Assessing Economic Impacts of Mile High 420 Festival in Colorado

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Abstract: This study uses an input–output model to assess the economic impact of the 2018 Mile High 420 Festival on the Colorado economy. A comprehensive assessment was conducted to determine the economic impact of the Mile High 420 Festival, which included analyzing the direct, indirect, and induced effects of festival spending. The study involved 233 respondents whose primary motive was to attend the 420 Festival. Using IMPLAN, the study’s data were analyzed to determine the economic activity generated by visitor activity. On average, each respondent spent USD 2013 during their trip to Colorado. The largest expense per person was on cannabis-related activities and shopping, followed by lodging and food and drink. When these expenses were multiplied by the number of visitors (25,650), the total spending amounted to USD 51.7 million. When indirect and induced spending was included, the 2018 Mile High 420 Festival generated a total economic impact of over USD 95 million for Colorado. It contributed to the creation of 787 jobs in the region. No study has been conducted on the economic impact of a cannabis-themed festival in the current tourism literature. Therefore, this study contributes to filling this gap by developing literature on the impact of cannabis tourism and its implications for host communities or states, especially for state policymakers and business professionals. The results of this study are expected to serve as a reliable benchmark for subsequent economic impact analyses and comparisons with other industries.

Keywords: economic impact; IMPLAN input–output model; marijuana festival; festival tourism; visitor spending; Colorado

1. Introduction

Tourism has long been recognized as a significant economic contributor and extensively studied for its role in attracting tourism development [1,2]. Local events and festivals have become crucial aspects of tourism attractions for various destinations. Therefore, such events and festivals’ economic activity and profitability are essential for destinations and festivals, particularly during tough economic times and in a highly competitive market environment [3] (p. 468). The tourism industry has played an essential role in the growth of the Colorado economy, with an average annual growth rate of 4.4% since 2009.

One area of Colorado tourism that is yet largely unexplored is the marijuana tourism industry, especially its broader economic impacts. Over the past few decades, the medical and recreational cannabis markets have expanded significantly, starting with the first cannabis legalization in California in 1996. As of January 2024, 24 states have legalized recreational cannabis for adults older than 21 [4]. In Colorado, medical marijuana was made legal in 2000, followed by recreational marijuana in 2012. The state of Colorado was one of the pioneering states, along with Washington, that has allowed recreational cannabis sales for adult use. Not only does it bring economic benefits to the state, but this niche tourism market also results in both positive and negative impacts on the community, ranging from...
business opportunities, employment, increased hospitality business, regulatory challenges, health risks, and social concerns [5–7].

Marijuana tourism is of particular interest to the state of Colorado as marijuana brings in significant tax revenues. Tax revenues come from the state sales tax, which is 2.9% plus a 15% state retail marijuana sales tax on marijuana sold in stores and a 15% state retail marijuana excise tax on wholesale sales and transfers of retail marijuana, in addition to the fee revenue generated from marijuana license and application fees [8]. Figure 1 illustrates the tax revenues generated from 2014 to 2023. Survey data for the economic impact analysis conducted in this study were collected in 2018 when marijuana tax revenues in the state were on the rise; tax revenues continued to rise until around 2021, when we started seeing a drastic decrease in tax revenues, illustrating the potential advantage of being an early adopter of legalization for Colorado’s tourism industry. This decrease happened for a variety of reasons, but one reason was the reduction in marijuana tourism from other states as they began also to legalize recreational marijuana. This makes understanding the spending of marijuana tourists in 2018 of particular interest to Colorado as a baseline for comparison as marijuana tourism in the state evolves and tax revenues decrease.

![Figure 1. Marijuana tax revenue collected 2014–2023. * Note that tax revenues for 2014 only represent February–December 2014, as January data were not provided (source: Colorado Department of Revenue, 2024 [8]).](image)

To put the economic values in perspective, a 2016 study reported that every dollar in retail marijuana expenditures generated USD 2.40 in state output, and the Colorado marijuana industry created 18,005 new workforce positions in 2015 [9]. Furthermore, the estimated excise tax revenue for cannabis in 2018 was over 16 times the excise tax revenue generated from beer and wine sales combined in Colorado [10].

An event’s impact on a region’s economy is measured in two categories: primary and secondary economic impacts. The primary impact refers to the direct measurement of the expenditure made by the participants or the sales made by businesses during the event (direct effects). The secondary impact measures the multiplier effect of the economic activity in the local region. It is broken into two components: the indirect effects (purchases of goods and labor that support direct activity) and induced effects (activity generated from wages spent in the local economy). It is important to consider all three factors when gauging the economic impact of an event such as the Mile High 420 Festival. Economic multipliers are used to assess the secondary impacts (indirect and induced) and to measure the leakage of new expenditures on the local economy.
Employment creation and increased labor supply are often key multipliers in economic impact assessments [11]. The employment multiplier indicates the total employment, both direct and indirect, resulting from additional consumer spending [11]. In summary, festivals have a complex impact on local economies, influencing direct spending and creating ripple effects throughout the community [1,11,12].

The popularity of cannabis-themed festivals worldwide has been well documented, including in Europe [6,13,14]. The European and US festivals have attracted many visitors due to their rare and unique offerings despite cannabis remaining a highly debated drug, leading to polarized public opinion [15]. Various interest groups attempt to influence drug policies from different perspectives [16]. Within civil society, there are voices advocating for cannabis policy reform, including activists and supporters of legalization. One approach involves organizing “cannabis festivals” as public spaces for protesting against cannabis prohibition [13].

Understanding the expenses of visitors at a destination or festival is crucial for policymakers and marketers to plan facilities and amenities for the event and promote its economic growth to stakeholders [17]. The Mile High 420 Festival, known as the largest cannabis festival in the world, is a significant event hosted by the City of Denver on April 20 every year. With over 50,000 attendees annually, the festival generates a substantial economic impact on the city and state [7]. The festival’s purpose is to celebrate the expanding legalization of recreational cannabis in the United States (Cannabis ‘420’ festival, 2022).

No research has been conducted to examine the economic impacts of cannabis tourism activities in Colorado to date. The Mile High 420 Festival, which has been highly successful as a new niche market, is an excellent starting point for evaluating how cannabis-themed tourism products and activities have contributed to the local and state economy. The cannabis tourism industry could economically justify itself if more data were available [18] (p. 16). Although the Mile High 420 Festival is only one aspect of the Colorado marijuana tourism economy, an analysis of the out-of-state festival visitors’ spending provides an initial profile of marijuana tourists in Colorado and their impacts on the Colorado economy. Furthermore, an event’s scale strongly correlates with the impacts measured with attendance, infrastructure, media coverage, costs, and benefits [11]. A half-day festival that attracted more than 50,000 attendees is, therefore, worth investigating to estimate its economic impact on the region. Thus, this study’s findings fill this research gap by developing the literature on cannabis tourism impacts and implications for the host communities or states in the early years of legalization. Additionally, this study’s results are expected to serve as a reliable benchmark for subsequent economic impact analyses and comparisons with other industries.

2. Literature Review

The impact of tourism is well documented in the existing literature review. Tourism significantly contributes to economic growth in host regions by increasing revenue, creating mass employment, and enhancing the development of small- and medium-sized enterprises. Additionally, tourism has played a critical role in sustainable development in many countries. It increases economic growth, alleviates property, creates jobs, and improves food security. In developing countries with rich biodiversity, natural resources, and cultural heritage sites, tourism attracts international tourists’ local purchases, which generate income and support economic development [19]. While tourism can yield positive economic impacts, addressing the adverse effects of certain types of tourism is essential. Sustainable tourism development seeks to mitigate these impacts and promote environmentally friendly practices.

2.1. The Economic Impact of Events and Festivals

There are five different approaches to implementing Event Impact Assessment (EIA) [20]. The main objective of these approaches is to gather accurate information and data to evaluate the event’s impact [11]. Out of these five methods, the economic impact approach
determines the overall benefits to the destination areas by calculating the direct and indirect income and employment benefits. The economic impact (EI) of special events and local festivals, in particular, has been extensively researched [21,22]. Therefore, there are numerous research studies available on the economic impacts of special events [1,2,21–25], specific sites or towns [26,27], recreational activities [28,29], geographic regions [23,30,31], and states and countries [32–34] for tourism policy development. These studies encompass various types of festivals worldwide and in different geographic locations. For example, Ref. [35] provided an overview of the discussions concerning the relationship between cities and their festivals during the COVID-19 pandemic. Their study focuses on Edinburgh, known as the ‘festival city’, and delves into how festival organizers tackled the challenges posed by the pandemic while staying connected with audiences and stakeholders. It examines a range of contributions to the literature, including topics such as festivalization and a suburban food festival in Barcelona, an art festival in Dublin, the European Capital of Culture in Hungary, and the festival portfolio of Hong Kong.

Measuring the economic impact of an event is difficult because of the complexities involved in estimating travelers’ spending. According to [32]’s argument quoted by [36], “the best way to measure the impact of visitor spending is to use surveys to determine the amount and type of goods that travelers tend to purchase, and then to estimate the portion of output visitors support in the key industry” [12] (p. 7) also supports this assertion, stating that an attendee expenditure survey is the best way to obtain an accurate estimate of event-related expenditures within the impact area, compared to secondary data. Ref. [11] further suggest that the flexibility to modify the survey specifically to the data tailored to the research methodology would allow researchers to target areas identified as key outcomes of the research. Thus, visitor expenditure is a critical factor in assessing the economic impact of tourism on destinations, including the profitability of tourism destinations and festivals [37] and strengthening research rigor [11]. Furthermore, visitor expenditures reported by the visitors can serve as a reliable foundation for subsequent economic analyses and a valid benchmark for comparison to other industries [11]. To obtain the best estimate, it is recommended to collect detailed expenditure patterns by each category instead of just the total expenditure. Additionally, it is important to differentiate local visitors from those traveling from outside the area. This approach is considered a better estimate of visitor expenditure and involves sub-categories like lodging, shopping, food and beverage, gasoline, and others [22,23]. The spending of festival visitors directly impacts the profitability and strategic planning of facilities and amenities at a festival. These findings will assist festival organizers in optimizing their offerings to increase visitor spending, compete effectively in the festival market, and enhance the economic impact on the host community [38]. Therefore, understanding visitor spending is crucial for festival organizers to maximize economic benefits and maintain successful events.

Economic impact (EI) studies require two main components: (1) estimating visitor attendance and (2) assessing their expenditures. The process begins with the direct expenses reported by participants either during or immediately after the event [1,12]. To project the impacts, attendee estimates are used to determine how visitor or attendee expenditure estimates will affect local income and employment. These measures and forecasts are then entered into one of the projection models, such as an input–output model or a computable general equilibrium [CGE] model, among others. During the estimation, it is highly recommended that the study defines the term “locals” and excludes their spending from the analysis [1,39].

2.2. Cannabis-Themed Events and Festivals

As cannabis consumption becomes more normalized, cannabis-specific topics such as events or festivals have garnered scholarly attractions in academia. One of the seminal works about cannabis-themed festivals was conducted in Europe [13,14]. Their dual studies investigated cannabis festivals in Amsterdam, Berlin, Rome, and Athens in Europe. Their findings indicated that most participants were daily cannabis users, with the average age
The increasing normalization of cannabis consumption has led to a growing scholarly interest in cannabis tourism in general and cannabis-related events and festivals specifically [40] investigated Canada’s reputation as a cannabis tourism destination to understand how tourists’ motivations, perceived risks, and travel constraints impact their intentions to visit Canada for leisure cannabis consumption. By analyzing the image of the formation process from a pre-travel perspective, the study’s findings showed that potential cannabis tourists’ visiting intentions were influenced more by their emotional image of Canada than their cognitive image. Additionally, perceived risk fully mediated the relationship between cognitive image and visiting intention. These findings offer valuable insights for local governments, destination marketing groups, and businesses interested in developing the cannabis tourism market. Furthermore, the normalization process can be boosted by cannabis tourism [41]. Their study explored how cannabis tourism can contribute to the normalization of cannabis. Its findings discuss how the tourism industry can promote social acceptance of cannabis and evaluate how tourism can help normalize cannabis by increasing its accessibility and prevalence, as well as promoting tolerance and cultural integration.

In the UK, Ref. [42] identified trends in legalizing cannabis for cultivation; the global trend towards more liberal cannabis laws for both medical and recreational purposes is expanding. However, current cannabis laws primarily cater to residents, which limits the growth of domestic tourism markets. There is limited consideration given to the potential for international tourism in cannabis markets. Therefore, the findings of this research are based on the potential for the UK to develop and promote a cannabis industry for international travelers.

In a study conducted in the US, the Mile High 420 Cannabis Festival in Denver, Colorado was analyzed to assess the satisfaction of festival attendees with the event and their likelihood of returning. The study revealed the diverse demographic profile of the attendees and emphasized the lack of research in the field of cannabis events and festivals. Additionally, the study outlined the implications for industry professionals and policymakers in understanding this emerging market [6]. Another study from the same location investigated festival attendees’ motivation and travel patterns [43]. Using the same festival, this study categorized visitors into four latent segments based on their motivation and participation in festival activities. The results showed that cannabis seekers and multi-purpose seekers were strongly motivated by cannabis-related factors. The study also found that moderate participants were more likely to be first-time visitors, while active and passive participants were classified as repeat visitors. These two studies are the first of their kind to be conducted after the legalization of recreational marijuana consumption in the US in 2014. Due to limited research, scholars must address the gap in the quantitative exploration of the cannabis tourism industry through diverse perspective studies in the future.

2.3. Input–Output Model

The input–output model [1,44,45] is the most popular method used to estimate the economic impact of visitor expenditure, especially in regional areas. This model works best for large economies that have a strong interdependence between industries in the supply chain. However, it may not be suitable for small regional economies that rely heavily on other regions in the supply chain to produce goods and services [11]. The input–output model assesses the direct, indirect and induced impacts of visitors’ spending in the area.
on the community or host region. The direct expenditures stimulate other sectors of the regional economy, such as input suppliers and employee spending in other industries, thereby contributing to the region’s overall economic growth.

The indirect and induced effects of tourism spending should be calculated to account for the total economic impact. Indirect effects occur because of the supply chain linkages. For instance, local businesses purchase goods and services from each other. The spending cycle then continues throughout the supply chain. Induced effects occur because of the spending habits of employee households. These spin-off effects result in a dollar of tourism expenditure generating more than its original value in total economy activity, as it ripples through other local businesses and household spending on goods and services [1,11,12]. Multipliers are used to measure the amount of money that remains in the region after excluding the spending on products and services not sourced within the impacted region. The multiplier process is repeated with each additional round of income/expenditure. However, the process becomes less effective as money “leaks” externally to pay off goods and services imported from outside the region [11].

The three primary multipliers used in economic impact assessments are output, employment, and value-added multipliers. The output multiplier measures the increased economic activity from direct consumer expenditure in the affected region. It considers changes in production levels, excluding sales or income left after leakages. On the other hand, the employment multiplier represents the direct and indirect employment generated by economic activity [11]. Value added is the total market value of all final goods and services produced within the region.

The purpose of this study is to assess the economic effects of the 2018 Mile High 420 Festival on the Colorado economy by utilizing an input–output model. This study will comprehensively evaluate the economic impact of the festival, including the direct, indirect, and induced effects of the spending related to the festival. Additionally, employment and industry output will be calculated based on the self-reported information provided by the festival participants.

3. Materials and Methods

3.1. Study Setting: 2018 Mile High 420 Festival

The Mile High 420 Festival 2018 was hosted at Civic Center Park in Denver, Colorado, on April 20th. The event drew around 75,000 attendees throughout the day, with the peak attendance occurring during 4:20 p.m. Admission was free. However, visitors had to pass through metal detectors and have their personal items, such as backpacks and purses, searched for weapons and alcohol. Public consumption of marijuana is illegal in Colorado. Therefore, the festival signs, marketing materials on the internet, and flyers distributed before and during the event indicated that marijuana consumption was strictly prohibited at the festival [46].

The event organizers received permits to sell alcoholic beverages only in four designated areas, known as “beer gardens”. Before entering and buying alcohol, identification was checked. The designated areas only served beer and wine. There was an elevated stage area where musicians performed for entertainment. Security was a top priority for the organizers, and for this reason, a two-layer security fence was placed around the festival grounds to prevent people from breaching it [46]. The City of Denver did not allow off-duty police officers to provide security at the event, a common practice with most public festivals. Therefore, a private security company was hired to provide the police function. This company was responsible for stopping marijuana consumption, but with less legal power, they could not completely prevent its occurrence [46].

3.2. Research Instrument and Data Collection

The questionnaire had two sections. The first section aimed to collect information about visitors’ profiles, including their socio-demographic details such as gender, age, education, income, ethnicity, marital status, and residing state, as well as travel-related
information such as previous festival attendance, trip party size, companion types, length of stay, and travel information source.

The second section focused on visitors’ expenses during their visit to Colorado. Participants were asked to provide expenditure details for various categories, including lodging, meals, transportation, retail shopping, marijuana-related shopping, sightseeing, nightlife, recreational activities, and other expenses. Notably, expenses related to airplane flights were not included in the survey as they did not directly impact the destination’s economy [22,47].

To check its face validity, a survey instrument was pilot-tested on five people who had attended the previous 420 festivals. The feedback was incorporated to improve question wording and unclear contexts. Two tourism researchers who have studied cannabis tourism reviewed the final survey questionnaire. An online survey was conducted with the 2018 Mile High 420 Festival attendees between September and October 2018. A total of 11,000 attendees received the survey instrument via email. Those who had not responded two weeks later also received a follow-up email. A screening question was added to ensure eligibility for the study, asking whether visitors had attended the 420 Festival. As a participation incentive, hotel and wine festival vouchers were provided. Figure 2 summarizes the data collection and analysis steps in a flowchart format.

![Flowchart of Study Methodology](image)

**Figure 2.** A flowchart of the study methodology.

### 3.3. Data Analyses

To assess the economic impacts of the 2018 Mile High 420 Festival on the Colorado economy, we analyzed the expenditure data from the 2018 visitor survey. We needed to identify the total number of visitors to aggregate the survey sample population to the entire population of visitors to the 2018 Mile High 420 festival.

Although there were no official reports to confirm the exact number of attendees since it was not a ticketed event, the festival organizers estimated the number of attendees for the 2018 Festival to be between 75,000 and 100,000 [48]. To avoid any overestimation, this study used 75,000 as a conservative measure.

A total of 991 responses were collected for the study, with a response rate of 9.1%. In order to capture the economic impacts that represent new dollars brought into the economy due to the festival, we were only interested in the expenditures by individuals with residency outside of the state of Colorado, and the data analysis only included out-of-state visitors. The state of Colorado was chosen as the region of interest for the analysis since local economic development depends on bringing outside dollars into the economy and preventing dollars from leaving. The survey pool was broken down as the primary...
reason for visiting Colorado on this trip following earlier work on Colorado festivals [22].
According to the result, 60% of out-of-state respondents stated that their primary purpose for the trip (as opposed to a secondary or incidental trip purpose) to Colorado was to attend the Mile High 420 Festival. Therefore, this study focused only on these primary-purpose visitors, as their spending in Colorado could be directly attributed to the 420 Festival. Tourists with other primary motivations for their trip, such as vacation or business, were excluded from the analysis since it was difficult to differentiate which expenditures were related to the festival.

Of the 991 responses, 233 responses represented the out-of-state cannabis tourists who cited the Mile High 420 Festival as their primary reason for visiting Colorado. This method was selected based on [11]'s recommendations, which suggest selecting only tourists who visited the region because of the event and specifying whether data were collected during or after the event when applying a survey approach.

We used a standardized approach outlined in “Approaches to Estimating the Economic Impacts of Tourism; Some Examples” [49] to analyze the economic impact of the 2018 Mile High 420 Festival. The most common approach to assessing economic impacts is examining how visitor activity generates economic activity using the IMPLAN Cloud Version 6 software model. The IMPLAN software estimates 536 sectors’ economic activities through various characteristics. IMPLAN draws on data collected by state and federal agencies to examine how changes in one industry will affect others. Thus, we used out-of-state visitor expenditure data and the 2016 IMPLAN economic modeling software and data to generate estimates of employment and output supported by the 2018 Mile High 420 Festival. Employment and industry output are operationalized as follows: (1) employment represents a sum of all waged and salaried employees, including self-employed jobs with both full-time and part-time workers. Specifically, the current study employed ES-202 data, County Business Patterns, and the Regional Economic Information System (REIS) data to derive employment totals in the IMPLAN model; (2) industry output is defined as a dollar value representing an industry’s production. It is important to note that output captures the total dollar value of the economic activity, including the value of all intermediate stages of the production process, not just the final product.

While the conceptual approach is simple, the cannabis industry is relatively new and has not yet been incorporated into the IMPLAN input–output models. Therefore, we utilized employment and economic output multipliers derived to model the economic impacts of cannabis-related spending for this study. For this purpose, the study conducted by [9] was used after ground-truthing the economic multipliers for the marijuana retail industry, as shown in Table 1. Their study integrated cannabis activities into the overall economy and estimated economic multipliers for the cannabis cultivation, manufacturing, and retail industries. Therefore, we used [9]'s data to model the economic impacts of cannabis-related expenditures on out-of-state festival participants. Relative to other retail sectors, cannabis retail has a relatively high multiplier, 2.398. This is explained by the fact that inputs are currently sourced almost entirely from within Colorado, unlike other retail sectors, at least partly due to the barriers to interstate commerce that remain given the federal limitations on cannabis commerce.

Table 1. Direct, indirect, and induced effects for the Colorado Marijuana industry (multipliers).

<table>
<thead>
<tr>
<th>Industry</th>
<th>Direct Impact</th>
<th>Indirect Impact</th>
<th>Induced Impact</th>
<th>Total Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana Retail (stores)</td>
<td>1.000</td>
<td>1.029</td>
<td>0.369</td>
<td>2.398</td>
</tr>
<tr>
<td>Marijuana Manufacturing and Banking</td>
<td>1.000</td>
<td>0.984</td>
<td>0.355</td>
<td>2.340</td>
</tr>
<tr>
<td>Marijuana Cultivation</td>
<td>1.000</td>
<td>0.793</td>
<td>0.332</td>
<td>2.126</td>
</tr>
</tbody>
</table>

Source: Light et al. (2016) [9].
4. Results
4.1. Respondent Characteristics

Table 2 presents the socio-demographic and travel-related characteristics of the study’s respondents. There were more female travelers (58.4%) than male counterparts. Approximately three-quarters (75.6%) of respondents were 40 years old or younger, with those in their 40s accounting for 20.2%. Regarding marital status, more than half of the respondents were either single (33.0%) or in a relationship but not married (20.6%). The education levels were distributed more uniformly, with 30.0% of respondents having a high school degree, 34.4% having a junior college degree, and 20.0% having a university degree. The majority of respondents identified as Black/African American (41.2%), followed by White/Caucasian (28.3%) and Hispanic/Latino (15.0%). In addition, nearly half of respondents (45.1%) reported an annual income of USD 50,000 or more, while about 10% earned USD 100,000 or more.

Table 2. Respondents’ socio-demographic profile and travel characteristics.
Table 2. Cont.

<table>
<thead>
<tr>
<th>Variables (N = 233)</th>
<th>Characteristics</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodging</td>
<td>Marijuana-friendly accommodation</td>
<td>28.3</td>
</tr>
<tr>
<td></td>
<td>Non-marijuana-friendly accommodation</td>
<td>50.6</td>
</tr>
<tr>
<td></td>
<td>Friends or family</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>Airbnb</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>2.6</td>
</tr>
<tr>
<td>Travel size</td>
<td>Mean: 3.82 people</td>
<td>Mode: 2 people</td>
</tr>
<tr>
<td>LOS</td>
<td>Mean: 3.73 nights</td>
<td>Mode: 3 nights</td>
</tr>
<tr>
<td>Information source</td>
<td>Internet</td>
<td>67.4</td>
</tr>
<tr>
<td></td>
<td>Past experience</td>
<td>18.9</td>
</tr>
<tr>
<td></td>
<td>Festival organizer</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>Social media</td>
<td>33.5</td>
</tr>
<tr>
<td></td>
<td>Advertisement</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>Word of mouth</td>
<td>32.6</td>
</tr>
</tbody>
</table>

* The percent represents the visitor portion from each state.

Regarding the residence of our sample, about 12% of respondents lived in Texas, followed by Florida (5.3%), Illinois (5.1%), and New York (4.1%). When asked about their previous experience with the 420 Festival, almost half of respondents (45.9%) indicated attending the festival for the first time. Over one-third (35.6%) reported that they had attended the festival before. At the time of the survey, nearly one out of five respondents (18.4%) had attended the festival more than once.

Over one-quarter (28.3%) of respondents indicated that they had stayed at a cannabis-friendly accommodation, while approximately half (50.6%) had stayed in traditional lodging. Airbnb was the third most popular option, with 13.7%. These individuals stayed on average for 3.73 nights in Colorado, with 3.82 people per group. As for the sources of information about the event, more than half of the respondents (67.4%) relied on the Internet to collect information about the festival, followed by social media (33.5%) and word of mouth (32.6%).

4.2. Expenditure Profile

Table 3 shows the per-trip expenditure profile of the respondents. On average, each respondent spent a total of USD 2013 during the trip to Colorado. Interestingly, the most significant per-person expenditure was on cannabis-related activities and shopping, with a total of USD 524. This is followed by lodging, which costs an average of USD 405, and food and drinks expenses, which cost an average of USD 329 per person.

Table 3. Trip expenditure profile of primary-purpose out-of-state travelers.

<table>
<thead>
<tr>
<th>Expense Category</th>
<th>Per-Person Expenditure</th>
<th>Total Sector Expenditure (Per-Person USD × 25,650 *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana-related activities and shopping</td>
<td>USD 523.89</td>
<td>USD 13,437,700.43</td>
</tr>
<tr>
<td>Lodging</td>
<td>USD 404.58</td>
<td>USD 10,377,385.15</td>
</tr>
<tr>
<td>Dining, drinking, and nightlife</td>
<td>USD 328.69</td>
<td>USD 8,430,931.96</td>
</tr>
<tr>
<td>Non-marijuana-related activities and shopping</td>
<td>USD 301.09</td>
<td>USD 7,722,991.96</td>
</tr>
<tr>
<td>Transportation excluding airfare</td>
<td>USD 260.78</td>
<td>USD 6,689,073.91</td>
</tr>
<tr>
<td>Sightseeing</td>
<td>USD 87.50</td>
<td>USD 2,244,486.52</td>
</tr>
<tr>
<td>Other accommodation expense</td>
<td>USD 66.99</td>
<td>USD 1,718,325.98</td>
</tr>
<tr>
<td>Recreational activities</td>
<td>USD 25.69</td>
<td>USD 658,870.43</td>
</tr>
<tr>
<td>Gambling</td>
<td>USD 14.48</td>
<td>USD 371,367.39</td>
</tr>
<tr>
<td>TOTAL</td>
<td>USD 2013.69</td>
<td>USD 51,651,133.74</td>
</tr>
</tbody>
</table>

* This represents the number of out-of-state visitors who visited Colorado to attend the 420 Festival.
According to estimates, about 75,000 people attended, with 57% of those visitors coming from outside of Colorado. This means that approximately 42,750 out-of-state cannabis tourists came to the 2018 Mile High 420 Festival. The survey results showed that the 420 Festival was the primary reason for 60% of these visitors, which means that around 25,650 out-of-state visitors came solely for the festival. To calculate the total sector expenditure, we used per-person expenditure per category and estimated the number of out-of-state visitors whose primary purpose was to attend the festival. The total expenses of each type ranged from USD 13.4 million on cannabis-related activities and shopping to USD 371,000 on gambling. In total, these expenditures generated USD 51.7 million.

4.3. Economic Impacts: Direct, Indirect, and Induced

The economic impacts, including the spin-off effects, are reported in Table 4. Notably, the direct output is USD 46,665,714, less than the total expenditures (USD 51,651,133) in Table 3. The difference is due to “margining”, meaning that not all initial spending on some industries, such as retail, stays in the region. Instead, only a portion of the receipts remains local, with the rest leaking to the area where the goods were produced. The retail margin only includes the expenditures that stay in the region. When the direct, indirect, and induced effects are combined, the total economic impact of the 2018 Mile High 420 Festival on Colorado was over USD 95 million, and the festival also contributed to 787 jobs in the region.

Table 4. Economic impacts of the 2018 Mile High 420 Festival. (The data is taken from the Festival Organization).

<table>
<thead>
<tr>
<th>Employment</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Effect</td>
<td>527</td>
</tr>
<tr>
<td>Indirect Effect</td>
<td>125</td>
</tr>
<tr>
<td>Induced Effect</td>
<td>135</td>
</tr>
<tr>
<td>Total Effect</td>
<td>787</td>
</tr>
</tbody>
</table>

4.4. Tax Impacts of 420 Festival Spending by Out-of-State Primary Purpose Visitors

Between January 2014 and June 2017, the state retail marijuana sales tax rate was established at 10%. It was then increased to 15% in July of 2017, as per the Colorado Department of Revenue (CDR, 2017). In 2018, this tax generated a staggering USD 266,529,637 in revenue for the state. Additionally, it is estimated that in 2018, out-of-state primary purpose travelers spent USD 13,437,700 on marijuana products during their stay in Colorado, which, at a 15% tax rate, would contribute over USD 2 million in marijuana tax revenue attributable to the festival. This amounts to around 0.8% of the total marijuana tax revenue generated in 2018.

By comparison, the total recreational (retail) marijuana sales in April between 2017 and 2019 accounted for approximately 8% to 9% of the total annual marijuana sales. In 2020, the contribution of April’s sales dropped to 6.41%, even though the total sales of recreational marijuana in 2020 increased by 24% compared to 2019 [50]. This is likely due to the reduced revenue contribution made by visitors to the 420 Festival.

5. Discussions

The economic impact of the Mile High 420 Festival held in Denver, Colorado was estimated by analyzing the expenditures of non-Coloradans attending the festival. Economic impact (EI) analysis is a commonly used method to measure the effects of an activity on the broader regional economy. This study aimed to offer three conceptual rationales: (1) to evaluate direct and indirect economic gains [51,52]; (2) to measure economic significance [1]; and (3) to expand the basic principles of EI studies [1,53].

Visitors to the 420 Festival spent the most on cannabis-related activities/shopping, followed by lodging, dining/drinking/nightlife, and general shopping and activities. This indicates that the primary reason for visiting Colorado was to experience cannabis-related
products and services. Even though the festival lasts for just one day, respondents reported an average length of stay of nearly four nights, which explains why lodging was the second-largest expenditure category. Other studies of short-term events identified restaurant meals, additional food and beverages, lodging, entertainment, and shopping as the main spending categories [23,54].

The attendees of the 420 Festival spent significantly more per person compared to visitors at other festivals. For example, in 2014, Mardi Gras Festival visitors spent USD 2455 per person [55], while in 2015, Big Sur and Wine Festival visitors spent USD 1520 per person [56]. Similarly, visitors to the Sundance Film Festival spent USD 1650 [54], and visitors to the Charleston Wine and Food Festival spent USD 1329 in 2022 [57]. However, it is important to interpret these comparisons cautiously since each study used a unique methodology and was conducted in different years. Nonetheless, this comparison shows how much attendees spent at the 420 Festival compared to other renowned festivals in the country.

Although it is challenging to compare this study’s findings with international festivals due to contextual differences, it is important to note that many international destinations are exploring the potential of the cannabis market through various studies and perspectives, such as trends and feasibility studies in the UK [42], visitors’ image formation and motivations for cannabis destination in Canada [40], rethinking cannabis as an agent of normalization [41], Chinese travelers’ cannabis tourism engagement in the Netherlands [58], and cannabis tourism as wellness tourism in the Caribbean [59].

The legalization of cannabis aims to enhance safety measures for adult consumers, regulate the potency of the drug, reduce drug-related offenses, and eliminate the need for illegal sales on the black market [60]. While legalizing cannabis can help remove it from the underground illegal market and make it available to legitimate businesses [61], the potential social costs of legalization have become a subject of significant interest among researchers. Ongoing and future studies should investigate the potential negative consequences, such as increased substance abuse among young people; use of opioids, alcohol, and tobacco; suicide; traffic fatalities; workplace health; and crime. The results of these studies will shed light on the potential risks and challenges associated with legalization, thereby informing policy and decision-making in this area [62].

It has been noted that no single method or approach can fully capture and measure the effects of events or festivals [63,64]. However, well-designed and properly executed studies on event impacts can provide meaningful and insightful information to event organizers and policymakers for community development [65]. This study finds that the 420 Festival in 2018 had a significant impact on the Colorado economy, amounting to over USD 95 million from out-of-state visitors who specifically traveled to Colorado for the 420 Festival. In addition, this study found that the 2018 420 Festival contributed 787 jobs to the Colorado economy. It is worth noting that this impact did not include the spending of the estimated 17,100 out-of-state travelers who attended the 420 Festival but did not make it their primary purpose for visiting Colorado. This study contributes to the tourism literature as only limited data and research have been conducted on the economic effects of marijuana tourism.

As the marijuana tourism landscape continues to change and adapt, this baseline of tourism spending patterns will be important to understanding the future economic impacts that marijuana tourism will have on the state of Colorado and can be adapted for other states as they legalize recreational marijuana.

6. Conclusions

This study’s findings suggest that cannabis festivals significantly contribute to the economy through visitor spending, job creation, and tax revenue, at least in the early stages within states that legalized cannabis. These festivals are part of a growing global trend that encompasses small street fairs to large-scale events, and they have substantial economic, political, and socio-cultural impacts on societies. While festivals serve as a platform for
promoting or challenging ideas of identity and ideology, they are also susceptible to becoming overly commercialized by the entertainment industry. This study underscores the impact of festivals on tourism development, emphasizing that festivals are vital tourism products and essential components of society. Furthermore, this study’s findings will help state policymakers and the cannabis industry form sustainable policies and regulations to assist tourism stakeholders in this emerging segment. As the legal recreational marijuana industry matures, and tax revenues from the industry change, having a baseline of tourists’ expenditures will help inform future policy for this emerging industry.

Study Limitations and Future Studies

This study has a few limitations to consider when interpreting the results. First, Ref. [66] discovered that exit interviews conducted during a sporting event were affected by recall bias. However, Ref. [67] argues that collecting accurate spending data immediately after the event is impractical. It is important to exercise caution when interpreting the study results, considering potential biases beyond the researchers’ control. In addition, the sample size of 233 is relatively small. Therefore, the current study’s findings should be cautiously interpreted to avoid drawing unwarranted conclusions.

Second, the results of this study suggest that caution should be applied when interpreting the substantial revenue influx into a region as a measure of success for a festival. According to [68], it is important to understand that the spillover effects of economic activity, including the money generated by a particular event, can have both positive and negative impacts on certain community members and economic areas that are not directly affected by the revenue and taxes. Therefore, economic activity related to how the event impacts surrounding businesses should be the main focus, along with the negative social, cultural, or environmental effects that the festival might cause (Janeczko et al., 2002) [11]. An economic impact assessment should balance all of these factors. Additionally, it is crucial to consider how hosting such events can benefit a business or industry by attracting supply chain partners, such as input suppliers and buyers, to relocate to the region. Given Colorado’s first-mover advantage in the cannabis sector, this could be an important factor in future research on the implications of this event.

This study was conducted prior to the onset of the COVID-19 pandemic, during a time when festival conditions differed significantly from the post-pandemic business environment. While the findings of this study are significant as an initial economic impact assessment for recreational marijuana festivals, it is essential to recognize that these findings may have constraints and should be interpreted with caution. A comparison of this study with a future study of a similar nature will offer valuable time-series data for the literature on tourism impact.

Future studies could examine several aspects related to the results of this study. First, tourism expenditures can have a significant relationship with various socio-demographic variables such as household characteristics [69,70], tourist types [71], regions visited [72], and repeat visitor status [73]. Therefore, it is worth exploring how the spending patterns of respondents are related to these variables mentioned above. Additionally, future studies should explore a wider range of aspects of marijuana tourism beyond its economic impact. This includes considering its social, environmental, and regulatory implications. By incorporating these impacts, we can gain a more comprehensive understanding of the effects of cannabis tourism, leading to more reliable and sustainable insights into this emerging market. In the state of Colorado, recreational marijuana tax revenues have increased for a variety of reasons, including the reduction in marijuana tourists to the state. Future studies should explore the accompanying changes in tourism expenditure patterns, which can be compared to the expenditure patterns found in this study.

Secondly, although the current study excluded local expenditure, comparing the spending patterns of locals with non-locals during annual large-scale events like the 420 Festival could have crucial managerial implications. Lastly, examining how future 420 events evolve as the world reopens after the COVID-19 pandemic would be interesting. As the
420 Festival resumed in 2022 on a full scale, with more than 50,000 people attending [74], it is important to investigate how the pandemic has affected cannabis festivals and events to provide accurate information to state policymakers and business professionals.

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