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**A Multi-state Asian-language Tobacco Quitline:  
Addressing a Disparity in Access to Care**

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## **Abstract**

**Objectives:** To translate an intervention protocol for Asian language smokers from an efficacy trial into a multi-state service.

**Methods:** Working with state tobacco programs, a multistate tobacco cessation quitline was promoted to three Asian language speaking communities: Chinese, Korean, and Vietnamese. Counseling was provided centrally from one location. We assessed the provision of counseling and quitting outcomes.

**Results:** The initial program consisted of three states (CA, CO, HI) and three more states joined the program during the study period (January 2010—July 2012). A total of 2,004 smokers called for the service, with 88.3% opting for counseling. Among those opting for counseling, the 6 month abstinence rate was (18.8%), which was similar to the results of an earlier efficacy trial (16.4%).

**Conclusions:** The intervention protocol, which was based on an efficacy trial, was successfully translated into a multi-state service. This project paved the way for the establishment of a national quitline for Asian-language speakers, which serves as an important strategy to address disparities in access to care.

## Introduction

Smokers who speak Asian languages and have low English proficiency have had limited access to tobacco cessation resources in the U.S. The idea of a multi-state cessation program grew out of a desire to address this disparity in access to care. The goal was to provide Asian-language smokers the same quality of tobacco cessation services currently afforded to English and Spanish smokers.

Smoking is expensive both economically and in terms of quality of life, and is a primary contributor to health disparities.<sup>1-3</sup> Yet even among long-term smokers, quitting smoking has immediate health benefits and reduces tobacco-related harms.<sup>4,5</sup> Telephone quitlines are one proven strategy for helping smokers quit.<sup>6</sup> The effectiveness of telephone counseling has been well documented and tobacco quitlines are accessible to any resident of the U.S.<sup>7,8</sup> Quitlines offer a relatively intense, individualized intervention but with a broader reach than clinic-based programs. Only one U.S. state quitline offers direct service in Asian languages; most other states utilize third party translation services to accommodate Asian language speakers.<sup>9</sup> Translation services have proven beneficial in fact-based information exchanges, such as physician and hospital visits, but behavioral counseling can be richer if provided directly by someone who speaks the client's language.<sup>10-12</sup>

Asian immigrant men have higher rates of smoking compared to their U.S.-born counterparts, perhaps due to the cultural acceptability of smoking in their home countries.<sup>13,14</sup> For example, smoking among men is estimated to be 56% in Vietnam, 52% in China and 40% in Korea.<sup>15-17</sup> Asians are the only ethnic group in the U.S. for whom cancer is the leading cause of death, with especially high mortality rates from lung cancer.<sup>18</sup> And although Hispanics still represent the largest ethnic minority in the U.S., since 2009, more Asians have immigrated to the United States than Hispanics.<sup>19</sup> Most Asians living in the U.S. are foreign-born (74%) and of those only about half are proficient in English.<sup>19</sup> Limited English proficiency is a major barrier to health service access and results in underutilization of services, less compliance with medications and programs, and greater likelihood of stopping treatment prematurely.<sup>20-25</sup>

In 1993, California established Chinese-, Vietnamese-, and Korean-language quitline services, but in the many years since, no other states have adopted the service. There may be any number of reasons but the main reason appears to be the logistics involved.<sup>26</sup> To establish and maintain language-specific programs, quitlines require available bilingual staff members and the funding to support them. Particularly for states with small Asian-language populations, the cost of counseling per person may seem prohibitive. Quitlines can minimize these logistical challenges; they offer a broad-reaching centralized infrastructure. While individual states may not have the resources to provide service to a specific language group, a quitline could provide the service nationally.

The creation of a national Asian-language quitline relies on several existing elements. First, an intervention must exist that has been proven to impact quitting success. From 2004-2008, a large

randomized controlled trial was conducted to test the efficacy of the quitline counseling protocol. Results of this trial indicated that telephone counseling significantly increased quitting success (OR = 2.26).<sup>27</sup> Second, it must be feasible to implement the quitline broadly while maintaining the impact of the intervention. Third, dissemination of the program will only happen if those who fund such programs decide it is a priority.

This paper describes the transformation of a single-state Asian-language quitline service into a sustainable national program. The multi-state quitline was supported by a Centers for Disease Control and Prevention (CDC) Implementation and Dissemination grant. This paper examines the dissemination of the counseling protocol across multiple states, and it assesses the implementation and impact by comparing results from the multi-state program to the previous efficacy trial. A multi-state quitline program that is feasible, disseminable, and impactful provides a model for reducing health disparities among underserved populations.

## **Methods**

Detailed information on the efficacy trial is available in Zhu, 2012.<sup>27</sup> Methods for the multi-state program are detailed below.

### **Population**

Starting in January 2010, California expanded its toll-free Asian-language tobacco quitlines to Chinese-(Mandarin and Cantonese), Korean- and Vietnamese-language callers living in California, Colorado, Hawaii, New York, Texas, and Washington. Lines were also open to callers nationwide, but the service was promoted only in these six states. Callers between January 2010 and July 2012 from all states, not just the six official participants, were included in the analyses.

### **Services**

Callers completed a standard intake interview, providing demographic information, health insurance status, smoking status, tobacco consumption, and how they heard about the services. Unlike the random assignment to condition used in the efficacy trial, smokers in the multi-state program were given the choice of service (counseling and/or self-help materials). Consistent with the services provided to English and Spanish speakers in each state, callers from CO, HI, NY, and TX were provided with free nicotine patches if they were eligible. Due to variations in funding, CA and WA provided nicotine patches only to callers from specific counties or during specific time periods.

All contact with participants was recorded in the quitline database, including the date and length of all counseling calls. The counseling protocol was the same one used in the efficacy trial and included a comprehensive session to prepare for quitting and follow-up calls scheduled according to the risk of relapse (i.e., front-loaded).<sup>28,29</sup> Counseling was provided by experienced quitline counselors who were bilingual and bicultural. The self-help materials used were the

ones used in the efficacy trial. They were language-specific; Chinese speakers were offered their choice of traditional or simplified characters. Materials were designed to motivate smokers to make quit attempts and to teach the skills needed to avoid relapse.

### Evaluation

Participants in the multi-state program were evaluated 7 months after intake. Due to the large number of participants and limited resources, a random 50% of those from CA were selected for evaluation. Following standard evaluation procedures, participants were asked about smoking status and quitting history since enrollment. To increase the contact rate, pre-contact letters with a \$2 bill were sent one week prior to evaluation.

### Quitting Outcomes

The efficacy trial and the multi-state program were compared on three outcome measures. These included (1) the quit attempt rate, defined as intentionally quitting for 24 hours or more within 90 days of enrollment; (2) the 30 day abstinence rate, defined as not smoking for at least 30 days prior to evaluation; and (3) the 180 day abstinence rate; clients were considered no longer abstinent if they smoked two or more days in a row.

### Statistical analysis

Efficacy trial results were compared to multi-state results using 95% Confidence Intervals (CI).<sup>30</sup> Thirty-day and 180 day abstinence rates were calculated using both intention-to-treat (ITT) analysis, in which all participants not evaluated were coded as smokers, and complete-case (CC) analysis, in which only participants reached for evaluation were included in analysis.<sup>31</sup>

In addition, logistic regression was used to test the independent effects of counseling and quit aid use, as well as the interaction, on the 180 day abstinence rate. All statistical analyses were conducted using SAS statistical package, version 9.3.<sup>32</sup>

## Results

The study began with three states (CA, CO and HI). Three additional states enrolled in the program during the course of the grant period. NY joined the program in November 2010, WA in January 2011, and TX in February 2011.

From January 2010 to July 2012, 2,004 smokers called the Chinese, Korean, and Vietnamese lines of the multi-state program and completed intake. By state, 1,339 (66.8%) were from CA, 70 (3.5%) from CO, 215 (10.7%) from HI, 162 (8.1%) from NY, 87 (4.3%) from WA, 22 (1.1%) from TX. The toll free lines were open to other states that were not officially part of the study; 109 smokers (5.4%) called from these other states. Greater numbers of smokers called the Korean line (1,144, 57.1%), 479 (23.9%) called the Chinese line, and 381 (19.0%) called the Vietnamese line.

Overall, 2,297 callers completed intake. Almost 13% (n=290; 12.6%) were proxies calling for family members or relatives and 3 were under age 18 (0.1%); these were excluded from further analysis.

Table 1 compares the demographics characteristics of the efficacy trial (column 1) and the multi-state program (column 2). Data from the multi-state program are further divided to allow comparison of CA callers (column 3) to callers from states other than CA (column 4). The multi-state program had more Korean speakers (57.1%) and a greater proportion of women (18.4%) than the efficacy trial (37.2% and 10.0% respectively,  $P<0.05$ ). Likewise, the multi-state population was older (69.4%, 45 years or more) than the efficacy trial population (52.0%,  $P<0.05$ ). The percentage of daily smokers was high in both samples (98.2% vs. 98.3%), and there was no significant difference in tobacco consumption between the two samples (cigarettes per day of 15+: 56.6% vs. 54.9%, for multi-state and efficacy trial, respectively). There were no differences between CA and the other states.

Table 2 compares the implementation of the counseling intervention for the efficacy trial (column 1) and the multi-state program (column 2); the multi-state program was again separated to compare CA to states other than CA. Data from the efficacy trial include all subjects randomly assigned to receive counseling (n=1,124). Data from the multi-state program include only the 1,769 participants who chose counseling (88.3% of the 2,004 smokers). Among those who opted or were assigned counseling, the rate of receiving counseling was higher in the multi-state program (91.6%) than in the efficacy trial (87.2%,  $P<0.05$ ). Table 2 also compares the multi-state sample and the efficacy trial on the number of counseling sessions received and minutes of counseling. Although participants in the multi-state program were more likely to be counseled, they received fewer counseling sessions (mean 4.1 vs. 4.9,  $P<0.05$ ) and fewer minutes of counseling across all sessions (58.2 vs. 72.0,  $P<0.05$ ) than those in the efficacy trial. Implementation data from CA and the other states do not differ from each other.

Table 3 displays the use of quitting aids among counseling clients (those who were randomly assigned or chose counseling) who were selected for evaluation. Using complete case analysis, participants in the multi-state program reported higher rates of using nicotine patches (43.0%) and any quitting aid (53.1%) compared to the efficacy trial (9.1% and 12.8%, respectively,  $P<0.05$ ).

Table 4 displays quitting outcomes. Data from the efficacy trial include all subjects randomly assigned to receive counseling. Data from the multi-state program include only the participants who opted for counseling and were randomly selected for evaluation. The evaluation contact rates were equivalent: 83.1% for the efficacy trial compared to 81.6% for the multi-state program. There was no significant difference in 180 day prolonged abstinence between the multi-state and the efficacy trial (18.8% vs. 16.4%) using an intent-to-treat analysis. Likewise,

the 30 day abstinence rates were similar (32.3% vs. 32.3% for the multi-state and efficacy trial, respectively). Similar patterns were noted in the complete case analysis.

There was a significant difference in the quit attempt rate, with participants in the multi-state program being more likely to make a quit attempt (65.3% vs. 54.9%,  $P < 0.05$ ). Complete case analysis showed similar patterns.

A logistic regression was run on the counseling condition, the use of quitting aids, and the interaction term between counseling and use of quitting aids on 180 day abstinence rate. Both counseling ( $\chi^2 = 4.28$ , OR = 2.23, 95%CI: 1.04 - 4.76) and use of quit aids ( $\chi^2 = 21.49$ , OR = 2.25, 95%CI 1.60 – 3.17) had independent effects on 180 day abstinence rates. There was no significant interaction effect between counseling and use of quit aids.

## **Discussion**

The original grant was designed to disseminate the Asian language quitline from the original state (CA) to two partner states (CO and HI). During the grant period, three additional states (NY, TX, and WA) formally joined, agreeing to promote the Asian language lines to their residents and to provide quitting aids in accordance with the services provided to their English and Spanish speakers. Since many of the promotions were through radio or in print, media not necessarily restricted by state, residents of many other states called and received service as well. The fact that the Asian-language program was able to be disseminated to more states than originally intended shows the natural appeal for such services.

This study also demonstrates the implementation of the counseling program to additional states in a way that maintained its impact. Several key factors contributed to this program's success. The multi-state program utilized the existing CA Asian quitline infrastructure, thus limiting costs typically associated with initiating a new program. Using a centralized service also facilitated consistency of implementation. And, most importantly, the CA quitline utilized an Asian-language counseling protocol that was proven effective in a rigorous randomized controlled trial.<sup>27</sup> Despite the challenges of offering service across five time zones (Hawaii-Aleutian to Eastern Standard Time), the multi-state program delivered counseling to a higher proportion of smokers than the earlier efficacy trial (91.6% vs. 87.2%). Consistent with the trend for the quitline overall, the multi-state program provided fewer counseling calls and sessions were shorter than the earlier trial; there were no differences found on the rate and duration of counseling by state (i.e., CA vs. other states).

Even though multi-state callers spent less time in counseling than those in the efficacy trial, the counseling protocol showed no decline in impact. Abstinence rates were similar between the multi-state and efficacy trial. An important consideration for any intervention is its ability to impact the behavioral outcome of interest. The effectiveness of an intervention may not translate to a more inclusive real-world setting. The population receiving the intervention may expand to



include less motivated people, or intervention may become routine and delivered with less enthusiasm and fidelity to protocols. Therefore, it is promising that the multi-state program maintained abstinence rates comparable to those found in the efficacy trial.

One significant difference between the two programs was the use of quitting aids; multi-state participants had higher rates of use than the earlier trial. This was not surprising, since many states provided free nicotine patches as part of the service. Logistic regression did show that both counseling and the use of quitting aids independently affected prolonged abstinence (180-days), but there was no interaction of the two.

There are some limitations to this study. First, there is no way of knowing exactly what features of counseling account for the comparability in outcomes across the programs. In the multi-state program more smokers made a quit attempt and more used quitting aids. At the same time, they received fewer counseling sessions and the sessions were of shorter duration. The net result is that the abstinence rates stayed the same. Second, the Asian-language quitline only provided in-language services for Chinese-, Vietnamese-, and Korean-speakers. These linguistic groups were chosen because they have high numbers of immigrants with low English proficiency.<sup>33,34</sup> However, other linguistic groups not included here would likely benefit from similar services. The original randomized controlled study was set up to test the efficacy of a single protocol which was translated into three languages, with the intent of showing that the findings could be broadly applicable. We reasoned that if this protocol worked both overall and for each of these three languages, there would be no need to test the protocol for each Asian language group (e.g., Hmong, Cambodian). The one-on-one structure of the telephone counseling allows the protocol to be tailored to an individual's culture and needs. This study provides a proof of concept for scaling a centralized infrastructure to reach underserved populations. Applications of this model could extend to other linguistic populations or to interventions on other behaviors that contribute to health disparities, such as diabetes management or cancer screening.<sup>35,36</sup>

On the strength of the results from the multi-state program, the CDC decided to expand the program nationally. The new national program includes funding for promotion and for service. Asian language speakers across the U.S. now have access to the same quality of service that has long been available to English and Spanish smokers. The new national Asian quitline will play an important role in helping reduce disparity in access to care.

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**Table 1 Demographic Characteristics in Efficacy Trial and Multi-state Program**

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	Efficacy Trial N=2,277 % (95%CI)	Multi-state (All) N = 2,004 % (95%CI)	Multi-state (CA) N=1,339 % (95%CI)	Multi-state (Other States) N = 665 % (95%CI)
<b>Language</b>				
Chinese	32.0 (30.1-33.9)	23.9 (22.0-25.8)	24.1 (21.8-26.4)	23.5 (20.2-26.7)
Korean	37.2 (35.3-39.2)	57.1 (54.9-59.3)	57.8 (55.2-60.5)	55.6 (51.9-59.4)
Vietnamese	30.7 (28.8-32.6)	19.0 (17.3-20.7)	18.1 (16.0-20.1)	20.9 (17.8-24.0)
<b>Age</b>				
18-24	3.2 (2.5-3.9)	1.6 (1.0-2.1)	1.7 (1.0- 2.4)	1.2 (0.4-2.0)
25-44	44.9 (42.9-46.9)	29.0 (27.0-31.0)	28.6 (26.2-31.0)	29.8 (26.3-33.3)
45-64	45.0 (42.9-47.0)	57.1 (55.0-59.3)	56.8 (54.1-59.4)	57.8 (54.1-61.6)
65+	7.0 (5.9- 8.0)	12.3 (10.9-13.7)	12.9 (11.1-14.7)	11.2 (8.7-13.5)
<b>Gender</b>				
Female	10.0 ( 8.8-11.2)	18.4 (16.7-20.1)	14.6 (12.7-16.5)	25.9 (22.6-29.3)
Male	90.0 (88.8-91.2)	81.6 (79.9-83.3)	85.4 (83.5-87.3)	74.1 (70.7-77.4)
<b>Education (years)</b>				
<=12	46.4 (44.4-48.5)	49.5 (47.3-51.7)	41.5 (38.8-44.2)	65.7 (62.0-69.3)
>12	53.6 (51.6-55.6)	50.5 (48.3-52.7)	58.5 (55.8-61.2)	34.3 (30.7-38.0)

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Note: Columns 3 and 4 are subsets of the overall multi-state program (Column 2)

**Table 2 Counseling Sessions and Length of Calls in Efficacy Trial and Multi-state Program**

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	Efficacy Trial N=1,124 % (95%CI)	Multi-state (All) N = 1,769 % (95%CI)	Multi-state (CA) N=1,188 % (95%CI)	Multi-state (Other States) N = 581 % (95%CI)
<b>Counseling Rate</b>	87.2 (85.2-89.1)	91.6 (90.3-92.9)	91.0 (89.4-92.6)	92.8 (90.7-94.9)
<b>Number of Sessions</b>				
Mean	4.9 (4.8-5.1)	4.1 (4.0-4.2)	4.1 (4.0-4.3)	4.0 (3.8-4.2)
Median	5.0	4.0	4.0	4.0
<b>Length of Counseling</b>				
Mean	72.0 (69.9-74.0)	58.2 (56.6-59.8)	58.6 (56.5-60.8)	57.4 (55.0-59.8)
Median	67.0	51.0	51.0	52.0

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Note: Columns 3 and 4 are subsets of the overall multi-state program (Column 2)

**Table 3 Use of Quitting Aids in Efficacy Trial and Multi-state Program**

	Efficacy Trial % (95%CI)	Multi-state (All) % (95%CI)	Multi-state (CA) % (95%CI)	Multi-state (Other States) % (95%CI)
Intent-to-Treat	N = 1,124	N = 953	N = 579	N = 374
Complete Case	N = 922	N = 781	N = 476	N = 305
Quit Aids Use				
Intent-to-Treat				
Patch	7.5 (5.9-9.0)	35.4 (32.3-38.4)	35.2 (31.3-39.1)	35.6 (30.7-40.4)
Any Aids	10.5 (8.7-12.3)	43.7 (40.5-46.8)	41.6 (37.6-45.6)	46.8 (41.7-51.9)
Complete Case				
Patch	9.1 (7.3-11.0)	43.0 (39.5-46.5)	42.6 (38.2-47.1)	43.6 (38.0-49.2)
Any Aids	12.8 (10.6-15.0)	53.1 (49.6-56.6)	50.4 (45.9-54.9)	57.4 (51.8-62.9)

Note: Columns 3 and 4 are subsets of the overall multi-state program (Column 2)



**Table 4 Cessation Outcomes of Counseling Clients in Efficacy Trial and Multi-state Program**

	Efficacy Trial % (95%CI)	Multi-state (All) % (95%CI)	Multi-state (CA) % (95%CI)	Multi-state (Other States) % (95%CI)
Intent-to-Treat	N = 1,124	N = 953	N = 579	N = 374
Complete Case	N = 922	N = 781	N = 476	N = 305
Quit Attempt made				
Intent-to-Treat	54.9 (52.0-57.8)	65.3 (62.2-68.3)	65.8 (61.9-69.7)	64.4 (59.6-69.3)
Complete Case	60.5 (57.3-63.7)	79.6 (76.8-82.5)	80.0 (76.4-83.6)	79.0 (74.4-83.6)
Prolonged Abstinence				
Intent-to-Treat				
$\geq 30$ days	32.3 (29.6-35.0)	32.3 (29.3-35.3)	30.4 (26.6-34.2)	35.3 (30.4-40.1)
$\geq 180$ days	16.4 (14.2-18.6)	18.8 (16.3-21.3)	17.1 (14.0-20.2)	21.4 (17.2-25.6)
Complete Case				
$\geq 30$ days	39.4 (36.2-42.5)	39.4 (36.0-42.9)	37.0 (32.6-41.3)	43.3 (37.7-48.9)
$\geq 180$ days	20.0 (17.4-22.6)	22.9 (20.0-25.8)	20.8 (17.1-24.5)	26.2 (21.3-31.2)

Note: Columns 3 and 4 are subsets of the overall multi-state program (Column 2)