Nine Years of the Young Adult Health Survey: Highlights, Trends, and Next Steps

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March 13, 2023

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Why conduct research with young adults between the ages of 18-25?

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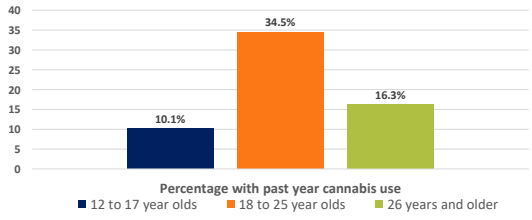
Past year cannabis use by age group

Source: SAMHSA 2020 National Survey on Drug Use and Health



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Washington Young Adult Health Survey (YAHS)

- Funded by Division of Behavioral Health & Recovery (DBHR):
  - Sarah Mariani
  - Sandy Salivaras
- Young Adult Health Survey Team:
  - Jason Kilmer
  - Mary Larimer
  - Alice Yan
  - Rose Lyles-Riebli
  - Isaac Rhew

Washington State Health Care Authority (Division of Behavioral Health and Recovery) (PI: Kilmer).

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Young Adult Health Survey Recruitment

- Aimed to collect all Year One data before the first store opened in July 2014
  - 69.3% collected before the first store opened
  - Remaining 30.7% collected into August 2014
    - Only 18 stores had opened statewide in July
    - Only 31 stores had opened by August

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Young Adult Health Survey Recruitment

- Participants recruited using a combination of direct mail advertising to a random sample from DOL, as well as online advertising (Facebook, Craigslist, Instagram, study web site, etc.)
- Assessed demographics on ongoing basis and modified strategies to recruit under-represented groups
- Convenience sample, not a random sample

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Post-stratification weighting and analyses

- To improve generalizability, used post-stratification weights based on sex, race, and geographic region
- Weighted results are consistently very similar to non-weighted

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Young Adult Health Survey

- Each year we collect data from a new cohort of 18-25 year olds

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Sample sizes over time

- Cohort 1 (2014): 2,101
- Cohort 2 (2015): 1,675
- Cohort 3 (2016): 2,493
- Cohort 4 (2017): 2,342
- Cohort 5 (2018): 2,412
- Cohort 6 (2019): 1,942
- Cohort 7 (2020) 1,643
- Cohort 8 (2021): 1,756
- Cohort 9 (2022): 1,110
- **TOTAL: 17,474**

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Young Adult Health Survey

- Each year we follow up with previous cohorts
- Very different for 2022 recruitment were the significant changes to social media advertising rules, decisions, and content

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Young Adult Health Survey

- Dr. Katarina Guttmannova applied for and obtained a secondary data analysis grant (NIDA grant R01DA047996, PI: Guttmannova) that has led to several publications using YAHS (beyond what we pass on as part of the contract).

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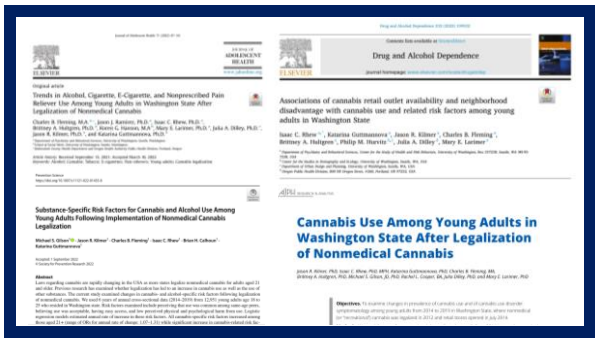

Trends in Alcohol, Cigarette, E-Cigarette, and Nonprescribed Pain Reliever Use Among Young Adults in Washington State After Legalization of Nonmedical Cannabis

Substance-Specific Risk Factors for Cannabis and Alcohol Use Among Young Adults Following Implementation of Nonmedical Cannabis Legalization

Drug and Alcohol Dependence

Associations of cannabis retail outlet availability and neighborhood disadvantage with cannabis use and related risk factors among young adults in Washington State

Cannabis Use Among Young Adults in Washington State After Legalization of Nonmedical Cannabis

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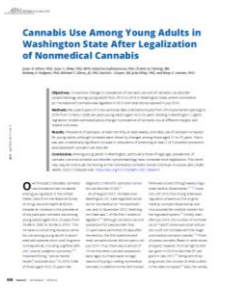
Kilmer, J.R., Rhew, I.C., Guttmannova, K., Fleming, C.B., Hultgren, B., Gilson, M.S., Cooper, R.L., Dilley, J., & Larimer, M.E. (2022). Cannabis use among young adults in Washington State after legalization of nonmedical cannabis. American Journal of Public Health, 112, 638-645.

- n=12,963 young adults in Washington over 6 time points
- Included covariates for:
  - Sex assigned at birth
  - Race
  - Ethnicity
  - Geographic region of the state
  - Age
  - Attending 4 year college
  - Full time employment status
- Applied post-stratification weights to make sample more similar to general population



Cannabis Use Among Young Adults in Washington State After Legalization of Nonmedical Cannabis

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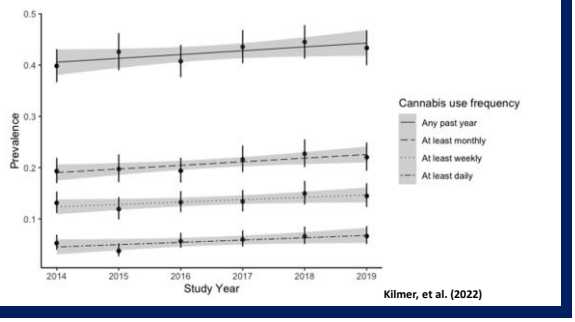

Kilmer, et al. (2022)

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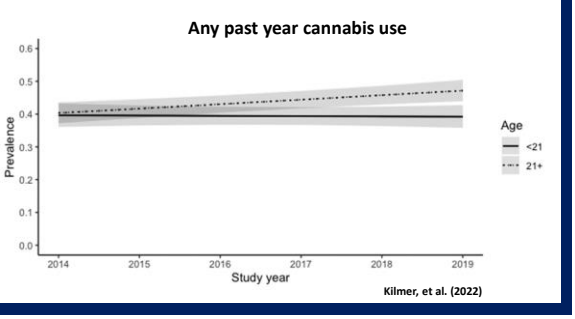

Kilmer, et al. (2022)

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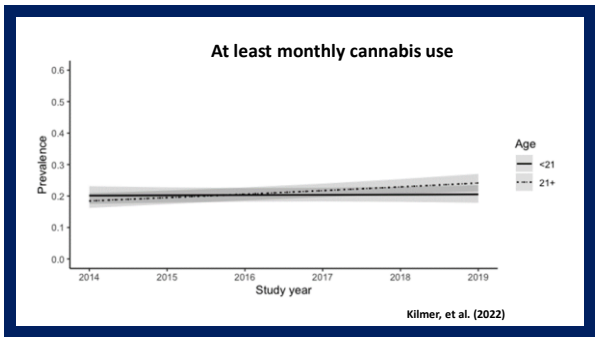

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MaCoun (2013), Frontiers in Psychiatry

Criterion	DSM-IV substance dependence	DSM-5 substance use disorder
Tolerance	✓	✓
Withdrawal	✓	✓
Taken more/longer than intended	✓	✓
Desire/unsuccessful efforts to quit use	✓	✓
Great deal of time taken by activities involved in use	✓	✓
Use despite knowledge of problems associated with use	✓	✓
Important activities given up because of use	✓	✓
Recurrent use resulting in a failure to fulfill important role obligations		✓
Recurrent use resulting in physically hazardous behavior (e.g., driving)		✓
Continued use despite recurrent social problems associated with use		✓
Craving for the substance		✓

DSM-5 Cannabis Use Disorder Criteria

Mild: 2-3 symptoms
Moderate: 4-5 symptoms
Severe: 6+ symptoms

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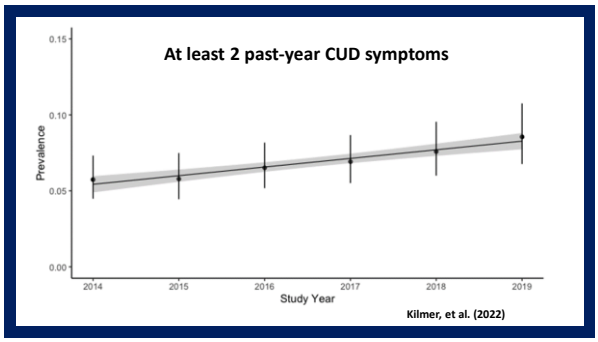

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What have trends looked like in the three years that followed?

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Any past year "recreational"/non-medical/personal use: Cohorts 4-8 higher than Cohort 1

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	43.27%	44.82%	40.94%	43.41%	44.42%	43.68%	40.39%	44.89%	39.11%	42.94%
21-25	43.67%	47.09%	46.55%	49.75%	50.87%	49.61%	52.29%	55.21%	53.60%	49.40%
TOTAL	43.51%	46.29%	44.76%	47.43%	48.49%	47.24%	47.94%	51.19%	47.26%	47.00%

Regression models:
Cohort 1 vs. Cohorts 2-9:
Compared to Cohort 1, significantly higher prevalence for
- Cohort 4 (t=2.29, p<.05; odds ratio = 1.171)
- Cohort 5 (t=2.96, p<.01; odds ratio = 1.222)
- Cohort 6 (t=2.11, p<.05; odds ratio = 1.163)
- Cohort 7 (t=2.41, p<.05; odds ratio = 1.196)
- Cohort 8 (t=4.19, p<.001; odds ratio = 1.361)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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Any past year "recreational"/non-medical/personal use: Increasing over time

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
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21-25	43.67%	47.09%	46.55%	49.75%	50.87%	49.61%	52.29%	55.21%	53.60%	49.40%
TOTAL	43.51%	46.29%	44.76%	47.43%	48.49%	47.24%	47.94%	51.19%	47.26%	47.00%

Regression models:
Linear trend from Cohort 1 to Cohort 9:
Significant (t=3.88, p<.001)
Odds ratio = 1.028 (odds of non-medical cannabis use are 2.8% higher with each successive year/cohort)
Age by cohort interaction:
Significant (t=3.69, p<.001)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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Any past year "recreational"/non-medical/personal use: Increasing over time

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	43.27%	44.82%	40.94%	43.41%	44.42%	43.68%	40.39%	44.89%	39.11%	42.94%
21-25	43.67%	47.09%	46.55%	49.75%	50.87%	49.61%	52.29%	55.21%	53.60%	49.40%
TOTAL	43.51%	46.29%	44.76%	47.43%	48.49%	47.24%	47.94%	51.19%	47.26%	47.00%

Model split by over/under 21
18-20:
No significant linear trend
21-25:
Significant increasing trend over time (t=5.76, p<.001)
Odds ratio = 1.054 (odds of recreational cannabis use are 5.4% higher with each successive year/cohort)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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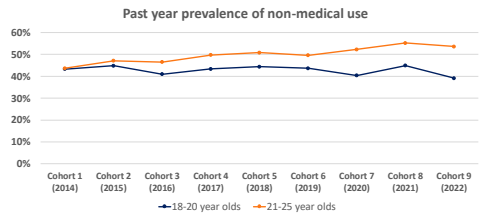
Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

Non-medical (or "recreational") use in the past year by age group



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At least monthly "recreational"/non-medical/personal use: Final five cohorts higher than cohort 1

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	24.08%	24.88%	21.19%	23.56%	27.06%	23.24%	23.17%	24.16%	26.21%	24.11%
21-25	23.63%	23.56%	25.12%	28.07%	27.88%	29.55%	33.81%	33.86%	31.65%	28.08%
TOTAL	23.81%	24.03%	23.84%	26.46%	27.62%	27.09%	29.99%	30.11%	29.19%	26.62%

Regression models:
Cohort 1 vs. Cohorts 2-9:
Compared to Cohort 1, significantly higher prevalence for
- Cohort 5 (t=2.56, p<.01; odds ratio = 1.221)
- Cohort 6 (t=2.08, p<.05; odds ratio = 1.189)
- Cohort 7 (t=3.73, p<.001; odds ratio = 1.365)
- Cohort 8 (t=3.88, p<.001; odds ratio = 1.379)
- Cohort 9 (t=2.99, p<.01; odds ratio =1.320)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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At least monthly "recreational"/non-medical/personal use: Increasing over time

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	24.08%	24.88%	21.19%	23.56%	27.06%	23.24%	23.17%	24.16%	26.21%	24.11%
21-25	23.63%	23.56%	25.12%	28.07%	27.88%	29.55%	33.81%	33.86%	31.65%	28.08%
TOTAL	23.81%	24.03%	23.84%	26.46%	27.62%	27.09%	29.99%	30.11%	29.19%	26.62%

Regression models:
Linear trend from Cohort 1 to Cohort 9:
Significant (t=5.75, p<.001)
Odds ratio = 1.048 (odds of recreational cannabis use are 4.8% higher with each successive year/cohort)
Age by cohort interaction:
Significant (t=3.66, p<.001)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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At least monthly "recreational"/non-medical/personal use: Increasing over time

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	24.08%	24.88%	21.19%	23.56%	27.06%	23.24%	23.17%	24.16%	26.21%	24.11%
21-25	23.63%	23.56%	25.12%	28.07%	27.88%	29.55%	33.81%	33.86%	31.65%	28.08%
TOTAL	23.81%	24.03%	23.84%	26.46%	27.62%	27.09%	29.99%	30.11%	29.19%	26.62%

Model split by over/under 21
18-20:
No significant linear trend
21-25:
Significant increasing trend over time (t=6.94, p<.001)
Odds ratio = 1.074 (odds of recreational cannabis use are 7.4% higher with each successive year/cohort)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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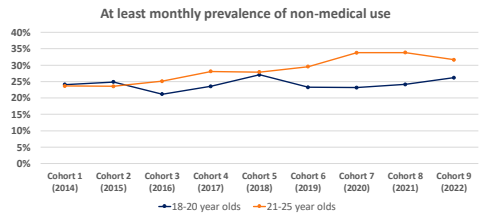
Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

At least monthly non-medical (or "recreational") use by age group



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At least weekly "recreational"/non-medical/personal use: Final two cohorts higher than cohort 1

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	16.51%	13.43%	13.30%	15.40%	18.56%	14.41%	15.21%	16.86%	16.40%	15.63%
21-25	16.86%	16.21%	18.55%	18.42%	19.22%	21.39%	24.07%	24.59%	21.93%	19.79%
TOTAL	16.72%	15.23%	16.85%	17.37%	19.03%	18.59%	20.84%	21.62%	19.47%	18.26%

Regression models:
Cohort 1 vs. Cohorts 2-9:
Compared to Cohort 1, significantly higher prevalence for
- Cohort 7 (t=2.86, p<.01; odds ratio = 1.311)
- Cohort 8 (t=3.37, p<.001; odds ratio = 1.374)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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At least weekly "recreational"/non-medical/personal use: Increasing over time

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	16.51%	13.43%	13.30%	15.40%	18.56%	14.41%	15.21%	16.86%	16.40%	15.63%
21-25	16.86%	16.21%	18.55%	18.42%	19.22%	21.39%	24.07%	24.59%	21.93%	19.79%
TOTAL	16.72%	15.23%	16.85%	17.37%	19.03%	18.59%	20.84%	21.62%	19.47%	18.26%

Regression models:
Linear trend from Cohort 1 to Cohort 9:
Significant (t=4.88, p<.001)
Odds ratio = 1.047 (odds of recreational cannabis use are 4.7% higher with each successive year/cohort)
Age by cohort interaction:
Significant (t=2.07, p<.05)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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At least weekly "recreational"/non-medical/personal use: Increasing over time

	Cohort 1 (2014)	Cohort 2 (2015)	Cohort 3 (2016)	Cohort 4 (2017)	Cohort 5 (2018)	Cohort 6 (2019)	Cohort 7 (2020)	Cohort 8 (2021)	Cohort 9 (2022)	Total across 9 years
18-20	16.51%	13.43%	13.30%	15.40%	18.56%	14.41%	15.21%	16.86%	16.40%	15.63%
21-25	16.86%	16.21%	18.55%	18.42%	19.22%	21.39%	24.07%	24.59%	21.93%	19.79%
TOTAL	16.72%	15.23%	16.85%	17.37%	19.03%	18.59%	20.84%	21.62%	19.47%	18.26%

Model split by over/under 21
18-20:
No significant linear trend
21-25:
Significant increasing trend over time (t=5.60, p<.001)
Odds ratio = 1.068 (odds of recreational marijuana use are 6.8% higher with each successive year/cohort)

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

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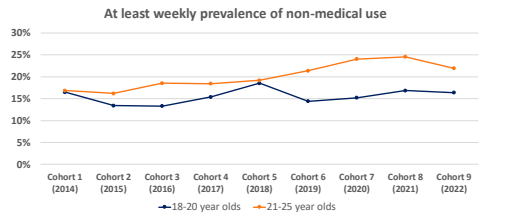
Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

At least weekly non-medical (or "recreational") use by age group



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In Cohort 9, 19.47% use at least weekly (meaning most don't), yet 67.71% think the typical person their age uses weekly

NON-MEDICAL/PERSONAL MARIJUANA USE, NORMS

PERCEPTIONS OF NON-MEDICAL MARIJUANA

	Cohort 1 2014	Cohort 2 2015	Cohort 3 2016	Cohort 4 2017	Cohort 5 2018	Cohort 6 2019	Cohort 7 2020	Cohort 8 2021	Cohort 9 2022
Never	2.41%	2.42%	1.61%	2.31%	2.06%	1.50%	2.38%	1.92%	3.05%
Once a year	1.82%	2.10%	1.74%	1.92%	1.27%	0.75%	1.32%	1.15%	1.37%
2 to 3 times a year	8.22%	10.12%	6.73%	6.40%	3.89%	3.31%	2.23%	3.87%	3.95%
Every other month	6.98%	7.29%	5.32%	4.59%	3.14%	3.90%	4.42%	3.48%	2.93%
Once a month	9.74%	11.15%	10.41%	9.07%	6.88%	5.51%	6.39%	7.07%	6.63%
2-3x/month	17.98%	19.68%	19.83%	18.91%	13.47%	13.93%	14.32%	14.04%	14.38%
Once per week	12.65%	12.72%	15.43%	13.89%	14.28%	12.91%	12.64%	14.11%	13.24%
More than 1x/wk	22.08%	20.70%	21.42%	23.94%	27.12%	25.90%	28.57%	29.17%	25.76%
Every other day	9.27%	6.87%	8.56%	8.65%	11.10%	12.25%	13.10%	10.45%	13.14%
Every day	8.84%	6.95%	8.96%	10.31%	16.79%	20.03%	14.62%	14.75%	15.57%

*** In ordinal logistic models, Cohort 4 (t=2.57, p<.01), Cohort 5 (t=10.66, p<.001), Cohort 6 (t=12.36, p<.001), Cohort 7 (t=9.72, p<.001), Cohort 8 (t=9.02, p<.001), and Cohort 9 (t=8.10, p<.001) have higher perceived non-medical marijuana norms compared to cohort 1; but cohort 2 has lower norms compared to cohort 1 (t= -3.35 p<.001) ***
*** Overall, a significant increasing linear trend over time (t=18.27, p<.001) ***

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Decreasing trend significant
Increasing trend significant

WHERE DO PEOPLE GET MARIJUANA, 18-20 year olds

	Cohort 1 2014	Cohort 2 2015	Cohort 3 2016	Cohort 4 2017	Cohort 5 2018	Cohort 6 2019	Cohort 7 2020	Cohort 8 2021	Cohort 9 2022
From friends	72.86%	76.24%	69.68%	77.40%	63.75%	60.74%	66.87%	65.62%	59.68%
Gave money to someone	23.29%	26.47%	34.72%	41.45%	39.29%	43.17%	40.55%	39.80%	37.62%
Got it from someone w/ medical mj. card	17.60%	14.12%	4.30%	5.24%	2.79%	2.82%	4.27%	4.58%	4.10%
Got it from a medical dispensary	13.65%	18.99%	5.58%	4.72%	6.50%	8.28%	8.41%	12.03%	3.40%
Got it at a party	22.99%	22.14%	23.08%	24.92%	20.12%	22.91%	8.82%	24.67%	16.43%
Got it from family	5.65%	5.18%	11.75%	9.75%	11.24%	10.92%	13.49%	7.09%	11.36%
Got it some other way	11.64%	4.12%	6.12%	9.02%	7.30%	6.21%	5.04%	6.24%	3.62%
Bought from retail store	0.99%	4.58%	1.73%	1.92%	2.03%	3.55%	1.58%	1.03%	3.08%
Got it from parents w/ permission	5.75%	6.02%	12.33%	10.44%	11.69%	12.91%	13.08%	13.91%	12.38%
Grew it themselves	1.91%	1.15%	1.65%	0.23%	1.47%	2.78%	1.64%	0.42%	0.59%
Stole it from store/ dispensary	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.16%	2.40%	0.00%

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WHERE DO PEOPLE GET MARIJUANA, 21-25 year olds

	Cohort 1 2014	Cohort 2 2015	Cohort 3 2016	Cohort 4 2017	Cohort 5 2018	Cohort 6 2019	Cohort 7 2020	Cohort 8 2021	Cohort 9 2022
From friends	67.50%	54.89%	42.78%	36.51%	33.80%	25.72%	20.26%	26.44%	26.04%
Gave money to someone	19.87%	10.72%	8.10%	5.64%	4.97%	3.63%	5.08%	4.61%	7.75%
Got it from someone w/ medical mj. card	18.85%	9.41%	2.53%	2.02%	0.17%	0.65%	0.27%	0.62%	1.16%
Got it from a med. dispensary	20.65%	13.03%	12.60%	9.96%	10.15%	14.23%	14.71%	15.62%	16.02%
Got it at a party	11.81%	10.76%	10.93%	8.06%	6.54%	5.76%	1.57%	7.12%	10.93%
Got it from family	11.48%	8.26%	4.08%	7.04%	5.76%	4.37%	4.02%	5.52%	4.56%
Got it some other way	5.13%	6.68%	3.29%	3.41%	3.71%	3.71%	1.24%	2.13%	1.85%
Bought from retail store	8.80%	51.86%	72.60%	76.31%	80.06%	78.03%	77.27%	74.42%	70.93%
Got it from parents w/ permission	4.56%	3.50%	2.02%	4.28%	4.47%	3.15%	2.75%	4.75%	4.41%
Grew it themselves	1.51%	3.01%	1.49%	1.82%	1.81%	0.71%	1.11%	1.74%	0.79%
Stole it from store/ dispensary	2.84%	0.17%	0.60%	0.29%	0.17%	0.11%	0.97%	0.43%	0.69%

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Driving after marijuana use

"During the past 30 days, how many times did you drive a car or other vehicle within three hours after using cannabis (e.g., marijuana, hashish, edibles)?"

	Cohort 1 2014	Cohort 2 2015	Cohort 3 2016	Cohort 4 2017	Cohort 5 2018	Cohort 6 2019	Cohort 7 2020	Cohort 8 2021	Cohort 9 2022
Never	50.59%	55.29%	58.19%	58.56%	58.73%	61.80%	65.00%	66.38%	64.64%
1 time	14.13%	13.13%	12.50%	12.85%	12.11%	8.32%	9.56%	10.25%	10.27%
2-3 times	13.28%	12.34%	11.97%	11.98%	10.59%	11.66%	11.24%	10.51%	11.50%
4-5 times	6.43%	4.35%	3.48%	4.48%	6.04%	4.00%	4.51%	4.39%	2.53%
6 or more times	15.57%	14.88%	13.85%	12.12%	12.52%	14.21%	9.69%	8.47%	11.05%

There are declines in driving after marijuana use between cohorts 3-9 and cohort 1 (cohort 3, p<.05; cohort 4, p<.01; cohort 5, p<.05; cohort 6, p<.01; cohort 7, p<.001; cohort 8, p<.001; cohort 9, p<.001), as well as a significant linear trend (p<.001).

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Medical cannabis

- Cohort 9 past year medical cannabis use (11.96%) is significantly lower than Cohort 1 (14.74%)
  - Same difference on overall frequency such that Cohort 9 is different than Cohort 1
- Perceptions of medical use increasing significantly (both a linear trend, and past 6 cohorts higher than cohort 1)

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Other substances

- Significant decreasing trend in:
  - Alcohol, at least once in past year
  - Alcohol, at least monthly
  - Cigarettes, at least once in the past year
  - Pain relievers to get high, at least once in the past year
  - Heroin use, at least once in the past year

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Perceived risk

- **Marijuana**
  - Physical risk of occasional marijuana use
  - Psychological/emotional risk of occasional marijuana use
  - Physical risk of regular marijuana use
  - Psychological/emotional risk of regular marijuana use
- **Alcohol**
  - Physical risk of 2 drinks every day
  - Psychological risk of 2 drinks every day
  - Physical risk of 5+ drinks every weekend
  - Psychological risk of 5+ drinks every weekend

Source: Young Adult Health Survey, Preliminary Data Report to DBHR, Kilmer (PI)

** significant decreasing linear trend **
** significant increasing linear trend **

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Young Adult Health Survey

- We will launch our 10th year of data collection this summer
- Pausing on longitudinal follow-up of Cohorts 1-5 (and will reintroduce them in subsequent years)
- Dr. Katarina Guttmannova received a second secondary data analysis grant (NIDA R01DA057705) focusing on changes before to during the COVID-19 pandemic among young adults
  - Findings from this project will inform tailoring and development of prevention and intervention efforts aimed at reducing health risk behaviors and improving public health
- Included new items (e.g., CBD only, Delta-8 only)…stay tuned
- Will be seeking input on survey items (please email me at jkilmer@uw.edu if you would like to receive a draft)

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Thank you!

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