

Sexual Health & Youth (SHY) SMS Project

Final Report

December 2014

Megan Lim

Kaytlyn Eaton



Table of Contents

Executive Summary.....	1
Background	3
Sexual health in Gippsland.....	3
Gippsland Sexual and Reproductive Health Strategy and the Gippsland Health Services Partnership	4
SMS for sexual health promotion	5
Australian experience	6
The SHY project.....	8
Methodology.....	9
The SHY project.....	9
Focus groups	9
Participant surveys.....	9
Results.....	11
The SHY intervention	11
Pre-intervention survey	13
Post-intervention survey.....	13
Focus groups	14
Discussion.....	15
Was SHY a Success?	15
Limitations.....	16
Recommendations	18
Conclusion.....	20
Appendices.....	21
References	25

Executive Summary

Background

Evidence drawn from Australia demonstrates that sexual and reproductive ill health has the greatest consequence on vulnerable groups including young people and people living in rural and remote areas. Research regarding the use of social media technologies indicates SMS messages can successfully promote positive change in individuals' health behaviours.

In 2008, the Gippsland Health Services Partnership made sexual and reproductive health a regional health promotion priority. The goal of the strategy was to reduce the incidence of chlamydia and teenage pregnancy.

Aim

This project, which ended in June 2014, aimed to utilise SMS messages to deliver health promotion messages to young people aged 15-25 years living in Central West Gippsland, focusing on chlamydia.

Methods

The SHY project involved sending 12 text messages to young people over a 12 month period. The project utilised messages developed in past research, for example: "Chlamydia: hard to spell, easy to catch. Use a condom!" The project utilised existing youth education, community and social settings to enroll young people.

The project was evaluated using a brief online survey at enrolment (pre-intervention) and after 12 months (post-intervention). The surveys assessed sexual health knowledge and behaviour, as well as acceptability of the messaging.

Results

From September 2012 to September 2013, a total of 119 young people enrolled for SHY messaging. Registrants were asked where they had heard about SHY; the most common responses were headspace (24%), Facebook (21%), and friends or family (15%).

Forty-one individuals completed the pre-intervention survey and 20 completed the post-intervention survey. Risk factors such as sex without condoms were fairly common among participants. There were no significant differences in STI testing or sexual risk behaviours between the pre- and post-intervention surveys, however, minor improvements in knowledge were seen.

Conclusions

The SHY project did not reach as many young people as hoped. However, among those who did participate, the project was well-liked, and there was potential for improvements in sexual health knowledge. Future SMS-based projects need to focus on promotion of the project to young people, possibly through engagement of commercial or school partners.

Background

Sexual health in Gippsland

Sexual and reproductive ill health has the greatest consequence on vulnerable groups including adolescents, young people and people living in rural and remote areas (O'Rourke 2008). Chlamydia is known as 'the silent disease' because approximately 85% of females and 40% of males do not have any symptoms. If left untreated it can result in severe damage to the female reproductive organs and is one of the leading causes of infertility (WebMD 2006).

The rates of Chlamydia notifications for people aged 12-24 years in Australia have increased dramatically in the 10 years from 1995 – 2005. This age group accounts for approximately 74% of the total notified cases (Australian Institute of Health and Welfare 2007). From 2002 – 2007, in Latrobe and Baw Baw, the crude rates of Chlamydia for 10-24 year olds per 100,000 population were 384.3 and 670.41 correspondingly (Communicable Diseases Unit Public Health Branch).

Table 1: Chlamydia: crude rates per 100,000 population, 10-24 yrs, 2002-07

Baw Baw	670.41
Latrobe	384.3

Source: Victorian Notifiable Infectious Diseases Database, Communicable Diseases Unit, Public Health Branch Department of Health.¹

Teenage childbearing is often related to an increase in adverse health, social and economic outcomes for teenagers and their children (Ambert 2006). Young mothers may be more likely to drop out of school, be unemployed or low paid, to live in poor housing conditions, to suffer from depression and require government assistance (United Nations Children's Fund 2001). In 2008, the teenage birth rate in Latrobe and Baw Baw were 26.6 and 8.2 per 1000 women respectively, whereas the rate for the Gippsland region was 18.1 per 1000 women aged 15 to 19 years. The overall rate in Gippsland is higher than the rate in rural Victoria (16.7 per 1000 teenage women) and higher than the rate in Victoria (10.6 per 1000 teenage women) (Department of Health 2010).

¹ Chlamydia rates calculated by using the number of Chlamydia cases from Victorian Notifiable Infectious Disease Data and 2006 estimated resident population from Australian Bureau of Statistics.

Table 2: Teenage pregnancy confinements (15-19yrs), 2007 & 2008

	Number	Crude rate per 1,000
Baw Baw	25	8.2
Latrobe	148	26.6
Gippsland	317	17.9
Victoria	3790	10.9

Source: Births in Victoria, The Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM), Department of Health.

Gippsland Sexual and Reproductive Health Strategy and the Gippsland Health Services Partnership

In recognition of the growing need to address sexual and reproductive health issues, the Gippsland Health Services Partnership (GHSP) made Sexual and Reproductive Health a regional health promotion priority in 2008 and a 3 year Strategy was developed based on comprehensive, evidence-based research. The Gippsland Sexual and Reproductive Health Strategy 2009 -2012 (the Strategy) was subsequently endorsed by the GHSP in November 2009. The implementation of the Strategy was led by Gippsland Women's Health Service through the Sexual and Reproductive Health Reference Group, who meet quarterly (Gippsland Women's Health Service 2008).

The target populations were School Communities and Young People at risk (including workers and Carers involved with young people at risk).

Gippsland Sexual and Reproductive Health Strategy Reference Group members included:

- Gippsland Women's Health Service
- Department of Education and Early Childhood Development
- Department of Health
- Department of Human Services Disability Program

- Community Health Services
- Family Planning Victoria
- South Coast, East, Wellington and Central West Gippsland Primary Care Partnerships
- Primary and Secondary Schools
- DEECD School Nursing Program

The Sexual and Reproductive Health Strategy had 2 main goals:

- To reduce the incidence of Chlamydia in the Gippsland Region, and;
- To reduce the rate of teenage pregnancy in the Gippsland region.

The Strategy recognised social marketing as a youth engagement tool to access disconnected youth not engaged in educational settings.

SMS for sexual health promotion

Most Australians own a mobile phone and the majority (73%) of adults own smartphones with computerised functions and internet connectivity (Frost & Sullivan 2012). The market penetration of these technologies into the 18-24 year old age group is nearly complete and 98% of 18-24 year report using mobile phones/SMS to contact friends and family outside of their homes (ABS 2010). The constant, instant, and ubiquitous connection between young people and their phones provides new opportunities for health interventions delivered directly to at-risk young people.

The potential of new communication technologies to reach young people and positively influence sexual risk taking and promote healthy relationships between youth has been widely recognised. Examples include the development of a variety of new social networking sites, websites, emails and text messaging campaigns targeting sexual health knowledge, attitudes and behaviours (Lim, Hocking et al. 2011). Systematic reviews have demonstrated the efficacy of SMS for changing a range of health behaviours, including smoking, physical activity, disease management, and health seeking behaviours (Fjeldsoe 2009, Cole-Lewis 2010, Free, Phillips et al. 2013).

While the use of social media technologies is still a relatively new way to deliver health promotion messages, experience to date demonstrates that SMS can be successfully utilised to deliver messages that promote positive changes in individual's health related behaviours. To date, the success of SMS has been attributed to its ability to connect with people with ease as:

1. Use of mobile phones and SMS is nearly universal among young Australians
2. SMS can be sent to multiple recipients simultaneously
3. The cost of sending messages is low
4. SMS can be a private and anonymous medium to receive sexual health information
5. Engagement with the messages is not imposing on the individual and increases the likelihood of continued engagement with the health promotion issue

With regards to engagement of young people, the ability of SMS to connect with this target group has been attributed to the fact that SMS is popular, instant, portable and convenient. These factors enable young people to engage with the health promotion campaign without altering their daily routine and thus increasing the likelihood of engagement.

Australian experience

In Australia, the Burnet Institute is currently exploring the use of communication technologies to deliver sexual health promotion to key at risk groups, inclusive of young people. Two recent projects conducted by the Burnet Institute have examined the outcomes of using SMS to deliver sexual health promotion messages to young people to positively influence sexual health knowledge and behaviour. These projects were driven by the recognition that SMS offers a novel means to deliver and evaluate the reach and impact of sexual health promotion messages amongst young people.

The first project conducted compared the use of sexual health SMS and email messages on sexual health knowledge and behaviour. In this project, 994 individuals were randomly selected to receive SMS and email messages related to sexual health or no messages over 12 months (Lim, Hocking et al. 2012). Young people were found to be highly accepting and responsive to receiving sexual health promotion messages in this manner, with 96% of participants able to recall at 12 months receiving a SMS about

sexual health messages. Of these, 62% agreed that they had learnt something from the sexual health messages.

At 12 months, young people involved in the intervention demonstrated higher sexual health knowledge after receiving the messages. The significant increases in STI knowledge shows that those who received the messages read, understood and learnt from them. However, it is important to recognise that increases in STI knowledge does not necessarily translate into changes in behaviour as many other complex factors are involved in health and preventive behaviours. Nevertheless attainment of a basic level of knowledge is necessary to enable young people to make informed decisions about sexual health.

The intervention also resulted in a positive change in young women's health-seeking behaviour. At 12 months, the proportion of young women in the control group reporting an STI test remained close to the community rate at 10%, while testing amongst the intervention group increased to 18%. This result suggests that the intervention rather than the background change in testing rates was the cause of the increase. These results suggest that many young women responded to receiving the intervention by taking an active interest in their sexual health. However, the increase in Sexually Transmitted Infection testing amongst women was not found to be replicated amongst young men (Lim, Hocking et al. 2012).

An unintended benefit of utilising SMS to deliver sexual health messages to young people is that over three quarters of participants who received SMS had shown them to someone, generally a friend or partner. The sharing of sexual health text messages with peers is of particular note as it extends the reach of the intervention to potentially capture non-participants and provides an opportunity for peers to engage each other in discussions surrounding sexual health in response to the text messages (Lim, Hocking et al. 2012).

Standard text messaging was also found to be ineffective in increasing condom usage amongst young people. Successful condom promotion requires development of knowledge and attitudes supported by condom training skills. Video or picture messaging rather than standard text messaging has the capacity to support delivery of condom training to young people via their mobile phones. Therefore, future approaches will need to consider integration of standard text messaging with video or picture messaging to support young people's acquisition of both knowledge and condom usage skills (Lim, Hocking et al. 2012).

The second project conducted by the Burnet Institute involved scaling up of the use of SMS to promote sexual health to examine population effectiveness. Over 2000 young people received SMS related to sexual health over a 4 month period (Gold, Lim et al. 2011). The outcomes of this project replicated the results of the initial project. Survey results found a significant increase in both sexual health knowledge and the number of people who have been recently tested for an STI following receipt of the sexual health promotion text messages. This demonstrates that the positive results of the initial intervention can be replicated at a population level (Gold, Lim et al. 2011).

The SHY project

headspace Central West Gippsland² was funded by the Victoria Department of Health to deliver the Sexual Health and Youth (SHY) project in 2012. The Burnet Institute³ was contracted to independently evaluate the project.

The SHY project had three objectives:

1. To increase young people's knowledge, awareness and uptake of sexual health seeking and sexual health protective behaviours, promoted in text messages (with a focus on chlamydia) in Baw Baw and Latrobe Local Government Areas (LGA).
2. To increase (by 5%) STI testing among sexually active young people aged between 15 and 25 years old and living in Baw Baw and Latrobe LGA by June 2014.
3. To increase young people's use of local sexual health services such as GP clinics or community health centres promoted via SMS.

² www.headspace.org.au/headspace-centres/headspace-central-west-gippsland headspace is the national youth mental health foundation. headspace central west Gippsland, based in Morwell, provides free, confidential health care and support for young people 12-25.

³ www.burnet.edu.au The Burnet Institute is an Australian, not-for-profit, unaligned and independent organisation that links medical research with public health action, recognising that solutions to many of the major global health problems require comprehensive and innovative responses. The Burnet Centre for Population Health implements novel, multidisciplinary scientific programs that use cutting-edge epidemiology, high quality laboratory science, excellent clinical and social research, and strong public health principles to address major health problems.

Methodology

The SHY project

SHY involved sending 12 SMS messages, monthly, for a period of 12 months. The messages used were developed and tested in previous research (Gold, Lim et al. 2010, Lim, Hocking et al. 2012). Examples of messages are shown in Box 1.

BOX 1: Examples of messages sent via SMS

Roses are red, daisies are white, use a condom if you get lucky tonight.

Protect your or your partner's eggs this Easter with a condom. Chlamydia can cause infertility.

Chlamydia: hard to spell, easy to catch. Use a condom!

Don't be fooled, chlamydia testing and treatment is easy. It's just a pee and a pill, see your doctor today.

SHY aimed to reach 5,100 young people (aged 15-25 years) living in Latrobe and Baw Baw LGA. A range of recruitment strategies were used:

- Face to face outreach recruitment at sporting clubs, youth community sites, local events and festivals, street intercept, and tertiary education settings.
- Advertisements via flyers and local newspaper.
- Recruitment through secondary schools; this involved organizing with school authorities to give presentations to students (e.g. at school assembly).
- Social networking and peer recruitment; i.e. participants refer further friends.

At registration, participants provided their mobile phone number and contact details. They provided written informed consent. The project was approved by the West Gippsland Health Care Group Ethics Committee.

Focus groups

Focus group discussions were conducted in the formative stages of the projects with a small convenience sample of young people. Data from the focus groups were not recorded.

Participant surveys

Pre- and post-intervention surveys were administered online using SurveyMonkey. Participants were invited to complete these surveys via email. The questionnaires covered demographic behaviour, sexual health (including STI testing history and STI knowledge), and sexual behaviours. The questionnaire was

based on questions used in the Big Day Out behavioural surveillance project (Lim, Bowring et al. 2012). In addition to these questions, the post-intervention survey assessed acceptability of the messages.

To determine whether the same participants completed both the pre- and post-intervention surveys, participants were asked to indicate their 'movie star name' (the name of their first pet and the name of their first street). This method has been proven valid for identifying repeat study participants without collecting identifying information (Lim, Bowring et al. 2011).

Differences in sexual health knowledge, STI testing, or sexual risk behaviours between the pre- and post-intervention surveys were assessed using a *t*-test for proportions.

Results

The SHY intervention

From September 2012 to September 2013, a total of 119 young people enrolled for SHY messaging. Enrolment peaked in December 2012, with 22 registrations in that month (Figure 1). At least ten people enrolled each month between November 2012 and March 2013, with a second peak in July 2013.

Registrants were asked where they had heard about SHY; the most common responses were headspace (24%), Facebook (21%), and friends or family (15%). As shown in Figure 1, recruitment via Facebook and friends was predominantly in the November 2012 to January 2013 period, while recruitment through headspace peaked in the February 2013 to May 2013 period. Thirteen individuals who registered in July 2013 indicated they heard of SHY at Community College Gippsland (CCG). Other methods of recruitment were primarily reported in January and February 2013 and included newspaper advertisements ($n=3$), school ($n=1$), Monash University ($n=2$), on the street ($n=2$), 'Drouin' ($n=5$), 'Mid Valley' ($n=5$), and 'website' ($n=1$).

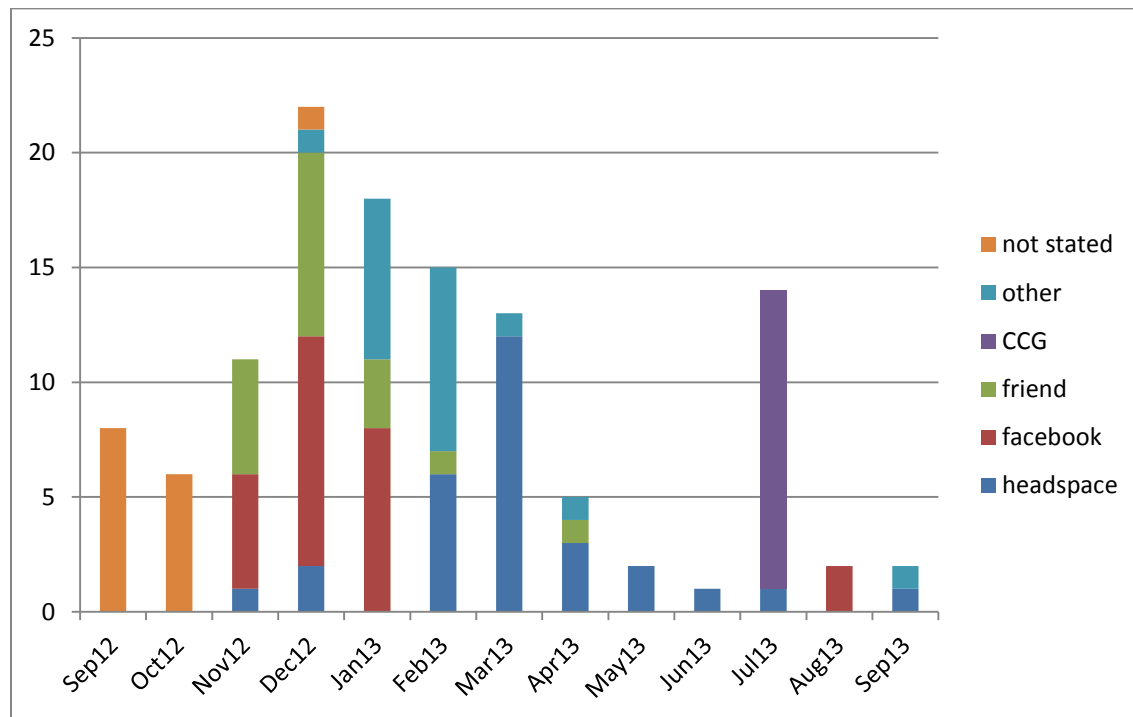


Figure 1: Recruitment site, by month

Overall there were 79 females, 39 males, and 1 unspecified person registered. Two registrants were aged over the 25 year upper limit, but the majority was spread across the target age group of 15 to 25 years (see Figure 2).

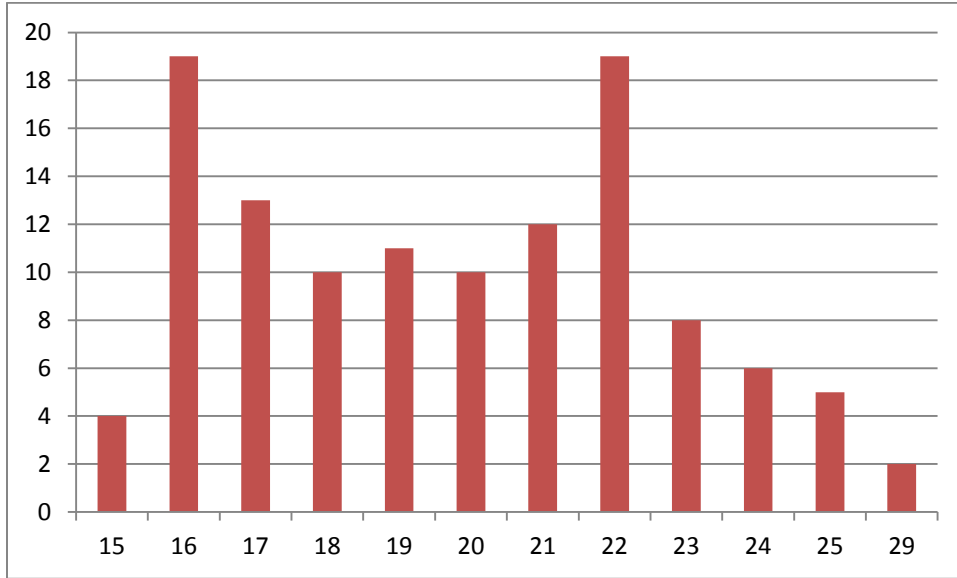


Figure 2: Age of 119 SHY participants

According to the postcode provided at registration, most young people resided in the target areas (Figure 3).

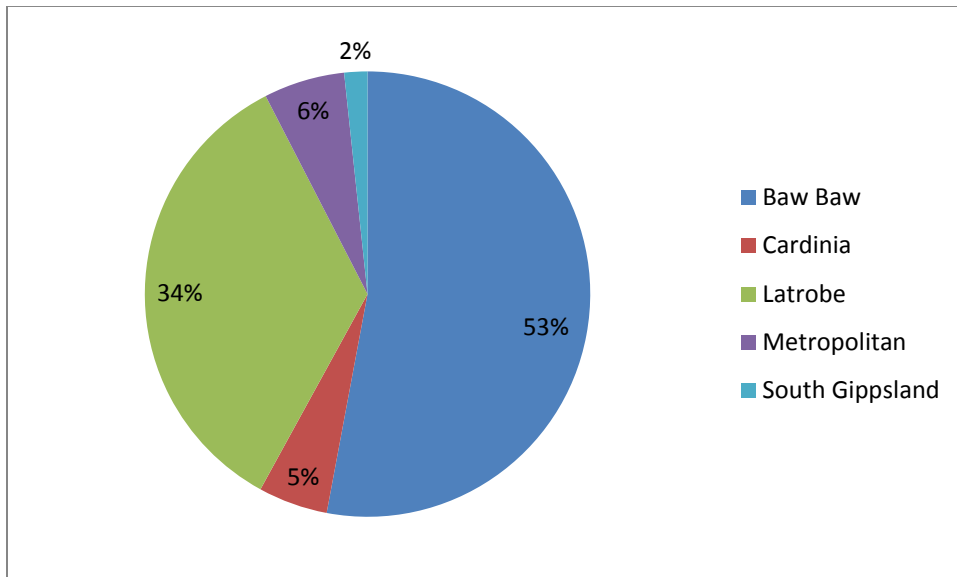


Figure 3: Residential region of 119 SHY participants

Pre-intervention survey

Table A shows results of the pre-intervention survey. Forty-one individuals completed the pre-intervention survey. The median age of participants was 20 years and 64% were female. All but one were Australian-born, and none reported being Indigenous.

Compared to all registrants, there was no significant difference in survey participation by gender ($p=0.82$) or age ($p=0.76$).

Just 17 (41%) participants had ever had an STI test. Ten people reported where they had had an STI test in the past six months; 8 were at a GP or doctor, one at 'detox' and one at headspace. Blood tests were the most commonly reported 'STI' test none reported ever having had a urine test for STI. While most participants knew that people infected with STI don't always have symptoms (73%) and that chlamydia can cause infertility (68%), just 1 person knew that the Pap smear could not diagnose all STIs, and only 44% knew that gonorrhoea, chlamydia, and syphilis were treatable.

Many participants reported behaviours that put them at risk of STI, for example 27% reported multiple partners in the previous year. Inconsistent or non-use of condoms was reported by 57% of the 28 young people who had had a regular partner, 45% of the 22 young people with a casual partner, and 55% of the 11 young people with a new partner.

SHY pre-intervention survey participants reported slightly different prevalences of sexual behaviours compared to 15 to 25 year olds surveyed at the 2014 Big Day Out (BDO) music festival. SHY survey participants were less likely to have visited a GP in the past 12 months but more likely to have ever had an STI test than BDO participants. Knowledge of STIs was similar in the two samples, except that only 1 SHY participant knew that the Pap smear did not detect all STIs, compared to 28% of BDO participants. SHY participants were less likely to report no sexual partners in the past year but also less likely to report a casual partner.

Post-intervention survey

Twenty participants (17% of those enrolled in SHY) completed the post-intervention survey. Participant demographics and sexual behaviours are shown in Table B. The median age was 22 years (IQR 18-24). Four participants completed both surveys (as determined through matching their movie star names).

There were no significant differences in STI testing or sexual risk behaviours between the pre- and post-intervention surveys. Participants in the post-intervention survey were less likely than those in the

baseline survey to report discussing sexual health with their doctor recently (25% vs 39%). Knowledge of sexual health was slightly higher in the post-intervention survey; however, the only statement for which this difference was statistically significant was ‘gonorrhoea, syphilis and chlamydia can be treated with antibiotics’ which was answered correctly by 44% in the baseline survey and 80% in the post-intervention survey.

Figure 4 shows participants’ attitudes to opinion statements regarding the messages. Participants mostly agreed that they learnt something from the messages and that the messages were interesting or entertaining. Only one participant indicated that they found the messages annoying. This one participant was also the only person who indicated that if the project were to continue they would not want to receive further messages. Fourteen (70%) indicated that they would want to receive additional messages and five did not answer. Fourteen (70%) also stated that they showed message(s) to friend(s) and one also posted messages on social media.

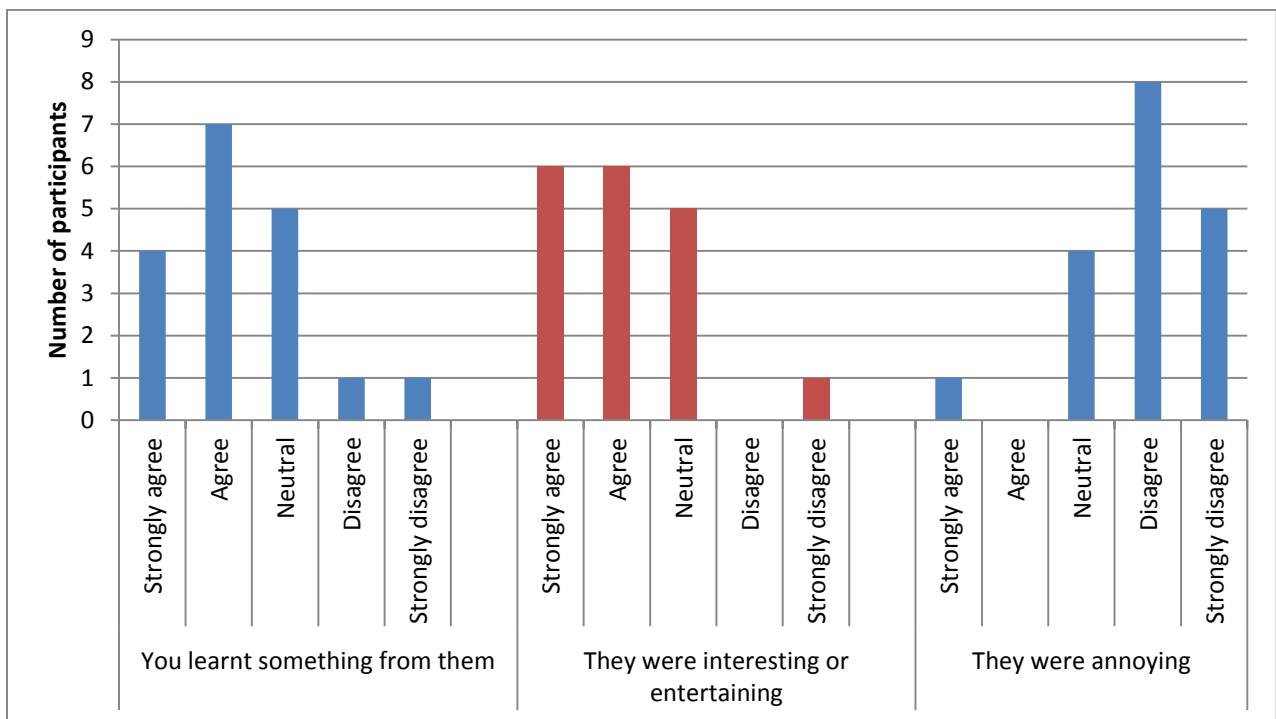


Figure 4: Opinions of SHY messages in post intervention survey

Focus groups

Focus group data were not available for analysis. Discussions were not recorded, and following change of staff, no results of these were available for analysis.

Discussion

Was SHY a Success?

There are many ways of measuring a project's success, including its acceptability, reach, and effectiveness. The SHY project was successful in some of these measures, yet had limited success in others.

Acceptability. Among the 20 participants who completed the follow up survey, acceptability of the messages was very high. The majority found them to be interesting and not annoying and all but one would have liked to continue to receive them. This echoes the acceptability among young people during the original message testing and development done by the Burnet Institute in 2006-2008 (Gold, Lim et al. 2010, Lim, Hocking et al. 2012). However, these results should be interpreted with caution, given that only 17% of SHY enrollees participated in the follow up survey. Those who liked the messages may have been more likely to complete the follow up survey. Acceptability of the intervention can also be inferred by its reach (i.e. the number of people enrolling in the intervention), which in this project was low.

Reach. Reach is an indicator of a project's popularity and uptake; i.e. the number of users. In 13 months of operation, only 119 young people registered to receive SHY project messages, just 2% of the initial goal of 5,100. The low reach achieved by SHY was partly due to the failure to engage schools effectively and partly due to the low success rate of other recruitment strategies. Problems encountered in attracting young people to SHY are discussed below in the limitations section. The low reach of the project and the low participation rates in the evaluation surveys meant that planned analysis to assess the impact of the project could not be undertaken.

Effectiveness. Effectiveness measures the influence of an intervention on changing the knowledge and behaviour of participants in a project. Impact measures the influence of an intervention on changing the knowledge and behaviour of the population in general. For a project to have an impact, it must be effective, but also needs to reach a large proportion of the population. Due to limited reach, the impact of the SHY project was not assessed, but was assumed to be minor. Analysis of the survey data was possible to determine the effectiveness of the project.

No significant changes in the prevalence of sexual risk behaviours were seen in the post-intervention survey, compared to the pre-intervention survey. Correct response to four of the five knowledge

questions increased between the pre and post survey; including a significant increase in the proportion aware that gonorrhoea, chlamydia, and syphilis were treatable with antibiotics.

These data should be interpreted with caution due to the very low response rates and the small number of participants leading to lack of statistical power. We cannot also determine whether the SHY project was the cause of changes over time because, a) the participants in the post survey were not the same as those in the pre survey – it may be possible that those participating in the post survey were more knowledgeable to begin with – and b) the evaluation methods use do not account for other influences on participants during the project period – it is possible that the participants were also exposed to other education programs (e.g. school sexuality education) at the same time. However, strong evidence does exist from other trials that these messages do result in changes to sexual health knowledge and testing rates, so it is likely that the same result would have been observed in this project if a greater number of young people had participated.

Limitations

Timelines

The completion of an ethics application was not considered in the initial project brief. Once the decision was made that an ethics approval was required for school recruitment, the project timelines needed to be adjusted to allow for the several months of preparing, submitting and waiting for an outcome from the ethics committee. Phase 2 recruitment was due to begin in November 2012, and ethics approval was not given until April 2013.

With the various barriers and challenges throughout the planning and implementation of the project, the project timelines had to be adjusted significantly. Flexibility of the timelines was crucial in allowing the project to meet its outcomes.

Engaging schools

The Department of Education Research and Analysis application form was required before contacting schools, which was a lengthy process similar to the ethics application process. This application was submitted in January 2013 and approval was given in March 2013.

An application to the Catholic Education Office was submitted and approval was not granted, therefore the project was not able to be run in Catholic schools across the catchment. There was no response

from any Independent schools. This resulted in a total of seven potential schools being excluded from the project.

Principals proved to be very difficult to arrange meetings with. Attempts to contact principals began in March 2013, with the first meeting with a principal occurring in late April. Of the 10 public schools contacted, only five principals were supportive of the research after the first meeting. Of these five schools who were initially supportive, we were successful in gaining presentations to students in only two schools. These presentations occurred up to four months after the initial meeting with the school principal. This delay was due to a number of factors including the workload of the principal and school staff, various school activities, school holidays and exams.

Of the two schools who allowed presentations to students, one school pulled out of the project due to poor response from students. In the other school, only one student returned their parental consent form. The ethics committee and DEECD required all students to get consent forms signed by parents and this resulted in poor student participation. Feedback from these schools was that it is extremely difficult to get students to return any forms if the activity is not mandatory.

Other recruitment settings

In the initial project run by the Burnet Institute, recruitment occurred at the Big Day Out festival in Melbourne. At this festival, over 1000 people were recruited in one day. One of the key challenges with the SHY project was identifying suitable recruitment settings, as there is no equivalent event in Gippsland. Recruitment occurred at one shopping centre, a show, Battle of the Bands, and another music event. These events were relatively ineffective with poor recruitment rates in these settings. Young people at the shopping centre were mainly accompanied by parents and therefore not receptive to discussing sexual health. Battle of the Bands and the other music event did not have good recruitment outcomes as young people were focusing on the music. The show was not successful due to the location of our stall; we were away from the rides and activities and therefore didn't have many young people in the area of our stall. Other recruitment opportunities were cancelled due to weather conditions (rain, storms or heat). Other requests to recruit at certain settings were denied, with one agency stating that the 'project did not align with their community values'.

Peer recruitment (inviting friends) also did not seem to be a successful strategy in this project. While many of the post-intervention survey participants did report showing the messages to friends, this was

clearly not sufficient to result in a substantial number of young people registering with the project. Only 1 of 20 reported sharing a message via social media. Recent emerging research suggests that young people may not be willing to share sexual health content via social media. Young people perceived that doing so may result in stigma and bullying, and may go against their carefully presented online personas (Byron, Albury et al. 2013). Young people also indicate that they are more comfortable with accessing sexual health information through more private means such as websites, rather than via social media or their mobile phones (Lim, Vella et al. 2014).

Evaluation

Robust impact evaluation was not possible due to delay in data availability and not relevant due to low enrollment. Further data on acceptability and effectiveness could have been gleaned from focus group discussions. However, these discussions were not recorded, and following change of staff, no results of these were available for analysis.

Recommendations

Recruitment

Other SMS based projects used music festivals (Gold, Lim et al. 2010, Lim, Hocking et al. 2012), street intercept (Buis, Hirzel et al. 2013, Lee, Koopmeiners et al. 2014), through schools and youth health centres (Sheoran, Braun et al. 2014) and SMS advertising lists (Gold, Aitken et al. 2011) to recruit participants. These projects have been successful in reaching large numbers of their target groups, in some cases several thousand people. SHY utilised many of these techniques, however, none stood out as being particularly successful.

It cannot be definitely stated why SHY was not successful in recruitment. A number of issues and obstacles were faced, as discussed in the 'limitations' section. One key factor restricting its success was likely the limited resources (financial and human) devoted to the project. The success of the Burnet's recruitment at the Big Day Out festival can be partly attributed to the large number of staff (20-25 people) present at recruitment. Furthermore, potential participants were not directly invited to sign up for the SMS project; they were invited to complete a survey. Providing something clear and immediate to engage with might have been a 'foot in the door' approach to attracting participants. The large number of staff and young people completing surveys created a large crowd which further attracted interest.

Given that the content of the SMS intervention had been previously created and was known to be effective, the primary focus of the SHY project should have been on advertising. While this was done to some extent, increased funding and staffing targeted solely on advertising might have improved reach and therefore improved the impact of SHY.

Partnerships

Stronger engagement of key partners might have assisted in this study. headspace was the most commonly stated way in which participants heard about SHY. Working with other community centres or clinics in Gippsland may have yielded further recruits. Still, despite the direct involvement of headspace in the project, only 24 people reported engaging with SHY via headspace. This suggests that either the majority of headspace clients were not interested in the project, or that SHY was not promoted widely among clients.

It was intended that schools would be the major partner for SHY in identifying enrollees. Many obstacles and lack of interest from schools (discussed above) meant that it was not possible to recruit young people from schools. Requiring written parental consent was a major hindrance to the project and future work should aim to avoid this step if possible. Sexual health is only one of many diverse and competing priorities that schools face and engaging schools in sexual health promotion and research can be extremely difficult. Despite the importance of this issue, there has been limited research into most effective strategies for engaging schools.

Future work of this sort could also consider partnership with mobile advertising or telecommunications companies. The ability to utilize or purchase an existing subscriber list would be hugely beneficial and efficient. However, this strategy raises ethical issues of privacy and consent.

Evaluation

The evaluation of the SHY project was limited due to the small number of participants in the program. Further analysis of population level service and testing uptake was planned, but was deemed irrelevant given the low reach of SHY.

It is still not known whether uptake of SHY was low because people did not know about it or whether they were aware of it and elected not to participate. This could have been elucidated through conducting a general population coverage survey. Through recruiting large numbers of young people in

the target area, further information could have been collected regarding the awareness of SHY and interest in the project. This type of research, however, is extremely costly and time consuming and was not possible in this case. Furthermore, this methodology might not be appropriate if awareness of SHY was extremely low.

Finally, the loss of focus group results meant that potentially useful data could not be utilised.

Conclusion

In summary, the SHY project demonstrated limited success in engaging with young people via text messaging for sexual health. The limited data collected showed that among those who did participate, there was potential for improvements in sexual health knowledge, however, the low uptake of the system meant that the impact was very minor. Future SMS-based projects need to focus on promotion of the project to young people, possibly through engagement of commercial or school partners.

Appendices

Table A: Sexual health and behaviour in the baseline survey, compared to the Big Day Out cohort

	SHY survey		BDO survey		
	N=41	%	N=899	%	p
Discussed sexual health with a GP					
No GP visit in past 3 months	17	41	230	26	<0.01
Visited GP, but didn't discuss SH	5	12	303	35	
Discussed sexual health	16	39	342	39	
Last STI test					
Never had one	22	54	635	71	0.04
Past 3 months	3	7	81	9	
3-24 months ago	11	27	157	18	
More than 2 years ago	3	7	19	2	
Correct answer					
People infected with STIs often don't have any symptoms	30	73	581	65	0.26
Chlamydia can be diagnosed by a urine test	26	63	460	51	0.13
Gono, syphilis and chlamydia can be treated with antibiotics	18	44	417	46	0.76
The pap smear can be used to diagnose all the main STIs	1	2	249	28	<0.01
Chlamydia can make women infertile	28	68	523	58	0.20
Lifetime sexual partners					
0	6	15	212	26	0.12
1-5	22	54	327	40	
6+	12	29	286	35	
Same sex partners in the past 12 months					
None	32	78	733	82	0.27
One or more	1	2	68	8	
Opposite sex partners in the past 12 months					
None	7	17	297	33	<0.01
One	21	51	320	36	
Two or more	11	27	282	31	

	SHY survey		BDO survey		p
	N=41	%	N=899	%	
Condom use with regular partners					
No regular partners	5	12	129	21	0.62
Always use condom	12	29	182	30	
Inconsistent condom use	16	39	291	48	
Condom use with casual partners					
No casual partners	21	51	245	41	<0.01
Always use condom	5	12	182	31	
Inconsistent condom use	4	10	169	28	
Condom use with new partners					
No new partners	19	46	293	49	0.26
Always use condom	5	12	174	29	
Inconsistent condom use	6	15	126	21	

Table B: Sexual health and behaviour in the baseline and post-intervention questionnaires

	Pre survey		Post survey		p
	N=41	%	N=20	%	
Discussed sexual health with a GP					
No GP visit in past 3 months	17	41	4	20	0.01
Visited GP, but didn't discuss SH	5	12	9	45	
Discussed sexual health	16	39	5	25	
Last STI test					
Never had one	22	54	9	45	0.56
Past 3 months	3	7	3	15	
3-24 months ago	11	27	4	20	
More than 2 years ago	3	7	3	15	
Correct answer					
People infected with STIs often don't have any symptoms	30	73	16	80	0.56
Chlamydia can be diagnosed by a urine test	26	63	10	50	0.32
Gono, syphilis and chlamydia can be treated with antibiotics	18	44	16	80	0.01
The pap smear can be used to diagnose all the main STIs	1	2	2	10	0.25
Chlamydia can make women infertile	28	68	17	85	0.16
Lifetime sexual partners					
0	6	15	0	0	0.22
1-5	22	54	10	50	
6+	12	29	7	35	
Same sex partners in the past 12 months					
None	32	78	17	85	0.66
One or more	1	2	1	5	
Opposite sex partners in the past 12 months					
None	7	17	1	5	0.43
One	21	51	12	60	
Two or more	11	27	5	25	

	Pre survey		Post survey		p
	N=41	%	N=20	%	
Condom use with regular partners					
No regular partners	5	12	2	10	0.24
Always use condom	12	29	3	15	
Inconsistent condom use	16	39	13	65	
Condom use with casual partners					
No casual partners	21	51	12	60	0.95
Always use condom	5	12	3	15	
Inconsistent condom use	4	10	3	15	
Condom use with new partners					
No new partners	19	46	12	60	0.49
Always use condom	5	12	1	5	
Inconsistent condom use	6	15	5	25	

References

- ABS (2010). General Social Survey: Summary Results, Australia: 4159.0. Canberra, Author.
- Ambert, A. (2006). *One Parent Families: Characteristics, Causes, Consequences and Issues*. Ontario, The Vanier Institute of the Family.
- Australian Institute of Health and Welfare (2007). *Young Australians: their health and wellbeing 2007*. Canberra, AIHW.
- Buis, L. R., L. Hirzel, S. A. Turske, T. R. Des Jardins, H. Yarandi and P. Bondurant (2013). "Use of a text message program to raise type 2 diabetes risk awareness and promote health behavior change (part I): assessment of participant reach and adoption." J Med Internet Res **15**(12): e281.
- Byron, P., K. Albury and C. Evers (2013). "'It would be weird to have that on Facebook': young people's use of social media and the risk of sharing sexual health information." Reprod Health Matters **21**(41): 35-44.
- Cole-Lewis, H. (2010). "Text messaging as a tool for behavior change in disease prevention and management." Epidemiol Rev **32**: 56-69.
- Communicable Diseases Unit Public Health Branch Victorian Notifiable Infectious Diseases Database. Department of Health.
- Department of Health (2010). Victorian Perinatal Data Collection Population by Age and Sex
- Fjeldsoe, B. S. (2009). "Behavior change interventions delivered by mobile telephone short-message service." Am J Prev Med **36**(2): 165-173.
- Free, C., G. Phillips, L. Watson, L. Galli, L. Felix, P. Edwards, V. Patel and A. Haines (2013). "The effectiveness of mobile-health technologies to improve health care service delivery processes: a systematic review and meta-analysis." PLoS Med **10**(1): e1001363.
- Frost & Sullivan (2012). Australian Mobile Device Usage Trends. Sydney, Author.
- Gippsland Women's Health Service (2008). *Gippsland Sexual and Reproductive Health Strategy 2009 - 2012 Sale*.
- Gold, J., C. K. Aitken, H. G. Dixon, M. S. Lim, M. Gouillou, T. Spelman, M. Wakefield and M. E. Hellard (2011). "A randomised controlled trial using mobile advertising to promote safer sex and sun safety to young people." Health Educ Res **26**(5): 782-794.
- Gold, J., M. S. Lim, M. E. Hellard, J. S. Hocking and L. Keogh (2010). "What's in a message? Delivering sexual health promotion to young people in Australia via text messaging." BMC Public Health **10**: 792.
- Gold, J., M. S. Lim, J. S. Hocking, L. A. Keogh, T. Spelman and M. E. Hellard (2011). "Determining the impact of text messaging for sexual health promotion to young people." Sex Transm Dis **38**(4): 247-252.
- Gold, J., M. S. C. Lim, M. E. Hellard, J. S. Hocking and L. Keogh (2010). "What's in a message? Delivering sexual health promotion to young people in Australia via text messaging." BMC Public Health (10): 11.
- Lee, H. Y., J. S. Koopmeiners, T. G. Rhee, V. H. Raveis and J. S. Ahluwalia (2014). "Mobile phone text messaging intervention for cervical cancer screening: changes in knowledge and behavior pre-post intervention." J Med Internet Res **16**(8): e196.

- Lim, M. S., A. Bowring, J. Gold and M. E. Hellard (2011). "What's your "porn star" name? A novel method of identifying research participants." Sex Transm Dis **38**(2): 150-151.
- Lim, M. S., A. L. Bowring, J. Gold, C. K. Aitken and M. E. Hellard (2012). "Trends in sexual behavior, testing, and knowledge in young people; 2006-2011." Sex Transm Dis **39**(11): 831-834.
- Lim, M. S., J. S. Hocking, C. K. Aitken, C. K. Fairley, L. Jordan, J. A. Lewis and M. E. Hellard (2012). "Impact of text and email messaging on the sexual health of young people: a randomised controlled trial." J Epidemiol Community Health **66**(1): 69-74.
- Lim, M. S., A. Vella, R. Sacks-Davis and M. E. Hellard (2014). "Young people's comfort receiving sexual health information via social media and other sources." Int J STD AIDS **25**(14): 1003-1008.
- Lim, M. S. C., J. S. Hocking, C. K. Aitken, C. K. Fairley, L. Jordan, J. A. Lewis and M. E. Hellard (2011). "Impact of text and email messaging on the sexual health of young people: a randomised controlled trial." Epidemiology Community Health.
- O'Rourke, K. (2008). "Time for a National Sexual and Reproductive Health Strategy for Australia: Background Paper February 2008." Retrieved 4 December 2011, from <http://www.fpwa.org.au/resources/srhbackground.pdf>.
- Sheoran, B., R. A. Braun, J. Gaarde and D. K. Levine (2014). "The Hookup: Collaborative Evaluation of a Youth Sexual Health Program Using Short Message Service (SMS) Technology " J Med Internet Res.
- United Nations Children's Fund (2001). A league table of teenage births in rich nations. Innocenti Report Card no.3. Florence, UNICEF Innocenti Research Centre.
- WebMD. (2006). "Chlamydia." Retrieved 4 December, 2011, from www.webmd.com/content/article/46/2953_512.htm.