



Does the Presence of On-Site Medical Services at Outdoor Music Festivals Affect Attendees' Planned Alcohol and Recreational Drug Use?

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Abbreviations:

EDM: electronic dance music
MGE: mass-gathering event
OMF: outdoor music festival
UK: United Kingdom

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Abstract

Background: Dedicated on-site medical services have long been recommended to improve health outcomes at mass-gathering events (MGEs). In many countries, they are being reviewed as a mandatory requirement. While it is known that perceptions of risk shape substance use plans amongst outdoor music festival (OMF) attendees, it is unclear if attendees perceive the presence of on-site medical services as a part of the safety net. The aim of this paper is to better understand whether attendees' perceptions of on-site medical services influence high-risk behaviors like alcohol and recreational drug use at OMFs.

Method: A questionnaire was distributed to a random sample of attendees entering and attending two separate 20,000-person OMFs; one in Canada (Festival A) and one in New Zealand (Festival B). Responses focused on demographics, planned alcohol and recreational drug use, perceptions of medical services, and whether the absence of medical services would impact attendees' planned substance use.

Results: A total of 851 (587 and 264 attendees for Festival A and Festival B, respectively) attendees consented and participated. Gender distribution was equal and average ages were 23 to 25. At Festival A, 48% and 89% planned to use alcohol and recreational drugs, respectively, whereas at Festival B, it was 92% and 44%. A great majority were aware and supportive of the presence of medical services at both festivals, and a moderate number considered them a factor in attendance and something they would not attend without. There was significant (>10%) agreement (range 11%–46%; or 2,200–9,200 attendees for a 20,000-person festival) at both festivals that the absence of medical services would affect attendees' planned use of alcohol and recreational drugs.

Conclusions: This study found that attendees surveyed at two geographically and musically distinct OMFs had high but differing rates of planned alcohol and recreational drug use, and that the presence of on-site medical services may impact attendees' perceptions of substance use risk. Future research will aim to address the limitations of this study to clarify these findings and their implications.

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Introduction

Patterns of alcohol and drug use have long been associated with certain types of mass-gathering events (MGEs) as significant contributors to increased patterns of injury, illness, morbidity, and mortality.¹

Outdoor music festivals (OMFs) are a subset of MGEs that are predominantly attended by young people aged 18 to 30. As OMFs have grown in popularity, so too has the amount of recorded patient presentation rates to medical services.^{2,3} Although OMFs are recognized to have multiple risk factors contributing to the need for medical attention, the use of drugs and alcohol by MGE attendees is likely to be one of the most important.^{1,2} When compared to similar-scale MGEs, OMFs often have a higher incidence of injuries and illnesses and demonstrate higher relative transport-to-hospital rates. This translates into an increased workload for both on-site providers and local emergency services during these events.^{3,4}

The term “recreational drug” is strictly defined as any chemical substance that is taken for pleasure, enjoyment, or leisure; however, in common usage, it often does not include alcohol. For the purposes of this paper, the term “recreational drug” will not include alcohol, but will include both illicit recreational drugs and prescription drugs used for nonmedical purposes. The concurrent use of alcohol and other substances is commonly present at OMFs¹ and “polysubstance use” refers to any combination of alcohol or recreational drugs.⁵ Substance use at events can include both legal (eg, alcohol as well as cannabis in some countries) and illegal substances. Alcohol use may be either licit alcohol (eg, beer gardens or sanctioned personal supply) or illicit alcohol (eg, underage drinking, sale at unlicensed events, unsanctioned personal supply, or alcohol use at dry events).

The use of alcohol and recreational drugs contributes to an elevated risk of morbidity and mortality at OMFs. Evidence of recreational drug use at OMFs can be found in reported presentations to on-site care^{2,6} and media reports of illness and death at these events.⁷ Lund and Turris⁸ reviewed the mortality of patrons at OMFs world-wide and found that 13% ($n = 96$) of reported fatalities were due to drug overdose, and between 2018 and 2019, six young people died at OMFs as a result of a toxic combination of alcohol and drugs.⁷

Existing research indicates that OMF attendees can be at risk of drug-related harms. When the profiles of Melbourne Big Day Out (Victoria, Australia) attendees were analyzed over a four-year period, Lim, et al⁹ found that attendees were more likely to have used illicit drugs than the general Australian population. At OMFs in the United Kingdom (UK), recreational drug use is greatly increased, includes more occasional users, and includes larger quantities and more varied substances relative to the general population.¹⁰

Dedicated on-site medical services have long been recommended as one of the ways in which to decrease risk and improve health outcomes at MGEs, and they are being reviewed as a mandatory event requirement in evolving government policies in many jurisdictions around the globe. Due to the high prevalence of recreational drug use at OMFs, one of the specific aims of on-site medical services at MGEs is to mitigate substance-related harms. While it is known that perceptions of risk shape substance use plans amongst festival attendees,¹¹ it is unclear if attendees perceive the presence of on-site medical services as a part of their safety net that affects their plans for alcohol and recreational drug use. This paper aims to better understand OMF attendees' perceptions of on-site medical services, and whether the presence of these services has an influence on their planned use of alcohol and recreational drugs. It also aims to evaluate potential similarities and differences by examining and comparing attendees' perceptions at two culturally, geographically, and thematically distinct festivals.

Methods

Design

A descriptive survey methodology was used for this research. The survey was specifically developed for this study. A questionnaire was distributed to a random sample of attendees entering and attending two separate outdoor, multi-day music festivals. Ethics approval for administration of the questionnaire was obtained from relevant research ethics boards (HREC:H-2019-0327 and REB 2015-16-022-H).

Population and Sample

Festival A is an annual, multi-day OMF of approximately 20,000 attendees in Canada. Artists that perform at the event are

predominantly of an electronic dance music (EDM) genre. Every fifth car entering the grounds was approached for recruitment, after clearing security but before the principal festival premises were open. The survey was administered at the 2015 edition of Festival A.

Festival B is an annual, multi-day OMF of 20,000 people in New Zealand (NZ). Researchers recruited participants from queues of attendees at the main entrance, bathrooms, and drink and food stalls. Every fifth person in each queue was invited to participate. The survey was administered at the 2020 edition of Festival B; artists that performed at the event were predominantly of a hip hop/rap genre.

To participate in the questionnaire, attendees had to be adults (18 years or older) attending the festival, understand English, and have the capacity to provide informed consent. Exclusion criteria included appearing or self-identifying as being intoxicated, or else being unwilling to provide consent.

A minimum sample size of 400 completed questionnaires was to be collected for each festival to achieve a five percent margin of error and 95% confidence interval.

Data Collection

Data were collected on paper-based surveys for Festival A and electronic surveys on tablets for Festival B. Participants were asked for: (1) demographics, and (2) individual perceptions of on-site medical services. They also gave five-point Likert scale responses about: (3) their plans for recreational drug use, and (4) how those plans might relate to the presence or absence of on-site medical services.

Data Analysis

Data were analyzed using statistical software (Stata S/E Version 13 for Festival A [StataCorp; College Station, Texas USA] and SurveyMonkey for Festival B [Momentive; San Mateo, California USA]). Descriptive statistics were generated for demographics and perceptions of medical services using frequencies and percentages. For Likert scales, belief in the statement was considered to be present if participants answered either “Strongly Agree” or “Agree;” this was expressed as an aggregate percentage. It was hypothesized that medical presence or absence would have no effect on planned substance use behavior. No effect was defined as a less than 10% change to planned recreational drug use in survey responses relative to the presence or absence of medical services.

Results

At Festival A and Festival B, 587 and 264 attendees consented and completed the 19-item questionnaire, respectively, for a total of 851 combined attendees.

Demographics and previous festival attendance are summarized in Table 1. Unless expressed otherwise, when describing results for both festivals concurrently, they will be presented as Festival A/Festival B. Gender distribution was the same across both festivals (55.5%/54.8%). The average age of attendees at Festival A and Festival B was 25 years and 22 years old, respectively. For Festival A, 51% ($n = 296$) were under the age of 25, whereas for Festival B, a larger proportion of 79% ($n = 205$) were under the age of 25. Festival A attendees reported a higher level of education, with 43% having completed university, college, tech, and/or grad studies compared to only 29% at Festival B. Thirty-five percent ($n = 205$) of those surveyed at Festival A were attending for the first time,

	Festival A	Festival B
	n (%)	n (%)
Participants	587	264
Age		
Average	25 (-)	22 (-)
Under 25	296 (50.4)	205 (77.6)
Gender		
Male	326 (55.5)	142 (53.8)
Female	258 (44.0)	114 (43.2)
Nonbinary	3 (0.5)	3 (1.2)
Highest Level of Education		
No High School	22 (3.8)	11 (4.2)
High School	159 (27.2)	96 (36.8)
Enrolled Post-Secondary	159 (27.2)	78 (29.9)
Completed Post-Secondary	217 (37.0)	38 (14.5)
Graduate Studies	28 (4.8)	38 (14.5)
Previous Festival Attendance		
First Time	205 (35.0)	137 (51.9)
Attended ≥ 1 Time(s) Before	380 (65.0)	120 (45.5)

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Table 1. Participant Demographics

	Festival A	Festival B
	n (%)	n (%)
Planning to Use		
Alcohol	280 (47.7)	242 (91.6)
Recreational Drugs	522 (89.0)	115 (43.6)
Cannabis	453 (77.2)	Not Asked

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Table 2. Planned Recreational Substance Use

whereas fifty-three percent ($n = 137$) at Festival B were first-time attendees.

Planned Recreational Substance Use at the Festival

Planned recreational substance use during the event is summarized in Table 2.

At Festival A, 48% ($n = 280$) planned to use alcohol at the festival, whereas 92% ($n = 242$) of attendees at Festival B planned to use alcohol. Eighty-nine percent ($n = 522$) of Festival A attendees planned to use recreational drugs at the festival, whereas 44% ($n = 115$) of attendees at Festival B planned to use recreational drugs. At Festival A, 77% ($n = 453$) of attendees stated they planned to use cannabis at the festival. This question was not asked of Festival B attendees.

Knowledge and Opinion of On-Site Medical Presence

Attendees were asked if they had knowledge or opinions of medical presence at the event and if they had ever used the service previously. Results are summarized in Table 3.

A high percentage were aware that on-site medical services existed, with 97% ($n = 571$) reporting awareness at Festival A, and to a lesser extent, 76% ($n = 200$) at Festival B. Most attendees at both festivals had not used on-site medical services, with only 19% ($n = 110$) of Festival A and 17% ($n = 46$) of Festival B attendees reporting previous use. All Festival A attendees ($n = 587$)

	Festival A	Festival B
	n (%)	n (%)
Aware that there are on-site medical services	571 (97)	200 (76)
Have used on-site medical services previously	110 (19)	46 (17)
Believe on-site medical services should be present at the festival	587 (100)	220 (83)
Presence of on-site medical services was a major factor when deciding to attend the festival	400 (68)	106 (40)
Would still attend if medical services were not present	343 (58)	133 (50)

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Table 3. Perception of On-Site Medical Services

surveyed believed that on-site medical services should be present at the festival, whereas 84% ($n = 220$) of Festival B attendees believed they should. Sixty-eight percent ($n = 400$) of Festival A attendees and forty percent ($n = 106$) of Festival B attendees believed that the presence of on-site medical services was a major factor in deciding to attend the festival. Fifty-eight percent ($n = 343$) of Festival A attendees and fifty percent ($n = 133$) of Festival B attendees indicated they believed they would still attend if medical services were not present.

Effect of Medical Services on Planned Behavior

The last questions focused on whether attendees would alter their use of alcohol and recreational drugs if medical services were or were not available. At Festival A, 30% ($n = 174$) would use less alcohol and 45% ($n = 266$) would use less recreational drugs if there were no on-site medical services. At Festival B, attendees agreed with these two statements in 25% ($n = 65$) and 53% ($n = 20$) of responses, respectively. Twenty-one percent ($n = 125$) of attendees at Festival A and twenty-two percent ($n = 59$) at Festival B agreed that the presence of medical services meant they would use more recreational drugs. Thirty-seven percent ($n = 217$) of Festival A and eleven percent ($n = 28$) of Festival B attendees intended to try recreational drugs that were new to them because on-site medical services were present.

Discussion

This is the first survey, to the authors' knowledge, regarding music festival attendees' perception of the effect of on-site medical services on planned substance use. Results demonstrated an unexpectedly high rate of planned substance use and high rate of agreement with a modified plan of use in the absence of on-site medical services.

Alcohol and Recreational Drug Use at Festivals

The use of recreational substances at OMFs is a well-recognized risk factor and contributor to the need for medical care, morbidity, and mortality.¹ Survey results demonstrate that attendees' planned use of recreational substances was significant at both festivals, with the vast majority (>90%) of attendees planning to use alcohol or recreational drugs. Plan of use at the time of entry seems to be distinct for each particular event community, with Festival A demonstrating an extremely high intent to use recreational drugs (89%) over alcohol (48%). This stands in contrast with the results of Festival B, where alcohol is the most commonly planned substance of use (92%) with only 44% planning to use recreational drugs.

Results are congruent with existing literature on the demographics and planned substance use at music festivals. Surveys performed at multiple festivals globally, including Denmark, Australia, and the UK, have demonstrated higher rates of planned and actual substance use (both legal and illegal) relative to the general population.^{9,12,13} A chapter recently published on substance use at festivals summarizes the patterns of use relative to the normal daily lives of attendees as atypical – with both increased amounts and variety of substances consumed – and points out that this atypical use occurs for individuals with both low and high rates of baseline substance use outside of these events.¹³ This publication details unpublished survey data from an on-going study in the UK where more than 2,000 participants at multiple UK festivals in 2018 demonstrated similar demographics (51.1% female; mean age 25.3 years), similar intent to use of alcohol (63.3% actively drinking and 86.8% either having had a drink or intending to drink that day), similar high intent to use other recreational drugs (52.4% had already taken or intended to take that day), and similar intent to abstain (9.1% not consuming or intending to consume that day). This is particularly congruent with results from Festival B.

Differences Between Festivals

Substance use behavior at festivals is a well-described social, cultural, and experiential construct. Festivals allow attendees to temporarily extract themselves from everyday life; intoxication is recognized to be an integral component of this experience. Moreover, this bounded community creates an environment of different norms and a community of acceptance that blurs the boundaries, forming an important part of the pleasure experience and an altered perception of risk as it relates to accessible substance use in these unique spaces.¹

Only one-half of the Festival A attendees planned to use alcohol, whereas the vast majority of Festival B attendees planned to use it; the inverse was true of recreational drugs. There are a number of factors that could contribute to these large differences in substances planned. First, the fact that Festival A does not permit or sell alcohol on-event (although it is interesting to note that one-half still plan to use it, albeit illicitly). Second, the fact that the festivals take place in two distinct milieus with different cultural norms as well as legal definitions of illicit substances (although cannabis was still illegal in 2015 in Canada). Third, the important demographic differences (age, education, and repeat attendees) may have played a role. Fourth, the genre of music involved is a major factor in planned substance use and event cultural norms. Attendees of EDM venues like Festival A have self-report in the literature as having a high rate of recreational drug use making them a high-risk population.^{14,15} Previous studies^{9,12,14,16,17} have found either alcohol or marijuana being the most used drug, depending on the type of music played at the event. For example, genres such as dance and house music have been associated with the use of ecstasy, speed, tobacco, alcohol, cannabis, and solvents,¹⁸ whereas Hesse and Tutenges¹² found that those who favored pop music were less likely to use substances other than alcohol, which was in line with Festival B findings. Finally, the culture of harm reduction present at Festival A likely contributes to a plan for and tolerance of substance use by attendees, as well as an environment in which substance use is felt to be safer, with 50% at Festival A (versus 22% at Festival B) declaring that medical services make them feel safer and more willing to use recreational drugs.

Perception of On-Site Medical Services

Even though most attendees had not previously made use of on-site medical services (19%/17%), a large majority of attendees at both festivals knew that these services existed (97%/76%). This result, particularly for Festival A, may reflect education or self-selection on the part of attendees related to the culture of safety and harm minimization, or perhaps strategic branding around the events themselves. Both festivals also had a high belief that medical services should be present (100%/83%), which is congruent with the current push to make them a legislated and essential service providing acute care for attendees and minimizing negative effects on the local community. It is interesting to note that despite the wide-spread belief that medical services should be present on site, attendees were not entirely deterred from attending if they were not present, with 58%/50% saying they would attend even in the absence of these services. This is an interesting and contradictory finding considering many attendees (68%/40%) stated that on-site medical care was a major contributor to the decision to attend. Perhaps this represents the conflicting yet simultaneous perceptions of a low risk of harm despite knowledge of heightened risks that have been described in the literature at these events.^{19,20} Whatever the case, these data suggest that the perception of festival safety consciously or unconsciously held by attendees appears to have a very strong link to medical services.

Effect of On-Site Medical Services on Planned Use

The primary aim of this study was to understand if the presence of medical services at an OMF has a perceived effect on attendees' planned use. To the authors' knowledge, no correlation has previously been drawn between these two elements. It is known that the perceived risks associated with substance use influence the intent to use and experiment with them.^{1,4} In the context of a music festival, plans for recreational substance use appear to be substantially altered by attendees' perceptions of the presence or absence of on-site medical services. This contradicts the initial hypothesis that medical services would not be a significant factor in planned substance use. There was significant (>10%) agreement (range 11%–46%; or 2,200–9,200 attendees for a 20,000-person festival) at both festivals that the absence of medical services would affect attendees' planned use of alcohol and recreational drugs. Again, this was above (and often well above) the established threshold of 10% that had been defined as a significant effect (Table 4). When comparing between festivals, in all cases, this effect was larger for Festival A. Although the greater change in planned recreational drug consumption at Festival A (45% versus 20% for Festival B) could potentially be explained by the relatively higher plan of recreational drug use there (92% versus 44%), the fact that Festival A also had a greater change in planned alcohol use under the same conditions (30% versus 25% for Festival B) despite a lower plan of alcohol use (48% versus 92%) is suggestive that any of the five festival-specific factors previously discussed – for example an increased culture of harm reduction – could be at play. Thus, a very significant number of attendees could be seen to consider medical services essential to their use of both alcohol and recreational drugs. This observation has limited practical application given the critical role of on-site medical care in reducing morbidity and mortality; regardless of effect, medical services should be present. However, it is nevertheless an important consideration in the delivery of these services that deserves further study.

	Festival A	Festival B
	n (%)	n (%)
I intend to do more recreational drugs because on-site medical services are present	125 (21)	40 (15)
I intend to try or experiment with recreational drugs that are new to me because on-site medical services are present	217 (37)	28 (11)
The presence of on-site medical services makes me more willing to do recreational drugs because I feel safer attending this festival	294 (50)	59 (22)
If this festival had no medical services on site, I would change my planned use of alcohol	174 (30)	65 (25)
If this festival had no medical services on site, I would change my planned use of recreational drugs	266 (45)	53 (20)

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Table 4. Effect of Medical Services on Planned Substance Use

Limitations

Results are from two festivals only and need to be reproduced. Both festivals were multi-day events, however data were only collected on one day for Festival B. Surveys distributed were not identical at both Festivals due to ethics requirements. Festivals known for attendee safety focus and on-site medical and/or harm reduction services may have generated responses reflecting an increased perceived contribution of on-site medical services to overall safety. Festival B did not achieve 95% CI for representation of festival populace (would have needed $n = 400$). Several methodological limitations of the survey format need consideration as well. The fact that medical services were not defined and attendees may have considered non-medical services (eg, drug checking) essential when describing a changed plan of use in their absence. Also, questions

regarding the consideration of medical services' effect on plan of use may have introduced a Type 1 error (false positive) and artificially inflated their importance through prompting, or the introduction of a Hawthorne effect. In addition, it must be noted that this study was conducted in English language populations, therefore the results are likely to only apply to English language speaking cultures.

Conclusion

It appears the presence of on-site medical staff was a positive influence among those surveyed for experimentation and use of recreational drugs. Survey results also demonstrate that the presence of on-site medical services can impact attendees' perceptions regarding the risks associated with both attendance and substance use at the event. Emerging efforts such as formal harm reduction programs and the mandated provision of on-site medical services are increasingly aimed at improving attendee safety at these events, but the effect of medical service presence on attendees' perceptions of safety and planned substance use needs to be considered. The perception of medical services as part of the safety net for attendees needs further study in the context of the atypical and prevalent pattern of substance use inherent in OMFs.

Author Contributions

AH – Data collection, analysis, and interpretation; writing of first manuscript draft. BM – Study concept and design, data interpretation, poster presentation, manuscript second draft. SW – Data collection. JR – Data analysis and interpretation, manuscript drafts.

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