



Reach and Effectiveness of a Ten-Year International Spanish-language Stop-Smoking Internet Site

Ricardo F. Muñoz, Ph.D.
Palo Alto University & University of California, San Francisco

Ken Chen, Julia Bravin, Elizabeth Shaughnessy
Palo Alto University

Eliseo J. Pérez-Stable, M.D.
University of California, San Francisco

{ 1 }

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{ 2 }

Key Points

- Smoking is a worldwide problem
 - Major cause of death and disability
 - We are approaching 10 million deaths per year in the world.
 - In 100 years, this would add up to 1 billion deaths.
- International efforts to reduce its effects are needed
- This presentation focuses on efforts for Spanish-speaking smokers

3

Top Ten Languages Used on the Web
(Number of Internet Users by Language)

Language	Internet Users	Internet Penetration	Growth in Internet (2000-2011)	Internet Users % of Total	World Population for this Language (2011 Estimate)
English	565,004,126	43.40%	301.40%	26.80%	1,302,275,670
Chinese	509,965,013	37.20%	1478.70%	24.20%	1,372,226,042
Spanish	164,968,742	39.00%	807.40%	7.80%	423,085,806
Japanese	99,182,000	78.40%	110.70%	4.70%	126,475,664
Portuguese	82,586,600	32.50%	990.10%	3.90%	253,947,594
German	75,422,674	79.50%	174.10%	3.60%	94,842,656
Arabic	65,365,400	18.80%	2501.20%	3.30%	347,002,991
French	59,779,525	17.20%	398.20%	3.00%	347,932,305
Russian	59,700,000	42.80%	1825.80%	3.00%	139,390,205
Korean	39,440,000	55.20%	107.10%	2.00%	71,393,343
TOP 10 LANGUAGES	1,615,957,333	36.40%	421.20%	82.20%	4,442,056,069
Rest of the Languages	350,557,483	14.60%	588.50%	17.80%	2,403,553,891
WORLD TOTAL	2,099,926,965	30.30%	481.70%	100.00%	6,930,055,154

4

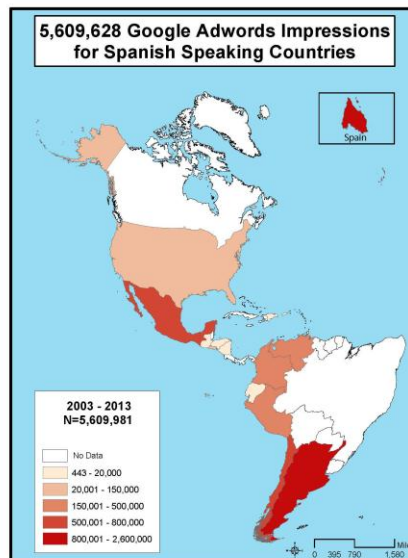
TC Internet Studies



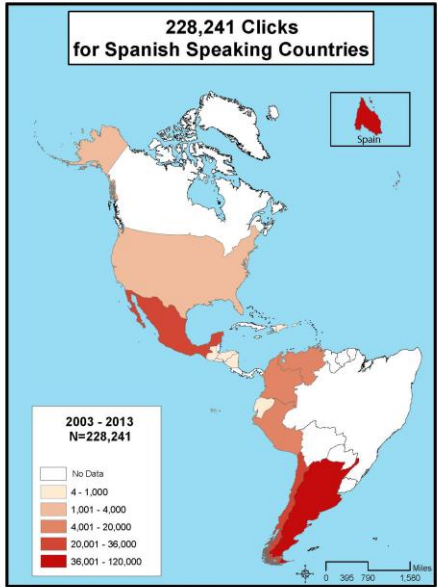
- TC = Tomando Control de Su Vida ([Taking Control of Your Life](#)).
- TC1: mail intervention study.
- TC2: initial internet studies(2002-2005)
- TC3 Main: Randomized Control Trial with Phone Follow-up. (2005-2006)
- TC3 Recruitment: RCT Exactly as TC3 Main without Phone Follow-up (2006-2008).
- TC4: Participant Preference Trial (2008-2011).

5

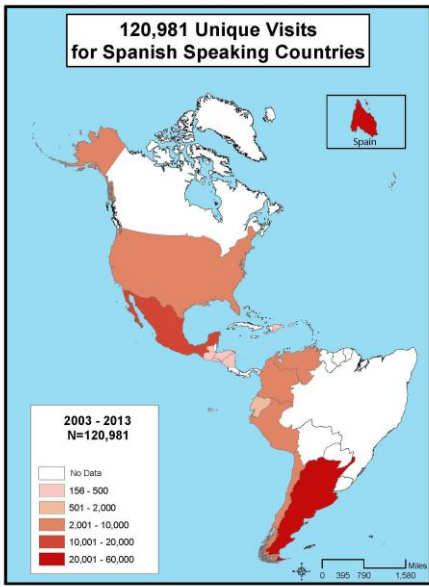
Who Searched for Stop Smoking information?



6



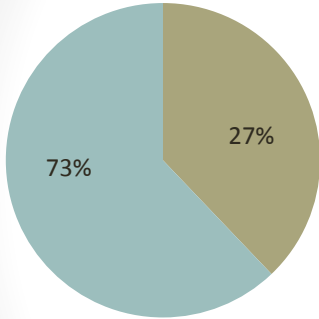
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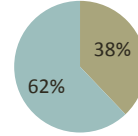
Consented Sample by Language

Overall Sample

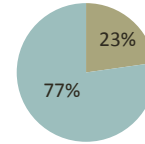


■ English-Speaking
■ Spanish-Speaking

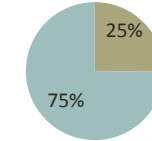
TC2(2002-2005)



TC3(2005-2008)



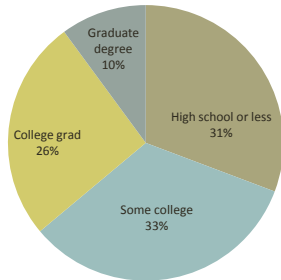
TC4(2008-2011)



{ 9 }

Demographic profiles of Spanish-Speaking visitors

Education

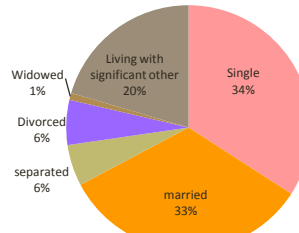


N=107,893

Gender	N	Percentage
Men	67,310	52.4%
Women	61,227	47.6%

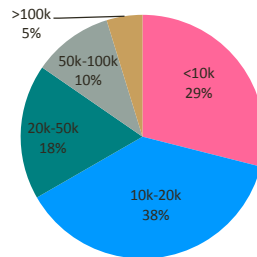
Marital Status

N=38,661



Income

N=23,776



{ 10 }

Definition of Quit Rates

Have you smoked one or more cigarettes in the last 7 days?

- A “No” answer is counted as abstinent for that week.
- Quit Rate:
 - Seven-Day Self-Reported Abstinence at 1-Month
- Observed quit rate:
 - number reporting not smoking / total providing data
- Missing=Smoking rate:
 - number reporting not smoking/ total randomized or consented

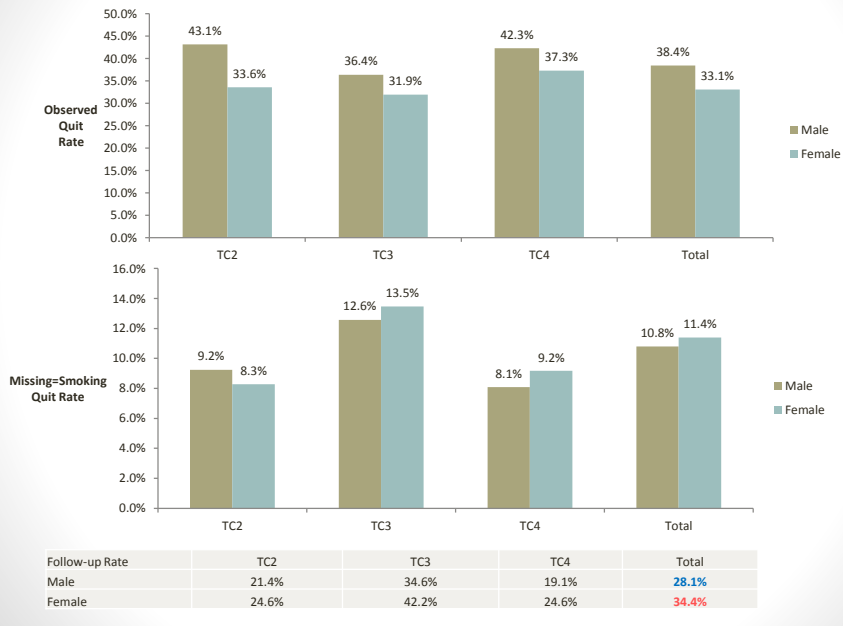
{ 11 }

Effective compared to what? Achievable smoking cessation rates

- Reviews of smoking cessation studies shows that 6-month quit rates are:
 - 4-8% for placebo patches
 - 14-22% for the nicotine patch
 - 24-27% for smoking cessation groups
- Our Internet intervention yields comparable results to the nicotine patch (using missing=smoking rates)

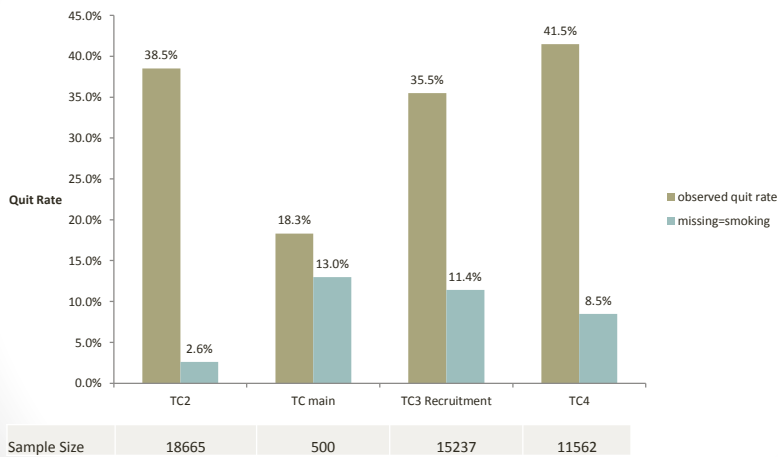
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Smoking Cessation Outcome by Gender



13

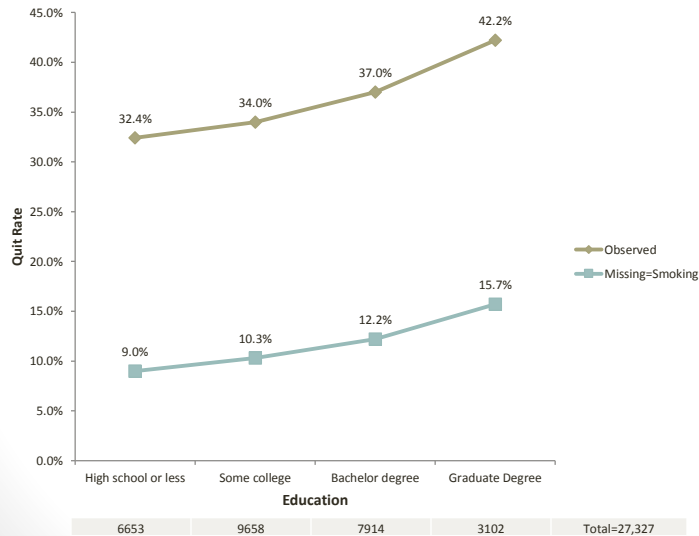
Smoking Cessation Outcome by Study (Spanish-speaking)



14

Note: TC main study contains 500 English-Speaking and 500 Spanish-Speaking participants.

One-Month 7-day observed and Missing=smoking quit rates by Education Level 2002-2011 (Spanish sample)



15

Impressions Ranked by Percentage of Smokers Reached

Country	Impressions	Smoking Pop	Percent
Spain	2,531,926	15,963,873	15.86%
Chile	509,260	6,525,222	7.80%
Venezuela	399,798	5,122,635	7.80%
Argentina	815,774	12,783,294	6.38%
El Salvador	20,690	714,705	2.89%
Mexico	745,544	28,706,574	2.60%
Colombia	322,541	14,181,193 [†]	2.27%
USA	102,183	8,845,305*	1.75%
Peru	154,195	10,089,064	1.50%

Information is retrieved from World Health Organization (www.who.int/en) and American Lung Association (<http://www.lung.org/stop-smoking/about-smoking/facts-figures/hispanics-and-tobacco-use.html>).

* The smoking population for USA includes only Spanish-Speaking smokers.

† Colombia National Study of Mental Health (2003)

16

Number of people quit

- Among **Spanish-Speaking** users,
 - **3438** out of **9291** providing data (**37.0%**) and out of **44,726** randomized or consented (**7.7%**) reported quitting smoking for at least 7 days in the past month.
- Additionally we helped **English-Speaking** users quit.
 - **1295** out of **3578** providing data (**36.2%**) and out of **19,052** randomized or consented (**6.8%**) reported quitting smoking for at least 7 days in the past month.
- Total reporting abstinence at 1-month: **4733**.

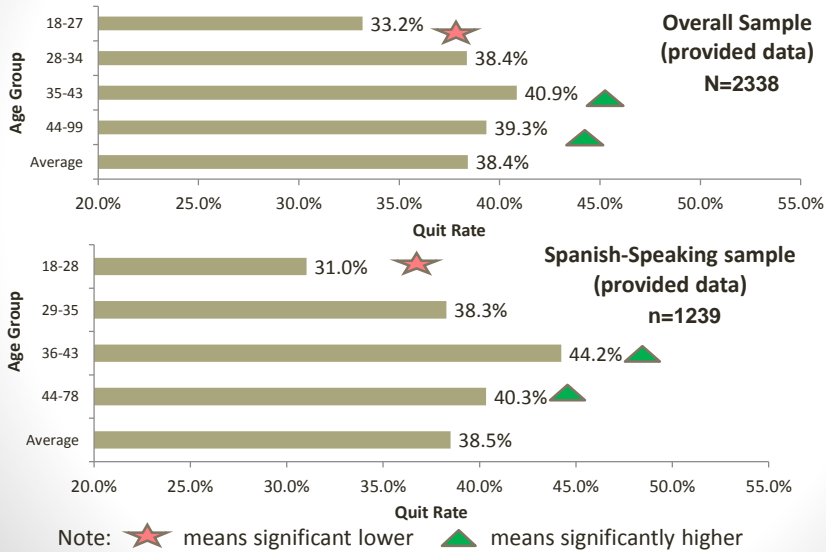
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Cost Comparison

- Nicotine patches cost \$2-\$4 per patch
- Need to be used 6-20 weeks
- Efficacy: 14%-22%
- To achieve abstinence for 4,733 people, total cost would be between **\$3 and \$5 million (plus administrative costs)**
- Cost of creating the site and conducting the trials was approximately **\$1.3 million including staff costs** over 10 years

(18)

7-day One-month Observed Abstinence Rate for TC2 by Age Group



19

Internet RCTs missing=smoking smoking cessation results

- Muñoz et al., 2006:
 - Best condition tested yields 26% at 6 months for Spanish speakers
- Muñoz et al. 2009: 12-month quit rates are:
 - 20% for Spanish speakers
 - 21% for English speakers
- These results suggest that making evidence-based Stop Smoking Internet sites available to the Spanish-speaking world would help large numbers of smokers to quit.
- Currently, few smokers who used our site have used other smoking cessation aids.

20

Utilization of other smoking cessation resources (TC3 rec)

	All participants (N=16,494)	English (n=3347)	Spanish (n=13,147)	Group test p
Smoking history	M (SD)			
Age (years)	36.3(12.9)	36.9(12.6)	36.2(12.9)	.002
Age (years), first cigarette	15.6(3.3)	15.8(4.0)	15.5(3.1)	<.001
Age(years) regular smoker	19.2(34.5)	19.3(36.2)	19.2(34.0)	.367
Cigarettes per day	19.6(10.1)	19.4(10.1)	19.7(10.1)	.161
FTND score	5.2(2.5)	5.4(2.4)	5.2(2.5)	<.001
Quit confidence	7.1(2.1)	6.9(2.2)	7.2(2.1)	0.32
Methods used to quit in last 6 months	% Using			
Nicotine gum	12.7	18.2	11.3	<.001
Nicotine patch	11.4	22.2	8.6	<.001
Nicotine inhaler	13.9	3.7	0.8	<.001
Nicotine spray	0.2	0.4	0.1	<.001
None	67.3	52.3	71.1	<.001

*FTND=Fagerstrom Test for Nicotine Dependence

(21)

The Role of Stop Smoking sites in Spanish

- To **meet** the perceived **need**
- To add a **new resource** to help people stop smoking
 - Spanish speakers are **less likely** to use any stop smoking aids (including nicotine replacement) than English speakers
- Quit rates are **comparable to nicotine replacement** methods.
- The **cost** of offering Internet interventions would be **much less** than offering NRT or offering smoking cessation groups per person quit.

(22)

Future Directions

- TC5: RCT testing participant preference Stop Smoking Site vs. Waitlist Control (“Quit on Your Own” for Three Months.) [Eliseo J. Pérez-Stable]
- San Francisco Stop Smoking App (Free research version available in English, Spanish and Chinese from iTunes) [Leandro Torres, Ricardo Muñoz, UCSF Information Services]
- Chinese stop smoking Website is under development. [Janice Tsoh, Angela Sun, Ricardo Muñoz]
- Expand to other health problems, for example, prevention and management of depression.

23

Institute for International Internet Interventions for Health (i4Health)



24

Thank you!

- Any Questions or Comments?



{ 25 }

Utilization of other smoking cessation resources (TC3 main)

	All participants (N=1,000)	English (n=500)	Spanish (n=500)	Group test <i>p</i>
Smoking history				
	<i>M (SD)</i>			
Age (years)	37.9 (11.3)	38.0 (11.9)	36.1 (10.8)	0.01
Age, first cigarette	15.6 (3.3)	15.7 (3.3)	15.6 (3.4)	0.675
Age, regular smoker	18.3 (4.0)	17.8 (3.5)	18.7 (4.5)	0.001
Cigarettes per day	19.8 (10.1)	19.6 (10.1)	20.0 (10.2)	0.525
FTND*	5.2 (2.5)	5.3 (2.4)	5.2 (2.5)	0.465
Quit confidence	6.8 (2.0)	7.0 (2.0)	6.7 (2.0)	0.039
Methods used to quit in last 6 months				
	<i>% Using</i>			
Nicotine gum	14.6	19.2	10.0	<.001
Nicotine patch	16.3	24.2	8.4	<.001
Nicotine inhaler	2.6	3.8	1.4	0.017
Nicotine spray	0.5	0.6	0.4	0.654
Bupropion (Zyban)	8.3	11.0	5.6	0.002
Other antidepressant	2.2	2.8	1.6	0.196
Stop smoking group	2.0	1.4	2.6	0.175
Hypnosis	3.1	4.6	1.6	0.006
Acupuncture	2.9	2.8	3.0	0.851
Motivational tapes	3.2	4.2	2.2	0.072
Other self-help	5.6	5.2	5.8	0.783
Other Web sites	6.2	5.6	6.8	0.431
Other	5.0	5.2	4.8	0.772
None	58.6	52.5	64.8	<.001

*FTND=Fagerstrom Test for Nicotine Dependence

{ 26 }

Utilization of other smoking cessation resources (TC3 rec)

	All participants(N=16,494)	English(n=3347)	Spanish (n=13,147)	Group test p
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Quit confidence	7.1(2.1)	6.9(2.2)	7.2(2.1)	0.32
Methods used to quit in last 6 months	% Using			
Nicotine gum	12.7	18.2	11.3	<.001
Nicotine patch	11.4	22.2	8.6	<.001
Nicotine inhaler	13.9	3.7	0.8	<.001
Nicotine spray	0.2	0.4	0.1	<.001
Bupropion	5.1	9.2	4.0	<.001
Other antidepressant	2.0	2.4	1.9	.055
Stop smoking group	2.0	2.2	1.9	0.117
Hypnosis	2.4	6.3	1.4	<.001
Acupuncture	2.1	2.5	2.0	.046
Motivational tapes	2.4	5.0	1.7	<.001
Other self-help	4.5	7.0	3.9	<.001
Other websites	2.9	4.4	2.5	<.001
Other	6.0	7.5	5.6	<.001
None	67.3	52.3	71.1	<.001

*FTND=Fagerstrom Test for Nicotine Dependence

27

Utilization of other smoking cessation resources (TC4)

	All participants(N=17500)	English(n=4474)	Spanish (n=13,026)	Group test p
Smoking history	M (SD)			
Age (years)	35.9 (13.9)	32.6 (15.6)	37.0 (11.9)	<.001
Age (years), first cigarette	15.9 (3.6)	16.8 (4.3)	15.7 (3.3)	<.001
Age(years) regular smoker	19.5 (35.5)	19.8 (29.0)	19.5 (37.4)	.486
Cigarettes per day	18.0 (16.7)	16.0 (24.5)	18.6 (13.1)	<.001
FTND* score	6.9 (2.4)	6.7 (2.4)	6.9 (2.4)	<.001
Quit confidence	6.7 (2.3)	6.8 (2.4)	6.7 (2.3)	.001
Methods used to quit in last 6 months	% Using			
Nicotine gum	12.6	13.6	12.2	.015
Nicotine patch	7.0	9.9	5.9	<.001
Nicotine inhaler	0.9	2.0	0.4	<.001
Nicotine spray	0.2	0.6	0.1	<.001
Bupropion	2.8	3.2	2.6	.044
Varenicline	2.7	2.0	2.9	.001
Other antidepressant	1.5	1.5	1.5	.995
Stop smoking group	1.5	1.3	1.6	.138
Hypnosis	1.7	2.8	1.3	<.001
Acupuncture	1.6	1.2	1.8	.010
Motivational tapes	1.9	3.0	1.5	<.001
Other self-help	4.1	6.3	3.3	<.001
Other websites	2.8	3.7	2.5	<.001
Prayer	4.4	8.8	2.8	<.001
Consulted with my doctor	3.4	3.8	3.3	.182
Other	5.1	6.8	4.5	<.001
None	67.3	59.7	70.0	<.001

*FTND=Fagerstrom Test for Nicotine Dependence

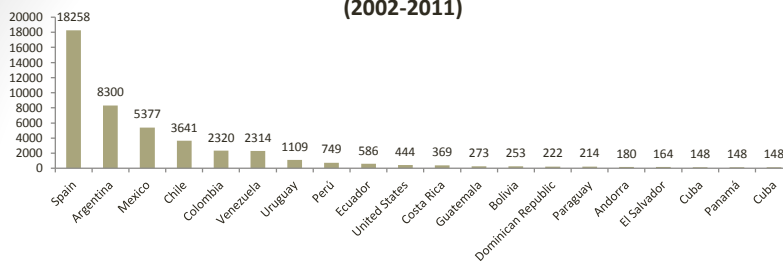
28

Background

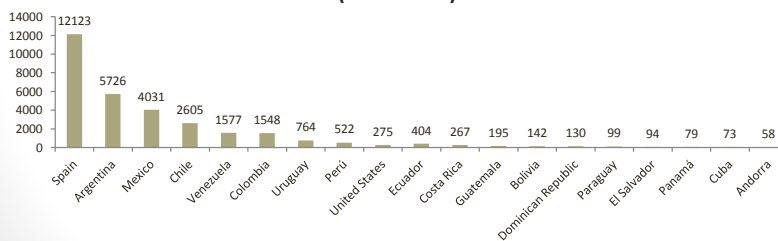
- Our goal: Reaching Spanish-speaking smokers
- We had difficulty having them come to groups in San Francisco
- We tried reaching them via surface mail, with some success
- We then tried reaching them via the Internet
- We have found we can now reach them across the world

29

Eligible Spanish-Speaking Participants of Top 20 Countries (2002-2011)



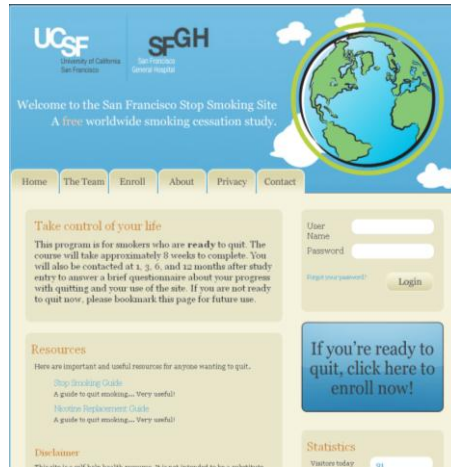
Consented Spanish-Speaking Participants of Top 20 Countries (2002-2011)



30

TC 3 Features

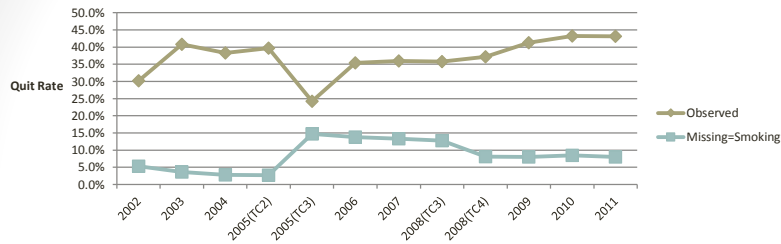
- Characteristics of the site
 - Guía
 - Email reminders
 - Mood management
 - Virtual group



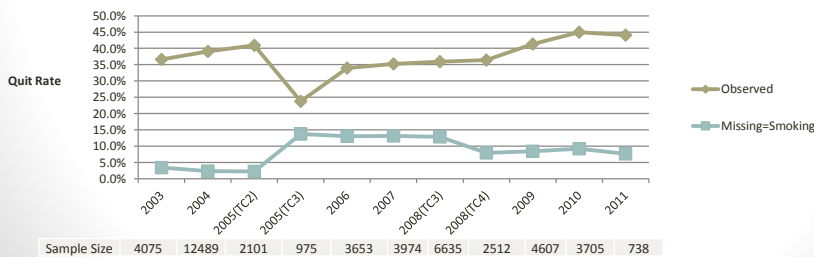
31

Smoking Cessation Outcome by Year

Entire Sample

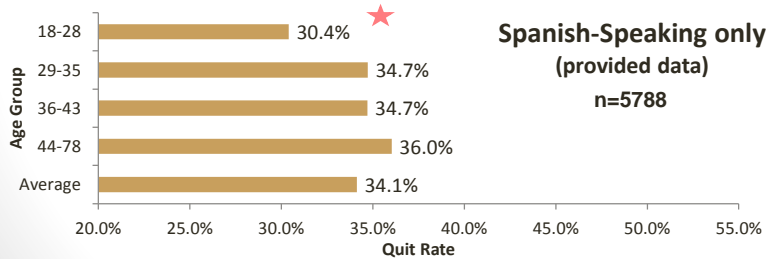
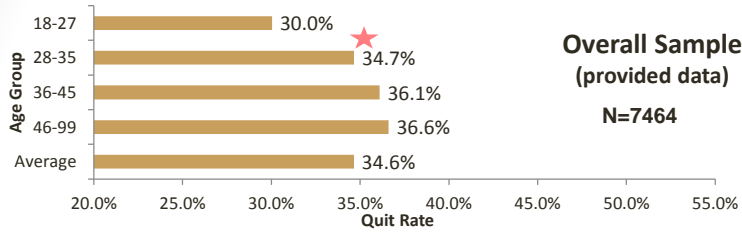


Spanish-Speaking sample only



32

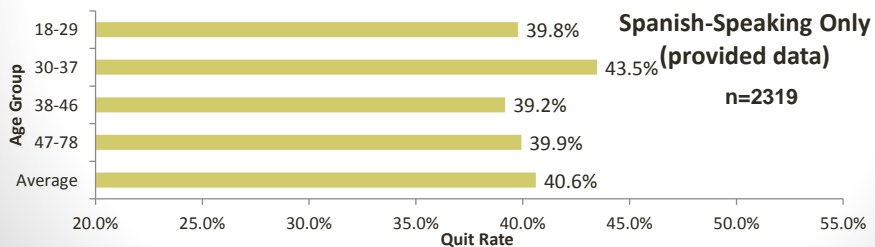
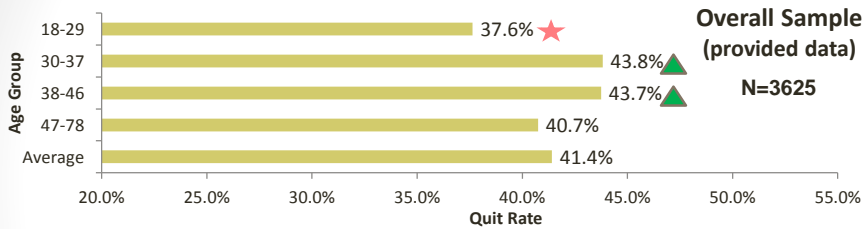
7-day One-month Observed Abstinence Rate for TC3 by Age Group



Note: The youngest age group has significantly lower observed quit rate the other three age groups.

33

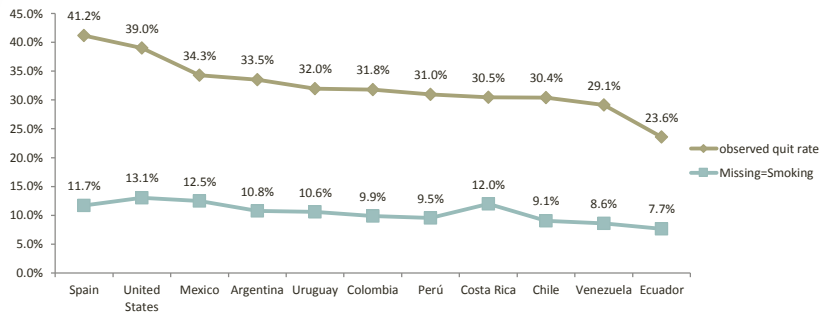
7-day One-month Observed Abstinence Rate for TC4 by Age Group



Note: ★ means significant lower ▲ means significantly higher

34

One-Month Seven-Day Abstinence Rate by Country across TC studies



Quit	1211	32	421	529	70	130	44	25	195	109	25
Randomized	2942	82	1227	1579	219	409	142	82	641	374	106
Provided Data	10367	245	3368	4907	661	1318	462	209	2152	1269	326
FU Rate	28.4%	33.5%	36.4%	32.2%	33.1%	31.0%	30.7%	39.2%	29.8%	29.5%	32.5%

35

Utilization of other smoking cessation resources (TC4)

	All participants (N=17500)	English (n=4474)	Spanish (n=13,026)	Group test p
Smoking history	M (SD)			
Age (years)	35.9 (13.9)	32.6 (15.6)	37.0 (11.9)	<.001
Age (years), first cigarette	15.9 (3.6)	16.8 (4.3)	15.7 (3.3)	<.001
Age(years) regular smoker	19.5 (35.5)	19.8 (29.0)	19.5 (37.4)	.486
Cigarettes per day	18.0 (16.7)	16.0 (24.5)	18.6 (13.1)	<.001
FTND* score	6.9 (2.4)	6.7 (2.4)	6.9 (2.4)	<.001
Quit confidence	6.7 (2.3)	6.8 (2.4)	6.7 (2.3)	.001
Methods used to quit in last 6 months	% Using			
Nicotine gum	12.6	13.6	12.2	.015
Nicotine patch	7.0	9.9	5.9	<.001
Nicotine inhaler	0.9	2.0	0.4	<.001
Nicotine spray	0.2	0.6	0.1	<.001
None	67.3	59.7	70.0	<.001

*FTND=Fagerstrom Test for Nicotine Dependence

36

Utilization of other smoking cessation resources (TC3 main)

	All participants (N=1,000)	English (n=500)	Spanish (n=500)	Group test <i>p</i>
Smoking history	<i>M (SD)</i>			
Age (years)	37.9 (11.3)	38.0 (11.9)	36.1 (10.8)	0.01
Age, first cigarette	15.6 (3.3)	15.7 (3.3)	15.6 (3.4)	0.675
Age, regular smoker	18.3 (4.0)	17.8 (3.5)	18.7 (4.5)	0.001
Cigarettes per day	19.8 (10.1)	19.6 (10.1)	20.0 (10.2)	0.525
FTND*	5.2 (2.5)	5.3 (2.4)	5.2 (2.5)	0.465
Quit confidence	6.8 (2.0)	7.0 (2.0)	6.7 (2.0)	0.039
Methods used to quit in last 6 months	% Using			
Nicotine gum	14.6	19.2	10.0	<.001
Nicotine patch	16.3	24.2	8.4	<.001
Nicotine inhaler	2.6	3.8	1.4	0.017
Nicotine spray	0.5	0.6	0.4	0.654
None	58.6	52.5	64.8	<.001

{ 37 }

*FTND=Fagerstrom Test for Nicotine Dependence