

STI testing among young people attending music festivals in New South Wales, Australia: exploring the client segmentation concept in the ‘Down to Test’ program

Marty Janssen^A, Sylvester Okeke^B , Carolyn Murray^C, Margy Ewing^D, Heng Lu^E, Christopher Bourne^{C,E,F} and Limin Mao^{B,*}

For full list of author affiliations and declarations see end of paper

***Correspondence to:**

Limin Mao
Centre for Social Research in Health,
UNSW Sydney, Room 307, Level 3 John
Goodsell Building, Kensington Campus,
Sydney, NSW 2052, Australia
Email: limin.mao@unsw.edu.au

Handling Editor:

Megan Lim

Received: 24 May 2021

Accepted: 30 July 2021

Published: 16 November 2021

Cite this:

Janssen M et al. (2021)
Sexual Health
doi:[10.1071/SH21101](https://doi.org/10.1071/SH21101)

© 2021 The Author(s) (or their employer(s)). Published by CSIRO Publishing.

This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC BY).

OPEN ACCESS

ABSTRACT

Background. The ‘Down to Test (DTT)’ campaign is a sexually transmissible infection (STI) social marketing intervention delivered through outdoor music festival activations and supported by digital media communications in New South Wales, Australia. This paper investigates whether and how the tailored messages reached the intended audience. **Methods.** Data was collected through three annual rounds of online surveys post campaign exposure, targeting young people (aged 15–29 years) attending 14 music festivals in NSW from October 2017 to March 2020. Descriptive statistics, principal component analysis and multivariable logic regression were applied to identify the key client segment and factors associated with a strong intention for future STI screening. **Results.** Of the 10 044 participants with a valid urine specimen submitted, 261 (2.8%) tested positive for chlamydia. Altogether, 1776 participants (median age = 22) self-completed the evaluation surveys online with more being female (73.4%) than male (26.2%). Participants were mostly Australian-born (89.5%), heterosexual (82.6%) and the majority being sexually active (96.7%). Rates of self-reported lifetime STI testing (70.4%) and intention for future STI screening (‘definitely yes’ in the next 12 months, 39.0%) were also high. The most significant factor associated with future intention for STI testing is the *Sexual Experience and Perception Factor* (adjusted odds ratio [AOR] = 2.02; 95%CI 1.76–2.32; $P < 0.001$), followed by the *Sexual Beliefs and Attitudes Factor* (AOR = 1.14; 95% CI 1.01–1.30; $P < 0.05$). **Conclusions.** The NSW state-wide DTT campaign has largely reached sexually active youth who are attentive to sexual health promotion messages and contributed to enhanced STI screening in a fun and peer-supportive environment.

Keywords: client segmentation, evaluation, music festival, sexual health promotion, social marketing, STI screening, youth.

Introduction

Young people are less inclined to engage with sexual health promotion in formal clinical settings, often due to fear of judgement and embarrassment.¹ Social marketing campaigns delivered at non-clinical settings can be effective in increasing youth engagement with sexual health promotion programmes.² Tailored sexual health programmes for young people are urgently needed given the increasing influence of social media and the internet on young people’s expanding sexual repertoire and health related needs, including STI testing and treatment.

Australian music festivals attract large cohorts of young people from diverse backgrounds, which offer a unique opportunity to provide youth friendly, sex positive sexual health promotion campaigns and health interventions to mitigate risk-taking behaviours.^{3,4} Previous research has drawn a link between condomless sex with multiple casual sex partners and increased alcohol or recreational drug use among attendees of musical festivals in Australia.^{5–8}

Both chlamydia and gonorrhoea infections have increased substantially in recent years in Australia, particularly among people less than 30 years of age.⁹ STI testing is one of the most critical aspect of sexual health promotion efforts, as some STIs are asymptomatic and effective treatment for most STIs is readily accessible and inexpensive. Among youth aged 12–25 years in Australia, STI testing rates are usually higher in non-clinical settings than sexual health or general practice settings.¹⁰ Using a range of social events and activities to reach at-risk youth for STI screening has been considered effective and viable, largely in metropolitan cities such as Sydney.¹¹

A common marketing concept, client segmentation, provides valuable insights by differentiating the target audience into subgroups that are expected to be identifiable (substantial sizes), distinctive (unique characteristics, channels to reach and tone of communication) and actionable (expected behavioural changes and social norm shifts). However, the use of client segmentation to deliver behavioural interventions in order to reduce blood-borne viruses (and by extension, sexually transmissible infections) remains an uncharted area,^{12,13} as ‘one-size-fits-all’ mass media campaigns continue to be the mainstay. Even if message tailoring has been applied, it has been limited to basic demographic profiling based on gender and age. Within the youth-targeted sexual and reproductive health promotion space, a nebulous term, ‘at-risk youth’, has been frequently used. There is a general lack of effective message tailoring to diverse needs of young people, particularly when it comes to their values, risk perceptions and sexual experiences.

We describe an STI prevention social marketing intervention delivered through music festival campaign activations (i.e. promoting engagement and positive behavioural changes through raising awareness) and supported by digital media communications. In this paper, key findings from post-exposure three annual rounds of onsite recruitment into an online survey series are reported. To be eligible for the post-exposure surveys, young people, aged 15–29 years, had to attend the VIP area of any of the designated music festivals in NSW by registering with an email address for post-exposure evaluation follow-up with or without subsequently providing a urine sample onsite for further chlamydia screening.

The primary research question was whether and how the tailored messages in the programme reached the intended sexually active young people, taking different sexual beliefs, attitudes, perceptions and experiences into account.

Methods

The ‘Down to Test (DTT)’ campaign is an STI prevention social marketing programme developed by the NSW Ministry of Health in collaboration with a marketing agency. The

campaign target audience was young people (aged 15–29 years) attending selected music festivals in NSW and was delivered from October 2017 to March 2020. After pilot testing with eligible youth identified as being at higher risk of STIs, the programme specifically tailored the key messages (e.g. ‘Testing for STIs is a good thing’. ‘My sexually active friends have been tested for STIs’; see [Appendix 1](#)) and delivery channels to encourage STI testing behaviour, focusing on correct knowledge, positive attitudes and social norms. Condom promotion messaging, accompanied by free onsite condom distribution, was also included throughout the campaign.

The NSW DTT social marketing campaign was delivered through both face-to-face activations at music festivals and concurrent digital media communication. The face-to-face activations occurred at 14 music festivals across NSW – four in metropolitan Sydney and 10 in regional NSW. Local young people were invited and further trained to work in pairs as peer educators at each festival activation. Activations involved a ‘VIP area’, mostly facilitated by the trained peers, which included accessible mobile toilets, a glitter make-up bar, and mobile phone charging docks.

Festival goers had to register with a valid email address to gain access to the VIP area. For those who subsequently opted to provide a self-collected urine sample after giving verbal consent to trained staff and peers onsite, they were further asked to register their name, brief demographic information and contact details (phone numbers and email addresses) on the teams’ electronic tablets (this secure online registration system was linked to and remotely managed by an existing STI notification service – Sexual Health Info Link [SHIL]) in order to receive the test result via Short Messaging Service (SMS) notifications within a week after the event.

A concurrent digital media communication campaign with tailored messages directed at the target youth population was launched prior to each onsite activation, to raise programme profiles and encourage participation in face-to-face activations. The digital promotion continued throughout each festival to encourage STI testing and promote the awareness of the Play Safe website (<https://playsafe.health.nsw.gov.au/>), a dedicated online youth STI promotion information hub.

Based on the initial pilot testing, distinctive segments of young people were identified by intersecting history of sex debut, attitudes towards sex and relationships, and perceived STI prevention norms and practices including condom use and STI testing (see [Appendix 1](#)), beyond the mere stratification of key sociodemographic characteristics.

The DTT intervention was accompanied by a monitoring and evaluation component, consisting of a repeated cross-sectional online survey series targeting eligible youth. The programme logic model was informed by the Transtheoretical Model of Health Behavior Change.¹⁴ Hereafter, the methods described pertain to the evaluative survey series, the focus of this paper.

Recruitment

The post-exposure three annual rounds (2018, 2019, 2020) of the survey series contained a total of 14 surveys each launched within 1 week after their corresponding face-to-face activation. For each survey, recruitment was administered consistently by the team to disseminate the online survey advertisements through eligible music festival patrons' mobile phone numbers or email addresses, as follows:

- SMS notifications to those who provided a urine sample and contact details to receive the chlamydia test result; and
- Electronic Direct Marketing (eDM) to those who attended the VIP area and provided an email address for follow-up.

During the 2018 annual round (four festival events in total), recruitment was limited to those residing in NSW only. For the subsequent 2019 and 2020 annual rounds (five festival events at each round), recruitment expanded beyond NSW residents to all living in Australia who attended the designated festivals in NSW at the time of survey.

After survey completion, participants were invited to enter their email address separately for a prize draw. The online survey series was approved by UNSW (Sydney) Human Research and Ethics Committee (HC17585).

Questionnaire and data collection

The online survey series were anonymous and administered through direct web links to the surveys hosted on the Qualtrics platform, where specific consent was essential before survey participants could proceed to the questionnaire. To be comparable, the majority of the questions were identical throughout the data collection period. Apart from the sociodemographic variables (e.g. age, gender, postcode), key indicators included: music festival attendance in the previous 12 months; past engagement with any STI health promotion messages; current engagement with the DTT social marketing programme onsite activations, and a range of key STI outcome indicators (e.g. knowledge, perceived social norms and history of STI testing; see [Appendix 1](#)). Participants were also asked about their attendance within the previous 12 months at a range of specific music festivals held in NSW. Ten festivals were listed for the 2018 round, and expanded to 12 for the 2019 and 15 for the 2020 round of the survey series. Altogether, there were up to 40 questions and on average, it took 6–7 min to complete.

Data analysis and outcome measures

Data collected online through the Qualtrics platform was downloaded and processed in SPSS. STATA14.2/MP was used for further data analysis, including sample description and exploratory factor analysis (i.e. Principal Component Analysis (PCA) with varimax rotation and Kaiser

normalisation) as informed by the initial pilot testing phase. Factors, assigned with the PCA generated item scores, along with other key sociodemographic variables were then force-entered into the initial multivariable logistic regression model as blocks. Following a hierarchical model reduction procedure, the final parsimonious model was produced. Statistical significance testing was set at $P < 0.05$.

We report here the following key outcomes: (1) the positive screening rate of chlamydia through self-collected urine samples (a proxy of active campaign engagement); (2) key factors informing client segmentation of the survey samples (a proxy of whether tailored messages reached diverse sexually active young people); and (3) key factors associated with their intention (= 'definitely yes') to have an STI test within the next 12 months (a proxy of future behavioural change intention).

Results

Onsite engagement, urine sample collection and result notifications

Of the 14 DTT activations across three annual rounds, 10 044 eligible youth patrons (aged 15–29 years) were registered through the VIP areas located at each of the corresponding music festival sites, with 62.1% being female and 37.5% male (0.4% self-identified as non-binary other). Altogether, 9413 (93.7%) participants submitted a valid urine specimen for chlamydia testing (discarded samples were either having an insufficient volume or an unrecognisable label), of which 261 (2.8%) tested positive for chlamydia. Subsequently, our team informed the majority ($n = 245/261$; 93.9%) about their screening result through SHIL, where a negative result was delivered through one SMS and a positive result through a second SMS notification to ascertain treatment uptake. Most of those notified ($n = 180/245$; 73.5%) informed the team that they had accessed STI treatment either through their local general practices or sexual health clinics.

Sample socio-demographic characteristics

A total of 1776 young people, aged 15–29 years old, self-completed the evaluation surveys online (unlinked to the chlamydia screening). The estimated response rate range was 20–30% with more female (73.4%) than male participants (26.2%). Participants were mostly Australian-born (89.5%), predominantly heterosexual (82.6%) while 3.2 % identified as being an Aboriginal or Torres Strait Islander. As shown in [Table 1](#), the majority of DTT exposed participants were recruited through SMS reminders after registration at the VIP area and subsequent submission of a urine sample at any of the 14 music festival activations. Participants were more likely to reside in NSW regional towns (Wollongong, Newcastle) and other regional or rural parts of NSW consisted just over half of the sample.

Table 1. The ‘Down to Test (DTT)’ campaign post-exposure online survey series*: sample characteristics.

	N = 1776 (%)
Age (years)	
Median (range)	22 (16–29)
Gender	
Female	1303 (73.4)
Male	465 (26.2)
Non-binary other	8 (0.4)
Australian-born	
Aboriginal or Torres Strait Islanders	56 (3.2)
Sexual orientation	
Heterosexual	1466 (82.6)
Bisexual	220 (12.4)
Other (e.g. LGBTIQ, non-labelling)	90 (5.0)
Sources of recruitment	
Direct SMS	1305 (73.5)
Direct eDM	471 (26.5)
Residential location	
Greater Sydney, Wollongong or Newcastle region	1103 (62.1)
Elsewhere in NSW	273 (15.4)
Elsewhere in Australia	400 (22.5)

*Three annual rounds: October 2017–March 2018, July 2018–March 2019 and July 2019–March 2020.

CBD, Central Business District; SMS, short messaging service; eDM, electronic direct marketing.

Awareness of general sexual health promotion messages and DTT tailored messages

During the previous 12 months, 750 (42.2%) had attended only one pre-specified music festival and a further 48.0% had attended two or more. Among those who had attended any of the selected music festivals in the previous 12 months ($n = 1602$; 90.2% of the total 1776), awareness of any general sexual health promotion messages was reasonably high ($n = 1273$; 79.5%). Of these 1273 participants, recall rates of the DTT tailored messages were also high, both over lifetime (i.e. ‘ever heard of’; $n = 877$; 68.9%) and more recently (i.e. ‘heard of within the previous 12 months’; $n = 835$; 65.6%).

STI knowledge, attitudes and practices

During the periods where information about STI-related knowledge was collected (up until the October 2019 round but no data afterwards from December 2019 to March 2020; $n = 1546$), correct response rates were high, with over half ($n = 792$; 51.2%) having all seven items answered correctly. As expected, an overwhelming majority ($n = 1729$; 97.4%) of participants endorsed (‘strongly agree’) the statement that ‘Testing for STIs is a good thing’. Further, 1189 participants

endorsed the statement that ‘My sexually active friends have been tested for STIs.’ (either ‘strongly agree’ or ‘somewhat agree’, 33.0% and 34.0%, respectively). Rates of self-reported lifetime STI testing ($n = 1250$; 70.4%) and intention for undertaking any STI testing in the next 12 months (‘definitely yes’ or ‘probably yes’, 39.0% and 27.2%, respectively) were also high.

Overall, the majority were sexually active ($n = 1718$; 96.7%). A total of 579 (37.3%) out of the 1552 who further specified their number of lifetime sex partners had more than 10 in total, including 384 (25.9%) having had more than 10 casual partners.

Within the previous 3 months, 765 (43.1%) reported any new or casual sex partners. Of these 765 respondents, 196 (25.6%) had always used condoms and a further 373 (48.8%) occasionally. Further, a majority (1830/1776; 78.0%) indicated a strong (‘definitely yes’ or ‘probably yes’) intention to use condoms with a new or casual partner in the next 12 months.

Exploratory factor analysis

Based on the exploratory factor analysis (Table 2), two factors were identified, namely, the *Sexual Experience and Perception Factor* (31.5% of the total variance) and the *Sexual Beliefs and Attitudes Factor* (21.9% of the total variance). The first factor contains five items, covering the reported number of lifetime casual partners, perceived level of sexual experience, perceived risk of STI infection, alcohol use, and recreational drug use. The second factor contains three items, covering their endorsed beliefs or attitudes toward being in love before commencing sex, male dominance and increased STI risks resulted from more sex.

Multivariable logistic regression

As shown in Table 3, to further assess key factors associated with youth participants’ a strong intention for STI testing (‘definitely yes’) in the next 12 months after the onsite DTT campaign exposure at our music festivals, the following five sociodemographic variables were entered into the initial multivariable logistic regression model: age, annual survey rounds, gender, Australian-born, heterosexual orientation along with the two factor scores generated by the prior factor analysis model.

After a hierarchical model reduction procedure, the final model suggests that the most significant factor associated with future intention for STI testing is the Sexual Experience and Perception Factor (adjusted odds ratio (AOR) = 2.02; 95%CI 1.76–2.32; $P < 0.001$). The Sexual Beliefs and Attitudes Factor was also significant (AOR = 1.14; 95% CI 1.01–1.30; $P < 0.05$). Also, younger age, being female and non-heterosexual orientation were associated with a strong intention for future STI testing after exposure.

Table 2. The 'Down to Test (DTT)' intervention post-exposure online survey series ($n = 1776$): principal component analysis.

Eight items	Eigenvalue		Mean (s.d.)	Min-max score
	Factor 1	Factor 2		
Ever drink alcohol and got drunk	0.618		2.82 (0.62)	0–3*
Ever used non-prescribed drugs (e.g. cannabis, ecstasy) for fun	0.686		2.37 (0.94)	0–3*
Male should take control and be the head of the household. (beliefs/attitude)		0.661	1.93 (1.10)	0–5**
You should be in love before have sex with someone. (beliefs/attitude)		0.805	2.05 (1.13)	0–5**
I have a lot of sexual experience. (perception)	0.709		3.20 (1.20)	0–5**
Someone like me is at risk of getting an STI. (perception)	0.701		3.19 (1.36)	0–5**
STIs are normal when you have a lot of sex. (beliefs/attitude)		0.577	2.40 (1.18)	0–5**
Lifetime casual sex partners (e.g. hook-ups, one night stands other than a boy/girl friend or spouse)	0.729		3.19 (2.32)	0–10***

*0 = missing, 1 = 'never', 2 = 'yes, more than 12 months ago', 3 = 'yes, within last 12 months'; **0 = missing, 1 = 'strongly disagree', 2 = 'disagree', 3 = 'neither agree nor disagree', 4 = 'agree', 5 = 'strongly agree'; ***Raw numbers were recoded into the following ordinal categories: 1 = '0 or missing', 2 = '1', 3 = '2–4', 4 = '5–9', 5 = '10–14', 6 = '15–19', 7 = '20–29', 8 = '30–49', 9 = '50–99', 10 = '100 or more'.

Principle Component Factor Analysis with (orthogonal) varimax rotation and Kaiser normalised matrix.

Two factors cumulatively explaining 53.4% variance (Factor 1–31.5%; Factor 2–21.9%).

Kaiser–Meyer–Olkin measure of sampling adequacy: overall 0.757 (middling), items – 0.748, 0.755, 0.778 (middling), 0.556 (miserable), 0.806, 0.807 (meritorious), 0.776, 0.747 (middling).

Table 3. Factors associated with the intention ('definitely yes') for STI testing in the next 12 months after the 'Down to Test (DTT)' intervention ($N = 1776$): final parsimonious model.

	Adjusted OR	95% CI	P-value
Age (continuous)	0.961	0.928–0.995	0.027
Female gender	1.413	1.121–1.782	0.003
Heterosexual orientation	0.743	0.573–0.963	0.025
Factor 1 (sexual experiences)	2.024	1.764–2.321	<0.001
Factor 2 (attitudes/beliefs)	1.146	1.007–1.304	0.038

Multivariable logistic regression with robust SE estimation; Wald $\chi^2 = 114.65$; $P < 0.001$; goodness-of-fit $P = 0.270$. Bold values indicate the most statistically significant factor.

Discussion

The DTT social marketing campaign was able to engage over 10 000 eligible young people to undertake chlamydia screening spanning over a 3-year period in an outdoor music festival setting in NSW. By combining STI health promotion and onsite screening within a convenient, confidential, free-of-charge and youth peer facilitated environment, the DTT intervention sets an exemplary service engagement model complimentary to sexual health clinic and primary care practice settings. Previous research in non-clinical settings, particularly involving well-trained youth peers, concurs with this model.^{1,10,11,15}

Guided by its initial client segmentation exploratory phase, the DTT intervention evaluation survey series confirm that those with more sexual experiences, perceiving themselves at a higher risk of STIs and to a less extent, holding certain attitudes towards sex are more likely to engage with the tailored messages and onsite STI screening. This highlights

the importance of understanding various segments of a target population through initial focus-testing and iterative adaptation at implementation and scale-up stages.^{12,16} This approach should be recommended as one of the best practices for future sexual health promotion programme design, implementation and evaluation. Also, even after the DTT onsite exposure, younger age, being female and non-heterosexual identities were associated with a stronger intention for STI testing in the next 12 months.

Delivered both online (a dedicated website, social media channels and assisted by the secure SHIL notification system) and offline (festival onsite activations), its service mix included a suite ranging from sexual health promotion message dissemination, social marketing-style persuasion to peer support. Throughout the programme, it was consistently underpinned by cultivating the norm whereby young people are encouraged to have fun (enjoying outdoor music) while keep themselves healthy (being sex positive and getting STI tests).¹⁷ Further, our findings shed light on the importance of encouraging young people to undertake STI screening together with their friends in a fun and supportive environment through the DTT exposure. Direct feedback from the festival attendees (verbal communications to the staff and peers onsite and through social media comments and tweets) and responses to the open-ended questions in the evaluative surveys suggest that the campaign has mostly helped to reduce embarrassment and shame by making it possible to discuss and test for STIs with friends and other peers; that is, the cultivation of positive social norms encouraging STI testing (data not shown).

It is expected that current service delivery mode can overcome some of the key barriers (e.g. inconvenience in attending medical services, embarrassment) to sexual health service access and have the potentials to sustained health

seeking behaviour. Rather than delivering a generalised STI message-only campaign and referring young people to their conventional clinical settings, the DTT intervention disseminated tailored messages to promote STI screening in alternative outdoor music festival settings. Outreach activities (including SMS result notifications and evaluative feedbacks) were wrapped around throughout each of the activation. This is consistent with the ‘hospitality’ service marketing principle aiming at engaging young people at multiple points of their consumer journey by breaking down existing service access barriers.¹⁷

This project had some limitations. First, the evaluation design was built on repeated cross-sectional samples, not a longitudinal cohort, which limited our ability to monitor trends in the same individuals over time. This type of convenience sampling is, however, the norm in behavioural surveillance to ensure participant anonymity and questionnaire brevity for a highly mobile and young music festival attendee population.⁷ Second, the estimated average survey response rate was below 30%, despite incentives (i.e. the prize draws) and confidential SMS or email reminders of survey participation. Third, despite our efforts to reach a diverse target population by using a range of online recruitment strategies, females were the most likely to complete the online surveys. The survey click-through-rates (CTRs) were, however, not as skewed as the completion rates (data not shown). However, our samples should not be considered as representative of the whole target population. In addition, some questions such as the number of casual sex partners and history of STI testing could be perceived by young people as private and sensitive. We conducted extensive consultancy and piloting with youth representatives, employed non-judgemental language and allowed for response options such as ‘prefer not to say’. However, both recall bias and social desirability bias are unavoidable in self-reported surveys. Last, causations cannot be directly drawn between programme exposure and key STI outcome indicator changes.

We recommend the DTT intervention be adopted and adapted to reach sexually active young people attending youth-oriented events. The core component, having an outdoor pop-up (outreach), youth friendly and peer-supported facility to promote chlamydia screening through self-collected urine samples, is highly replicable and maintains the programme’s fidelity. Future expansion of delivering key messages through social media channels preferred by young people (e.g. Facebook, Instagram, Tinder), another core component of the DTT programme, is worthy of exploration. Proactively reaching out to young people who are not yet sexually active is challenging but necessary.

Of note, the chlamydia positive rate in our campaign (<3%) is much lower than that of the 15–29-year age subgroup national average (>10%),⁹ but comparable to those of the music festival attendees in Victoria.¹⁸ The lifetime self-reported STI testing rate (around 70%) is reasonably high in our survey.^{19,20} This suggests that more efforts and

innovative strategies are needed to reach those less motivated and not-yet-engaged festival attendees.

Finally, the ongoing programme activations in a range of well-established annual music festival events, preferably in a COVID-safe environment nowadays, would offer an opportunity to explore whether repeated exposure to onsite STI testing and social media messaging fosters a supportive peer culture towards annual STI testing in local sexual health clinics and primary care settings outside the music festival settings.

Conclusions

The DTT intervention sets yet another positive example of improving young people’s uptake and experiences of STI testing to enrich a participatory customer journey. Future design and implementation of youth-focused health promotion and service delivery programmes should involve the target audience throughout entire co-production process. Importantly, implementing a well-designed client segmentation-informed social marketing programme supported by trained local peers, offers valuable opportunities to foster collaboration and service improvement. This, in turn, will enhance the social transformative capacities of such public-funded and public-facing health promotion programs to engage and motivate young people.²¹

References

- 1 Freeman G, Smith LW, McNulty A, Donovan B. Sexual health and students: the pathways travelled by those with sexual health concerns. *Sex Health* 2018; 15(1): 76–78. doi:10.1071/sh17083
- 2 Friedman AL, Kachur RE, Noar SM, McFarlane M. Health communication and social marketing campaigns for sexually transmitted disease prevention and control: what is the evidence of their effectiveness? *Sex Transm Dis* 2016; 43(Suppl 2): S83–101. doi:10.1097/olq.0000000000000286
- 3 Agius PA, Pitts MK, Smith AMA, Mitchell A. Sexual behaviour and related knowledge among a representative sample of secondary school students between 1997 and 2008. *Aust NZ J Public Health* 2010; 34(5): 476–81. doi:10.1111/j.1753-6405.2010.00593.x
- 4 Dimech W, Lim MS, Van Gemert C, Guy R, Boyle D, Donovan B, Hellard M. Analysis of laboratory testing results collected in an enhanced Chlamydia surveillance system in Australia, 2008–2010. *BMC Infect Dis* 2014; 14: 325. doi:10.1186/1471-2334-14-325
- 5 Jenkinson R, Bowring A, Dietze P, Hellard M, Lim MS Young risk takers: alcohol, illicit drugs, and sexual practices among a sample of music festival attendees. *J Sex Transm Dis* 2014; 2014: 357239. doi:10.1155/2014/357239
- 6 Lim MS, Hellard ME, Aitken CK, Hocking JS. Sexual-risk behaviour, self-perceived risk and knowledge of sexually transmissible infections among young Australians attending a music festival. *Sex Health* 2007; 4(1): 51–56. doi:10.1071/sh06031
- 7 Lim MS, Hellard ME, Aitken CK, Hocking JS. Surveillance of STI risk behaviour among young people attending a music festival in Australia, 2005–08. *Aust NZ J Public Health* 2009; 33(5): 482–84. doi:10.1111/j.1753-6405.2009.00434.x
- 8 Lim MS, Hellard ME, Hocking JS, Aitken CK. A cross-sectional survey of young people attending a music festival: associations between drug use and musical preference. *Drug Alcohol Rev* 2008; 27(4): 439–41. doi:10.1080/09595230802089719

- 9 The Kirby Institute. HIV in Australia: annual surveillance short report 2018. 2018. Retrieved from Sydney https://kirby.unsw.edu.au/sites/default/files/kirby/report/supplHIV2018_content_20180920r.pdf [Accessed 22 October 2019].
- 10 Kang M, Skinner R, Usherwood T. Interventions for young people in Australia to reduce HIV and sexually transmissible infections: a systematic review. *Sex Health* 2010; 7(2): 107–28. doi:10.1071/sh09079
- 11 Martin L, Freedman E, Burton L, Rutter S, Knight V, D'Amato A, et al. The C-project: use of self-collection kits to screen for *Chlamydia trachomatis* in young people in a community-based health promotion project. *Sex Health* 2009; 6(2): 157–62. doi:10.1071/sh08039
- 12 Brommels M. Patient segmentation: adjust the production logic to the medical knowledge applied and the patient's ability to self-manage – a discussion paper. *Front Public Health* 2020; 8: 195. doi:10.3389/fpubh.2020.00195
- 13 Treloar C, Mao L, Wilson H. Beyond equipment distribution in Needle and Syringe Programmes: an exploratory analysis of blood-borne virus risk and other measures of client need. *Harm Reduct J* 2016; 13(1): 18. doi:10.1186/s12954-016-0107-0
- 14 Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot* 1997; 12(1): 38–48. doi:10.4278/0890-1171-12.1.38
- 15 Botfield JR, Newman CE, Zwi AB. Young people from culturally diverse backgrounds and their use of services for sexual and reproductive health needs: a structured scoping review. *Sex Health* 2016; 13(1): 1–9. doi:10.1071/SH15090
- 16 Lee K, Milat A, Grunseit A, Conte K, Wolfenden L, Bauman A. The intervention scalability assessment tool: a pilot study assessing five interventions for scalability. *Public Health Res Pract* 2020; 30(2): e3022011. doi:10.17061/phrp3022011
- 17 Russell-Bennett R, Glavas C, Previte J, Härtel, CEJ, Smith G. Designing a medicalized wellness service: balancing hospitality and hospital features. *Serv Ind J* 2017; 37(9–10): 657–80. doi:10.1080/02642069.2017.1354988
- 18 Sacks-Davis R, Gold J, Aitken CK, Hellard ME. Home-based chlamydia testing of young people attending a music festival – who will pee and post? *BMC Public Health* 2010, 10: 376. doi:10.1186/1471-2458-10-376
- 19 Douglass CH, Vella AM, Hellard ME, Lim MSC. Correlates of sexually transmissible infection testing among a sample of at-risk young Australians. *Aust J Prim Health* 2017; 23: 272–277. doi:10.1071/PY16115
- 20 Adam PCG, de Wit JBF, Ketsuwan I, Treloar C. Sexual health-related knowledge, attitudes and practices of young people in Australia: results from the 2018 Debrief Survey among heterosexual and non-heterosexual respondents. Sydney: Centre for Social Research in Health, UNSW Sydney; 2019. http://handle.unsw.edu.au/1959.4/unsworks_55103 [Accessed 2 July 2021].
- 21 Russell-Bennett R, Fisk RP, Rosenbaum MS, Zainuddin N. Commentary: transformative service research and social marketing – converging pathways to social change. *J Serv Mark* 2019; 33(6): 633–42. doi:10.1108/JSM-10-2018-0304

Data availability. The evaluative survey data included in the analysis of this paper is available upon direct request to the author team.

Conflicts of interest. The authors declare no conflicts of interest.

Declaration of funding. The project is funded by the NSW Health BBV & STI Research, Intervention and Strategic Evaluation Program (BRISE).

Author affiliations

^ASTI Programs Unit, Centre for Population Health, NSW Health, Sydney, NSW, Australia.

^BCentre for Social Research in Health, UNSW Sydney, NSW, Australia.

^CCentre for Population Health, NSW Health, Sydney, NSW, Australia.

^DNSW Sexual Health Infolink, NSW Health, Sydney, NSW, Australia.

^ESydney Sexual Health Centre, Sydney, NSW, Australia.

^FKirby Institute, UNSW Sydney, NSW, Australia.

Appendix I. STI testing related key questions in the evaluative survey series

STI knowledge (True, False, Don't know)

1. Anyone who is sexually active can catch an STI.
2. STIs are rare among young people.
3. Chlamydia is the most common STI among young people in Australia.
4. STIs often have no symptoms.
5. If left untreated, STIs can have negative impact on your health.
6. Common STIs can often be treated.
7. Sexually active young people should be tested for STIs every year.

Norms regarding STI testing and prevention

1. Testing for STIs is a good thing.
2. My sexually active friends have been tested for STIs.
3. Using condoms is a good thing.
4. My sexually active friends use condoms.

STI testing

1. Have you ever had a test for STIs (other than HIV)? (Never, within last 3 months, 4–6 months, 7–12 months, more than 12 months ago, I don't want to say.)
2. Do you intend to test for STIs in the next 12 months? (Definitely yes, Probably yes, Might or might not, Probably not, Definitely not, I don't want to say.)

Beliefs, attitudes and perceptions (Strongly agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, Strongly disagree)

1. Males should take control and be the head of the household.
2. You should be in love before have sex with someone.
3. I have a lot of sexual experience.
4. Someone like me is at risk of getting an STI.
5. STIs are normal when you have a lot of sex.