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**Devil's Lettuce or Heaven Sent? How the Legalization of Recreational Cannabis Impacts
Rates of Schizophrenia in Washington State.**

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Honors Research Project

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Abstract:

Washington State legalized the manufacturing, processing, and distribution of recreational cannabis with the passing of Initiative 502 in November of 2012. As of 2021, there are over 500 retail stores with active licenses to sell (*Cannabis License Applicants*, 2021). Since then, public opinion polls and state-wide surveys have found a steady increase in the percentage of the population using cannabis, including children under the age of 18. Schizophrenia is a complex disease thought to be influenced by several genetic and environmental factors. The association between cannabis use and the development of schizophrenia has been well documented (Marconi et al., 2016 & Pearson, 2019). Recent studies have found this association to be more robust as the concentration of THC and frequency of use increase. This paper assesses the impact that legalizing cannabis use for recreational purposes has on the rates of schizophrenia in Washington State. National institutes have not well documented the prevalence of schizophrenia; however, the increase in cannabis usage across all age groups, along with the increasing concentration of THC, causes the population of Washington to be at greater risk for developing schizophrenia.

Perceptions changing:

Across the United States, public opinion polls suggest that most Americans support cannabis for medical or recreational purposes (Green, 2021), which is consistent with the increasing percentage of adults using cannabis (Carliner, 2017). The Pew Research Center asked Americans whether they believed cannabis should be made legal. In 2011 only 45% of Americans supported legalization (Heimlich, 2012). In 2021 this increased to 60% of adults supporting the legalization of recreational and medical cannabis and 30% supporting the legalization of medical cannabis exclusively (Green, 2021). Not only do a majority of Americans support cannabis, but studies show that the number of Americans using cannabis is also increasing each year (Blevins et al., 2018).

Research suggests that the perception of cannabis is changing for both adolescents and adults. The National Survey on Drug Use and Health (NSDUH) annually surveys non-institutionalized U.S. citizens over the age of 12. They provide state and regional estimates of substance use and abuse, and mental illness. The NSDUH surveys found that the perceived harmfulness of consuming cannabis is decreasing in both adults over the age of 18 and adolescents aged 12–17 (Carliner, 2017 & Compton, 2016). With the growing support of cannabis for medical and recreational purposes, a growing majority of both adults and adolescents now believe cannabis use poses very little to no harm (Carliner, 2017). Viewing cannabis in this manner removes the motive to abstain.

Cannabis:

Cannabis is a plant that contains hundreds of different compounds, some of which feature psychoactive properties. Two of the most well-known compounds found in cannabis are Tetrahydrocannabinol (THC) and cannabidiol (CBD). These molecules enter the bloodstream and are recognized by cell receptors in the brain and most other organs in the nervous and immune systems that contain cannabinoid-1 (CB1) receptors (Nazareus, 2020). CB1 receptors are a part of the Endocannabinoid System (ECS) which is involved in many regulation systems throughout the body with a complex network of receptors that bind to endocannabinoids. Endocannabinoids are primary messengers that regulate the amount and type of neurotransmitters and maintain homeostasis in the body system (Nazareus, 2020). The ECS is absolutely crucial to human physiology since it directs cell signaling processes by monitoring any changes due to injury or illness, interpreting those changes, and responding to damaged cells (Nazareus, 2020). Even though CBD and THC are structurally different than natural, bodily-produced endocannabinoids like anandamide, they can be recognized by CB1 receptors to cause numerous downstream effects (Nazareus, 2020 & Volkow et al., 2016).

Cannabinoid receptors are ubiquitous in the brain and are responsible for nerve transmission, mood, emotion, brain development, and adaptability. They are found in the central nervous system and are highly concentrated in the cortex, hippocampus, and basal ganglia (Nazareus, 2020). CB1 receptors are known to affect anxiety, fear, stress, motor control, and psychoactivity (Nazareus, 2020). THC and CBD are both present in cannabis, but they have different effects. THC is psychoactive and can produce anxiety, especially in higher doses. However, CBD does not cause intoxication; instead, it produces antipsychotic effects that reduce psychotic symptoms such as hallucinations, delusions, and paranoia or anxiety (Nazareus, 2020). Studies have shown that CBD is associated with less severe psychotic symptoms and leads to similar behavioral responses as a patient on antipsychotic drugs (Ahmed et al., 2021). However, the same study reported that intravenous THC increases positive, negative, and general symptoms of psychosis and impaired cognition in patients with schizophrenia.

These observations led researchers to process images and scans of the brain when THC and CBD were used to visualize the physiological changes. Previous studies have demonstrated that the posterior cingulate cortex (PCC) is a crucial structure involved in the effects of cannabinoids like THC. Researchers analyzed positron emission tomography to visualize the CB1 receptor distribution in the brain and found high concentrations located in the PCC. Daily cannabis smokers experience a reduction in CB1 receptors in the PCC region (Wall et al., 2019). It has been demonstrated that this reduction leads to deterioration of the PCC, causing hyperactivation or hyperconnectivity (Seen in Orr, et al., 2013), however, more research is necessary to solidify this finding. This hyperconnectivity is hypothesized to increase psychotic symptoms. A study done by Wall et al. showed that cannabis reduces functional connectivity in brain networks (2019). However, a different effect occurs if the strain of cannabis contains CBD along with THC (Wall et al., 2019). The study found that strains with THC and CBD did not cause any decrease in brain network activity, but the strain containing THC without CBD had a significant reduction in brain network connectivity (Wall et al., 2019). This is in accordance with current theories that CBD acts as a buffer against the harmful effects of THC (Wall et al., 2019).

The THC found in cannabis overactivates parts of the brain that contain elevated levels of CB1 receptors, which cause the "high" that people feel (Nazarenus, 2020). Short-term side effects of cannabis include altered senses, changes in mood or anxiety, impaired memory, and difficulty thinking and problem-solving. In high doses, side effects can include hallucinations, delusions, and paranoia with possible psychosis (Nazarenus, 2020 & Kroon et al., 2020). In addition, there are both physical and mental side effects of long-term cannabis use, including breathing problems, elevated heart rate, and an increased risk of stroke and mental illness. In fact, the Medical Cannabis Handbook for Healthcare Professionals notes that persons with a personal or family history of psychosis, schizophrenia, or panic disorders should not use products containing THC (Nazarenus, 2020).

A recent study done by a psychiatrist from Harvard medical school showed that areas in the United States with recreational and medical cannabis had higher proportions of hospitalizations for psychosis associated with cannabis use (Moran, 2022). Specifically, Washington State saw an exponential increase in cannabis-related hospitalization discharges from about 0.7% in 2009 to over 3.5% in 2016 (Close, 2019). It was not reported whether those hospitalizations resulted in Cannabis-Induced Psychotic Disorder (CIPD) diagnoses, but patients likely experienced one or more of the short-term side effects associated with THC, which could include hallucinations, delusions, and psychosis.

Research shows that cannabis is involved in about half of all psychosis, schizophrenia, and schizophreniform cases (Shirvastava et al., 2014). The DSM-5 included CIPD in its newest edition, which is diagnosed when hallucinations, delusions, or both have developed during or soon after cannabis intoxication (Grewal, 2017 & Pearson, 2019). The psychotic symptoms can last days to weeks, and a diagnosis of CIPD is heavily associated with a future diagnosis of schizophrenia (Pearson, 2019). Many studies have examined the proportion of patients diagnosed with CIPD that would later receive a diagnosis of schizophrenia. The results show that as many as 50% of all patients with CIPD are eventually diagnosed with schizophrenia (Pearson, 2019).

Schizophrenia:

The Diagnostic and Statistical Manual places schizophrenia in a category with other psychotic disorders (5th ed., DSM-5; American Psychiatric Association). To be diagnosed with schizophrenia, a person must have two or more of the following symptoms over one month: delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, and negative symptoms (American Psychiatric Association, 2013). In addition, at least one of the symptoms must be delusions, hallucinations, or disorganized speech to be categorized as schizophrenia (American Psychiatric Association, 2013). Another criterion for diagnosis is that these symptoms have affected interpersonal, academic, or occupational functioning and that other disorders, such as schizoaffective disorder or bipolar disorder with psychotic features, have been ruled out.

There are five domains of abnormalities in schizophrenia spectrum disorders. The first domain is delusions that are fixed even in the presence of conflicting evidence. The most common type of delusion is a persecutory delusion that typically involves a belief that one will be harmed or harassed by another individual or group (American Psychiatric Association, 2013). Other delusions include, but are not limited to, erotomanic delusions (falsely believing someone is in love with oneself) or Nihilistic delusions (a conviction that a catastrophe will occur). One may notice that many of these delusions share common characteristics with the paranoia cannabis users may experience.

Another characteristic feature of schizophrenia is hallucinations. These are vivid, involuntary, perception-like experiences that occur without any external stimulus. A hallucination may occur in any of the five senses, however, auditory hallucinations are the most common type in schizophrenia and other psychotic disorders (American Psychiatric Association, 2013). Other symptoms of schizophrenia include disorganized thinking, which is typically classified as random or incoherent speech affecting communication. Disorganized or abnormal motor behaviors can range from "silliness" to catatonia (being less reactive to the world) or can even result in flares of anger (American Psychiatric Association, 2013). Negative symptoms are common in patients with schizophrenia and cause the most suffering; these include reductions in emotional expression, decreased motivation in self-initiated activities, reductions in speech output, decreased pleasure, and a lack of interest in social interactions (American Psychiatric Association, 2013).

Schizophrenia is a complex disease thought to be triggered by a combination of genetic and environmental factors. More research needs to be done, but thus far, several genes are associated with schizophrenia, leading researchers to believe the disease is up to 80% heritable (Pearson, 2019). Some environmental factors including cannabis usage, malnutrition, and lead poisoning have been found to increase the risk of developing schizophrenia (American Psychiatric Association, 2013). The symptoms of schizophrenia can negatively affect every relationship and every aspect of a person's life. Studies show that only 20% of people with schizophrenia are employed, 80% of people with schizophrenia are homeless, and they are three times more likely to end up in prison or jail instead of a hospital (Insel, 2010). A disease with that much destruction deserves our attention.

The side effects of cannabis closely resemble the symptoms of schizophrenia, as demonstrated in a randomized, double-blind, placebo-controlled human laboratory study where subjects given intravenous doses of THC subsequently experienced positive and negative symptoms of schizophrenia (Sherif et al., 2016). Cannabis is considered a risk factor for developing schizophrenia. A 2016 meta-analysis confirmed previous findings: an association between the extent of cannabis use and the risk for psychosis. This analysis pooled 571 different studies across the globe to determine how great the risk increased and how the frequency of cannabis use affects it. They reported a 4-fold increased risk in heavy users of cannabis and a 2-fold increased risk for average or occasional users compared to those who abstain entirely (Marconi et al., 2016).

The association of cannabis use with schizophrenia is well documented in hundreds of studies worldwide (Pearson, 2019 & Marconi et al., 2016 & Shirvastava et al., 2014). However, none of these studies could conclude a causal relationship, just an association. The exact way cannabis can induce psychosis has not been proven, however, there have been several studies that developed theories as to how this occurs. One study discovered that schizophrenic patients had a higher density of CB1 receptors in the PCC (Newell et al., 2006). A similar study by Leweke et al. showed that schizophrenic patients have smaller amounts of anandamide, the naturally produced neurotransmitter that binds to CB1 receptors to regulate memory, motivation, and cognitive processes (2018). Anandamide concentration is negatively correlated with psychotic symptoms, meaning the more anandamide in the body, the less likely psychotic symptoms will present (Leweke et al., 2018). Anandamide is thought to be defensive against psychotic symptoms while THC induces them. Researchers found that patients with schizophrenia that use cannabis experience significantly lower levels of anandamide than schizophrenic patients that abstain. This led researchers to theorize that when anandamide levels are reduced from cannabis use, the THC can easily bind to the CB1 receptors as there is less competition, thus inducing psychotic symptoms (Leweke et al., 2018).

Looking at Washington State:

Cannabis has been on Earth longer than humans, but since the 1970s, the concentration of THC found in the plant has seen a steep increase. Before recreational cannabis was legalized in Washington, the average cannabis flower contained 2% THC. Comparatively, years after cannabis was legalized in 2021 the average cannabis flower contained over 20% THC (Ahmed et al., 2021). Higher concentrations of THC have been shown to induce psychotic symptoms and anxiety (Sherif et al., 2016 & Nazarene, 2020). Despite various adverse side effects associated with using cannabis, it has been growing in popularity.

In Washington State alone, the first cannabis stores in 2014 generated over \$259 million worth in sales in one fiscal year, which increased to \$1.49 billion in 2021 (Recreational and medical marijuana taxes, 2014-2021). This significant increase in sales speaks to the growing popularity. The National Survey on Drug Use and Health (NSDUH) confirmed that the population of cannabis users in Washington state has been increasing since recreational use became legal (Compton, 2016). The percentage of adults over 18 consuming cannabis in Washington state was about 18% in 2014, which then increased to over 27% of adults in 2019 (SAMHSA, 2019). Steady increases like this have also been seen among adolescents in Washington state. In 2015 when retail stores opened, the NSDUH estimated that 13.5% of adolescents aged 12-17 used cannabis (SAMHSA, 2015). This number gradually increased year over year, with 16.38% in 2018 (SAMHSA, 2018).

The Washington Poison Center (WAPC) reports the number of toxic cannabis exposure calls they receive each year. They report an exponential increase in cannabis exposure cases for children under the age of five and a drastic increase in the number of cannabis exposure cases across all other age groups (Toxic Trends report, 2018). For example, a year after cannabis stores opened, 46% of all calls to the WAPC involved children under nineteen years old (Toxic Trends report, 2015). The WAPC does not specify whether the reported cases of cannabis exposure involved a Cannabis-Induced Psychotic Disorder (CIPD) diagnosis. However, they report that 60% of their cases result in hospitalizations, and about 16% of cannabis exposure patients report hallucinations and delusions as side effects (Toxic Trends report, 2018). Hallucinations and delusions following cannabis intoxication classify CIPD, and a diagnosis of CIPD will lead to a diagnosis of schizophrenia about half of the time (Pearson, 2019). Studies have shown that Washington state is experiencing an increase in cannabis-related hospitalizations and has higher proportions of hospitalizations for psychosis with cannabis use involved than states that have not legalized recreational use (Moran, 2020 & Close, 2019).

Discussion:

According to the National Institute of Mental Health (NIMH), the prevalence of schizophrenia and related psychotic disorders in the United States is somewhere between 0.25% and 0.64% of the population, or 823,000 to 2.1 million people. From 1985 to 2016, the NIMH reported the prevalence of schizophrenia to be 1.1%, which then dropped to 0.3% in 2017 (Torrey). After 2 million people with schizophrenia seemingly disappeared, the NIMH received intense criticism. As a result, the NIMH decided to combine schizophrenia with other psychotic disorders, including bipolar disorder with psychotic features and major depressive disorder with psychotic features, as a quick fix. According to the NIMH, the prevalence of schizophrenia and other psychotic disorders has not changed since 2018. It is still reported to be between 0.25% and 0.64%, but other public health researchers have found schizophrenia in a much higher prevalence. For example, the Johns Hopkins Bloomberg School of Public Health used the 2010 census data and found the prevalence of schizophrenia to be 1.62%, although it admits that they did not include individuals in jails or prisons thus the actual estimate would be about 1.7% within the U.S. (Torrey).

Dr. Fuller Torrey, the founder of the Treatment Advocacy Center, reports that there is a significant problem with the NIMH's estimations of the prevalence of schizophrenia. The studies for NIMH estimations use a screening that is known to be bad at diagnosing schizophrenia. In addition, they do not include any institutionalized individuals, and they can only account for the individuals currently being treated for schizophrenia and who live in a residence (Torrey). The problem with this is that many individuals with schizophrenia are institutionalized in places like hospitals, nursing homes, and prisons, and the NIMH itself estimates that around 45% of individuals with schizophrenia are not being treated (Torrey). The studies the NIMH provides as evidence for the prevalence of schizophrenia leave out a major portion of the schizophrenic population. The NIMH has received further criticism because one study they cite found that 3.03 million non-institutionalized United States residents have schizophrenia or 0.91% of the population. Nevertheless, the NIMH still reported a much lower prevalence that contradicts their cited evidence (Desai et al., 2013). The actual prevalence of schizophrenia seems to be higher than what the NIMH is reporting, and it is unclear why the prevalence is so underreported.

In 2020, the Treatment Advocacy Center (TAC) estimated that 1.1% of the Washington state population included individuals with schizophrenia, or 66,272 people; this is significantly higher than the NIMH's estimate of the prevalence of schizophrenia in the United States. Unfortunately, the TAC did not produce any previous estimates for Washington State specifically, so it is difficult to tell exactly how the rates of schizophrenia have, or have not, changed over time. It is abundantly clear that the NIMH needs a more accurate way to determine the prevalence of schizophrenia. That data helps determine how resources and funding are allocated to disease research. Schizophrenia is imperative to study and understand because it has severely high morbidity and mortality (Pearson, 2019).

Despite the rates of schizophrenia being somewhat elusive, it is possible to examine the factors that increase the risk of schizophrenia, such as cannabis use. A dose-dependent relationship between the level of cannabis use and the risk for schizophrenia has been confirmed (Marconi et al., 2016). In addition, studies show that frequent cannabis use increases an individual's risk of developing schizophrenia, and that the risk is amplified as the concentration of THC increases (Marconi et al., 2016). Several reviews that examined hundreds of studies and case reports have confirmed these results (Pearson, 2019 & Ahmed et al., 2021). Some have also shown that the age at which cannabis use begins is positively correlated with earlier onset of psychotic symptoms, many of which are associated with schizophrenia (Forti et al., 2014 & Langlois et al., 2020).

A growing majority of adults and adolescents do not view cannabis as dangerous or posing harm, consistent with the rise in cannabis use documented across all age groups in Washington State. The NSDUH and Washington Poison Center report a substantial rise in adolescent cannabis use and toxic exposure cases since recreational cannabis was legalized. Evidence indicates that using cannabis at a young age increases the risk of developing schizophrenia, meaning a larger population of Washington adolescents are at an increased risk of developing the disease (Forti et al., 2014).

Across the world, the concentration of THC in cannabis has increased dramatically since 2012, and Washington state is no exception. In addition to THC concentrations rising in cannabis flower, many cannabis products, such as concentrated butane hash oil (commonly known as dabs), have been specifically designed to contain extremely high levels of THC (up to ~95%). THC is proven to induce psychotic symptoms, and it is established that the risk of developing schizophrenia increases as the concentration of THC increases (Marconi et al., 2016). The increase in THC concentration and the increase in products with high THC concentrations result in an increased risk of developing schizophrenia in the population.

Schizophrenia is a complex disease, and the association between it and cannabis is not a genuine causal relationship. Many individuals who use cannabis for medical or recreational purposes do not develop schizophrenia because a combination of genetic and environmental factors are assumed to trigger the disease; it is not a simple effect of one behavior. Cannabis use, specifically THC, does not cause schizophrenia, but it does increase the risk of developing the disease (Forti et al., 2014 & Langlois et al., 2020 & Marconi et al., 2016). The legalization of recreational cannabis in Washington state has resulted in a more significant percentage of citizens being at an increased risk of schizophrenia. If cannabis use and THC concentration continue to increase and the NIMH finds more accurate ways to report schizophrenia prevalence, it would not be alarming if the rates of schizophrenia were to increase.

Cannabis usage has become increasingly popular in Washington state and across the country. Recreational cannabis is legal in eighteen of the fifty United States, and Senators from New York, New Jersey, and Oregon have been working on bills that would federally decriminalize and legalize cannabis (Lyons, 2021). As cannabis becomes more easily accessible, it is imperative to examine its effects. Research has identified many side effects of cannabis use, but the mechanism behind these effects and the full consequences are not well understood. Cannabis is considered a risk factor for schizophrenia, however, there needs to be more research on both.

The first step to fully understanding the relationship between cannabis and schizophrenia requires the National Institute of Mental Health (NIMH) to provide accurate and reliable statistics regarding the prevalence of schizophrenia. Not even the exact cause of schizophrenia is known, nor are many aspects of how the disease functions, but the severity of the disease is becoming increasingly apparent. A lifelong illness that is heavily associated with comorbidity and premature death deserves attention, especially when a risk factor for that disease is exponentially increasing in popularity.

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Appendix

A Call for Accountability in the NIMH's Reported Data on Schizophrenia

This appendix contains the verbal presentation given at the Honors Symposium 2022 at Seattle Pacific University. The following presentation was in a panel that explored hierarchical values of bodies, a central question to Honors Liberal Arts studies at SPU, with specific attention to marginalized or underrepresented populations in the United States. This project uses the lens of psychology to investigate the association between cannabis use and schizophrenia, but uncovers a prevalence of schizophrenia that seems to be minimized by the National Institute of Mental Health (NIMH) and hypothesizes that minimization of schizophrenia creates a barrier to funding and resources allocated towards the illness.

After Initiative 502 was passed in 2012, cannabis became legal in Washington State for recreational purposes (*People of the State of Washington*, 2011). Since then, hundreds of shops have opened, selling billions of dollars worth of cannabis each year (*Cannabis License Applicants, 2021 & Recreational and medical marijuana taxes 2012-2021*). According to studies from the National Survey on Drug Use and Health (NSDUH), over one-fourth of all Washington residents consume cannabis, and that number has been exponentially increasing each year. In addition, the Washington Poison Center (WAPC) reports an exponential increase in cannabis exposure cases for children under the age of five and a drastic increase in the number of cannabis exposure cases across all other age groups since legalization (Carliner, 2017 & Toxic Trends report, 2018). For example, a year after cannabis stores opened, 46% of all calls to the WAPC involved children under nineteen years old (Toxic Trends report, 2015).

Cannabis is about as common at college parties as alcohol. At a party a few years back, my good friend shared with us that he had never, and would never use cannabis because his father had schizophrenia. We both knew from the TV show *Criminal Minds* that traumatic events or heavy drug usage could cause early-onset of schizophrenia, a disease that usually does not take effect until an individual is in their mid-twenties to thirties. Although, I had never heard of cannabis causing schizophrenia, this was a novel and perplexing idea that I needed to uncover the truth about. So, I began looking into the association of cannabis and schizophrenia, reading accredited studies from Sweden, New Zealand, Holland, and the United States (Pearson, 2019 & Sherif et al., 2016 & Nazarens, 2020). They all report an increased risk of schizophrenia from cannabis use, first documented in 1987. More recent studies have shown this risk increases further as the frequency of use and the concentration of THC increase (Pearson, 2019 & Marconi et al., 2016 & Shirvastava et al., 2014). Most notably, a 2016 meta-analysis reported a 4-fold increased risk in heavy users of cannabis and a 2-fold increased risk for average or occasional users compared to those who abstain entirely (Marconi et al., 2016). Many studies have also confirmed that the age cannabis use begins correlates to an increased risk of developing schizophrenia.

Cannabis is becoming increasingly popular and potent, rising from 2% THC in 2012 to over 25% today (Ahmed et al., 2021). Based on these findings, I expected to see the prevalence of schizophrenia increase in Washington state since legalization, but that was not the case. The National Institute of Mental Health (NIMH) has reported the prevalence of all Serious Mental Illnesses since 1985. From 1985-2016 the NIMH reported the prevalence of schizophrenia in the United States to be 1.1% of the population (about 3.6 million people) (Torrey, 2018). In 2017 this dropped dramatically to 0.3%, or about 975,000 people. Schizophrenia is a lifelong disease, so many health-care professionals wondered what happened to those 2 million schizophrenics within a single year. The NIMH director took severe criticism from scientists across the United States and produced a statement that “we did not provide sufficient context to understand or justify the selected prevalence estimate, nor did the number we settled on reflect the full spectrum of knowledge available in the relevant literature” (Gordon, 2018).

The next year, 2018, the NIMH produced a new statistic, and this time decided to group schizophrenia with “other psychotic disorders”, changing the prevalence to a range between 0.25% and 0.64% (*Schizophrenia*, 2022). This is still the current estimation today. Before going into details about why these changes were made, I wanted to take a moment to describe the NIMH website. They produce detailed statistics on Serious Mental Illnesses such as, depression, anxiety, PTSD, bipolar disorder, OCD, personality disorders, and many more. Schizophrenia is the only illness that has its prevalence listed as a range, instead of a concrete number. It is also the only listed illness that does not specify prevalence based on sex. Instead, the NIMH provides a two sentence “summary of the current data” while using sources from 2005, 2008, and one study from 2018 (*Schizophrenia*, 2022).

One of the strongest critics of the NIMH has been Dr. E. Fuller Torrey, the founder of the Treatment Advocacy Center. He calls the NIMH’s directors’ way of handling the prevalence of schizophrenia an “embarrassment,” and further remarks that the nation’s lead mental illness research agency should not find it difficult to report how many people have schizophrenia (Torrey, 2018). The drastic change in the prevalence in 2017 made over 2 million individuals disappear, and grouping schizophrenia along with “other psychotic disorders” only further undermined the actual prevalence.

For their estimation of 0.25%-0.64%, the NIMH used data from a 2005 survey to report the “most current” data (Torrey, 2018). One study the NIMH cites from 2008 reports that about 3.03 million non-institutionalized US residents have schizophrenia or over 1% of the population (*Schizophrenia*, 2022). The keyword for this estimation is “non-institutionalized,” meaning the actual prevalence would be much higher since most schizophrenics are institutionalized in hospitals, prisons, or nursing homes (Torrey, 2018).

However, the 2008 study that reported the prevalence at 1%, did not impact the NIMH director’s estimation. The global estimate for schizophrenia is about 0.5%-1% of the total population (*Schizophrenia*, 2022). Even our neighbors in British Columbia report a greater prevalence of the disease, that being 1 in 100. The United States has come out with more recent studies and surveys, most notably the Johns Hopkins Bloomberg School of Public Health study using Medicare and Medicaid claims, along with the 2010 census data. This study reported that the prevalence of schizophrenia in the US was 1.62% among adults, but acknowledged the actual number would be higher since they were not able to include individuals from jails or prisons in their study (Torrey, 2018). Schizophrenia is not disappearing from our world, so why is the NIMH making it seem that way?

Many assume the consistent underrepresentation of schizophrenia is due to the NIMH decreasing their funding spent on the disease. From 2016 to 2019 the budget for research on schizophrenia decreased by 18% (Torrey, 2018). Furthermore, from 2003 to 2019, the NIMH decreased funding for treatment trials for schizophrenia, bipolar, and depression by 90%. The best way to avoid spending more money on the disease is to make it seem like the disease is fading away, although this is not ethically sustainable. The NIMH does not seem motivated to further their understanding and treatment/prevention of schizophrenia. If you find that evaluation unfair, I would like to point out that the Substance Abuse and Mental Health Services Administration (SAMSHA, 2018) attempted to jointly fund a new study to ascertain the true prevalence of schizophrenia in 2018, but the NIMH declined.

As our nation's leading mental illness research agency, the NIMH must be held accountable for bad science and severely underestimated statistics. The NIMH's mission is to better the current understanding and treatments of mental illness by funding and conducting research (*Schizophrenia*, 2022). They use the prevalence of diseases to determine where more funding and resources need to be allocated, and since their poor estimation of schizophrenia, we have seen that funding significantly decrease (*Schizophrenia*, 2022 & Torrey, 2018).

Schizophrenia is a serious mental illness categorized by delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, and negative symptoms, including decreased pleasure and reductions in speech and emotional expression. People who have schizophrenia are 2-3 times more likely to die a premature death, and it is estimated that 5% of all schizophrenics die by suicide (*Schizophrenia*, 2022). Studies estimate that 90% of all individuals with schizophrenia experience mental and physical comorbidities (*Schizophrenia*, 2022). The indirect costs of the disease, including missed or reduced work, caregivers, and premature death, are over 4x higher than the direct costs that come from healthcare visits, medication, and hospitalizations. The approximate annual cost of schizophrenia was over \$30,000/ patient in 2008, which we can assume has increased due to inflation (*Schizophrenia*, 2022).

Millions of people have schizophrenia, despite the NIMH attempting to marginalize those bodies. The disease is not fading from our society. In fact, the risk of schizophrenia is increasing due to the rising popularity of cannabis. The decisions made by the NIMH are causing a depletion of funding and resources being allocated to schizophrenia research and treatment, which will only further the suffering of this vulnerable population. The NIMH needs to address this problem and find a suitable way to determine the prevalence of schizophrenia in the United States, preferably one that does not include a disappearing act.