

How Does the Cannabis Industry Respond to Variation in Cannabis Policy?

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What I will not Talk about:

Variation Across States and Localities

- **Reasons**

- There isn't much variation in fundamentals ("lab of states" failed)
- It is well (over?) studied, and others can speak to it
- Results are weak/incomplete because
 - Spill over effects across states
 - National-level time trends are the key
 - Some effects precede the policy change
 - Others will take many years (decades?) to play out
 - Policy shifts are not binary
- U.S. policy is dysfunctional, not a model

Hasten to add: I have great respect for state regulators. The problems are not their fault.

Key Observation: Cannabis Industry is Just an Industry

- Legal cannabis is a new industry going through shake out period
 - State legalization eliminates structural consequences of product illegality
 - Sharp declines in price, including because of economies of scale
 - Able to maintain capital equipment (so extract-based products proliferate)
 - Sales in bricks & mortar stores permits maintaining inventory of varied products
 - National legalization will be another big change
 - Dormant commerce clause makes state-specific markets unconstitutional
 - Permits interstate commerce & greater economies of scale
 - Production will shift to where costs are low (cheap labor, electricity, etc.)
 - Permits access to greater investment capital
 - Elimination of 280(e) effect will reduce costs

But What Is Special About Cannabis Industry?

- **Production costs radically lower than consumers' willingness to pay**
 - People paid \$10 per gm for material that can be produced for less than \$1 per gm.
 - Profits vulnerable to intense price competition.
- **Compact product**
 - Year's supply for a heavy users weighs less than one 20-ounce can of beer
 - Can supply any market with production from anywhere the law allows
- **Pareto Law applies**
 - Most revenues & profits come from selling to daily & near daily users
 - Corollary: Profits come mostly from people who spend thousands of dollars a year on the product
- **Product has an upscale image but a downscale client base**
 - Most sales are to people with a high school education or less

What Is Special About Cannabis Industry? (cont.)

– Strong symbolic/cultural associations

- Enjoys vociferous support from loyal consumers (akin to gun owners & NRA)

– Wide range of product forms, already as much as tobacco or alcohol

- Nicotine: Mostly cigarettes and e-cigs, plus some cigars & pipes
- Alcohol: Traditionally beer, wine, & spirits
 - Now more boundary crossing products (e.g., hard seltzers, cocktails in a can)
- Cannabis:
 - Flowers, vapes, dabs, edibles (candy, cookies, beverages), tinctures, lotions, etc.
 - Various THC & CBD combinations
 - Medical and non-medical
 - Non-psychoactive products (hemp fiber, seed, etc.)

– International trade forbidden (for now)

What Is Special About Cannabis Industry? (Health Issues)

- **Most common form exposes consumer to substantial loads of carcinogens**
 - Gram for gram akin to tobacco (e.g., Moir et al., 2008)
- **Most common form exposes consumer to other lung challenges**
- **Perhaps half of consumption is by people with some use disorder**
 - 19 million consumers have a use disorder with product? (2022 NSDUH)
- **Cannabis is a drug, but it is not treated or regulated as such**
 - Production does not meet Good Manufacturing Practice (GMP) standards
 - It is dispensed without a prescription by facilities that lack a DEA license
 - That would not be allowed if marijuana is down-scheduled to Schedule III

Industry Responses to Regulations

— Effects of legalization

- Professionalization of production (better varieties; monoculture and pesticides; etc.)
- Expansion of extract-based products (since capital equipment is possible)
- Massive expansion in product variety
- Beginning of development of brands

— Effects of federal prohibition

- Legal industry (mostly) respects ban against interstate commerce
- Tobacco and alcohol industry only invests in cannabis firms north of the border
- Production still not achieving Canadian style scale economies

— Effects of state regulations

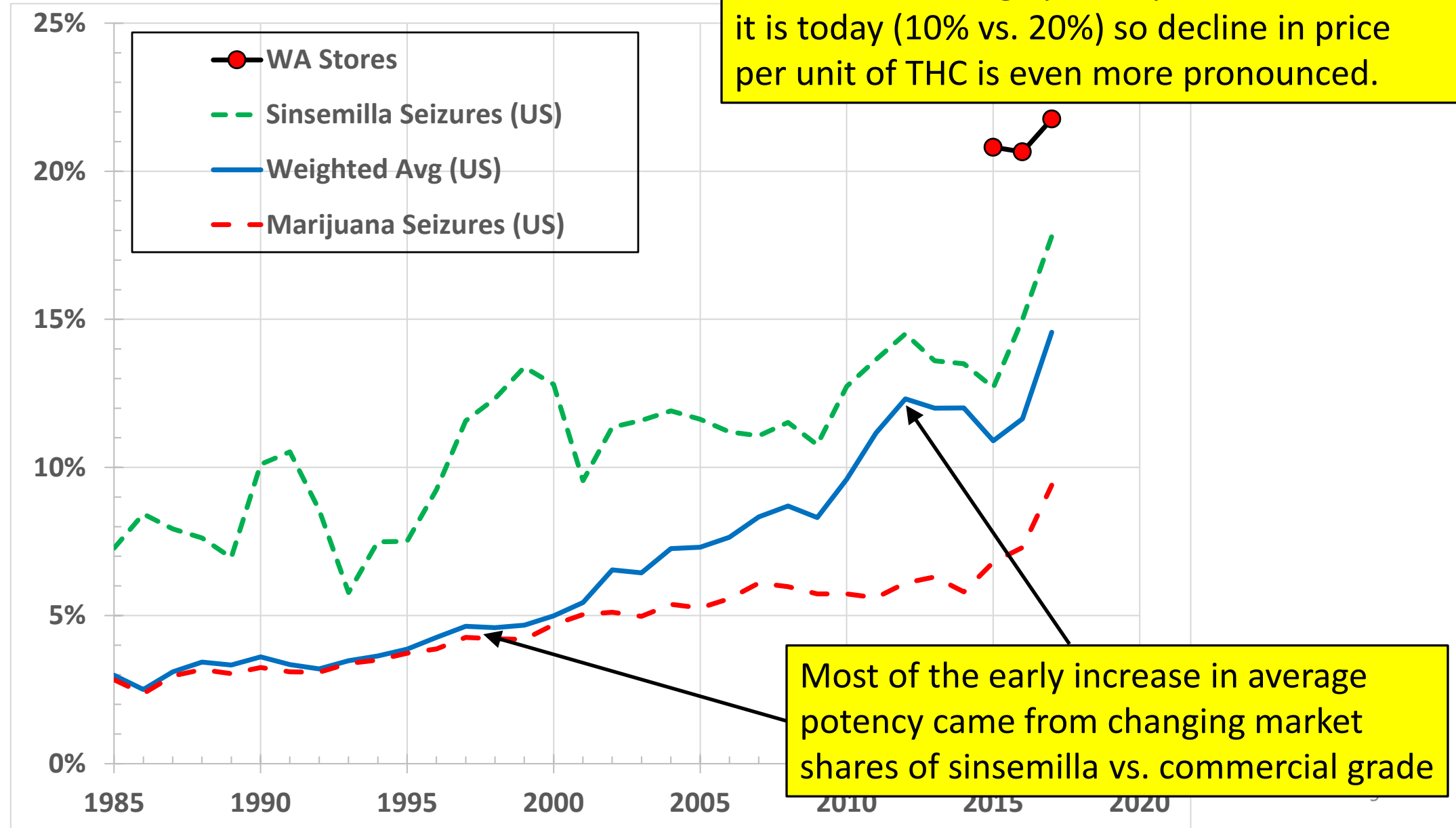
- Sales are primarily in stand-alone stores (even though that defies economic logic) ⁷

Prices Have Already Fallen ~80%

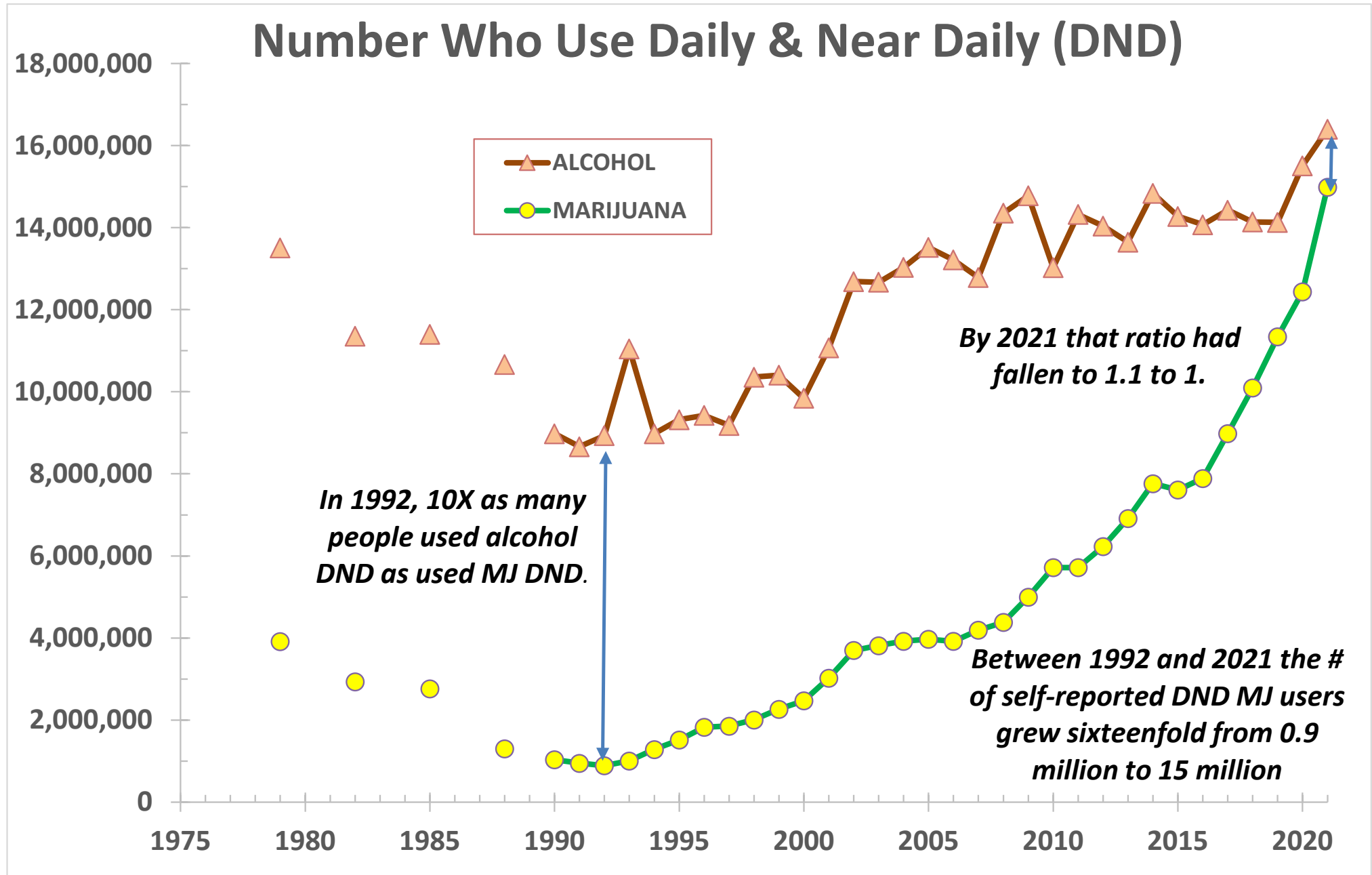
(All price inflation adjusted to 2022 USD but not adjusted for potency)

- **CA/National Wholesale prices down 82%**
 - 2010 wholesale price of sinsemilla in CA was \$5,500 per pound
 - Spot index wholesale price in Sept '22 was \$1,000 per pound
- **WA Wholesale prices down about 77%**
 - 2006 wholesale price of US/BC was \$4,085 per pound
 - Spot index wholesale price in March '22 was ~\$950 per pound
- **WA Retail prices down about 75%**
 - 2006 average for bud was \$40 per gram
 - Today about \$10 per gram (depends how one counts taxes)

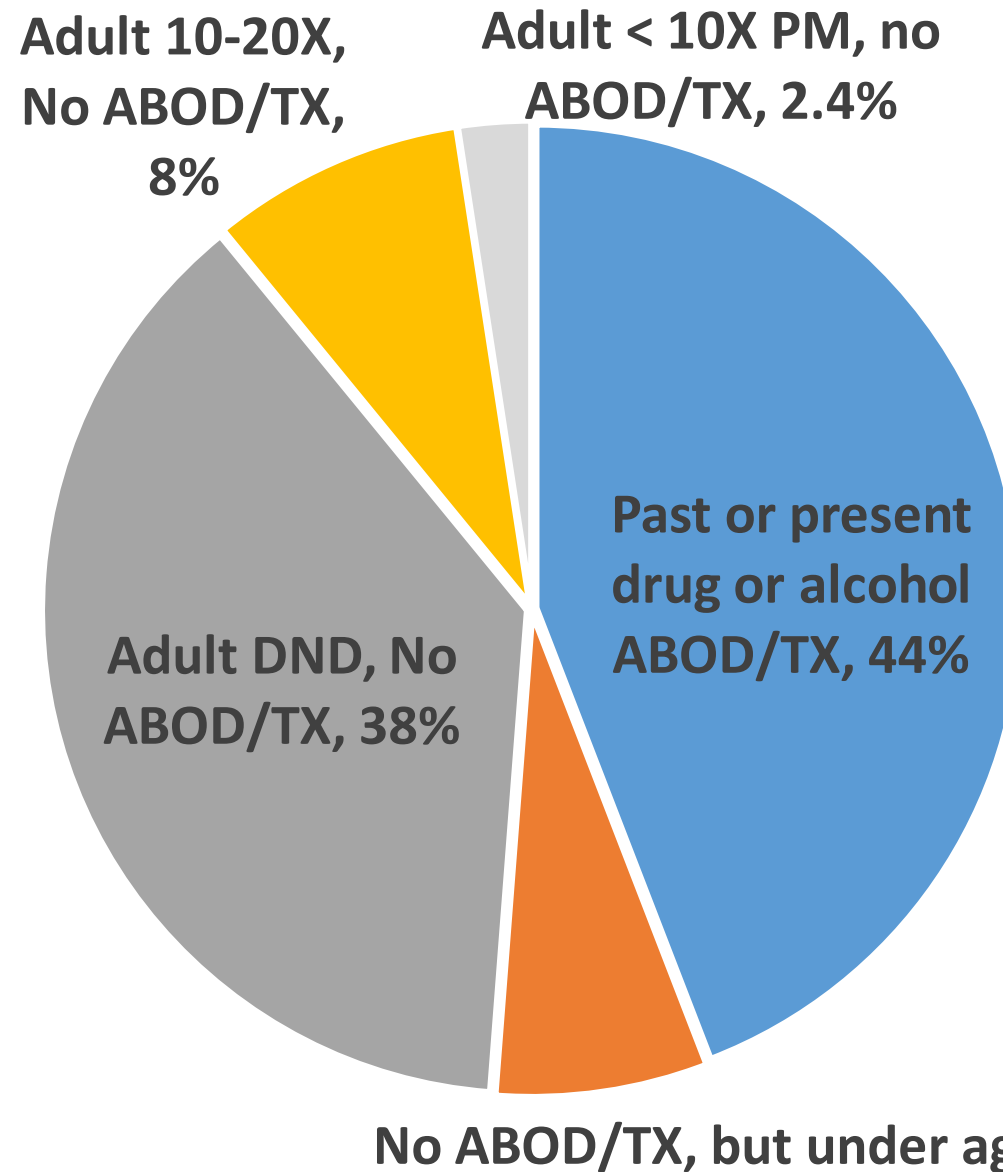
And Flower Potency Rose Dramatically in the U.S.



High-Frequency Use Approaching that of Alcohol



Heavy Users Dominate Consumption



In 2016, adults with no substance abuse or dependence (ABOD) issues and using fewer than 10X in past month (PM) accounted for only 2.4% of consumption.

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Industry Responses to Lack of Effective Regulation

- **Product labels are often wrong**
- **Direct or implied inflated health claims**
 - More for THC than for CBD, because FDA pays more attention to CBD
- **Extensive lobbying and attempts are regulatory capture**
 - Because state regulations matter
- **Illegal industry continues to produce and sell**
 - Some states laws make enforcement difficult
 - Some states just haven't tried hard enough

To be clear: This bullet is about illegal industry. Rest of talk is mostly about the licensed industry.

Summary

- **Like all industries, the cannabis industry factors its environment into its strategic approach to maximizing profits**
 - Regulations (and their occasional absence) are part of that environment
- **Variation across states is not the most interesting part of the story**
 - Not all that much variation across U.S. states
 - Greater variation exists internationally; even more variation possible
 - State-specific markets & regulations likely to get blown up anyhow
 - Scientific community studies it because that's where the light is
 - But the keys are elsewhere
- **Much of what is happening can be “derived” from the “physics” of the product, regulatory context, and free market behavior**