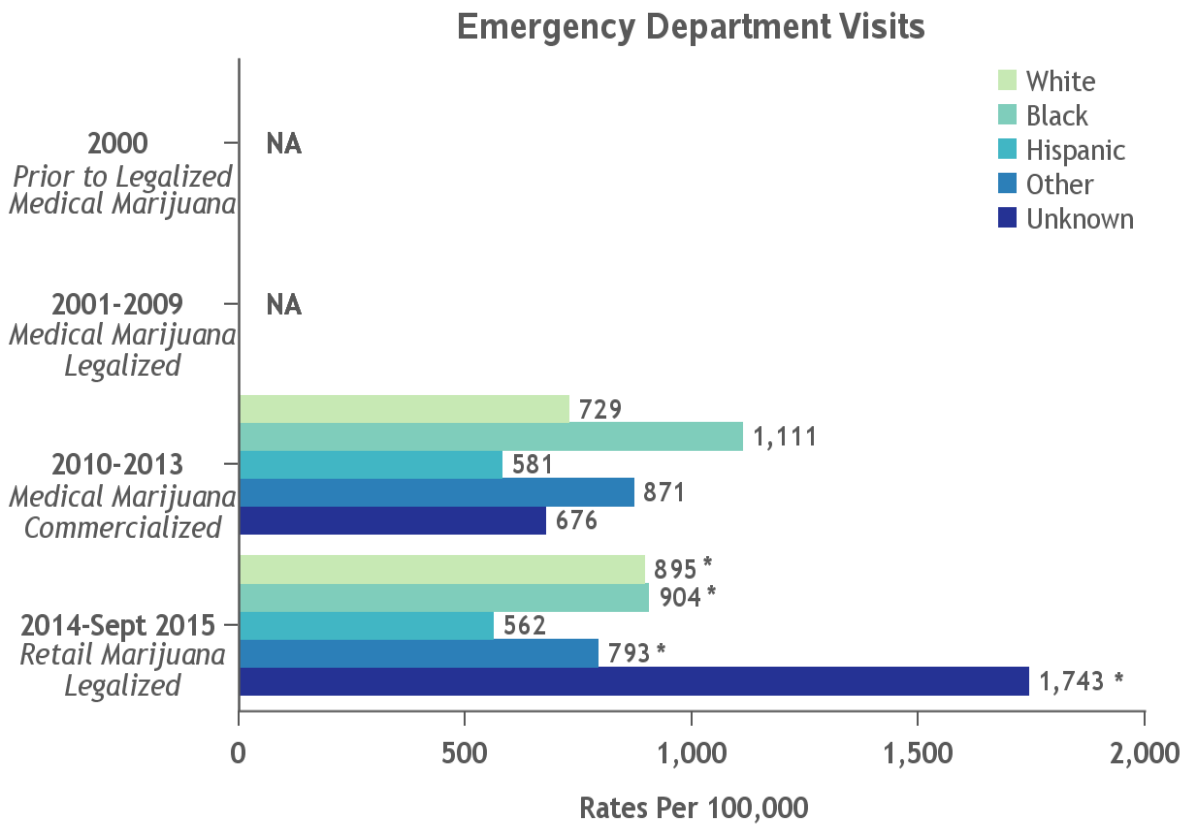
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1 were used to determine HD with marijuana-related billing codes.
‡Data Source: Colorado Hospital Association 2000-Sept 2015.

Major findings:

- Rates of HD with marijuana-related billing codes significantly increased for all age groups from 2001-2009 to 2010-2013 and for those 9 and older for 2010-2013 to 2014 through September 2015.[n]

[n] Rate of HD visits per 100,000: Child 2001-2009 (2) vs 2010-2013 (2), X^2= 28.2, p<0.001; Adolescent 2001-2009 (4348) vs 2010-2013 (6411), X^2= 315.6, p<0.001; 2010-2013 (6411) vs 2014-Sept 2015 (7325), X^2= 19.6, p<0.001; YA 2000(1624) vs 2001-2009 (2571), X^2= 131.5, p<0.001; 2001-2009 (2571) vs 2010-2013 (5129), X^2= 2123.6, p<0.001; 2010-2013 (5129) vs 2014-Sept 2015 (8072), X^2= 634.9, p<0.001; Adult 2000(997) vs 2001-2009 (1371), X^2= 48.7, p<0.001; 2001-2009 (1371) vs 2010-2013 (2546), X^2= 1205.2, p<0.001; 2010-2013 (2546) vs 2014-Sept 2015 (4584), X^2= 904.0, p<0.001; middle aged 2000(627) vs 2001-2009 (958), X^2= 143.4, p<0.001; 2001-2009 (958) vs 2010-2013 (1788), X^2= 2384.5, p<0.001; 2010-2013 (1788) vs 2014-Sept 2015 (4004), X^2= 3754, p<0.001; Elderly 2001-2009 (22) vs 2010-2013 (89), X^2= 406.2, p<0.001; 2010-2013 (89) 2014-Sept 2015 (435), X^2= 1082.3, p<0.001
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S table S.5.

Figure 6.a Rates of emergency department (ED) visits with marijuana-related billing codes by race/ethnicity.



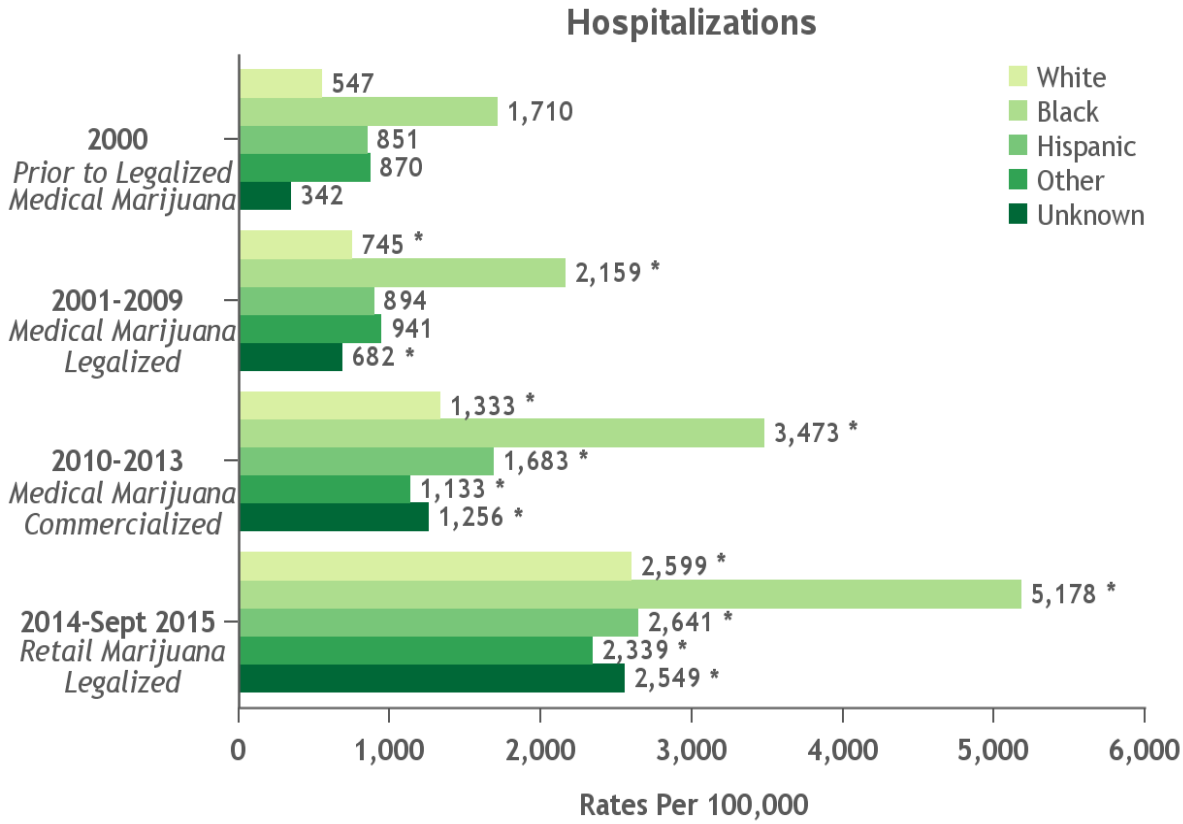
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1 were used to determine ED visits with marijuana-related billing codes.
‡Other race included Asian, Native American, and Other races. Unknown race was recorded as "unknown" not including missing data.
§Data Source: Colorado Hospital Association 2011-Sept 2015.

Major findings:

- Rates of ED visits with marijuana-related billing codes significantly increased from 2010-2013 to 2014 through September 2015 for White, Black, Other, and Unknown races.[o]

[o]Rate of ED visits per 100,000: White 2010-2013 (729) vs 2014-Sept 2015 (895), X^2= 409.0, p<0.001; Black 2010-2013 (1111) vs 2014-Sept 2015 (895), X^2= 50.7, p<0.001; Other 2010-2013 (581) vs 2014-Sept 2015 (562), X^2= 13.1, p<0.001; Unknown 2010-2013 (676) vs 2014-Sept 2015 (1743), X^2= 1509.3, p<0.001
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S table S.6.

Figure 6.b Rates of hospitalizations (HD) with marijuana-related billing codes by race/ethnicity.



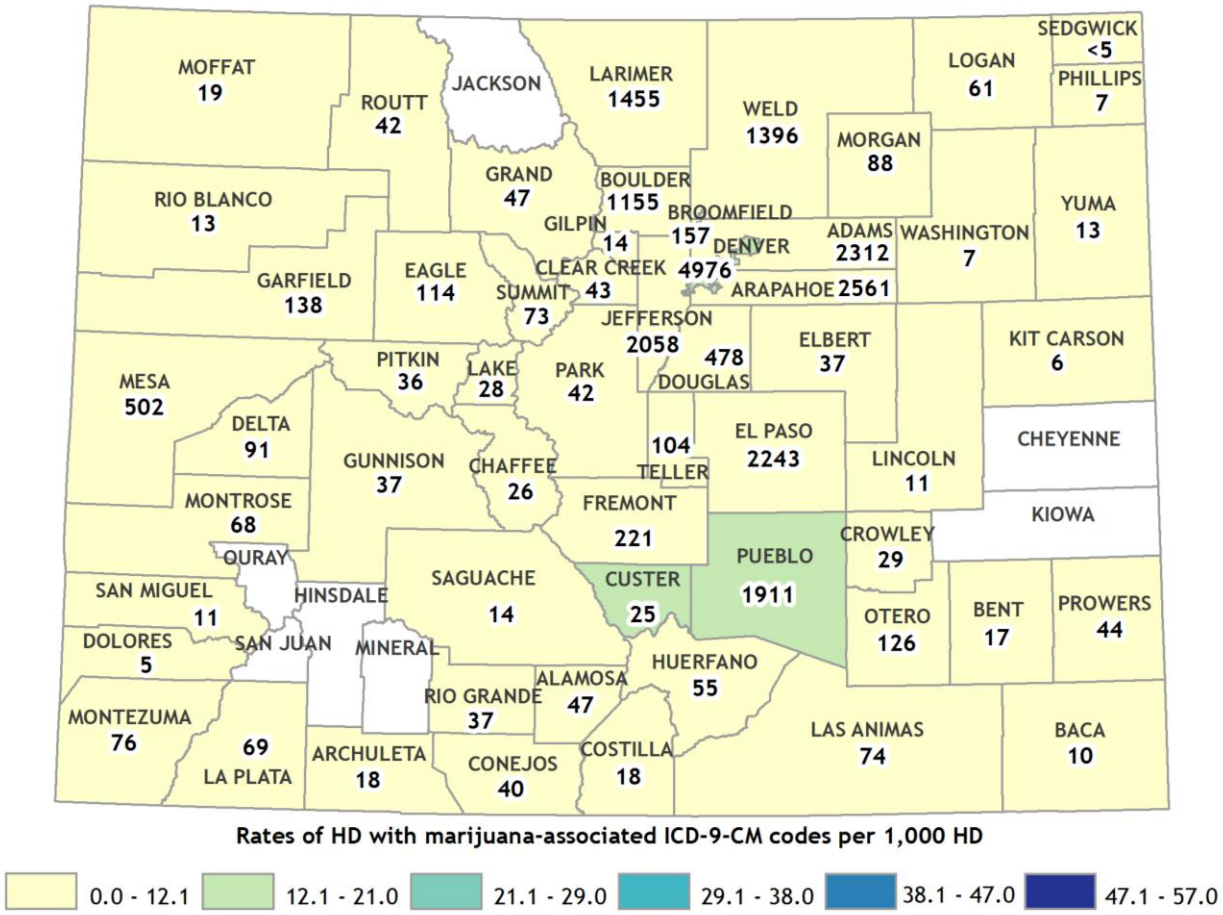
Produced by: EEOHT, CDPHE 2016
*Rate significantly increased from previous time period with a p-value <0.001.
†ICD-9-CM codes 969.6 and E854.1 were used to determine HD with marijuana-related billing codes.
‡Other race included Asian, Native American, and Other races. Unknown race was recorded as "unknown" not including missing data.
§Data Source: Colorado Hospital Association 2000-Sept 2015.

Major findings:

- Rates of HD with marijuana-related billing codes significantly increased each time period for White, Black, and Unknown races.[p]
- Rates of HD with marijuana-related billing codes for all races significantly increased each time period from 2001-2009 to 2014 through September 2015.[q]

[p] Rate of HD visits per 100,000: White 2000 (547) vs 2001-2009 (745), X^2= 122.0, p<0.001; 2001-2009 (745) vs 2010-2013 (1333), X^2= 3127.2, p<0.001; 2010-2013 (1333) vs 2014-Sept 2015 (2599), X^2= 3903.7, p<0.001; Black 2000 (1710) vs 2001-2009 (2159), X^2= 12.3, p<0.001; 2001-2009 (2159) vs 2010-2013 (3473), X^2= 362.5, p<0.001; 2010-2013 (3473) vs 2014-Sept 2015 (5178), X^2= 198.1, p<0.001; Unknown 2000 (342) vs 2001-2009 (682), X^2= 165.4, p<0.001; 2001-2009 (682) vs 2010-2013 (1256), X^2= 594.7, p<0.001; 2010-2013 (1256) vs 2014-Sept 2015 (2549), X^2= 431.2, p<0.001
[q] Rate of HD visits per 100,000: Hispanic 2001-2009 (894) vs 2010-2013 (1683), X^2= 793.8, p<0.001; 2010-2013 (1683) vs 2014-Sept 2015 (2641), X^2= 223.1, p<0.001; Other 2001-2009 (941) vs 2010-2013 (1133), X^2= 31.6, p<0.001; 2010-2013 (1133) vs 2014-Sept 2015 (2339), X^2= 455.1, p<0.001
For an explanation of statistical comparisons used, see Appendix S. For data, see Appendix S table S.6.

Map 2. Rates and numbers of hospitalizations (HD) with marijuana-related billing codes Per 1,000 HD in all ages in Colorado From 2004-2009.

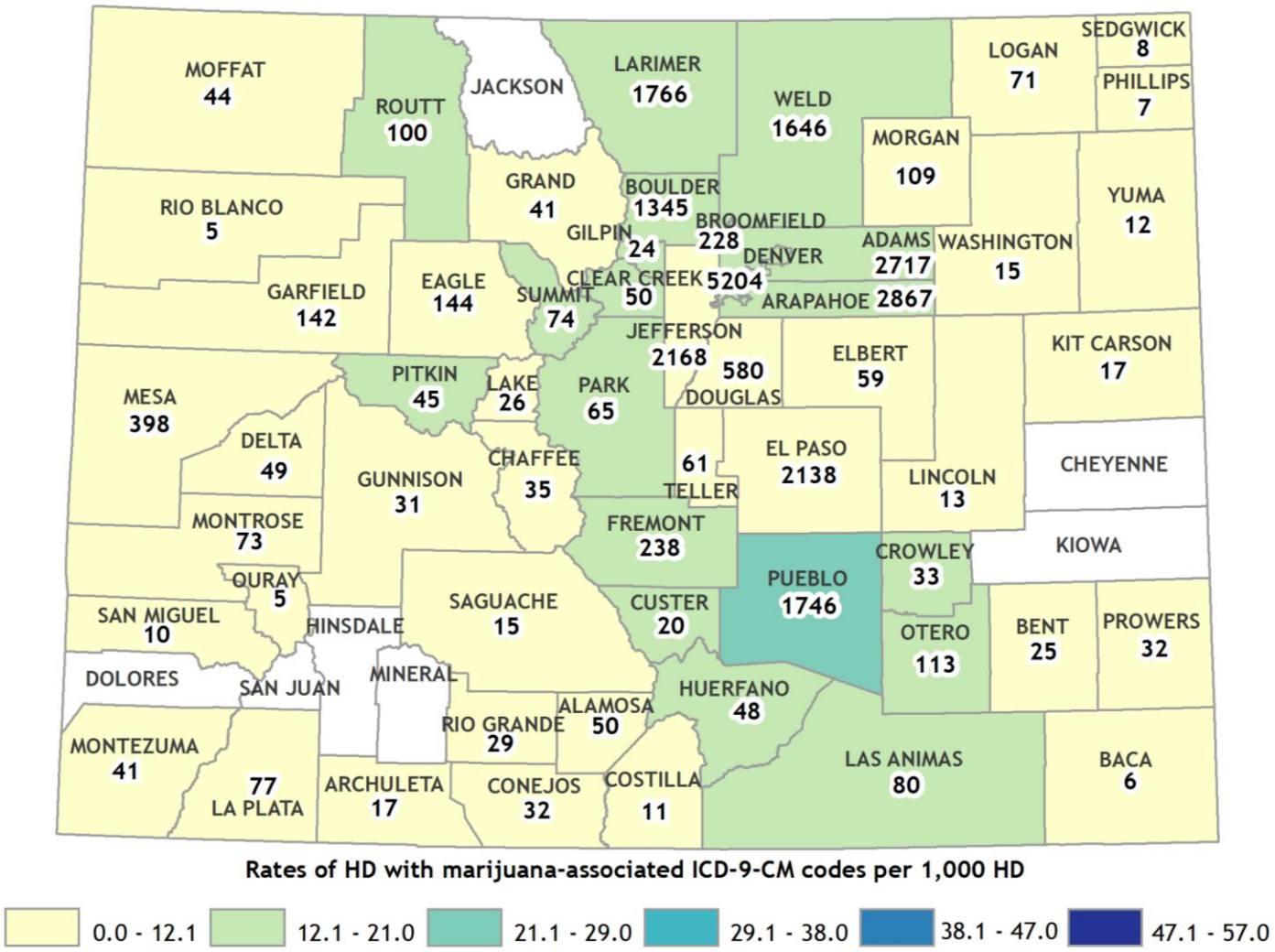


Produced by: EEOHT, CDPHE 2016
*Counties shown in white have no reported ED visits with marijuana-related billing codes.
†The number inside the counties was the total number of HD with marijuana-related billing codes in the specified county.
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine HD with marijuana-related billing codes.
§ Data Source: Colorado Hospital Association 2004-2009.

Major findings

- Rates and numbers of HD with marijuana-related billing codes were higher in urban areas compared to rural areas.
- The highest rates were in Pueblo (16 per 1,000 HD), Denver (13 per 1,000 HD), and Custer (12 per 1,000 HD) counties while the highest numbers of HD were in Denver (N=4,976 HD), Arapahoe (N=2,561 HD), and Adams (N=2,561 HD) counties.

Map 3. Rates and numbers of hospitalizations (HD) with marijuana-related billing codes per 1,000 hospitalizations in all ages in Colorado from 2010-2013.

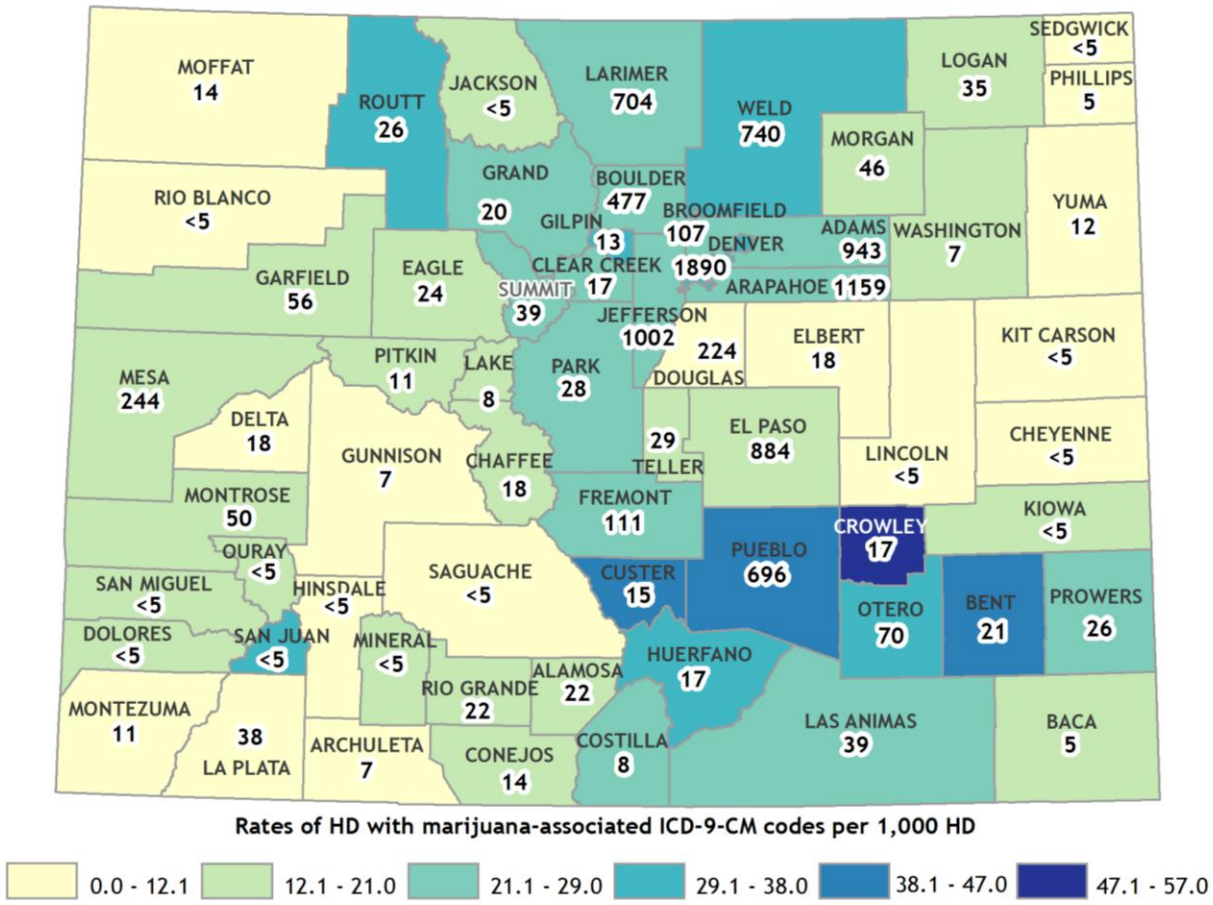


Produced by: EEOHT, CDPHE 2016
*Counties shown in white have no reported ED visits with marijuana-related billing codes.
†The number inside the county was the total number of HD with marijuana-related billing codes in the specified county.
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine HD with marijuana-related billing codes.
§ Data Source: Colorado Hospital Association 2010-2013.

Major findings

- Rates and numbers of HD with marijuana-related billing codes were higher in urban areas compared to rural areas.
- The highest rates were in Pueblo County (24 HD per 1,000 HD); however, the highest number of HD was in Denver County (N=5,204 HD).

Map 4. Rates and numbers of hospitalizations (HD) with marijuana-related billing codes per 1,000 hospitalizations in all ages in Colorado in 2014-September 2015.

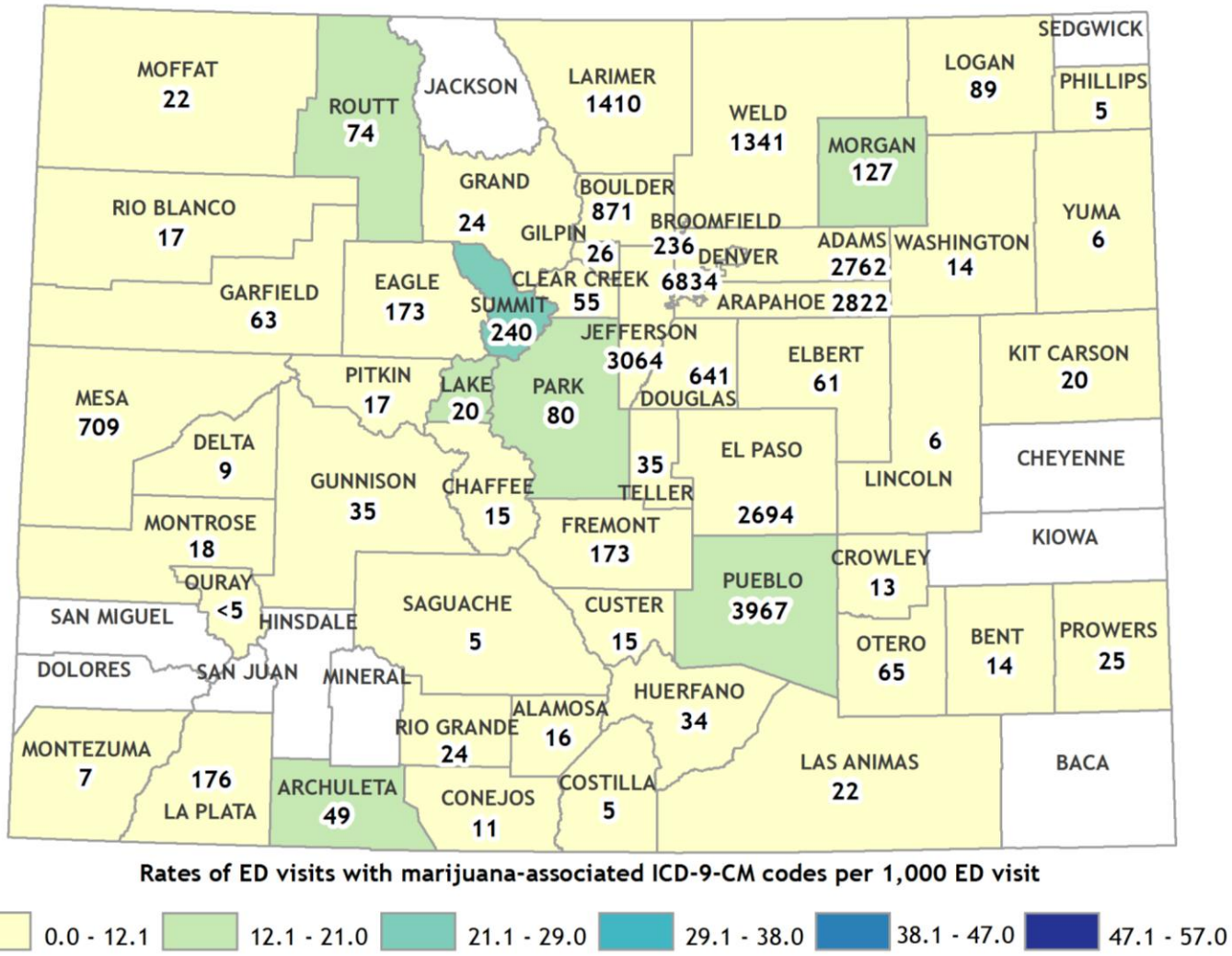


Produced by: EEOHT, CDPHE 2016
* Counties shown in white have no reported HD with marijuana-related billing codes.
†The number inside the county was the total number of HD marijuana-related billing codes in the specified county.
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine HD with marijuana-related billing codes.
§ Data Source: Colorado Hospital Association 2014-Sept 2015.

Major findings

- Numbers of HD with marijuana-related billing codes were higher in urban areas compared to rural areas.
- The highest rates of HD were in Crowley County (56 per 1,000 HD) while the highest numbers of HD were in Denver County (N=1,749 HD).

Map 5. Rates and numbers of emergency department (ED) Visits with marijuana-related billing codes per 1,000 ED visits in all ages in Colorado from 2011-2013.



Produced by: EEOHT, CDPHE 2016

* Counties shown in white have no reported ED visits with marijuana-related billing codes.

†The number inside the county was the total number of ED visits with possible marijuana-related billing codes in the specified county.

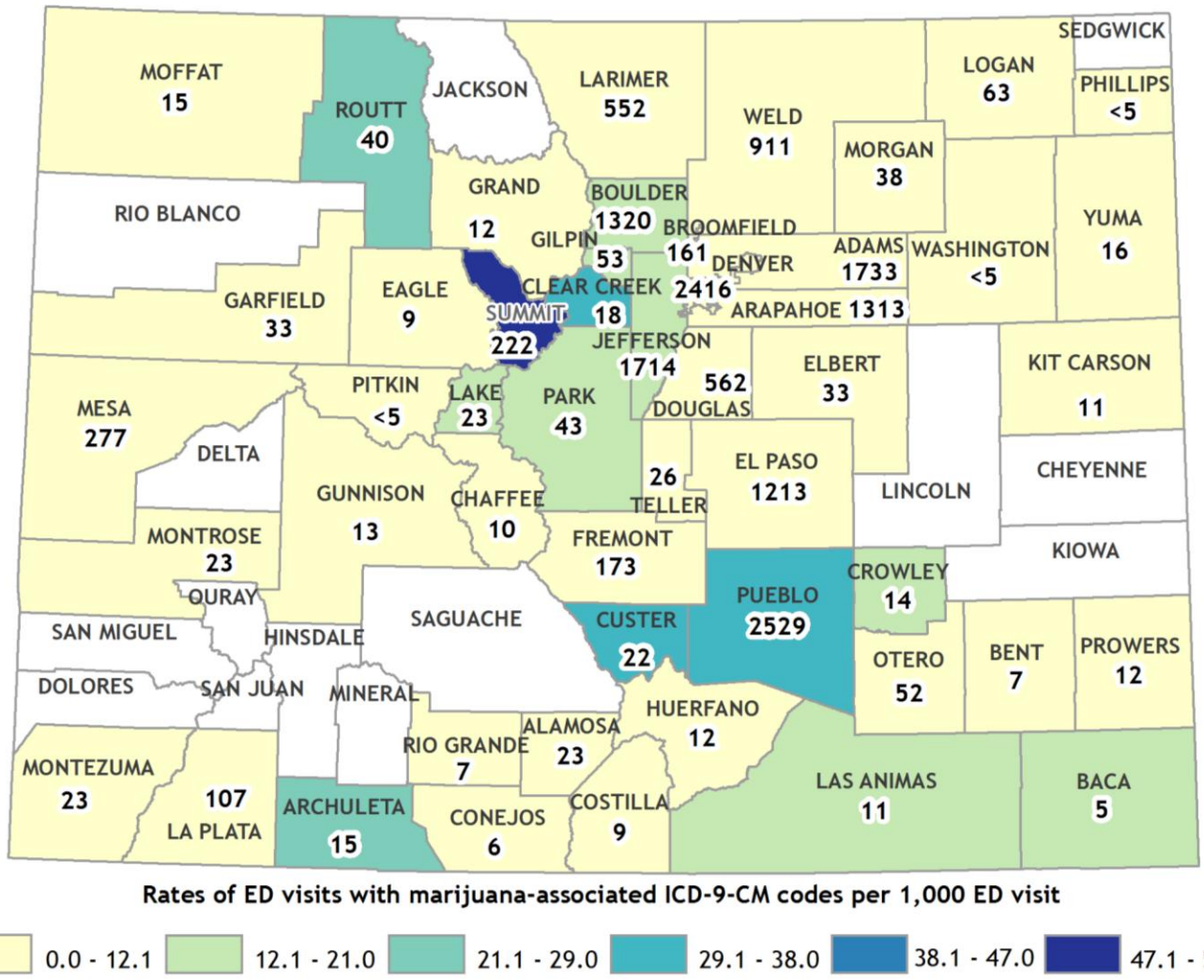
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine ED visits with marijuana-related billing codes.

§ Data Source: Colorado Hospital Association 2011-2013.

Major findings

- The rates of ED visits remained fairly constant from urban to rural counties; however, the numbers of ED visits were higher in urban counties compared to rural counties.
- The highest rates of ED visits were in Summit (21 per 1,000), Routt (17 per 1,000), Pueblo (17 per 1,000), Lake (13 per 1,000), Park (13 per 1,000) and Archuleta (13 per 1,000) counties, while the highest numbers of ED visits were in Denver (N=6,834) and Pueblo (N=3,967) counties.

Map 6. Rates and numbers of emergency department (ED) visits with marijuana-related billing codes[b] per 1,000 hospitalizations in all ages in Colorado in 2014-September 2015.

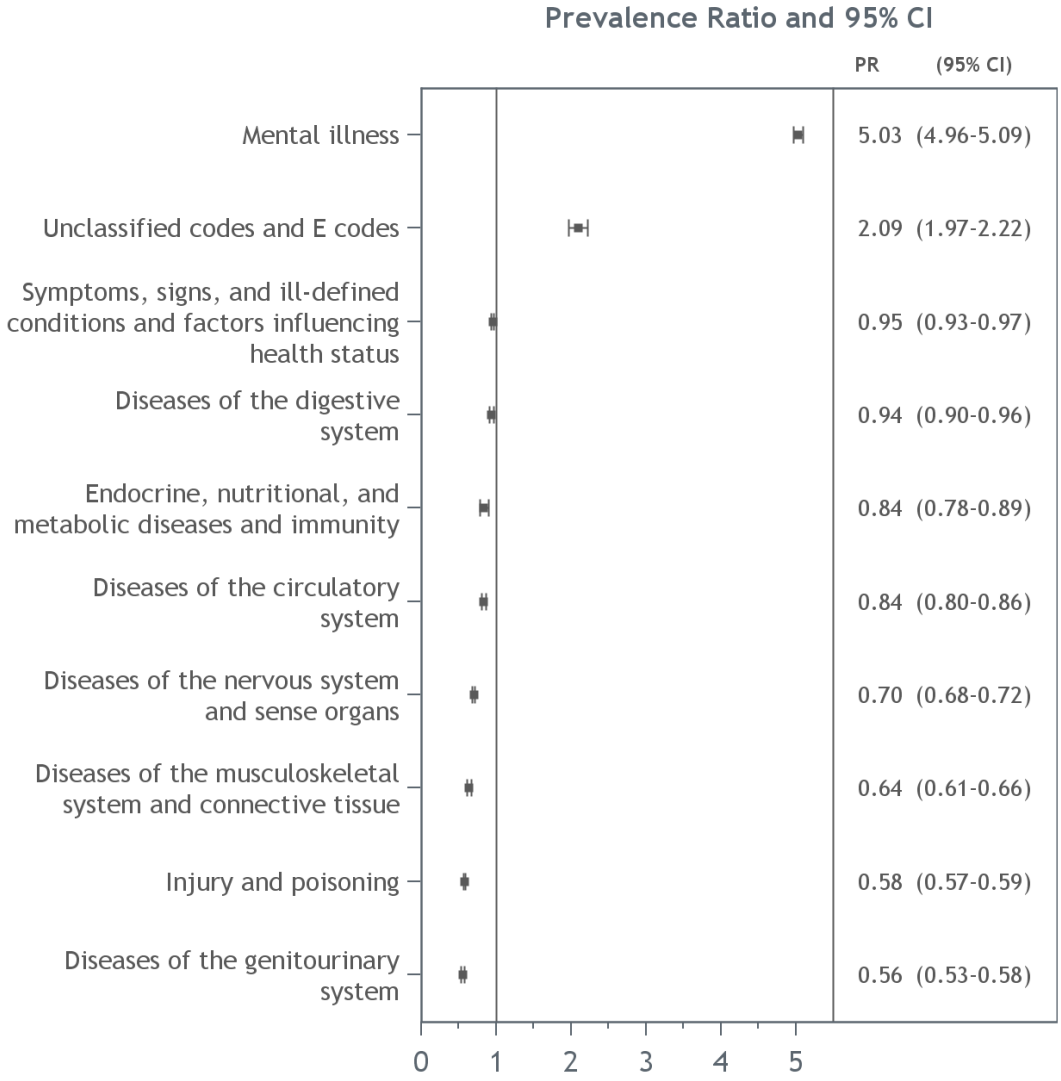


Produced by: EEOHT, CDPHE 2016
* Counties shown in white have no reported ED visits with marijuana-related billing codes.
†The number inside the county was the total number of ED visits with marijuana-related billing codes in the specified county.
‡ICD-9-CM codes 305.20-305.23, 304.30-304.33, 969.6, and E854.1 were used to determine ED visits with marijuana-related billing codes.
§ Data Source: Colorado Hospital Association 2014-Sept 2015.

Major findings

- The rate of ED visits increased in Adams, Alamosa, Arapahoe, Archuleta, Baca, Boulder, Broomfield, Chaffee, Clear Creek, Costilla, Crowley, Custer, Dolores, Douglas, El Paso, Elbert, Fremont, Garfield, Gilpin, Grand, Jefferson, Kit Carson, La Plata, Lake, Las Animas, Logan, Mesa, Moffat, Montezuma, Montrose, Morgan, Otero, Park, Phillips, Pueblo, Routt, Summit, Teller, Washington, Weld, and Yuma counties from 2011-2013.
- The highest rates of ED visits were in Summit County (56 per 1,000), while the highest numbers of ED visits were in Pueblo County (N=2,529).

Figure 7. Top ten primary diagnosis categories among emergency department (ED) visits with marijuana-related billing codes compared to those without in Colorado from 2011 through September 2015.

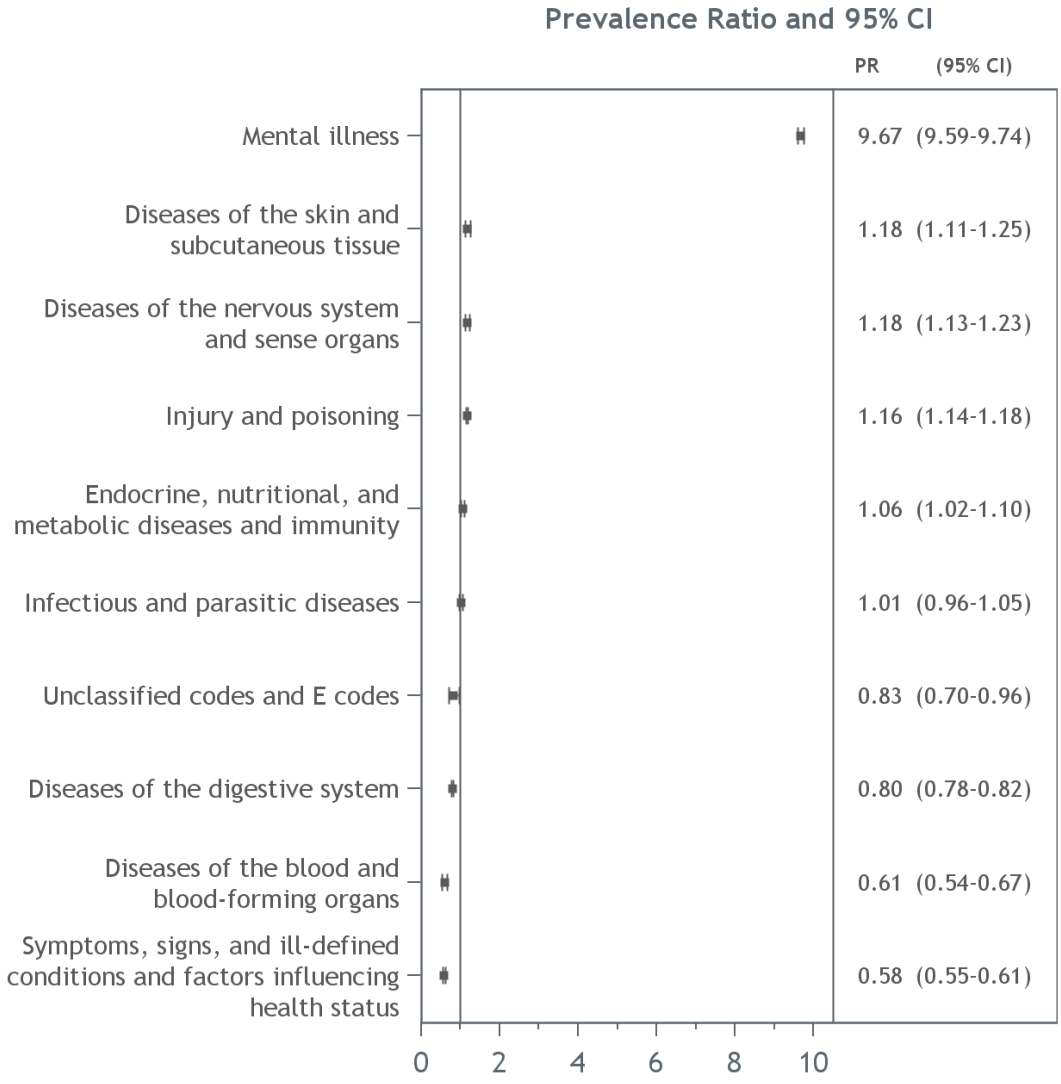


Produced by: EEOHT, CDPHE 2016
*ED visits with marijuana-related billing codes included 304.30-304.33, 305.20-305.23, 969.6, and E854.1 in any of the listed 30 diagnosis codes.
†PR=Prevalence Ratio, CI=Confidence Interval
‡Data Source: Colorado Hospital Association 2011-Sept 2015.

Major findings

- The prevalence of the primary diagnosis category *mental illness* was five-fold higher and the category of *unclassified codes and E codes* was two-fold higher among ED visits with marijuana-related billing codes compared to ED visits without marijuana-related billing codes.

Figure 8. Top ten primary diagnosis categories among hospitalizations (HD) with marijuana-related billing codes compared to those without in Colorado from 2000 through September 2015.



Produced by: EEOHT, CDPHE 2016
*Hospitalizations with marijuana-related billing codes included 304.30-304.33, 305.20-305.23, 969.6, and E854.1 in any of the listed 30 diagnosis codes.
†PR=Prevalence Ratio, CI=Confidence Interval
‡Data Source: Colorado Hospital Association 2000-Sept 2015

Major findings

- The prevalence of the primary diagnosis category *mental illness* among HD with marijuana-related billing codes was nine-fold higher compared to HD without marijuana-related billing codes.

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