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Horizon Scanning Technology Prioritising Summary

Quit onQ SMS for smoking cessation support for individuals

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PRIORITISING SUMMARY

REGISTER ID: 000497

NAME OF TECHNOLOGY: QUIT ONQ SMS FOR SMOKING CESSATION

PURPOSE AND TARGET GROUP: CESSATION SUPPORT FOR INDIVIDUALS
WANTING TO STOP SMOKING

STAGE OF DEVELOPMENT (IN AUSTRALIA):

- | | |
|--|---|
| <input type="checkbox"/> Yet to emerge | <input type="checkbox"/> Established |
| <input type="checkbox"/> Experimental | <input type="checkbox"/> Established <i>but</i> changed indication or modification of technique |
| <input type="checkbox"/> Investigational | <input type="checkbox"/> Should be taken out of use |
| <input checked="" type="checkbox"/> Nearly established | |

AUSTRALIAN THERAPEUTIC GOODS ADMINISTRATION APPROVAL

- Yes
- No
- Not applicable

INTERNATIONAL UTILISATION:

COUNTRY	LEVEL OF USE		
	Trials Underway or Completed	Limited Use	Widely Diffused
New Zealand	✓	✓	
UK	✓	✓	
USA		✓	
Norway	✓		
Germany	✓		

IMPACT SUMMARY:

QuitSA provides Quit onQ with the aim of helping smokers adhere to smoking cessation through the use of mobile phone SMS (short message service). Services that use mobile phone technology to provide quitting smokers with supportive text messages have emerged in the UK, USA, Europe and New Zealand, however, Quit onQ is the first Australian service. Developed with the help of The Cancer Council Victoria, the service is currently being trialled for 12 months and is available to all smokers with access to a mobile phone. Smokers can register (as of July 2010) to receive SMS, free of charge, through calling the South Australian Quitline or via the QuitSA website. A small-scale trial has also begun in Tasmania.

BACKGROUND

The adverse health effects of tobacco smoking have been established for many years. Causal relationships between smoking and multiple chronic medical conditions include a wide range of cancers and diseases of the cardiovascular, respiratory and digestive systems. The effects of environmental (passive) smoke on the health of others have also been widely documented (MCDS 2005).

Tobacco dependence is a chronic condition that may require many attempts to overcome. The majority of smokers that attempt to quit during the course of any given year fail to do so. Only three to five per cent of smokers succeed in quitting each year (AIHW 2008a).

Prevalence of smoking is highest among lower socioeconomic groups. Higher rates of smoking show clear relationships with factors such as lower household income, higher unemployment, and lower levels of education. There is also an association between young people and smoking, with the greatest number of smokers being aged 20-29 years (AIHW 2008a; MCDS 2005). Given this, important considerations for an effective smoking cessation intervention are that it is affordable to those who are trying to quit and can successfully appeal to key target groups. The use of mobile phones is widespread, and for smokers who already have access to a phone, the service is free. Given mobile phones have become a major mode of preferred communication among younger age groups, it is anticipated that Quit onQ and other SMS-based interventions for smoking cessation are particularly marketable within these population niches.

CLINICAL NEED AND BURDEN OF DISEASE

Tobacco smoking is the single largest cause of preventable mortality and morbidity in Australia. In 2004-2005, it was estimated to account for 7.8 per cent of the total disease burden (10% vs 6% among males and females, respectively). Health care costs and loss-of-productivity costs due to tobacco were estimated at \$12 billion during 2004-2005 (AIHW 2008a).

Most recently available reports on drug use in Australia indicate that between 1991 and 2004 the proportion of the Australians who smoked on a daily basis dropped from 24 per cent to 17 per cent, with 53 per cent of the population having never smoked and 26 per cent regarded as ex-smokers (AIHW 2007). Smoking remains the foremost identifiable risk factor for disease and disability (Figure 1) (AIHW 2008). In 2006, the Australian Bureau of Statistics reported that in 1998, 15 per cent (19,000) of all deaths were attributable to tobacco smoking and 40 per cent of tobacco related deaths were due to cancer (ABS 2006). During 2005 there were an estimated 11,308 new cases of cancer and 8,155 deaths from cancer attributed to smoking, which represented 11 per cent of cases and nearly 21 per cent of cancer deaths (AIHW 2008b).

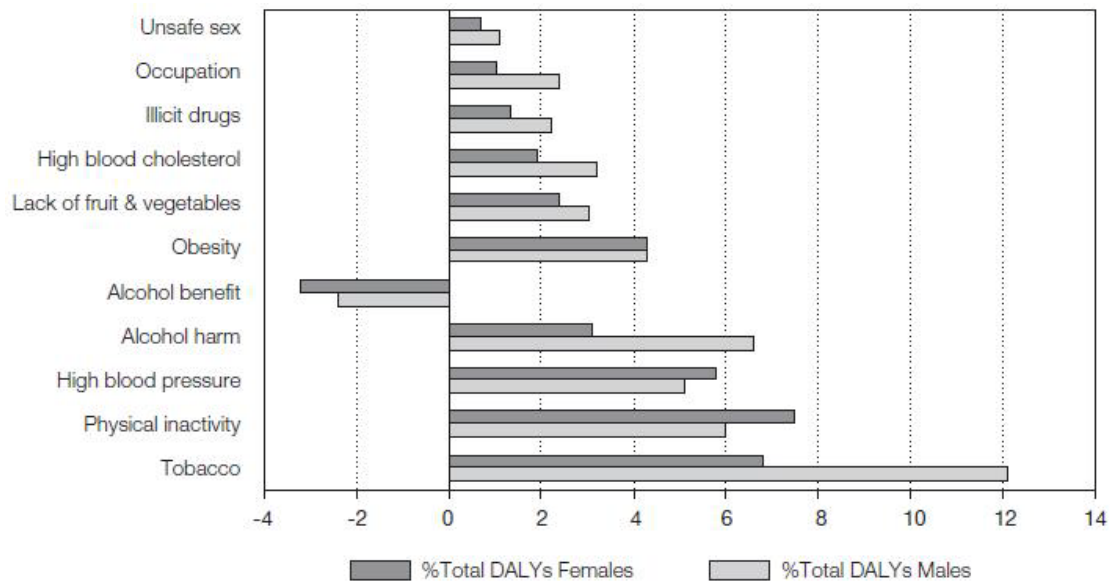


Figure 1 Burden of disease in Australia attributable to 10 major risk factors (AIHW 2008)

In 2008, 23 per cent of New Zealanders were current smokers. Smoking accounts for an estimated 4500-5000 New Zealand deaths per year, including deaths due to environmental smoke exposure. One third of these deaths are thought to occur among middle aged persons, which conveys a general sense of the premature mortality (and underlying morbidity burden) attributable to smoking in New Zealand (MoH 2009).

DIFFUSION

QuitSA currently provides the Quit onQ SMS service on a free-to-user basis. Further information can be found at the Quit onQ website (<http://quitonq.quitsa.org.au/>).

COMPARATORS

Well established interventions for smoking cessation include: face-to-face services provided via health professionals, social workers, and community health workers; telephone-based quitlines that require the smoker to contact a designated call-centre with appropriately trained operators; print-based self-help materials; nicotine replacement therapy (NRT), using gum or patches, and drugs such as Zyban (bupropion). While face-to-face interventions and quitline services have been demonstrated as effective, they are also resource intensive. The Pharmaceutical Benefits Advisory Committee considers bupropion, varenicline and nicotine replacement transdermal patches are cost effective interventions that improve abstinence rate as part of a comprehensive support and counselling program. Conversely, while print-based materials are much less costly than other aids to smoking cessation, at best they have found to have very limited effectiveness (Lancaster & Stead 2005b; Lancaster & Stead 2005a; Stead et al 2008; Stead et al 2006).

SAFETY AND EFFECTIVENESS ISSUES

A Cochrane review investigated the effectiveness of mobile phone-based interventions to help smokers quit (Whittaker et al 2009) (level I intervention evidence). The selection criteria included studies that examined any type of mobile phone-based intervention and those with smokers of any age who wanted to quit. The primary outcome was smoking abstinence at six months or longer after commencement of the intervention. Both sustained and point prevalence measures of abstinence, and self-reported and biochemically verified smoking status were considered. Point prevalence is generally defined as not smoking one or more days prior to the point of follow-up (Hughes et al 2010). The studies included in Whittaker review defined point prevalence as not smoking for seven days prior to follow-up.

Of the 103 papers identified by the literature search for the review, many were found to be irrelevant due to the use of search terms with multiple meanings (e.g. cell, txt, pxt, sms, mms) and were immediately excluded, leaving 15 papers. A further 10 papers were excluded on the basis of study design (not randomised nor quasi-randomised trials) or insufficient follow-up time (<6 months), leaving a total of five papers that described four trials. It should be noted that two of the included trials conducted by the same authors incorporated applications via internet and email in addition to mobile phone services as part of the intervention, and therefore did not strictly meet the selection criteria of the review. However, these were included for analysis given the authors of the trials placed equal emphasis on the mobile phone-based component of their intervention, which was similar to other included studies. The authors of the review undertook separate analyses for the studies in which interventions were exclusively by mobile phone and those in which interventions were equally internet/email and mobile phone-based. However, it was reported that combining all studies (no data provided) for short-term point prevalence measures of abstinence produced similar results as the analyses separated by intervention (see Table 2 and Table 3). Long-term outcome measures were associated with substantial heterogeneity ($I^2=77\%$)¹, and therefore, a meta-analysis was not undertaken for these measures (Whittaker et al 2009).

Results, analysed on an intention-to-treat basis, of studies which considered mobile phone-only interventions are shown in Table 1. One study did not indicate a significant difference in self-reported point prevalence abstinence between the intervention and control groups. However, self-reported prolonged abstinence (allowing ≤ 3 relapses within 6 months) showed a three per cent difference between the intervention (7.5%) and control groups (4.6%) ($p=0.01$). Study two was a pilot study and not sufficiently powered to provide statistically significant results.

¹ I^2 (“I-squared”) is a robust measure of heterogeneity. An I^2 statistic exceeding 50 per cent is deemed sufficient to question whether combining studies in a meta-analysis is appropriate.

Table 1 Self-reported abstinence for included studies examining mobile phone-only interventions

	Overall point prevalence abstinence (%)		Prolonged abstinence (%)	
	Intervention	Control	Intervention	Control
Study 1	216/852 (25.4)	202/853 (23.7)	64/852 (7.5)	39/853 (4.6)
Study 2*	15/102 (14.7)	19/98 (19.4)	15/102 (14.7)	19/98 (19.4)

*NB: Point prevalence and prolonged abstinence measures were both taken at six months. Given point prevalence abstinence refers to not smoking one or more days prior to the follow-up, it is possible that this measure will coincide with prolonged abstinence when both measures are self-reported (Hughes et al 2010).

Pooled data for self-reported point prevalence abstinence are shown in Table 2. These data indicate that mobile phone interventions increase self-reported point prevalence abstinence by a factor of two compared with control programmes.

Table 2 Meta-analysis of self-reported point prevalence for included studies examining mobile phone-only interventions

	Intervention		Control		Weight, %	Risk ratio [95% CI]
	Events	Total	Events	Total		
Study 1	26	102	12	98	10.1	2.08 [1.11, 3.89]
Study 2	239	852	109	853	89.9	2.20 [1.79, 2.70]
Total [95% CI]		954		951	100	2.18 [1.80, 2.65]
Total events	265		121			

Heterogeneity: $I^2=0\%$, Test for overall effect: $p<0.0001$

The two studies that assessed mobile phone and internet/email-based interventions presented point prevalence abstinence over 12 months (self-reported at 1 week, 1, 3, 6 and 12 months), which was two times greater among those receiving the intervention than among the control groups (Table 3).

Table 3 Meta-analysis of self-reported point prevalence for included studies examining mobile phone and internet/email based interventions

	Intervention		Control		Weight, %	Risk ratio [95% CI]
	Events	Total	Events	Total		
Study 3	44	200	26	200	72.2	1.69 [1.09, 2.64]
Study 4	29	148	10	148	27.8	2.90 [1.47, 5.73]
Total [95% CI]		348		348	100	2.03 [1.40, 2.94]
Total events	73		36			

Heterogeneity: $I^2=41\%$, Test for overall effect: $p=0.0002$

In terms of biochemical verification of abstinence, Whittaker and colleagues reported that data were insufficient to pool across included studies. Study 1 attempted to verify

smoking status in a random sample of 125 (35.9%) of subjects who reported quitting at six weeks, while study 2 attempted verification of all self-reported quitters at six months (38 subjects). Both these studies used salivary cotinine to verify smoking status. Despite small sample sizes, over-reporting of smoking cessation was evident among both intervention and control groups Table 4. Among study 1 participants who were invited to provide a cotinine sample, 83 were in the intervention group and 42 were in the control group; 31 (37.3%) and 18 (42.9%) provided samples, respectively. Of those in the intervention and control groups who did provide samples, 17 (54.4%) and 6 (33.3%) were respectively verified to have quit. In study 2, there were 18 self-reported quitters in the intervention group and 20 in the control group of whom 15 (83.3%) and 15 (75%) provided cotinine samples, respectively. Of those in the intervention and control groups who did provide samples, eight (53.3%) and six (40%) were respectively verified to have quit. These results show that there was greater over-reporting of having quit among the control groups compared to the intervention groups.

Table 4 Biochemical verification of abstinence amongst self-reported quitters invited to provide a cotinine sample

	Invited to sampling, n	Provided sample, n (%)	Verified quit status, n (%)
Study 1			
Intervention group	83	31 (37.3)	17 (54.4)
Control group	42	18 (42.9)	6 (33.3)
Study 2			
Intervention group	18	15 (83.3)	8 (53.3)
Control group	20	15 (75)	6 (40)

The body of evidence examined by Whittaker et al (2009) indicates that to date, no randomised studies of smoking cessation services administered solely by mobile phone have demonstrated long-term benefits. However, programmes that combine mobile phone and internet/email based services have shown improvement in self-reported abstinence over 12 months.

During the preparation of this summary, it was found that one of the papers excluded by Whittaker and colleagues (Haug et al 2008) on the basis of non-randomised design was a feasibility study for a randomised trial which was published the following year under the same title (Haug et al 2009) (level II intervention evidence). The trial assessed the acceptability of a smoking cessation intervention for young adults in Germany using SMS support and the intervention's short term effectiveness. The investigators screened 575 visitors to a University cafeteria for smoking status and their use of text messaging, of whom 194 were found to be eligible. Of the 194 eligible, 174 (90%) gave consent to participate and were randomised to one of three study groups: (1) control group with no intervention; (2) intervention group with one weekly SMS; (3) intervention group with three weekly SMS. In groups 2 and 3, individualised messages were sent based on data from baseline assessment and weekly SMS updates sent by participants which were categorised according stages of

behaviour change, self-efficacy and decisional balance according to the transtheoretical model². The study groups were followed over three months. Results indicated that acceptance of the program did not differ between intervention groups and no significant differences in smoking variables were observed between any of study groups. While participation and retention rates were high, supporting the hypothesis that SMS-based smoking cessation interventions appeal to young adults, the authors concluded that longer follow-up and larger samples would be needed to provide evidence of effectiveness. Additionally, the high participation and retention rates may be a reflection of the higher educational levels of the young adults in this study, and therefore the observed appeal cannot be generalised to young adults with lower levels of education, or to other age groups. Relative to other trials in the literature, the text messages sent to the intervention groups were infrequent, and this may be another contributor to the inconclusive results.

COST IMPACT

It has been estimated that the gross cost of treating smoking related disease in Australia exceeds \$2 billion per annum. However, this is almost certainly an underestimate as this figure does not include difficult to quantify costs such as ambulance and allied health services and domiciliary care costs attributable to tobacco use. Furthermore, this estimate takes into account only conditions for which smoking-related risk has been firmly established, thus omitting the effect of a variety of illnesses and disabilities that are adversely affected by smoking. It has been found that on average, the cost of treating illness among smokers is more costly than treating non-smokers and this is believed to be a result of factors such as higher complication rates and slower wound healing observed among individuals who smoke (MCDS 2005).

Thus the true costs of treating smoking related illness are hard to quantify, but without doubt represent a heavy burden on the health system and also carry a wider economic impact through substantial loss of productivity. Services that assist people to quit smoking offer means to reduce these costs, and the use of SMS for smoking cessation support may provide a cost effective intervention in the effort to further reduce smoking rates. No cost effectiveness studies investigating the use of SMS in smoking cessation programs were located during the literature search for this summary.

ETHICAL, CULTURAL OR RELIGIOUS CONSIDERATIONS

No issues were identified/raised in the sources examined.

² The transtheoretical model in health psychology assesses an individual's readiness to act on a new, healthier behaviour. The processes or stages of change involve: (1) 'precontemplation', (2) 'contemplation', (3) 'preparation' and (4) 'action'. Adapted specifically to a smoking cessation context, Haug et al (2009) designated the stages 1, 2, 3 and 4 to correspond respectively with: 'no intention to quit smoking', 'intention to quit smoking within the next six months', 'planning to quit smoking in the next 4 weeks, and 'quitted smoking in the past 6 months'.

OTHER ISSUES

No issues were identified/raised in the sources examined.

SUMMARY OF FINDINGS

As yet, there is no evidence to support long-term effectiveness of smoking cessation interventions based *solely* on mobile phone interventions, much less SMS alone. However, high-level evidence for the 12-month effectiveness of broader interventions incorporating multimedia through internet/email with mobile phone applications has been published.

HEALTHPACT ASSESSMENT:

Access to programs such as the Quit onQ SMS service is provided free to smokers and is independent of location, and therefore offers an affordable option to reduce smoking prevalence. Based on the high level of evidence which appears likely to expand in further support of mobile phone based smoking cessation, the present availability of this technology within Australia, the potential for widespread clinical impact, and fiscal costs that are unlikely to exceed more traditional interventions, it is reasonable to expect that the programs such as Quit onQ will continue to diffuse. Therefore no further research on behalf of HealthPACT is warranted.

NUMBER OF INCLUDED STUDIES

Total number of studies	2
Level I intervention evidence	1
Level II intervention evidence	1

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SEARCH CRITERIA TO BE USED:

Smoking cessation
SMS
Mobile/cell phone
Tobacco, cigarettes