Epidemiology of Hardcore Smoking: The Need to Advance the Field

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Transdisciplinary Classification of Hardcore Smokers: How Shall We Define “Hardcore”? Symposium
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Definitions of Epidemiology and Public Health Surveillance

Epidemiology: The study of the distribution and determinants of health-related states or events in specialized populations and the application of this study to the control of health problems.

Public Health Surveillance: The ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and improve health.

Sources: Last JM, *A Dictionary of Epidemiology* 1995; *MWWR* 2001;50(No. RR-13),page 2.
Purposes of a Tobacco-Related Surveillance System

To provide timely information from populations on:

- prevalence of use of various products (tobacco and pharmaceutical)
- factors that influence their use
- incidence, prevalence, and mortality from tobacco-attributable diseases
- impact of tobacco control programs and policies on relevant outcomes
Uses of Tobacco Surveillance Data

- Learn about nature of the problem
- Justify policies, programs, and legislation
- Monitor and evaluate these
- Set realistic objectives
- Identify high risk groups
- Justify research initiatives
- Conduct research
Trends in cigarette smoking* among adults aged ≥18 years, by sex - United States, 1955-2003

*Before 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes during their lifetime and who reported now smoking every day day or some days. 2003 estimate is for January-June.

Background

• Key Question: As tobacco control progresses, are we left with proportionately more smokers who either can’t or won’t quit? Previous work:

• Fagerström and colleagues’ international comparisons of dependence (Tobacco Control 1996).

• Irvin and Brandon (N&TR 2000, 2003)
  - increasing recalcitrance in CT samples
  - concern about representativeness.
Background (2)

- Warner and Burns (2003) define the “Hard-Core Smoker” as a daily, long-term smoker who is unable or unwilling to quit and who is likely to remain so even when possessing extensive knowledge about the hazards of smoking and confronting substantial social disapproval of smoking.
- E.g., older physicians who smoke.
Russell’s Motivation/Dependence Model of Quitting

Source: Progress in Smoking Cessation; Schwartz JL (ed); ACS/WHO, 1978
Background (3)

- One empirical measure, developed by Emery and colleagues (*AJPH* 2000):
  - current daily smoking of ≥ 15 CPD among persons aged ≥ 25 years who had not attempted to quit during the preceding year and who never expected to quit.
  - 5.2% of California smokers
  - Retired, white males, low to moderate SES, who live alone
Background (4)

- Jarvis et al (BMJ 2003):
  - Less than a day w/o cigarettes in past 5 yrs; no quit attempt in past year; no desire or intention to quit.
  - 16% of UK smokers were hardcore
  - Hardcore smoking was associated with nicotine dependence, socioeconomic deprivation, and age (older).
  - HC smokers in denial about personal health consequences
Background (6)

• Hughes and Brandon (N&TR 2003) stress importance of distinguishing two types of hardening:
  – Decreases in intention to quit and
  – Decreases in ability to achieve abstinence.

• Whether the smoking population is hardening is a testable hypothesis.
Background (5)

- “Hardening” assesses whether the population of smokers is less likely to quit, either because of less motivation or greater dependence.
- Accurate diagnosis of U.S. smoking population could influence allocation of resources.
Outline of Today’s Presentation

• Epidemiologic Model
• Previous Work
  - National trends
  - State-specific patterns
• Advancing the Field
  - Incorporating measures of dependence
  - Incorporating cotinine
  - Incorporating cohort data
  - COMMIT
  - Hard Core Smoker & Harm Reduction Survey
Agent

Tobacco Products

Environment

Familial, Social, Cultural, Political, Economic, Media, Historical

Vector

Tobacco Industry; Other Users

Host

Smoker/User
Incidental Host
Involuntary Smoker

Adapted from: Orleans & Slade, 1993
Heavy Cigarette Smoking* Among Adults Aged 18+ by Gender – United States, 1974 -2002

Source: various National Health Interview Surveys, 1974-2002

*Smoking 25+ cigarettes per day
Trends in cigarette smoking* among adults aged ≥25 years, by education-United States, 1965-2002

*Before 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes during their lifetime and who reported now smoking every day day or some days.

Source: various National Health Interview Surveys from 1965 - 2002, National Center for Health Statistics
Heavy Cigarette Smoking* Among Adults Aged 25+ by Education – United States, 1974 -2002

Source: various National Health Interview Surveys, 1974 - 2002

*Smoking 25+ cigarettes per day
Some Day Smoking among Current Smokers by Current Smoking Prevalence in 50 States and D.C., 1998-1999


$r^2 = 0.363$

$B = -0.844$

$P < 0.001$

$N = 51$


Note: among persons aged 25+ years; estimates are age-adjusted
Cigarettes Smoked per Day by Current Smoking Prevalence in 50 States and D.C. -- 1998-1999


$\text{r}^2 = 0.435$
$\beta = -0.416$
$P < 0.001$
$N = 51$


* Among Current Smokers

Note: among persons aged 25+ years; estimates are age-adjusted

Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

Source: SAMHSA – National Household Survey on Drug Abuse

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Advancing the Field
Optimal Methodologies

- Population-based serial cross sectional surveys AND rolling cohorts – national / state
- Measuring
  - Tobacco use behaviors
  - Dependence
  - Motivation and intentions
  - Co-Morbidities
  - Efficacy, stress, support, coping skills
  - Appropriate body fluids for biomarker and genetic testing
Current Surveys

• National Health Interview Survey
• Current Population Survey Tobacco Use Supplements
• National Survey on Drug Use and Health
• National Health and Nutrition Examination Survey
Current Measures

- Smoking behaviors
- Indicators of dependence
- Alcohol and illicit substance use
- Co-morbidities
- Motivation and intentions to quit
- Selected demographics
Incorporating Measures of Dependence

- 2002 National Survey on Drug Use and Health (NSDUH) – assesses use of tobacco, alcohol, and illicit drugs; serious mental illness, depressive symptoms; 2002 data considered baseline
- Nicotine Dependence Syndrome Scale (Shiffman)
- Analyses (to be completed in Spring):
  - Assess NDSS score (continuous) as a function of change in smoking prevalence in respondent’s state (controlling for demographics and with and without CPD)
Incorporating Cotinine

- Stratify appropriately
- Assess:
  - cotinine per smoker
  - CPD
  - cotinine per cigarette

Mean ± 95%CI

Plasma cotinine (ng/ml)

DEPRIVATION SCORE
Incorporating Cohort Data
COMMIT

• 2001 follow-up of original 1988 COMMIT cohort (ages 25-64)
• 3,448 persons who were smoking at both waves
• Results:
  – Average cigarettes per day decreased (by 5)
  – Time to first cigarette increased
  – Desire to quit increased slightly
• Loss to follow-up: Those not followed more likely to smoke early and not want to quit. No difference in CPD.
Hard Core Smoker & Harm Reduction Survey

• National telephone survey of current smokers and former smokers off < 5 years; ages 25 years and older
• Fielded on February 12, 2004
• One year follow-up assessment
• Measures:
  – Smoking behaviors
  – Dependence
  – Readiness to quit
  – Motivation and intentions
  – Perceptions of cigarettes
  – Perceptions of treatments
  – Functional utility
  – Support and advice
  – Motivation enhancers
  – Quitting experiences, methods
  – PREPs – awareness, use, perceptions of; interest in
  - Media exposure
  - Home/work smoking bans
  - Health beliefs
  - Alcohol and illicit drug use
  - Mental health indicators
  - Perceived stress
  - Physical health
  - Fruit and vegetable consumption
  - Demographics
Summary

• Optimal definition involves motivation and dependence
• Analyses based on CPD do not indicate hardening, but CPD is not enough.
• Concurrent binge drinking and MJ use do not suggest hardening
• Clinical trial data consistent with hardening, but how representative are the samples used and does representativeness change over time?
• COMMIT cohort data do not support hardening.
• Measures of dependence needed – which scale?
• Is cotinine necessary?
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Famous Marlboro flavor now in an Ultra Light.
NEW! Omni
Reduced carcinogens. Premium taste.

Introducing the first premium cigarette created to significantly reduce carcinogenic PAHs, nitrosamines, and catechols, which are the major causes of lung cancer in smokers.

WARNING: Smoking is addictive and dangerous to your health. Reductions in carcinogens (PAHs, nitrosamines, and catechols) have NOT been proven to result in a safer cigarette. This product produces tar, carbon monoxide, and other harmful by-products.
Discussion

• Recommend: NHIS split-sample technique to compare current quitting patterns to those from decades ago.

• Recommend enhanced population-based surveillance (rolling cohorts):
  – Product surveillance
  – Host factors – use patterns, dependence, quitting experiences & methods, motivation, intentions, dependence, perceptions, functional utility, co-morbidities, genetics, biomarkers.
  – Environment: marketing (tobacco and pharmaceuticals), government messages, programs, policies.
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