Patterns of Tobacco Use in the United States

Gary A. Giovino, PhD, MS
Professor and Chair
Department of Community Health and Health Behavior
University at Buffalo, School of Public Health and Health Professions

Surveillance and Evaluation Net Conference Series
CDC Office on Smoking and Health
June 27, 2012

Outline

• Per capita consumption of various tobacco products
• Prevalence estimates from survey comparisons
  – Current smoking
  – Indicators of quitting
  – CPD/DPM
  – Cigarettes and other tobacco products
• Indicators of hardening
• International
Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2006

Source: US Department of Agriculture

Small cigars
- Weigh less than or equal to 1.36 grams
- Features common to cigarettes, such as shape, length (70 to 100 mm), and use of filter tips

Large Cigar
- Weigh > 1.36 grams
- Wide variety of cigar products

Cigarillo
- Considered a “large” cigar for taxation purposes

Source: Cristine Delnevo, UMDNJ School of Public Health
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau

Per Capita Consumption of Cigarettes and Cigars (Number of Sticks) – 2000-2010

Source: US Department of Treasury; Alcohol and Tobacco Tax and Trade Bureau
Unintended tax disparities from S-CHIP (effective April 1, 2009)?

<table>
<thead>
<tr>
<th>Product</th>
<th>Pre-SCHIP tax</th>
<th>SCHIP tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes (pack of 20)</td>
<td>$0.390</td>
<td>$1.010</td>
</tr>
<tr>
<td>Roll Your Own (per ounce)</td>
<td>$0.069</td>
<td>$1.549</td>
</tr>
<tr>
<td>Small Cigars (pack of 20)</td>
<td>$0.040</td>
<td>$1.010</td>
</tr>
<tr>
<td>Large Cigars (single)</td>
<td>$0.05 maximum</td>
<td>$0.40 maximum</td>
</tr>
</tbody>
</table>

20.72% of sales price but not to exceed $0.05 per stick
52.75% of sales price but not to exceed $0.40 per stick

Little cigars now taxed at ~$10/carton, whereas a carton of cigarillo cigars with wholesale cost of $10 would have FET liability of $5.28/carton

Source: Cristine Delnevo, UMDNJ School of Public Health

Per Capita Consumption of Cigars (Number of Sticks) – 2000-2010

Source: US Department of Treasury; Alcohol and Tobacco Tax and Trade Bureau
Per Capita Consumption of Smokeless, Pipe, and Roll-Your-Own Tobacco Products (in pounds) – 2000-2010

Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2006

Source: US Department of Treasury; Alcohol and Tobacco Tax and Trade Bureau

Source: US Department of Agriculture
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau
Chesterfield Cigarettes

"Gee! I'm in luck"

A cigarette of the finest TURKISH and DOMESTIC tobaccos - blended.
And the blend can't be copied.
they "Satisfy" - Ginn & Wilson, Inc.

To keep a slender figure
No one can deny...

Reach for a LUCKY instead of a sweet
"It's toasted"
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau
"I'll Be Right Over!"

...24 hours a day your doctor is "on duty"...

...guarding health... protectng and prolonging life...

According to a recent Nationwide survey:

MORE DOCTORS SMOKE CAMEL THAN ANY OTHER CIGARETTE!

CAMELS Cigarettes Tobacco
A Frank Statement to Cigarette Smokers

Jan. 4, 1954

For more than 30 years, Dunhill has been the name of a fine-quality cigarette. And for more than 30 years, Dunhill has been the name of a cigarette that screens out irritants but never screens out flavor.

Dunhill screens out irritants but never screens out flavor!

Today, decide on Dunhill...a better, longer cigarette...at no extra cost.

Tobacco Industry Research Committee

Jan. 4, 1954
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau
Brown & Williamson on Nicotine....

“Moreover, nicotine is addictive... We are, then, in the business of selling nicotine, an addictive drug....”

Addison Yeaman; General Counsel to the Brown & Williamson Tobacco Company; July 17, 1963.

Source: U.S. Food and Drug Administration, 1996.

“Cigarette smoking is a health hazard of sufficient importance to warrant remedial action”

1964 Report of the Advisory Committee to the U.S. Surgeon General
Philip Morris on Nicotine....

“Think of the cigarette pack as a storage container for a day’s supply of nicotine....
Think of the cigarette as a dispenser for a unit dose of nicotine...
Think of a puff of smoke as a vehicle of nicotine...

Smoke is beyond question the most optimized vehicle of nicotine and the cigarette the most optimized dispenser of smoke.”

Dr. William Dunn; Philip Morris Tobacco Company, 1972.

Source: U.S. Food and Drug Administration, 1996.

R. J. Reynolds chimes in....

“In a sense, the tobacco industry may be thought of as being a specialized, highly ritualized, and stylized segment of the pharmaceutical industry. Tobacco products uniquely contain and deliver nicotine, a potent drug with a variety of physiological effects.”


Source: U.S. Food and Drug Administration, 1996.
All the fuss about smoking got me thinking I’d either quit or smoke True.

I smoke True.

National Smoker Study:

Merit Science Works!

Low tar MERIT with Enriched Flavor tobacco delivers taste equal to—or better than—leading high tar brands.

MERIT
Kings & 100s
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau
"They don't look like passive smokers to me...."

Of course it's different.

It's cleaner.

Premier: The cleaner smoke.

Some people say Premier is different. That's no surprise. At one time, filtered and "light" cigarettes were thought to be different as well, yet it wasn't long before they became preferred choices among smokers.

Today, Premier offers smokers a whole new choice—a cleaner smoke. Because it's the first cigarette that burns tobacco instead of burning it.

By burning tobacco, Premier changes the very composition of cigarette smoke—substantially reducing many of the controversial compounds found in the smoke of filter-burning cigarettes. Those that remain include carbon monoxide. But it's a level so low that it's the best-selling "filter".

You get a smoke that you've never experienced before. A smoke that's fresh, pure, and free from the odor of old tobacco. And you'll find it easy to quit, too, so try it. If you've never tried a pack of Premier, you'll find it easier to quit.
Take a pouch instead of a puff.

New Skoal Bandits - an individual portion of tobacco in a neat little pouch.

A lot of smokers want to enjoy tobacco - but don’t want to light up. New Skoal Bandits is an easy alternative. Skoal Bandits is an individual portion of whole leaf, flavored tobacco in a neat, pre-moistened pouch. It’s easy to pull out, easy to take out. Just put a pouch between your lip and gum. Don’t chew it, just let it sit there. You’ll get real tobacco pleasure without lighting up. It’s a taste you’ll like anytime, anywhere. If you’re a smoker, try new Skoal Bandits, 20 pouches for 69¢. We think you’ll like taking a pouch instead of a puff.

THE DORAL WAY TO SAVE

1. Save with everyday generic prices.

2. Save an extra $3.00 with these coupons.

Also available in Filter 100’s & Menthol 100’s.
Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2010

Source: United States Department of Agriculture; Centers for Disease Control and Prevention; Alcohol and Tobacco Tax and Trade Bureau

“Our lack of greater progress in tobacco control is more the result of failure to implement proven strategies than it is the lack of knowledge about what to do.”

Former U.S. Surgeon General David Satcher, M.D., Ph.D.
2000
US Consumption of Cigars
1950 - 2002

Source: USDA Tobacco Yearbook 2002; Tobacco Outlook 2003 TBS-254
Outline

• Per capita consumption of various tobacco products
• Prevalence estimates from survey comparisons
  – Current smoking
  – Indicators of quitting
  – CPD/DPM
  – Cigarettes and other tobacco products
• Indicators of hardening
**Current Use Among Middle and High School Students by Type of Tobacco Product – National Youth Tobacco Survey, 2004**

Note: Used tobacco on $\geq 1$ of the 30 days preceding the survey  
Source: American Legacy Foundation, National Youth Tobacco Survey

**Past Month Cigarette Use among Persons Aged 12 or Older, by Age: 2006**

Source: National Survey on Drug Use and Health, SAMHSA
Trends in Cigarette Smoking Anytime in the Past 30 days by Grade in School – United States, 1975-2010

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

Trends in Prevalence of Past Month Cigarette Smoking Among High School Seniors by Gender – United States, 1975-2010

Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys
Trends in Prevalence of Past Month Cigarette Smoking Among High School Seniors by Race – United States, 1977-2010

Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys; for racial subgroups, data for the current year and the previous year are combined.

Trends in cigarette smoking* - United+ States, 1974-2010

*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 or some days.

+Source: various National Health Interview Surveys from 1974-2010, National Center for Health Statistics, CDC
Average Annual Rates of Change in Various Surveys

- **NHIS**
  - 1974 (37.1%) – 1990 (25.5%) = -0.73%
  - 1990 (25.5%) – 1997 (24.7%) = -0.11% (1992 Definition Δ)
  - 1990 adj. (26.2%) – 1997 (24.7%) = -0.21%
  - 1997 (24.7%) – 2004 (20.9%) = -0.54%
  - 2004 (20.9%) – 2010 (19.4%) = -0.25%
  - 1990 adj. (26.2%) – 2010 (19.4%) = -0.34%

- **TUS-CPS (self-respondents)**
  - 1995/96 (23.7%) – 2006/07 (18.5%) = -0.47%

- **BRFSS (Median of all states + D.C.)**
  - 1997 (23.2%) – 2010 (17.3%) = -0.45%

---

**Trends in cigarette smoking* - United**

*Source: various National Health Interview Surveys from 1974-2010, National Center for Health Statistics, CDC*
*Adult data are from the National Health Interview Surveys, ages ≥ 18 year olds. 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 or some days. High School Senior data are on daily smoking. Source: University of Michigan, Institute for Social Research, Monitoring the Future

Trends in cigarette smoking* by age -
United States, 1965-2009

*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 or some days. Source: various National Health Interview Surveys from 1965 - 2009, National Center for Health Statistics, CDC
Percentage of Ever Smokers* Who Have Quit, by Age – United States, 1965-2009

Source: various National Health Interview Surveys, 1965 – 2009; *Ever-smoked 100+ cigarettes
Also known as the “quit ratio”, estimates since 1992 incorporate same-day smoking.

Prevalence (%) of cigarette smoking among US adults as estimated by various surveys – 2002-2009

NSDUH – w/o 100 cigarette criterion; NSDUH-100 – with 100 cigarette criterion
* TUS-CPS;
## Average Annual Rates of Change (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NHIS</td>
<td>-0.54</td>
<td>-0.06</td>
<td>-0.25</td>
<td>-0.27</td>
</tr>
<tr>
<td>NSDUH (w/o 100 cigarette criterion)</td>
<td>NA</td>
<td>-0.30</td>
<td>NA</td>
<td>-0.37</td>
</tr>
<tr>
<td>NSDUH 100 (with 100 cigarette criterion)</td>
<td>NA</td>
<td>-0.32</td>
<td>NA</td>
<td>-0.37</td>
</tr>
<tr>
<td>BRFSS</td>
<td>-0.33</td>
<td>-0.60</td>
<td>-0.60</td>
<td>-0.76</td>
</tr>
</tbody>
</table>

## Prevalence (%) of daily and less than daily smoking among U.S. adults (ages 18+ years old) -- 2002-2009 NHIS, BRFSS, and NSDUH

Confidence intervals around 2002 and 2009 estimates do not overlap.
Prevalence (%) of daily and less than daily smoking among U.S. adults (ages 18+ years old) -- 2002-2009 NHIS, BRFSS, and NSDUH-100

NSDUH, NSDUH 100 and NHIS (during 2002-2009, on average)

- NSDUH was 5.35 percentage points (PP) higher than NHIS.
- NSDUH-100 was 3.56 PP higher than NHIS.
- NSDUH was 1.79 PP higher than NSDUH-100.
  - Essentially all of that difference was between estimates of less than daily smoking.
- Why NSDUH still higher than NHIS?
  - Would “Not at all” NHIS ever smokers of 100+ lifetime cigarettes who were abstinent < 30 days have responded that they smoked during the previous 30 days in NSDUH? If so, prevalence estimate would be raised only by approximately 0.4 PP, thus not explaining much of the difference.
  - Design issues?
  - Something else?
Trends in cigarette smoking* among adults aged >18 years, by sex - United States, 1955-2010

*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 or some days.


Trends in cigarette smoking* among adults aged ≥25 years, by education- United States, 1974-2009

*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 or some days.

Source: various National Health Interview Surveys from 1974 - 2009, National Center for Health Statistics
Prevalence (%) of current cigarette smoking among US adults (ages 18+ years old) – 1995-2007 TUS-CPS

Past month tobacco use among adults aged 18 or older, by education – United States, 2009

Source: National Survey on Drug Use and Health
Trends in cigarette smoking* among adults, by poverty status - United States, 1983-2009

*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 or some days.

Source: various National Health Interview Surveys from 1983 - 2009, National Center for Health Statistics, CDC.

Cigarette Smoking Trends among Adults, by Race/ Ethnicity, 1978-2009

Source: National Health Interview Surveys, 1978-2009, selected years, aggregate data
Median Household Income and Current Smoking Prevalence – United States, 2006/07

Source: US Census Bureau and 2006/07 TUS-CPS.

Median Household Income and Quit Ratio – United States, 2006/07

Source: US Census Bureau and 2006/07 TUS-CPS.
Marketing Factoids

• Percent of smokers who were male in:
  – 1974 - 53%; 2009 – 55%.

• Percent of smokers by race/ethnicity:
  – Non-Hispanic White: 1983 – 82%; 2009 – 75%
  – Hispanic: 1983 - 5%; 2009 – 10%
  – Asian/Pacific Islander: 1983 – 1%; 2009 – 3%

• Percent of smokers by education:
  – Less than HS: 1974 – 41.1%; 2009 – 18.6%

• Percent of smokers below poverty line in:
  – 1983 – 10%; 2009 – 18%

Outline

• Per capita consumption of various tobacco products

• Prevalence estimates from survey comparisons
  – Current smoking
  – Indicators of quitting
    – CPD/DPM
    – Cigarettes and other tobacco products

• Indicators of hardening
Percentage of Ever Smokers* Who Have Quit, by Age – United States, 1965-2009

Quit Ratio (%) among US adults, by age, 2002-2009 NSDUH

Source: various National Health Interview Surveys, 1965 – 2009; *Ever-smoked 100+ cigarettes
Also known as the “quit ratio”, estimates since 1992 incorporate same-day smoking.
Quit Ratio (%) among US adults, by age, 1992/93 – 2006/07 TUS-CPS

Recent Quit Ratio (%)* among US adults aged 35-64 – 2002-2009 NSDUH

% abstinent among adults who smoked during the previous year
Recent Quit Ratio, Adults aged 45-64, NHIS, 1978-2009

3+ Month abstinence for US adults (ages 25+) who were daily smokers 12 months previously – 1992/93 – 2006/07 TUS-CPS
Outline

• Per capita consumption of various tobacco products
• Prevalence estimates from survey comparisons
  – Current smoking
  – Indicators of quitting
  – CPD/DPM
    – Cigarettes and other tobacco products
• Indicators of hardening

Mean CPD for all current smokers – United States, 1974-2010, NHIS

Mean CPD for all current smokers, daily and less than daily smokers – United States, 1995-2010, NHIS
Mean CPD for all current smokers, daily and less than daily smokers – United States, 1995/96 – 2006/07 – TUS-CPS

Change in Mean Cotinine and Number of Cigarettes Smoked Each Day in the Last 5 Days – United States, 1988-1994 and 1999-2002 National Health and Nutrition Examination Surveys

Among participants aged 25 and older who smoked in the last five days and did not use other nicotine-containing products in the last five days.
Trends in the percentage of US adult smokers who smoke on some days – 1993-2010 NHIS

Outline

• Per capita consumption of various tobacco products
• Prevalence estimates from survey comparisons
  – Current smoking
  – Indicators of quitting
  – CPD/DPM
  – Cigarettes and other tobacco products
• Indicators of hardening
Prevalence (%) of cigarette smoking and use of OTPs among US adult males – 2000, 2005 and 2010 NHIS

* 2002 and 2009 confidence intervals do not overlap

Prevalence (%) of cigarette smoking and use of OTPs among US adult males – 1995/96 – 2006/07 TUS-CPS

* 2002 and 2009 confidence intervals do not overlap
Prevalence (%) of cigarette smoking and use of OTPs among US adult males – 2002 – 2009 NSDUH

* 2002 and 2009 confidence intervals do not overlap

Outline

• Per capita consumption of various tobacco products
• Prevalence estimates from survey comparisons
  – Current smoking
  – Indicators of quitting
  – CPD/DPM
  – Cigarettes and other tobacco products
• Indicators of hardening
Current Cigarette Smoking (%) Among Adults – 2006/07

Fagerström Test for Nicotine Dependence Score and Cigarette Smoking Prevalence – by Country

Source: Fagerström & Furbeg, Addiction 2008; 103:841-845.
Percentage of Cigarette Smokers Who Smoke Within 30 Minutes of Waking and Smoking Prevalence, by State – US, Ages 25+ Yrs Old, 2006/07

Source: Tobacco Use Supplement to the Current Population Survey, 2006/07


Source: 2006-07 Tobacco Use Supplement to the Current Population Survey

Notes: Estimates represent the percentage of current cigarette smokers 25 years old who smoke within 30 minutes of waking.
Mean Number of Cigarettes Smoked/Day Among Current Smokers and Smoking Prevalence, by State – US, Ages 25+ Yrs Old, 2006/07

Hypothetical Relationship Between Smoking Prevalence and Indicators of Willingness to Quit if Population is Hardening
Percentage of Current Smokers Who Have a Strong Interest in Quitting and Smoking Prevalence, by State – US, Ages 25+ Yrs Old, 2006/07

Source: Tobacco Use Supplement to the Current Population Survey, 2006/07

---

Percentage of Current Smokers Who Believe They Would be Very Likely to Succeed if They Tried to Quit and Smoking Prevalence, by State – US, Ages 25+ Yrs Old, 2006/07

Source: Tobacco Use Supplement to the Current Population Survey, 2006/07

Source: Current Population Survey, 2006/07


Trends in Recent Quitting Haven’t Changed Much


Assisted Quitting Has Increased but Overall Abstinence Hasn’t

Possible Explanations

• Hardening of the target
  – Rate of self-quitting without intervention is decreasing over time

• Unintended consequences
  – Promoting medications might lead smokers to think that they cannot quit without medications, lowering self-efficacy
  – Increased taxes might lead some to reduce consumption and thus feel they’ve done enough
  – Smoke-free → I’m OK as long as I don’t bother others; bonding with colleagues

Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2006

Source: US Department of Agriculture
Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2006

Source: US Department of Agriculture

Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2004 and Linear Projection to 2035

Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2004 and Asymptotic Projection to 2060

Trends in Per Capita Consumption of Various Tobacco Products – United States, 1880-2004 and Possible Projection to 2060
Reflections

- Major reductions in consumption of cigarettes, chewing tobacco.
- Increased consumption of snuff and cigars
- Concerns about waterpipes
- Concerns about industry manipulation – marketing to promote dual product use
- Concerns about OTPs – alone or with cigarettes
- Little population evidence for hardening.
- Continuing need for detailed surveillance to effectively monitor use and factors influencing use
Hardening

• “The ‘hardening hypothesis’ states that tobacco control activities have mostly influenced those smokers who found it easier to quit and, thus, remaining smokers are those who are less likely to stop smoking.” Hughes JR, *Drug & Alcohol Dependence* 2011.
  – Has been used to call for better treatment and in support of harm reduction strategies
The Environment and Drug Use

• “… in animal studies, natural behaviors such as eating, drinking palatable substances, social access, and opportunities to exercise reduce the rewarding effects of drugs. Likewise, in humans, an environment enriched with positive reinforcers such as opportunities for learning, personal comfort, and social success serves as a deterrent to drug abuse, while negative aspects of the environment such as stress, poverty, and social isolation contribute to drug abuse.”

Carroll, Anker & Perry. Drug and Alcohol Dependence 2009;104S:S70-S78.