



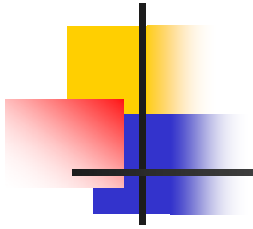
The Need for a Cannabis Phyto-Epidemiology

Public Health Consequences of the Global Green Rush Era

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Epidemiology

- The study of incidence and prevalence patterns of disease in populations
- The basic science of Public Health
- Cornerstone methodology of Public Health Research
- Used throughout the entire Public Health Process



Pharmaco-epidemiology

The study of the use and effects of drugs in large numbers of people.

-International Society of Pharmacoepidemiology

The study of population level incidence and prevalence of Adverse Drug Events (ADEs) caused by pharmaceutical drugs (synthetic molecules) and devices

-Health LAMP, LLC Cannabis Initiative 2019

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ADEs also known as **Adverse Events** since both drugs and devices are pharma.



Pharmaco-epidemiology

- ❑ Post-Marketing Surveillance of synthetic drug related morbidity or mortality is mandated for pharmaceutical companies: **Sentinel Events Monitoring**
- ❑ Reporting ADEs is mandatory for hospitals
- ❑ Usual done by collection of spontaneous case reports:
FDA Adverse Event Reporting System (**FAERS**) & **MedWatch**
- ❑ We do not fully understand the epidemiology of pharmaceutical ADEs
- ❑ Voluntary reporting vs. mandatory. Unreported Community-based ADEs



ADEs: A Hidden Public Health Concern

- ❑ 100,000-150,000 deaths per year
- ❑ 4th largest cause of mortality in the U.S.
- ❑ 1.5-2.2 million hospitalizations
- ❑ 20-70% preventable
- ❑ **Where's The Ribbon?**

Lazarou J, Pomeranz BH, Corey PN. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. JAMA 1998;279(15):1200-5



Incidence of fatal adverse drug reactions: a population based study

The **incidence** of fatal adverse drug reactions in hospitalized patients has been estimated to be **approximately 5%**. In previous studies the incidence of fatal adverse drug reactions in hospitalized patients has been reported, but the **incidence of fatal adverse drug reactions in the general population is largely unknown.**

Wester K, Johsson AK, Spigset O, Hagg S. Incidence of fatal adverse drug reactions: a population based study. *Br J Clin Pharmacol* 2007,65(4):573-579
www.ncbi.nlm.nih.gov/pmc/articles/PMC2291376/
Retrieved Feb 2019



Phyto-epidemiology

The study of the use of plant derived and plant-based molecules (phytocules) for improving health, and the incidence and prevalence of adverse events they cause in populations.

- ❑ **Phytoceutical vs. Pharmaceutical**
- ❑ **Plant derived vs. Synthetic**
- ❑ **Phytocule vs. Molecule**
- ❑ **Phytotherapeutics vs. Pharmacotherapeutics**

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Phyto-epidemiology

A Note on Nutraceuticals

- ❑ Foodstuffs (fortified food or dietary supplement) providing health benefits in addition to their basic nutritional value
- ❑ Must be included as an objective of phytoepidemiology

Example:

Red Yeast Rice is a **nutraceutical** that contains Monoconin-k

Monoconin-k is also known as lovastatin

lovastatin was marketed by Merck as Mevacor for hyperlipidemia

Statin drugs cause liver and muscle damage and may cause death



Cannabis Phyto-epidemiology

The study of the:

- ❑ Use and effects of cannabis on populations
- ❑ Incidence and prevalence of cannabis-related adverse events
- ❑ Exposure to contaminants, and waste products
- ❑ Environmental consequences of cannabis waste

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Cannabis-related Adverse Events

Any noxious, unintended, or undesired effect of Cannabis

when used in humans for prophylaxis, therapy or recreation **by exposure to:**

- Cultivation
- Processing
- Manufacturing
- Consumption
- Waste Disposal



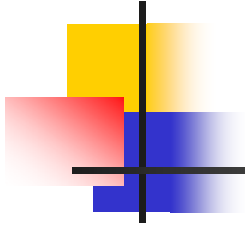
Cannabis Manufacturing Residues

- Flower: Pesticides, bacteria, mold, mycotoxins
- Extract: Hydrocarbon residues
- Oils: Alcohol residues
- Waste All of the above



Cannabis Product Exposure

- Flower Blunts: Cigar wrapped: lung cancer, emphysema
- Extract: Dabbing: High THC concentrations: respiratory arrest
- Oils Vaping: Inhaling contaminants of processing
- Edibles Food poisoning, consumption indiscretion



Genetics Loads the Gun

Environment Pulls the Trigger

-Joslin