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[Drug Alcohol Depend.](#) 2016 Aug 1;165:175-80. doi: 10.1016/j.drugalcdep.2016.06.004. Epub 2016 Jun 21.

## Bayesian inference for the distribution of grams of marijuana in a joint.

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### Abstract

**BACKGROUND:** The average amount of marijuana in a joint is unknown, yet this figure is a critical quantity for creating credible measures of marijuana consumption. It is essential for projecting tax revenues post-legalization, estimating the size of illicit marijuana markets, and learning about how much marijuana users are consuming in order to understand health and behavioral consequences.

**METHODS:** Arrestee Drug Abuse Monitoring data collected between 2000 and 2010 contain relevant information on 10,628 marijuana transactions, joints and loose marijuana purchases, including the city in which the purchase occurred and the price paid for the marijuana. Using the Brown-Silverman drug pricing model to link marijuana price and weight, we are able to infer the distribution of grams of marijuana in a joint and provide a Bayesian posterior distribution for the mean weight of marijuana in a joint.

**RESULTS:** We estimate that the mean weight of marijuana in a joint is 0.32g (95% Bayesian posterior interval: 0.30-0.35).

**CONCLUSIONS:** Our estimate of the mean weight of marijuana in a joint is lower than figures commonly used to make estimates of marijuana consumption. These estimates can be incorporated into drug policy discussions to produce better understanding about illicit marijuana markets, the size of potential legalized marijuana markets, and health and behavior outcomes.

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**KEYWORDS:** Bayesian inference; Brown–Silverman drug pricing model; Drug markets; Marijuana

PMID: 27346327 DOI: [10.1016/j.drugalcdep.2016.06.004](https://doi.org/10.1016/j.drugalcdep.2016.06.004)

[Indexed for MEDLINE]



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**MeSH terms, Substance**

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