

To the CSDE Fellowship Review Committee:

Allow me to introduce myself. I am a third-year MD/PhD student—simultaneously a graduate student and a medical student. I am a first-year post-masters graduate student in the Department of Geography. My advisor and committee chair is Dr. Jonathan Mayer. I joined the Geography Department as part of the University of Washington School of Medicine's MD/PhD or MST program (Medical Scientist Training Program). Through that program, I have completed my first two years in medical school (2002-2004) including a six-week third-year clinical clerkship in Family Medicine at the Country Doctor Community Clinic in Seattle. I have also completed two summer research rotations: one with Dr. Mayer in the summer of 2002 and another with Dr. Carol Sibley in Genome Sciences. The funding I have received through the MSTP does not cover any year beyond my first year of graduate work. Upon completion of my PhD work, I will return to complete medical school with funding from the MSTP. Beyond medical school, I intend to complete a residency and am interested in specializing in either emergency medicine, addiction medicine, family medicine, or pain medicine. I intend to blend social advocacy and academics into whatever path I choose.

I am applying for a fellowship with the CSDE to continue to develop my research focus in the area of the impact of drug policies on population health. The drug policies I am referring to are those enforced by governing bodies across all scales, from municipal and state to national and international. In addition to the numerous health impacts of 'war on drugs' policy such as those related to incarceration and the stress of threatened criminal sanctions, inadequate access to treatment of addictions, and ongoing violence in the unregulated black market dealing of prohibited substances, there is also the health impacts of prohibiting a substance that is health-promoting. Though I am interested in all the health impacts of the drug war, it is this latter health impact that I would like to focus on for this proposal. As it is said that the first casualty of war is the truth, the same is true for the drug war environment which has succeeded in blocking many attempts to conduct research into the health benefits of prohibited substances. I propose to conduct research regarding the health effects of criminal sanctions on medical cannabis patients and broader geographic and population-based research into the health promoting effects of cannabis.

While cannabis has been used medicinally for thousands of years, modern medicine recognizes cannabis for its analgesic, anti-inflammatory, immunomodulatory, neuroprotective, anti-emetic, anti-spasmodic, and pro-phagic properties. It has been shown to be helpful for cachexia, nausea, and loss of appetite experienced by cancer and HIV patients due either to their primary condition or to the side effects of dominant treatment modalities. Cannabis has also been shown to be efficacious in the reduction of intraocular pressure experienced in glaucoma, as an analgesic in the treatment of chronic pain syndromes, and again as an analgesic and muscle relaxant to treat pain and/or muscle spasticity associated with conditions such as multiple sclerosis, myasthenia gravis, fibromyalgia, and spinal cord injury. Crohn's disease or IBD, Hepatitis C, and seizure disorder are also treatable by cannabis. Other indications are being investigated. For example, in Israel, cannabis is being used to treat soldiers with PTSD, and in Canada, some rheumatoid arthritis patients use cannabis therapy.

Ten US states have laws in place that recognize medical cannabis use for patients with physician recommendation. An eleventh state, Maryland, recognizes the medical necessity defense for patients on trial for cannabis-related criminal charges. The US federal government classifies cannabis as a Schedule I substance having “no currently accepted medical treatment.” However, thanks to a Compassionate IND (Investigational New Drug) program, seven individuals currently use medical cannabis supplied by the federal government. All others who possess cannabis do so illegally under federal law, including those who use cannabis medically. On November 29, 2004, the US Supreme Court heard oral arguments in the case *Ashcroft v. Raich* which turns on the question whether or not the US Congress has legal reach to regulate state-sanctioned intrastate use of cannabis for medical reasons. That decision is expected in the next few months and may impact the course of my research.

One question I am interested in is whether or not the health of the population of individuals who use cannabis for medical reasons is measurably influenced by the region-specific legal status of the plant. This question is based on the ecological premise that macro-level policies and legislation can impact individual health and population health by restricting access to a given therapy or by problematizing the use of a therapy. Based on anecdotal reports I collected while doing field work in Seattle’s medical cannabis community, patients with stress-sensitive illnesses such as Inflammatory Bowel Disease who use medical cannabis tend to show poorer health and a worsening of symptoms (from self-reported health indicators) when medical/legal protections are not in place for medical cannabis usage compared to when they are. This is likely to be the case with other conditions as well. Oftentimes, medical/legal protections are in-themselves difficult to obtain even in a state such as Washington where medical cannabis therapy is state-sanctioned with physician recommendation. This is due to pressures from the federal government on physicians and health care workers who recommend cannabis therapy and due to a lack of education and training about cannabis therapy in the health care community. The research I propose would involve surveying a sampling of medical cannabis patients from the population about their health outcomes when medical/legal protections are in place and when they are not; it would also involve review of patient medical records and interviews with their healthcare providers to investigate further into patient health profiles. This will serve to complement patients’ health status self-reports. Patients could be recruited into this study through making contacts at medical cannabis community centers and drawing on patient registries such as the Cannabis Patient Registry<sup>1</sup>.

Because medical cannabis laws are a state-specific patchwork in the United States with each state offering varying degrees of legal protection to patients and providers, this study would be comparative geographical in nature. For example, medical cannabis protections for Washington patients are far stronger and more comprehensive than those for medical cannabis patients in Maryland where simply the legal defense of medical necessity is allowed. Moreover, thirty-nine US states have no standing legal protections for medical cannabis patients. Patients in these states have faced incarceration and other severe stress-inducing punishments from the criminal justice system. Certainly, the added health impact of prior or current incarceration would have to be considered broadly in these cases. Beyond the stress of confinement and internal prison-violence, physician-

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<sup>1</sup> Maintained by MAPS, a non-profit organization in Florida

anthropologist Paul Farmer, MD, PhD, in his book *Pathologies of Power: Health, Human Rights, and the New War on the Poor*, makes the grim connection between multi-drug resistant tuberculosis outbreaks in overcrowded American prisons and ‘war on drugs’ driven criminalization and incarceration policies<sup>2</sup>. In addition to state-to-state comparisons in the US, medical cannabis patients in other countries such as Canada where federal protection for medical cannabis use is in place would add an international comparative geography component to the research.

The data from such a study could be stratified by patient population illness-type. For example, medical cannabis multiple sclerosis (MS) patients in the Vancouver, B.C. area where medical cannabis is federally sanctioned would be a population sub-group whose health outcomes would be compared with those of medical cannabis-using MS patient populations in certain American cities where medical cannabis is state-sanctioned yet federally prohibited. Already, MS patient unions are forming in which groups of MS patients who use medical cannabis across the US and other countries come together for community support and advocacy. Such groups could serve as an entry point for this patient population research. My hypothesis is simply that patients who use cannabis medically in places that are federally sanctioned will have better health outcomes compared to those patients who use medical cannabis living in places with mixed legal protection.

The data from this project could generate other kinds of demographic, geographic, and clinically-relevant information. One benefit of this work would be that it could provide the first comprehensive assessment of the demographics and population size of medical cannabis patients in the United States and conceivably Canada as well. These statistics could be mapped. Indeed, this would require numerous contacts with groups and individuals across the US and Canada who would be able to help compile this information. In some places such as the state of Oregon where a comprehensive registry is maintained, it was recently reported that nearly 10,000 medical cannabis are registered in that state<sup>3</sup>. A survey conducted in Canada reported that over one million people use cannabis for medicinal purposes at a time when only several hundred permits had been issued by the Canadian government<sup>4</sup>. Depending on their reliability, other published survey results such as these would be aggregated along with my own collected data to obtain a comprehensive geography of medical cannabis use in the US and Canada.

Additionally, a geographic description of medical cannabis patient migration could be described through this study. In my field work, I have learned that several patients have chosen to move to Washington State where they are offered clemency and protection to use and grow medical cannabis. This I believe is representative of a larger trend of medical cannabis patients migrating across state lines to live in states that offer medical cannabis patients legal protection. Furthermore, news reports of medical cannabis political asylum seekers leaving the United States and fleeing to Canada is creating a population that the *LA Times* calls “drug war refugees<sup>5</sup>.” Some reports claim that several hundreds of Americans are crossing the border into Canada to escape

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<sup>2</sup> p.183-4, 312

<sup>3</sup> “Medical Marijuana Cards Abound” *The Oregonian*. 01/23/05

<sup>4</sup> “Most ‘Medical’ Marijuana Use Illegal: Poll” *Ottawa Citizen*. 02/03/02

<sup>5</sup> “The Drug War Refugees” *LA Times*. 02/02/03

persecution and are filing for refugee status<sup>6</sup>. The demographics, health status, and migration patterns of this population of medical and political asylum seekers has not been described.

If the dataset were expanded to include health outcomes in samplings of illness-specific patient populations who *do not* use medical cannabis therapy, yet another set of interesting and clinically-relevant findings could arise from this research. It would be possible to determine the crude efficacy of cannabis therapy outside of FDA-approved clinical trials. Here I will present several examples. The health outcomes of a sampling of MS (multiple sclerosis) or IBD (inflammatory bowel disease) patients who use cannabis therapy in places where medical cannabis is sanctioned could be compared with those of similarly matched patients who suffer from the same conditions but do not use medical cannabis. An outcome such as frequency of emergency room visits due to acute exacerbations in both populations would be a useful outcome measure for comparison. Glaucoma patient populations who use and do not use medical cannabis could be compared based on average visual acuity. Other health benefits that medical cannabis patients may enjoy, relative to patients with similar conditions who do not use cannabis therapy, could include reduced or absent opiate use for pain management and thus less opiate related problems such as tolerance, withdrawal and addiction. A study published earlier this year from Stanford University School of Medicine showed that HIV-infected patients with moderate to severe nausea who used medical cannabis were 3.3 times more likely to demonstrate adherence to anti-retroviral therapy<sup>7</sup>. HIV patients anti-retroviral adherence frequencies could be compared among medical cannabis and non-medical cannabis users. There may also be medical and health benefits that cannabis users in the general population enjoy that are not necessarily known or demonstrable unless a population approach is utilized. A study published in 1984 by Paul Gahlinger, MD, PhD, showed that cannabis users in a rural Canadian fishing community had lower rates of peptic ulcer disease relative to non-cannabis users<sup>8</sup>. There was a dose-dependent relationship between frequency of cannabis use and lack of ulcer symptoms in the population aged 18-34. While there were several unaccounted confounders in this study, it is a plausible result based on cannabis's known physiological effects. Such a study could be expanded by comparing region-to-region cannabis use frequencies with the prevalence and incidence of gastrointestinal diseases. A rigorous statistical method would be required to analyze such data. A final example of a population approach would examine further what has been known as the "substitution effect" with cannabis. Cannabis use has been shown to substitute at a population level for the use and demand of more dangerous substances such as alcohol, tobacco, and cocaine when more lax cannabis regulatory laws are in place. Previous research has demonstrated that times when cannabis was decriminalized in several US states were accompanied by significant reductions in emergency room visits involving other more dangerous substances<sup>9</sup>. This

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<sup>6</sup> "US Cannabis Refugees Cross Border: 'Persecuted Medical Marijuana Users Seek Asylum in Canada'" *Guardian*. 07/20/2002

<sup>7</sup> Jong, et. al. Marijuana use and its association with adherence to antiretroviral therapy among HIV-infected persons with moderate to severe nausea. *J Acquir Immune Defic Syndr*. 2005 Jan 1;38(1):43-6.

<sup>8</sup> Gahlinger PM. Gastrointestinal illness and cannabis use in a rural Canadian community. *Journal of Psychoactive Drugs* 1984; 16: 263-265

<sup>9</sup> Model K. The Effect of Marijuana Decriminalization on Hospital Emergency Room Drug Episodes: 1975-1978. *Journal of the American Statistical Association*. 88: 423, 737-747.

association could be expanded, for example, to look at whether or not the rate of regional alcohol-related violence and alcoholism incidence and prevalence varies geographically by regional legal laxity regarding cannabis. The same questions could be asked about cocaine and methamphetamine use.

The questions I am asking here about the health benefits of cannabis would be incomplete and unbalanced without also an investigation into the prevalence and geography of cannabis dependency. It would be worthwhile to see which regions in the United States have increased patients in cannabis dependency treatment and whether this correlates with state-specific legal frameworks regarding cannabis and other scheduled substances. It would be necessary to distinguish voluntary admission to cannabis dependency treatment from legally coerced admissions when determining regional health outcomes from treatment. Again, an ecological connection between macro-level policies and individual and population health would be sought.

There are many research questions and direction that I have proposed here. Over time, I expect to focus on a smaller sub-set of these questions. There are several faculty members and resources at the University of Washington that will allow me to conduct this research with extensive advising and support. Professor Steven Herbert in Geography and Law, Societies and Justice has research interests in legal geography and policing, especially as it relates to drug-related activities. Professor Jonathan Mayer, my advisor and a CSDE faculty affiliate, has conducted numerous ecologically-based studies in medical geography and recently completed a study on geographic variation on the availability of opiates for pain management. Professor G. Alan Marlatt in the School of Public Health and Community Medicine is an expert in the area of harm reduction. Professor Roger Roffman in the School of Social Work studies cannabis dependency and treatment and has written two books on medical cannabis. Several clinician-faculty members at the School of Medicine such as Dr. Gregory Carter are proponents and active researchers in the area of cannabis therapeutics. Additionally, several professors such as Professors Nephi Stella and Ken Mackie in the Department of Pharmacology conduct basic science research into the mechanisms and health benefits of cannabis-based therapeutics. There is extensive expertise in this area at this university which I intend to draw on to complete this intriguing and exciting research project.

Thank you for your consideration.