

Reducing Tobacco Use and Secondhand Smoke Exposure: Quitline Interventions

Summary Evidence Table - Economic Evidence

Offering Medication (NRT) through Quitlines

Study	Study and Population Characteristics	Intervention Description	Effect Size	Program Costs (\$2010)	Full Economic Summary Measure (\$2010)
<p>Author (Year): An et al. (2006)</p> <p>Study Design: Pre-Post</p> <p>Economic Method: Cost-Effectiveness</p>	<p>Minnesota; smoked five or more cigarettes per day; planned to quit within 30 days; age 18 or older; no contraindications to the use of NRT</p> <p>n=380 callers in the pre-NRT sample and n=373 in the post-NRT sample for evaluation of cessation outcomes</p> <p>Sept 2002 to May 2003</p>	<p>Compare pre-post of existing quitline (pre) and addition of NRT (post)</p> <p>Mailed 8-week supply of NRT (patch or gum) to callers enrolling in multi-session counseling;</p> <p>Four cohorts (n = 670) were selected in the year before the introduction of NRT (September 2001 to August 2002) and two cohorts (n = 596) in the nine months after the introduction of NRT (September 2002 to May 2003).</p> <p>Earned Media: addition of NRT to the helpline was reported by major news outlets, including a front-page story in the state's largest newspaper.</p>	<p>Primary cessation outcome: self-reported abstinence from all tobacco products for 30 days or longer after six months</p> <p>-Compared the period from January to May in the year before and after the introduction of NRT.</p> <p>Secondary outcomes: 7 day point prevalence abstinence at 6 months and the number of quit attempts</p> <p>30-day abstinence at 6 months: Pre-NRT: 10.0% (historical rate) Post-NRT: 18.2%</p>	<p>Assume \$2003; CPI= 1.185</p> <p>Pre-NRT costs determined by the number of individuals who receive single or multi-session counseling.</p> <p>Post-NRT, MPAAT costs include cost of providing phone counseling and the cost of providing free NRT.</p> <p>MPAAT media expenditures (unchanged pre-NRT versus post-NRT) are not included because media efforts promoted cessation in general and did not specifically mention the availability of NRT from the helpline.</p> <p>Average cost per caller: Pre-NRT: \$136.17 (\$161) (SD \$61.49). Post-NRT: \$352.00 (\$417) (\$109.51); increased cost per caller post-NRT (\$215.83) is due to an increase in the proportion of callers enrolling in multi-session counseling and the cost of providing free nicotine patch or gum</p> <p>Cost per quit: Pre-NRT: \$1362 Post-NRT: \$1934 (+\$572)</p>	<p>Cost/addt'l quit: \$572 (\$678)</p>

Study	Study and Population Characteristics	Intervention Description	Effect Size	Program Costs (\$2010)	Full Economic Summary Measure (\$2010)
<p>Author (Year): Cummings et al. (2011)</p> <p>Study Design: RCT</p> <p>Economic Method: Cost-Effectiveness</p>	<p>NYC (NYSSQL)</p> <p>Adults (aged 18 years or older), current daily smokers of 10 or more cigarettes per day N=2806</p> <p>Sample more likely to be female, white, and older than 45 years July-Oct 2008 7-month follow up</p>	<p>Assigned according to a pre-randomized assignment sheet into 1 of 3 groups:</p> <p>Group 1: Sent a 2-week free supply of nicotine patches; Group 2: Sent a 4-week supply of free patches; Group 3: Sent a 6-week supply of free patches.</p> <p>All participants also received: 1. Cessation guide (<i>Break Loose</i>) that provided tips on quitting smoking along w/ info on the benefits of smoking cessation 2. One 10- to 15-minute proactive follow-up call conducted 2 weeks after initially contacting the quit line.</p>	<p>2806 participants → 1682 completed the 7-month follow-up</p> <p>Historical NYSSQL counseling-only quit rate (no NRT provided) estimated from a prior study at 20.0%--however this group did not receive a proactive callback counseling call</p> <p>Quit rates for 7-day point prevalence: Group 1: 25.5% Group 2: 27.7% Group 3: 29.1%</p> <p>Quit rates (intent-to-treat) for the 7-day point prevalence: Group 1: 14.8% Group 2: 17.1% Group 3: 17.5%</p> <p>Quit rates for 30-day point prevalence: Group 1: 21.3% Group 2: 21.6% Group 3: 23.6%</p> <p>Quit rates (intent-to-treat) for the 30-day point prevalence: Group 1: 12.3% Group 2: 13.3% Group 3: 14.2%</p>	<p>Assumed \$2009</p> <p>Cost of counseling + 2 wks NRT: \$49 -Cost of counseling + 4 wks NRT: \$71 -Cost of counseling + 6 wks NRT: \$93</p> <p>Cost estimates based on: (1) average number of minutes spent by quit line coaches screening and counseling callers at intake: \$9.71; (2) average number of minutes spent by quit line coaches for the 2-week phone follow-up call: \$9.71; (3) cost of each 2-week supply of nicotine patches: \$22; and (4) costs associated w/ handling and shipping of the nicotine patches: \$7.60</p> <p>Point estimate was lowest in the 2-week arm (\$891, 95% CI: \$533-\$2722) followed by the 4-week arm (\$922, 95% CI: \$623-\$1775) and the 6-week arm (\$1,022, 95% CI: \$727-\$1,722). See Figure 2 below.</p> <p>Findings from this study suggest that supplying more than a free 2-week supply of patches to smokers who contact a quit line was no more cost-effective than sending just 2 weeks of patches. 49/.05=891 75/.077=922 93/.091=1022</p>	<p>Cost/additional quit: \$891 (2 wk NRT) (\$906) \$922 (4 wk NRT) (\$937) \$1022 (6 wk NRT) (\$1039)</p>

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			No differences in quit rates by the amount of free NRT given to quit line callers		
<p>Author (Year): Cummings et al. (2006 a)</p> <p>Study Design: Pre-Post</p> <p>Economic Method: Cost-Effectiveness</p>	<p>NY City and state; Free nicotine patches or gum was sent to 40,090 smokers; study reports on the results of 2,384 completed interviews, which represent an overall 61 percent response rate</p> <p>18 or older; smoke more than 10 or more cigarettes per day</p> <p>Participants more likely to be female and slightly older on average (45 years vs 42 years) than the smokers in the general population.</p>	<p>New York State Smokers' Quitline was used to screen and register eligible smokers for the free medication; also received a copy of the quitline's <i>Break Loose</i> stop smoking guide, and an info sheet on local stop smoking programs.</p> <p>To measure efficacy, a telephone follow-up survey of program participants was conducted 4 months after enrollment in the free NRT giveaway program.</p> <p>Earned/Paid Media: Most programs advertised the free NRT through press releases or by holding staged press events. In a few instances, local coalitions produced posters or paid for newspaper and/or radio advertisements.</p>	<p>Outcome: self-reported smoking status at 4-month; no cigarettes smoked in the 7 days</p> <p>The quit rate of program participants was contrasted with the quit rate computed from an earlier follow-up survey of 515 quitline callers conducted in July 2001 in which NRT was not distributed (received counseling support and a free <i>Break Loose</i> cessation guide); Baseline 12% quit rate per previous experience with the quitline.</p> <p>Quit rates were highest among those who used the NRT for a longer duration.</p> <p>Reported quit rates are based only on those who responded to follow-up survey (see Table 4)</p>	<p>Assumed \$2004 C/E measured smoker enrollment and quit rates, relative to the costs associated with offering NRT and advertising the program (quitline service costs not included)</p> <p>Program costs included: Marketing, purchasing, and mailing out the free NRT, and the costs of registering and counseling smokers when they called the quitline.</p> <p>2-wk (voucher): 46,365 1-wk (mail): 38,441 2-wk (mail): 96,826 6-wk (mail): 2.7 million</p>	<p>\$274-347</p> <p>Cost/additional quit: \$316- \$401</p>
<p>Author (Year): Cummings et al. (2006 b)</p>	<p>See above 12 month follow up</p>	<p>Study evaluated the 6 week intervention (telephone + free NRT)</p>	<p>7-day nonsmoking prevalence rate measured at 12-month quit rate (as opposed to 4 months) 19% quit rate</p>	<p>\$2.7 million → \$2.5 million (nicotine patches) \$200,000 for extra personnel, printing of materials, storage of the medication, and mailing of the</p>	<p>Cost/additional quit: \$420 (\$485)</p>

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<p>Study Design: Pre-Post</p> <p>Economic Method: Cost-Effectiveness</p>			<p>28%- intervention; 9%-control</p>	<p>patches; Assuming abstinence rate of 19%, the free NRT program cost ~ \$420/addt'l quitter.</p>	
<p>Author (Year): Hollis et al. (2007)</p> <p>Study Design: RCT (treated control)</p> <p>Economic Method: Cost-Effectiveness</p>	<p>Oregon (state) Age 18 or older, spoke English or Spanish, smoked 5 or more cig per day over the past 6 months; planning to quit within the next month (or had quit within the preceding 7 days).</p> <p>60% female, middle aged and half had some college education; Most were moderate to heavy smokers and nearly half had other smokers in the home. By design, all participants were planning to quit within the next 30 days.</p>	<p>Oregon Tobacco Quit Line (OTQL)</p> <p>Callers randomly assigned to 1 of six interventions in a 3 (behavioral) X 2 (NRT) design that compared brief, moderate and intensive telephone counseling, with or without an offer of free NRT patches</p> <p>Earned Media: Used mass media campaigns, direct mailings to select popul (for example, Medicaid) and encouragement to physicians and health plans to recruit tobacco users to the OTQL.</p> <p>All callers mailed a "quit kit"- included a cessation booklet (Stop Smoking, Smoke-Free for Life) and, if applicable, other materials on stress management, smokeless tobacco, secondhand smoke, pharmacotherapy and social support.</p> <p><u>Brief counseling:</u> 15-minute call.</p>	<p>30 days abstinence at 12 month follow-up; outcome relied on self-reported abstinence.</p> <p>Follow-up assessment: Data on tobacco use status were obtained for 67% of randomized participants at 6 months and 69% at 12 months.</p> <p>ITT: Brief no NRT (12%) Brief NRT (17%) Moderate NRT (20%) Intensive NRT (21%)</p> <p>One-year abstinence rates increased when quitline callers were offered: (1) free NRT patches shipped by mail; and/ or (2) more intensive counseling with follow-up calls.</p>	<p>\$2004; state program perspective; CPI= 1.154</p> <p>Labor costs included salary and benefits for interventionists, supervisory staff (including medical oversight) and administrative staff.</p> <p>Interventionist time included the actual time spent with individual participants, off-line preparation, training and other administrative functions.</p> <p>Contact time w/participants included screening and enrollment, intervention delivery calls and ad hoc calls.</p> <p>Facility space, technical and administrative support and office supplies were estimated using the indirect cost rate for the intervention delivery organization.</p> <p>NRT costs were calculated as the program price for actual shipments plus postage, as obtained from pharmacy records; Nicoderm CQ was provided free by GlaxoSmithKline, analyses</p>	<p>Incremental cost/quit Brief no NRT: NA Brief NRT: 2467 (\$2,848) Moderate NRT: 2109 (\$2,435) Intensive NRT: 2112 (\$2,438)</p>

Study	Study and Population Characteristics	Intervention Description	Effect Size	Program Costs (\$2010)	Full Economic Summary Measure (\$2010)
	<p>Jan 2001 to Jan 2003.</p> <p>6-month and 12-month follow-up assessments.</p>	<p><u>Moderate counseling</u>: 40-min session + brief follow-up call one to two weeks later</p> <p><u>Intensive counseling</u>: 30-min to 40-min counseling session + up to four additional telephone support calls over a three-month period.</p> <p>Participants initially received a 5-week supply and then placed a toll-free call to request a refill for the final 3 weeks.</p> <p>Brief no NRT: n=872 Brief NRT: n=868 Moderate NRT: n=715 Intensive NRT: n=721</p>		<p>used the usual NRT costs paid by Free & Clear, Inc.</p> <p>Incremental cost/quit Brief no NRT: NA Brief NRT: 2467 Moderate NRT: 2109 Intensive NRT: 2112</p> <p>Cost/participant: Brief no NRT: 67 (77) Brief NRT: 193(223) Moderate NRT: 242 (279) Intensive NRT: 268 (309)</p>	
<p>Author (Year): Miller et al. (2005)</p> <p>Study Design: Pre-Post</p> <p>Economic Method: Cost Effectiveness</p>	<p>At least 18 years of age, resident of New York City, no medical contraindications to NRT patch use, smoked 10 or more cigarettes per day for at least a year</p> <p>More NRT recipients compared to NYC heavy smokers were women, aged 25–44, and fewer were aged 18–24 years or</p>	<p>Earned Media: Announced availability of free 6-week courses of NRT patches to the first 35,000 eligible smokers to call the New York State Smokers’ Quitline; Major metropolitan newspapers, television and radio stations reported the program launch; neighborhood-specific media and promotional efforts were used to reach populations with the highest prevalence of heavy smokers.</p> <p>NRT patches were sent to 34,090 individuals. Kits contained a 2-week supply each of generic 21 mg, 14 mg, and 7 mg patches; instruction sheets in English</p>	<p>Self-report quit after 6 months, individual had not smoked cig in the last 7 days</p> <p>Quit attempt: stopped smoking for a day or longer in an attempt to quit smoking</p> <p>ITT-Assumed all survey non-respondents were still smoking.</p> <p>Quit (ITT): NRT recipients: 20% (435), compared to 2% (10) of comparison group (quitline callers no NRT) participants, which is an attributable quit rate of 18%, or 6038 people.</p>	<p>Assumed \$2003</p> <p>Costs of NRT purchase and shipping, <u>additional</u> quitline staff for the increase in call volume, and staff to make counseling calls.</p> <p>Cost estimate did not include existing staff or infrastructure of the NYC DOHMH tobacco control program and quitline</p> <p><u>Incremental</u> program cost estimates: NRT purchases (US\$2.5 million), additional quitline staff and shipping costs (\$200 000), and cost of staff making counseling calls (\$100,000).</p>	<p>Cost/additional quit: \$464 (\$550)</p>

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	65 years and older N=34,090 (n=2,150) April 2003-Dec 2003	and Spanish; patient information from the manufacturer; a self-help stop-smoking guide; and a list of local services for smoking cessation. Counseling calls, averaging 3 min, were attempted to all NRT recipients at 3 weeks and again at about 14 weeks after the intake call. Of the NRT recipients, 15 212 (45%) received at least one counseling call, and 5128 (15%) received two calls.	Quit attempt: 1135 (87%) of NRT recipients reported they had attempted to quit compared with 84 (54%) of comparison group respondents NRT recipients who received counseling calls were more likely to stop (246 [38%] vs 189 [29%], than those who did not	~ Additional cost of the free patch distribution program was \$2.8 million Cost per successful quit: \$464 (2.8 million/6038)=\$464.	
<p>Author (Year): Saul et al. (2011)</p> <p>Study Design: Observational</p> <p>Economic Method: Average Cost</p>	Single NRT shipment period (May–July 2003) N=247 Split NRT shipment period (July–September 2004). N=160; 94 received only 1 5-week shipment of NRT, while 66 received the 1 st 5-week shipment plus a 2 nd 3-week shipment for a total of 8 wks of NRT shipped. 3 NRT groups: 8 week single-shipment group; 5 week one-	Evaluated the impact of the Minnesota QUITPLAN® Helpline’s shift from distributing NRT using a single eight-week shipment to a two-shipment protocol. The eight week single-shipment cohort received 8 weeks of NRT (patches or gum) at once; the split-shipment cohort (n = 160) received five weeks of NRT (n = 94), followed by an additional three weeks of NRT if callers continued with counseling (n = 66).	Self-reported abstinence from tobacco products for 30 days or longer; Six-month follow-up Callers in 8 week two-shipment group completed significantly more calls (3.0) than callers in the five week one-shipment group (2.4) or eight week single-shipment group (1.7) (p < 0.001). ITT: 28.3*% for 8 week single-shipment group, 18.1% for the 5 week one-shipment group and 28.8% for the 5 plus three two-shipment group *cost-per-quit calculation was repeated using a single overall quit rate of	Perspective of the organization funding counseling and NRT (ClearWay Minnesota); \$2004; CPI=1.15 \$175 per participant for counseling alone; 8 week single-shipment period—additional \$175 estimated as the cost of providing NRT. (single equilibrated cost estimate for both types of NRT—patch and gum) Split-shipment NRT period: 1 st 5-week shipment cost~ \$120 2 nd 3-week shipment cost ~ \$75 Total cost for NRT was greater during the split-shipment phase due to additional administrative and shipping costs. Mean cost per caller greater for the single-shipment phase compared to split-shipment phase	Cost/quit: 5 week: \$1,155 (\$1,333) 8 wk: \$1,242 (\$1,434) (2 shipment) 8 wk: \$1,350 (\$1,558) (1 shipment) Average cost: Cost/caller 5-wk: \$295 (\$340) 5+3: \$370 (\$427) 8-wk: \$350 (\$404)

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	shipment group; 8 week two-shipment group 6 month follow-up		26% for all study participants (grouping all participants and assuming all non-responders were still smoking) in order to avoid spurious differences between protocol groups artificially influencing the cost analysis.	<p>(\$350 vs. \$326) due to the savings associated with not sending a second shipment to some participants.</p> <p>Cost-per-quit was lowest for the 5 week one-shipment group (\$1,155), and lower for the combined split-shipment cohort (\$1,242) than for the single-shipment cohort (\$1,350).</p> <p>Results of this evaluation indicate that while satisfaction rates increase among those receiving more counseling and NRT, quit rates do not; Splitting the 8-week dose of NRT into 2 shipments reduced the cost of providing medications per caller</p>	
<p>Author (Year): Shearer et al. (2006)</p> <p>Study Design: Modeling based on RCT</p> <p>Economic Method: Cost-Effectiveness</p>	<p>Meta-analyses, systematic review, and RCT studies N=100 6 month follow up</p>	<p>Effectiveness data were obtained from a review of the international literature. Results were then limited to RCT, systematic reviews, meta-analyses or economic evaluations published in peer-reviewed journals in English</p> <p>Costs and effects of telephone smoking cessation interventions were estimated.</p> <p>Treatment costs and effects were modeled using incremental cost-effectiveness ratios; Proactive telephone</p>	<p>Estimated six-month natural quit rate of 4%*</p> <p>Self-reported or biologically validated</p> <p>Quit rate estimates were sourced from the previously referenced meta-analyses. Meta-analysis was not available for bupropion plus telephone counseling, NRT plus telephone counseling and bupropion plus NRT, and quit rate estimates for these are based on the cited studies.</p>	<p>Australian government perspective; 2003 Australian dollars (PPP=1.41)</p> <p>Addition of pharmacotherapies to telephone counseling increased the number of successful quitters but at a relatively high cost; Adding proactive counseling to pharmacotherapy appeared to improve outcomes at a small cost and therefore appeared to be highly cost effective.</p> <p>The hourly cost of telephone counseling has been based on initial consultation fee for social workers paid by the Australian Federal Government. This estimate, which is recommended</p>	<p>Telephone counseling was both more effective and less costly than physician-based brief advice and even if the costs were the same, telephone counseling was more cost-effective than physician brief advice. See ICER in Table 4. Cost of treatment= \$A3029 (\$2546) *CG calculated C/E ratio: 25.46/.05= \$509.20/additional quit</p>

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		<p>counseling involves telephone counselors actively calling clients using individually tailored call-back schedules that match clients' personal circumstances and identified peak relapse risk periods.</p> <p>Counselor contact time is ~39 minutes (pro-active counselor time is ~47 minutes—more relevant in NRT+counseling)</p>	<p>Quit rate (minus 4%) Telephone counseling: 5%</p> <p>Telephone + NRT: 13%</p> <p>Proactive telephone + NRT: 23%</p> <p>*based on a comprehensive review of relapse among smokers who tried to quit without treatment and Cochrane meta-analysis of brief physician advice.</p>	<p>for submissions to the Pharmaceutical Benefits Advisory Committee (PBAC), includes salaries, benefits and infrastructure costs, thus increasing the comparability to government-paid medical consultation fees</p> <p>Multi-way sensitivity analysis was used to examine the impact of uncertainty on resource use, prices and outcomes on the costs of treatments.</p> <p>Bupropion is listed for public subsidy on the Australian Pharmaceutical Benefits Scheme (PBAC, September 2002) with a nine-week course of treatment that requires two prescriptions consisting of an initial prescription of 30 tablets (150 mg sustained release) and a repeat prescription of 90 tablets. The nicotine patch is the only form of NRT that is listed for subsidy in Australia and only for veterans; however, for this analysis we have assumed that NRTs are available by prescription to all</p>	
<p>Author (Year): Swartz et al. (2005)</p> <p>Study Design: Pre-Post</p> <p>Economic Method:</p>	<p>Maine (statewide)</p> <p>Compared to smokers statewide, callers were more likely to be aged 45 to 64,</p>	<p>Maine HelpLine provides toll-free counseling to any tobacco user who is ready to quit in 30 days or has recently quit. Callers are encouraged to receive three additional proactive calls, scheduled around a planned quit date.</p>	<p>Abstinence measures based on self-report and included 7-day point prevalence, 30-day point prevalence, and continuous abstinence.</p> <p>Intent-to-treat quit rates at 6 months:</p>	<p>Assumed \$2004</p> <p>HelpLine costs included direct costs for administration, counseling, self-help materials, and telephone. Promotion and evaluation cost not included. Costs per quitter estimated using the intent-to-treat quit rates at 6</p>	<p>Counseling plus free NRT: \$275/ tobacco user (\$317)</p>

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Average Cost	female, or uninsured. N=1067 (random sample n=600) January 2003 to December 2004	<p>For each proactive call, the HelpLine attempts to contact an individual up to three times.</p> <p>For individuals who successfully quit, specialists focus on relapse prevention. Specialists establish a new quit plan if a caller has relapsed. All callers, regardless of quit status, receive mailed self-help materials.</p> <p>Specialists may authorize 1 month of NRT per voucher, and provide up to 2 months of therapy.</p> <p>Maine’s media promotes the HelpLine number, but does not advertise free NRT; instead, vouchers are promoted through clinical outreach efforts. Important areas of study include the influence of free NRT, provider education, and word-of-mouth communication on quit-line utilization.</p>	<p>6.1% (self-help) 12.3% (counseling) 22.5% (counseling + NRT)</p> <p>10% of voucher users obtained nicotine gum, 89% used the nicotine patch, and 1% used both.</p> <p>The duration of NRT drug supply showed that 63% had 14 to 30 days supply, and 35% acquired 31 to 60 days supply.</p> <p>Study states “it cannot be concluded in this observational study that higher quit rates among NRT voucher users compared to counseling alone were due to the effect of free NRT. Not all smokers were eligible for vouchers (e.g., callers having Medicaid insurance). Additionally, some callers obtained NRT or used bupropion on their own.”</p>	<p>months (30-day point prevalence) from the quit survey, applied to the delivery of services provided in 2003–2004.</p> <p>The duration of NRT drug supply showed that 63% had 14 to 30 days supply, and 35% acquired 31 to 60 days supply.</p> <p>The drug costs of NRT per individual treatment episode averaged \$123, with 97% ranging between \$50 and \$300.</p> <p>The mean cost of providing HelpLine services was \$201 per tobacco user; the cost of providing counseling plus free NRT was \$275 per individual. The mean cost per quitter was estimated at \$1344 (assume quite rate of 14.9%; not clear on how the study calculated this value—may be a combination of both interventions).</p>	

Abbreviations

CPI, consumer price index

PPP, purchasing power parity