Tobacco Use Behavior and Health Consequences Among U.S. Racial and Ethnic Minorities

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Summary of Presentation

- Prevalence rates by race/ethnicity
- Very light and non-daily smoking
- Second-hand smoke consequences
- Cessation studies
- Biological factors



Cigarette Smoking in the U.S. – 2013 National Health Interview Survey

	% Men	% Women
White	21.2	17.8
African Am	21.8	15.4
Latino	17.3	7.0
Asian	15.1	4.8
Am Ind/AN	32.1	22.0
Multi-racial	29.1	24.8
8 years or less	21.9	9.2
9-11 yrs school	40.0	26.6
GED	42.9	39.7
High School diplo	26.7	17.6
College degree	10.4	7.9

MMWR 2014;63:1108-1112



Smoking Prevalence Among California Men By Race/Ethnicity, 1994-2010



BRFSS and California Adult Tobacco Survey data are combined for 1993-2010. The data are weighted to the 2000 California population. California Department of Public Health, California Tobacco Control Program.



Smoking Prevalence Among California Women by Race/Ethnicity, 1994-2010



BRFSS and California Adult Tobacco Survey data are combined for 1993-2010. The data are weighted to the 2000 California population. California Department of Public Health, California Tobacco Control Program



Cigarette Smoking Behavior in Latinos by Sex, NHLIC *En Acción*,1993-1994

	Smokers	
	Men	Women
	%	%
Mexican American	25.0	10.4
Central American	23.0	10.1
Puerto Rican	27.6	24.2
Cuban American	24.7	12.4
South American	23.0	15.8

Am J Public Health 2001; 91: 1424-30

Daraant Currant



Acculturation and Smoking Behavior in Latinos by Sex, En Acción, 1993-1994 Percent Current **Smokers** Women Men Acculturation Score 25.7 10.3 1 to <2 (less) 2 to <3 25.0 11.9 15.5 3 to <5 (more) 23.0



Cigarette Smoking Rates, Daily and Some Days, Study of Latinos, 2009

Kaplan RC, Am J Prev Med 2014; 46:496-506

National Origin	Men (6532) 16.9% / 9.9%	Women (9790) 10.7% / 5.8%
Cuban	26.2% / 4.9%	18.2% / 3.7%
Puerto Rican	27.0% / 9.0%	24.2% / 7.4%
Dominican	8.8% / 2.3%	7.5% / 4.3%
Mexican	10.3% / 15.5%	4.4% / 6.2%
Central Am	12.1% / 9.8%	5.0% / 3.3%



Light and Non-Daily Smokers Tobacco Use Supplement, CPS, 2003

	% Current	% Non-Daily / 1-5
White	24.5	17/ 5
African Am	20.3	24/12
Latino	14.2	35/18
Asian/PI	12.3	30/14

Trinidad D, et al, NTR, 2009; 11:203-210



Light and Non-Daily Smokers Tobacco Use Supplement CPS, 2003

- Smoke average 11.7 d / month
- Younger, more educated, women
- Smoke an average of 3.7 cigarettes on days they do smoke
- Daily smokers averaged 10.8 cigarettes per day



Cigarette Smoking Prevalence, TUS/CPS, 1992-1996 and 2003-2007

National Origin	Men	Women
Cuban (n=1093)	27.7% / 19.5%	16.4% / 12.5%
Puerto Rican (n=2955)	31.8% / 19.9%	21.6% / 19.5%
Mexican (n=13283)	25.2% / 16.7%	13% / 8.6%



Populations Targeted by the Tobacco Industry

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

LEGACY TOBACCO DOCUMENTS LIBRARY

Kalmanovitz Libral "Prestige, status, pride and luxury are extremely important to **Blacks** who, as a people, were historically denied those things...The physical and psychological deprivation that occurred during and after slavery gave rise to certain wants and needs which, even today, affect Black consumer behavior...The desire for instant gratification reflects the inclination of a deprived people to get as much satisfaction as they can as soon as they **can.**" (RJR, 1990)



Targeted by the Tobacco Industry



Appeal to luxury and style



Targeted by the Tobacco Industry



- 80% of blacks smoke menthol cigarettes compared to 30% of whites
- Menthol marketing
- In 1969 Lorillard increased its "Negro market budget" by 87% over 1968



African American Smokers Show Greater Nicotine Dependence



National Health Interview Survey, United States, 2010



Second-Hand Smoke



Second Hand Smoke Proposed Health Effects

- Increased risk of Attention Deficit/Hyperactivity among children 4-15 years of age with Mexican Americans having OR 2.72 (1.25-5.93) by blood cotinine level in NHANES
- Risk of Abnormal cervical cytology associated with SHS exposure: OR 1.70 (1.14-2.52) among 4403 women
- Compelling evidence for increased risk of MI by 30%
- Asthma and COPD exacerbations
- Lower Respiratory Infections
- Breast cancer?





Persistent Asthma Associated with In Utero-Tobacco Exposure

- In Utero smoke vs. SHS: asthma
- 295 Mexican, Puerto Rican and Black children with asthma, age 8-16 years
- Standard interviews of parents
- Evaluate tobacco smoke exposure In Utero and exposure from parents in first 2 years of life on severity outcomes

Akuete K, Pediatrics 2011; 128: e623-30



In-Utero Tobacco Smoking and Asthma-Related Outcomes





Smoking and Asthma Severity



Oh, et al. JACI 2012



SHS Exposure in California

California Health Interview Survey, 2005-2007; California Tobacco Surveys, 2002-2005; Public Health Reports 2012; 127: 81-88

	At Home	At Work
Total adults	6.0%	12.9%
Latinos	4.0%	19.5%
Whites	6.7%	9.7%
African Am	11.3%	10.4%
Asian/PI	5.9%	10.5%
Children	3.4% 4.7%	R/E: 1.9, 4.1, 11.2, 3.3 R/E: 3.3, 5.1,
Audiescents		11.8, 3.8



SHS Exposure: % Non-smokers with cotinine ≥ 0.05 ng/ml

	1999-2000	2007-2008
Total	52.5	40.1
Age 3 to 11	64.9	53.6
Whites	49.6	40.1
African Am	74.2	55.9
Mexican Am	44.3	36.7
Below poverty	71.6	60.5



Cessation Patterns and Interventions

Home Smoking Bans Community-Based



Smoking Cessation Patterns

- Light smoking has not translated to more success in cessation
- Complete home smoking bans more common among Latinos and Asians and less common among African Americans
- Less frequent use of NRT
- No difference in advice by clinicians



Home Smoking Bans in US Households with Children and Smokers

Tobacco Use Supplement, Am J Prev Med 2011; 41: 559-65

	1992-1993	2006-2007
Total	14.1%	50%
Asian/PI	28.5%	65.9%
Whites	12.7%	48%
African Am	9.2%	32.8%
Latinos	26.7%	72.2%
HS Grad or <	11.1%	42%



Presence of a Total Home Smoking Ban Among Current Daily Smokers by Race/Ethnicity: Comparison to Whites





Second Hand Smoke Exposure in Multiunit Housing, Southern CA

- Focus Groups and Surveys
- High levels of exposure reported
- Fear of retaliation expressed
- Support for indoor and outdoor smoking bans to protect families
- Advocacy group helped implement voluntary policies

Am J Health Promotion 2011; (5 Suppl): S82-90



Latino Smoking Behavior: Subjective Culture Results from Convenient Sample Research

- Less likely to smoke due to habitual cues
- As likely to smoke due to emotional cues
- More likely to want to quit because of:

 cigarette smoke effects on others,
 especially family
 smoking affects interpersonal relations
 - smoking affects interpersonal relations
 smoking effects on own health



Population-Based Replication Study: Sampling Strategy

Are ethnic differences independent of education and nicotine dependence?

- RDD phone X-sectional survey
- Target census tracts ≥ 10% Latinos
- Self identified Latino or Anglo (NLW)
- 18 to 65 years of age; last birthday
- 20 minute survey
- Response rates average 85%

J Gen Intern Med 1998; 13:167-174



Multivariate Model Results for Latino Ethnicity: Reasons to Quit or Continue

	OR	95% CI
Criticized by family	1.93	(1.26, 2.98)
Burn clothes	1.57	(1.02, 2.42)
Children's' health	1.67	(1.08, 2.57)
Bad breath	2.07	(1.40, 3.06)
Family pressure	1.69	(1.10, 2.60)
Good example	1.83	(1.21, 2.76)
Not to gain weight	0.38	(0.24, 0.59)

JGIM 1998; 13: 167-174



Guia Para Dejar de Fumar

- Developed in 1987, revised 3 times; in Spanish, color photos, low literacy
- Free on NCI Planet web site, updated pharmacological information
- Evaluation from post implementation showing acceptance and cessation-8.4%
- Used as main intervention component in community study in San Francisco
- Culturally and linguistically tailored– 6th grade reading level



Smoking Prevalence in SF Latinos, Age 18-64, 1986-89

	1986	1987	1988	1989
(n)	(1659)	(2053)	(1965)	(1989)
Men	34.5	27.0	27.8	24.4
Women	17.1	17.1	16.4	12.2
Low Acc	24.8	20.3	18.9	15.3
Hi Acc	24.1	22.6	25.0	21.4



Association of Exposure and Mediating Outcomes among Smokers

<u>Outcome</u>	<u>OR</u>	<u>95% CI</u>
Attempted to Quit	1.6	(1.0-2.5)
Knew of Guia	2.5	(1.5, 4.0)
Knew of raffle	12.2	(5.3, 28.1)
Asked to quit	2.2	(1.4, 3.5)

Define "exposure" to the intervention by responses that they "heard of" 8 specific components including PLDF name, Guia, and a \$500 raffle to quit High Exposure = 4 or more of the components

Am J Prev Med 1994; 10:340-347



Pharmacological Treatment of Smoking Cessation

- Almost all RCT data in studies with Whites
- No published drug trials with Asian/PI and 2 NRT studies with Latinos
- 6 trials with African Americans: NRT and bupropion are effective
- Dependence measures predicted success in African Americans
- Smokers of mentholated cigarettes were less successful at quitting



Smoking and Depression: What is the Connection?

- Depressed smokers found to have a harder time quitting in trials
- Association of depression and depressive symptoms in current smokers
- Efficacy of bupropion and nortriptyline
- Depression is symptom of nicotine withdrawal
- Smoking leads to deficits in dopamine, serotonin, NE



Tomando Control de su Vida: Mood-Management Smoking Cessation for Latinos



Am J Comm Psychol 1997; 25 (3): 325-343







Tomando Control 3

1000 randomized smokers with 70% follow-up

12 month quit rates by Condition	on
Guia alone	19.8%
Guia + ITEM	19.1%
Guia + ITEM + MM	20.7%
Guia + ITEM + MM + VG	22.7%

http://stopsmoking.ucsf.edu Randomized Smoking Cessation Trial on the Web

Muñoz RF, et al, Nicotine and Tobacco Research, 2009 Sep; 11 (9):1025-34



Questions and Gaps in Cessation Research

- Tailoring messages by race/ethnicity group has become standard: How much that cultural tailoring is needed?
- Smoking intensity reduction as an intermediate outcome —incremental change?
- Serious quit attempt of at least 24 h as a mediating outcome
- Recruitment to intervention trials



Variance in the Cessation Paradigm?

- Light smokers are less addicted
- Non-daily smokers are not addicted by definition
- Pharmacological treatment needs to be modified for these smokers
- Adapt behavioral interventions directed at light smokers for use in self-help, internet and quit line



Biological Factors in Smoking Behavior

Cotinine Smokers Vary by Race/Ethnicity Tobacco Smoking and Lung Cancer



Menthol and Dependence

- Use of menthol cigarettes almost exclusively among African Americans and Puerto Ricans
- Increase dependence by cooling smoke sensation?
- Associated with smoking within 5 minutes of waking among light smokers of 6 to 10 cigarettes per day
- Starter brands due to taste: youth
- 52% mentholated smokers are women



Menthol and Cessation (Addiction 2010; suppl 1: 84-94)

- Among mentholated cigarette smokers, African Americans and Latinos:
- More likely to consider quitting in 6 months (AA: OR=1.62; L: OR=1.21)
- Have positive estimation of success in 6 m (AA: OR=1.87; L: OR=1.34)
- Former smokers had less success to quit if smokers of mentholated cigarettes in all groups (L: OR=0.48)



Cotinine Measures in Mexican American Latinos

- Self-reported smoking valid?
- Underreporting occurred in up to 25%
 of Mexican American smokers
- 12.1% of smokers had non-smoker cotinine levels in HHANES sample
- Cotinine correlates with physiological variables
- Light and Intermittent smoking is the norm for most Latino smokers

American Journal of Public Health 1990; 80: 1057-1061; Am Rev Respir Dis 1992; 145:53-57



Ethnic Differences in Serum Cotinine Levels: NHANES 3

	>15 ng/ml	<u><</u> 15 ng/ml	
	%	%	
African Americans			
Smoker	96	4	
Non-smoker	2	98	
Whites			
Smoker	94	6	
Non-smoker	2	98	
Mexican Americans			
Smoker	72	28	
Non-smoker	1	99	

JAMA

Optimal Serum Cotinine for Distinguishing Smokers and Nonsmokers

- NHANES: 13,078 nonsmokers and 3,078 smokers; based on ROC curves
- Whites: 5.92 ng/ml
- African Americans: 4.85 ng/ml
- Mexican Americans: 0.84 ng/ml
- Overall cut point is 3.08 ng/ml; 96% sensitivity and 97% specificity
- 14 ng/ml underestimates smokers

Benowitz N, Am J Epidemiol, November 19, 2008



Nicotine Metabolism and Intake in African Americans

- African Americans have 50% more lung cancer and higher cotinine levels per cigarette despite fewer cigarettes/day
- Total and renal clearance of cotinine were 20% lower in African Americans
- Nicotine intake per cigarette was 30% greater in African Americans

JAMA 1999;280:152-56



Nicotine Metabolism in Blacks, Whites, Chinese and Latinos

- Metabolic clearance of nicotine and cotinine in Latinos was similar to Whites, higher among Blacks and lower among Chinese
- Intake of nicotine (mg) per cigarette:
 - Chinese: 0.73
 - Latinos: 1.05
 - Whites: 1.10
 - Blacks: 1.41
- Nicotine intake = tobacco smoke

JNCI 2002; 94:108-115



Tobacco Smoking and Lung Cancer

- Tobacco smoke causes 85% to 90% of lung cancer in high-income countries
- 10% 15% of smokers get lung CA
- Linear-exponential dose response effect with OR varying from 10 to 20 as CPD increases to >20
- Variation in incidence rates by race/ethnicity and gender are striking



Lung Cancer Incidence by Race/Ethnicty and Sex

	White	African American	Latino	Asian/PI
Wome Lung	n 54.7	54.8	25.4	28.1
Men Lung	76.3	101.2	41.4	52.9

These rates are per 100,000 population and are based on cases diagnosed in 2003-2007 from 17 SEER geographic areas.



Racial Disparities in Lung Cancer Rates





Multiethnic Cohort Study: Lung Cancer by Smoking Intensity

- 183,813 Af Ams, Japanese-Am, Latino, Native Hawaiian, Whites; age 45 - 75, in California and Hawaii
- 1979 cases lung cancer, from SEER, 1993-2001; 1135 in men
- African Americans as referent group
- Stratify by smoking intensity
- Relative risk of lung cancer by race/ethnicity within smoking level

Haiman CA, et al. N Engl J Med. 2006;354(4):333-42



Relative Risk of Lung Cancer by Ethnicity and Smoking Intensity

Cigs/d	Af Am	Hawaii	Latino	Japan	White
1-9	1.0	0.88	0.21	0.25	0.45
11-20	1.0	0.90	0.36	0.39	0.57
21-30	1.0	0.93	0.61	0.61	0.73
31+	1.0	0.95	0.79	0.75	0.82

Haiman CA, et al. N Engl J Med. 2006;354(4):333-42



Possible Explanations

- Genetic factors linked to African ancestry
- Genetic-Environmental factors triggered by tobacco carcinogens
- Metabolism differences lead to greater intake of carcinogens despite similar CPD intensity
- Mentholated brands
- Smoking topography
- Protective factors for other groups



Final Points

- Cigarette smoking is less frequent and less intense among Latinos and Asian/Pacific Islanders
- Cessation paradigm needs to adapt to light and non-daily smokers
- Self-help, culturally appropriate materials are available and need to be promoted
- Biological pathways vary—to define

