

# Depictions of Tobacco Use in 2007 Broadcast Television Programming Popular Among US Youth

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**Objectives:** To determine the quantity of tobacco use in network television programming popular among US youth and to examine variation in tobacco depictions by TV Parental Guidelines system rating and television network.

**Design:** A content analysis was conducted of broadcast network television programming popular among youth. Nielsen viewership rating data were used to identify a sample of top-rated television series for youth aged 12 to 17 years during the fall 2007 television season. Depictions of tobacco use per television episode were examined by TV Parental Guidelines rating and television network.  $\chi^2$  testing was used to examine differences in proportions of tobacco depictions across television episode ratings and networks.

**Setting:** Data collection and analysis were conducted at the American Legacy Foundation (now known as Legacy).

**Subjects:** Broadcast television viewers in 2007.

**Main Outcome Measure:** Tobacco use depictions on broadcast television were examined.

**Results:** Forty percent of television episodes examined had at least 1 depiction of tobacco use. Of these depictions, 89% were of cigarettes. Among episodes rated TV-PG (ie, parental guidance suggested) (N=73), 50% showed 1 or more incidents of cigarette use, in contrast to 26% of TV-14 (ie, parents strongly cautioned) episodes. The percentage of episodes with any tobacco use depictions was highest on the FOX network (44%; n=32), followed closely by The CW (CBS–Warner Brothers) (41%; n=30).

**Conclusions:** Substantial tobacco use was observed in television shows popular among youth. It is projected that almost 1 million youth were exposed to tobacco depictions through the programming examined. Tobacco use on television should be a cause for concern, particularly because of the high volume of television viewing among younger audiences.

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**I**N 2004, 78% OF MIDDLE SCHOOL students and 87% of high school students reported seeing actors using tobacco on television or in movies.<sup>1</sup> Studies have documented the prevalence of tobacco imagery in movies,<sup>1-7</sup> as well as the association between exposure to tobacco imagery in movies and initiation of smoking among

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youth.<sup>8-12</sup> Based on these findings, the National Cancer Institute recently concluded that “the total weight of evidence . . . indicates a causal relationship between exposure to movie smoking depictions and youth smoking initiation.”<sup>13(p11-12)</sup> In fact, Dalton et al<sup>12,13</sup> estimate that exposure to smoking in movies accounts for approximately 52% of all smoking initiation. Because movies and

television are not mutually exclusive media channels, the body of evidence pertaining to movies is relevant to television as well, particularly because most movies are shown on television after airing in cinemas. In addition, movie trailers (the advertisements used to promote movies playing in theaters) contain depictions of tobacco use and commonly air on television. A 2006 study<sup>14</sup> found that 95% of youth aged 12 to 17 years in the United States were exposed to images of tobacco use on television in the context of a movie trailer during a 1-year period between August 2001 and July 2002. Exposure to these trailers has been shown to increase the attractiveness of smoking among youth who have experimented with cigarettes.<sup>15</sup>

Several studies<sup>16-20</sup> have found a relationship between television viewing and smoking initiation. One study<sup>16</sup> used longitudinal data to demonstrate that television viewing was associated with subse-

quent initiation; another study<sup>17</sup> noted a quadratic relationship, with risk for initiation increasing markedly with more hours of television viewing. However, these studies do not document the number or prevalence of tobacco depictions in the televised content, nor do they make any claim regarding a causal association between televised tobacco depictions and youth smoking initiation. Other investigations have documented the prevalence of televised tobacco depictions within popular television series, such as *The Simpsons*,<sup>21,22</sup> and across multiseried samples that are designed to represent popular television more broadly.<sup>23-27</sup> The most recent data on US youth are from an Office of National Drug Control Policy study<sup>28</sup> conducted in 1998. The study found tobacco depictions in 20% and tobacco-related dialogue in 23% of the sampled episodes, which were drawn from the 20 top-rated situation comedies or dramas popular among US youth aged 12 to 17 years. The study also found tobacco imagery in 6% of programs rated TV-G (defined as appropriate for a general audience), 20% of programs rated TV-PG (ie, parental guidance suggested), and 24% of programs rated TV-14 (ie, parents strongly cautioned).

The objective of this study was to provide current information about the potential exposure of US youth to tobacco imagery via television by quantifying the number of tobacco use depictions in a sample of television programs popular with youth aged 12 to 17 years during the fall 2007 season. We also compare the quantity of tobacco use across television rating categories and television networks.

## METHODS

### SAMPLE SELECTION

The sample for this study included new television programming popular among an audience aged 12 to 17 years that aired on broadcast television during prime-time hours in the fall season of 2007 (September 21 through December 31, 2007). Prime time is defined as the part of day during which the greatest television viewership takes place,<sup>29</sup> usually 8 to 11 PM. Programming that achieved a top 15 viewership rating among those aged 12 to 17 years according to Nielsen<sup>30</sup> viewership data were selected for the sample. Sporting events, movies, awards programming, rerun episodes, and programming on cable television were excluded from the sample. Because of the Hollywood writers' strike in December 2007, two of these series (*Family Guy* and *House*) did not air new programming during the last month of the study period. The final study sample included 73 episodes representing the following 8 television series: *American Dad*, *America's Next Top Model*, *Desperate Housewives*, *Family Guy*, *Gossip Girl*, *Heroes*, *House*, and *The Simpsons*. All 73 episodes aired on 1 of the following 4 national broadcast television networks: ABC, FOX, NBC, or The CW (CBS-Warner Brothers). These 8 series represent an estimated 61.5 hours of television programming over a 14-week period.

### MEASURES

The thumbs up! thumbs down! method for counting tobacco use depictions was used for this study.<sup>4,31,32</sup> In brief, this approach consists of counting tobacco use in the following manner: (1) Each instance of on-screen tobacco depiction—

regardless of whether the product is lit or how it is depicted in the episode (ie, in an ashtray, on a billboard, in a character's hands, etc)—is counted as a single incident. (2) When 2 characters are shown simultaneously smoking, it is counted as 2 incidents. (3) When a character who is smoking moves his or her cigarette, cigar, or pipe off screen and then back on, it is counted as 2 incidents. (4) When the camera focuses on a character using tobacco, focuses elsewhere, and then refocuses on the character using tobacco, it is counted as 2 incidents. An appearance of a carton of cigarettes is counted as 1 incident, with each visible cigarette in the carton counted as an additional incident.

Using the thumbs up! thumbs down! method, the following 3 forms of tobacco use were analyzed: cigarette, cigar, and pipe use. The number of tobacco incidents is presented as a cumulative count across the series, as well as dichotomously (no tobacco use vs  $\geq 1$  incidents of tobacco use per episode) to account for the potential of the thumbs up! thumbs down! approach to produce an overestimation of tobacco use.<sup>4</sup> Dichotomous variables for tobacco use depictions were also created for cigarette and cigar use separately (any vs none).

All 73 episodes were analyzed by 2 trained research assistants. A third coder (D.S.) was used to resolve any discrepancies in incident counts. To assess overall agreement in tobacco content counts between the 2 coders,  $\kappa$  interrater reliability statistic was computed for each tobacco variable. Agreement for all forms of tobacco use was high ( $\kappa=0.999$ ,  $P<.001$ ).

### TV PARENTAL GUIDELINES DATA

All television episodes are categorized according to their rating based on the TV Parental Guidelines system, a national public service classification established by the National Association of Broadcasters, the National Cable Television Association, and the Motion Picture Association of America to help guide parents regarding television content for their children.<sup>33</sup> Rating categories, ordered from less to more restrictive, include the following: TV-Y, TV-Y7, TV-G, TV-PG, TV-14, and TV-Mature. All episodes in the study sample were rated TV-PG or TV-14. TV-PG is defined as the following: "Parental Guidance Suggested. *This program contains material that parents may find unsuitable for younger children.*" In contrast, TV-14 is defined in the following manner: "Parents Strongly Cautioned: *This program contains some material that many parents would find unsuitable for children under 14 years of age.*"<sup>34</sup>

Coarse or indecent language, sexual content, and portrayals of violence are the only factors considered in assigning TV Parental Guidelines.<sup>33</sup> These ratings can be found on the television screen in real time for the first 15 seconds of each episode, as well as in *TV Guide*, *Reader's Digest*, and online. In addition, the Federal Communications Commission<sup>33</sup> has made these ratings accessible via the V-chip technology.

### ESTIMATION OF NATIONAL TOBACCO EXPOSURE AMONG THE TARGET AUDIENCE

The proportion of youth nationwide exposed to tobacco as a result of viewing the episodes examined in this analysis was estimated using 2 data sources. First, the estimated number of youth aged 12 to 17 years was obtained from the 2000 US Census.<sup>35</sup> Second, Nielsen<sup>30</sup> data estimating the number and percentage of youth watching the study episodes were obtained. A mean percentage was calculated by adding all the percentages and then dividing the aggregate sum by 73. Finally, the mean percentage of youth watching these 73 episodes was multiplied by the total number of individuals aged 12 to 17 years in the US population, resulting in the number of youth ex-

**Table 1. Tobacco Depictions Among 73 Episodes**

Series Name (Network)	Total No. of Episodes	Depictions					
		Cigarette			Cigar		
		Absolute Count	Median (IQR) [Range] <sup>a</sup>	Episodes With ≥1 Depiction, %	Absolute Count	Median (IQR) [Range] <sup>a</sup>	Episodes With ≥1 Depiction, %
<i>American Dad</i> (FOX)	8	57	0.5 (0-10) [0-36]	50.0	21	0.5 (0-5) [0-10]	50.0
<i>America's Next Top Model</i> (The CW)	13	157	1 (0-4) [0-122] <sup>b</sup>	69.2	0	0	0
<i>Desperate Housewives</i> (ABC)	8	4	0 [0-4]	12.5	1	0 [0-1]	12.5
<i>Family Guy</i> (FOX)	8	11	1 (0-1.5) [0-5]	62.5	0	0	0
<i>Gossip Girl</i> (The CW)	9	0	0	0	0	0	0
<i>Heroes</i> (NBC)	11	0	0	0	0	0	0
<i>House</i> (FOX)	9	13	0 [0-8]	22.2	0	0 [0-8]	0
<i>The Simpsons</i> (FOX)	7	29	0 (0-6) [0-20]	42.9	7	0 (0-6) [0-7]	14.3
<b>Overall</b>	<b>73</b>	<b>271</b>	<b>0 (0-1) [0-122]</b>	<b>32.9</b>	<b>29</b>	<b>0 [0-10]</b>	<b>8.2</b>

Abbreviation: IQR, interquartile range.

<sup>a</sup> P = .003; Difference in proportions of episodes with at least 1 tobacco depiction by  $\chi^2$  test.

<sup>b</sup> Computed after exclusion of the outlier episode that contained 122 incidents of cigarette use.

**Table 2. Tobacco Depictions by TV Parental Guidelines Rating Among 73 Episodes**

Depicted Use	TV-PG Episodes (n=20)			TV-14 Episodes (n=53)			P Value <sup>a</sup>
	Absolute Count	Median (IQR) [Range]	Episodes With ≥1 Depiction, %	Absolute Count	Median (IQR) [Range]	Episodes With ≥1 Depiction, %	
Cigarette	168	1 (0-4) [0-122]	50.0	102	0 (0-1) [0-36]	26.4	.09
Cigar	7	0 [0-7]	5.0	22	0 [0-10]	9.4	.99
All tobacco <sup>b</sup>	179	1 (0-5) [0-122]	60.0	126	0 (0-1) [0-46]	32.1	.03

Abbreviation: IQR, interquartile range.

<sup>a</sup> Difference in proportions of episodes with at least 1 tobacco depiction by  $\chi^2$  test.

<sup>b</sup> Combination of cigarette, cigar, and pipe use depictions. Absolute counts do not sum to 100.0% because pipe use is not reported owing to the rarity of depictions.

posed to tobacco as a direct result of the programming examined in this study.

### STATISTICAL ANALYSIS

Statistical analysis was performed using commercially available software (SAS version 9.1; SAS Institute, Cary, North Carolina).<sup>36</sup> Descriptive statistics include the median and interquartile range as measures of dispersion, as well as the absolute count of tobacco use depictions. Two-sided  $\chi^2$  testing was used to compare TV Parental Guidelines categories and television networks by tobacco use (dichotomized as none vs  $\geq 1$  depictions), with episode as the unit of analysis. For contingency tables with at least 20% of cells containing fewer than 5 observations, Fisher exact test P values are reported.

### RESULTS

Of 73 episodes examined, 40% (n=29) included at least 1 depiction of tobacco use, 33% (n=24) showed 1 or more depictions of cigarette use, and 8% (n=6) demonstrated at least 1 depiction of cigar use. Most tobacco depictions were of cigarettes, amounting to 271 total incidents in 61.5 total hours of programming analyzed, for a mean of 4.4 incidents per hour (**Table 1**). Given the low incidence of pipe use, data are not shown for this product (data are available on request from author J.C.).

Two of the series, *Heroes* and *Gossip Girl*, amounting to 20 episodes (or more than one-quarter of the study sample), did not include any depictions of tobacco use.

More than one-quarter (27% [n=20]) of episodes examined in this study were rated TV-PG, in contrast to 73% (n=53) of episodes rated TV-14 (**Table 2**). When comparing the proportion of episodes with any tobacco use, significantly more episodes rated TV-PG contained at least 1 tobacco depiction vs programming rated TV-14 (60% vs 32%, P = .03). While exactly half (50% [n=10]) of episodes rated TV-PG had at least 1 cigarette depiction compared with just over one-quarter (26% [n=14]) of episodes rated TV-14, this difference was not statistically significant (P = .09). In contrast, twice as many episodes rated TV-14 (9% [n=5]) had 1 or more cigar depictions vs those rated TV-PG (5% [n=14]), but this difference was also not statistically significant (P = .99). The median number of cigarette use depictions was 1 (interquartile range, 0-4) among episodes rated TV-PG compared with a median of 0 (interquartile range, 0-1) among episodes rated TV-14.

Most analyzed episodes aired on FOX (44% [n=32]) network, followed by The CW (30% [n=22]), NBC (15% [n=11]), and ABC (11% [n=8]) (**Table 3**). All episodes shown on NBC were rated TV-14, yet none contained tobacco depictions. In contrast, more than half of

**Table 3. Tobacco Depictions by Television Network Among 73 Episodes**

Network	Cigarette			Cigar			All Tobacco <sup>a</sup>		
	Absolute Count	Median (IQR) [Range]	Episodes With ≥1 Depiction, %	Absolute Count	Median (IQR) [Range]	Episodes With ≥1 Depiction, %	Absolute Count	Median (IQR) [Range]	Episodes With ≥1 Depiction, %
ABC (n=8)	4	0 [0-4]	12.5	1	0 [0-1]	12.5	5	0 (0-0.5) [0.5-4]	25.0
The CW (n=22)	157	0 (0-2) [0-122]	40.9	0	0	0	157	0 (0-2) [0-122]	40.9
FOX (n=32)	109	0 (0-3) [0-36]	43.8	28	0 [0-10]	15.6	143	1 (0-5) [0-46]	56.3
NBC (n=11)	0	0	0	0	0	0.0	0	0	0
<i>P</i> value <sup>b</sup>		.01			.12			.004	

Abbreviation: IQR, interquartile range.

<sup>a</sup>Combination of cigarette, cigar, and pipe use depictions. Absolute counts do not sum to 100.0% because pipe use is not reported owing to the rarity of depictions.

<sup>b</sup>Difference in proportions of episodes with at least 1 tobacco depiction by  $\chi^2$  test.

the programming on The CW contained tobacco use depictions; episodes on this network were evenly distributed across rating categories TV-PG and TV-14.

Significant differences were noted in the distribution of TV Parental Guidelines across television networks ( $P=.003$ ). Television programming that aired on NBC was exclusively rated TV-14 (100%,  $n=1$ ), while most episodes on ABC (75%) and FOX (81%) were rated TV-14, and episodes on The CW were almost evenly distributed across the 2 ratings categories, with 45% rated TV-14 and 55% rated TV-PG.

The greatest proportion of episodes with at least 1 tobacco depiction was observed on FOX (44%), followed by The CW (41%), yet a higher absolute count of tobacco depictions was observed on The CW ( $n=157$ ), followed by FOX ( $n=143$ ). When comparing the proportions of episodes with 1 or more tobacco use depictions across all networks, significantly greater proportions of FOX and The CW episodes contained tobacco use ( $P=.004$ ) than was observed in ABC and NBC programming. Nationally, the estimated number of youth aged 12 to 17 years who were exposed to tobacco use as a result of the television programming examined in this study was 940 000.

### COMMENT

This is the first study in almost a decade that documents the incidence and proportion of tobacco depictions in a multiseries sample of television programming popular among US youth. Findings indicate that almost 40% of television programming most popular among youth aged 12 to 17 years includes tobacco depictions. Perhaps the most striking observation was that a higher proportion of tobacco use depictions was found among programs rated TV-PG compared with those rated TV-14, indicating that exposure to tobacco use may skew toward youth of younger ages, resulting in earlier exposure to this behavior. In fact, approximately half of all TV-PG-rated programming included some level of tobacco depictions. Estimates project that 940 000 (almost 1 million) youth were exposed to tobacco depictions on television during this single fall programming season.

This study included 1 reality (or allegedly unscripted) television series, *America's Next Top Model*.

This popular series includes an episode in which there were 122 incidents of cigarette use. This incidence far exceeds that of any other single episode in this sample. As a result, analyses were performed with and without this outlier; tests of differences in the proportion of tobacco use depictions were consistent (data are available from author J.C.).

This study has several important limitations. Because the sample included only new and popular television programming and was reduced as a direct result of the writer's strike during the study interval, this study underestimates the total amount of exposure to tobacco depictions. In fact, Nielsen<sup>30</sup> data indicate that the typical US youth aged 12 to 17 years watches on average 3 hours 20 minutes of television per day, or 200 minutes per day. Our study captured tobacco use during 61.5 hours (3690 minutes) of television during the 98-day study period, reflecting a mean of 38 minutes per day. If this estimate is taken as a fraction of the daily mean for a typical US teen, the programming examined in this study represents only 19%, or less than one-fifth, of a US youth's mean daily television consumption.<sup>37</sup>

Future research is warranted to better understand what, if any, effect exposure to televised tobacco depictions has on youth tobacco use initiation, particularly given the high level of television viewing among youth audiences. It is likely that multiple media channels provide exposure to tobacco depictions and, as such, may stimulate a similar effect. Ideally, samples should include a broad portfolio of programming popular among youth, with particular attention to cable and reality television programming.

Public health officials should urge television networks to eliminate all depictions of tobacco use in youth programming. Until then, TV Parental Guidelines should be adjusted so that programs featuring tobacco use are rated TV-MA (mature audience only).

### CONCLUSIONS

Current TV Parental Guidelines do not consider any form of substance use, including tobacco, in determining a program rating.<sup>33</sup> The strong evidence linking youth exposure to tobacco depictions in movies to initiation of smoking among youth should serve as a rationale for including tobacco use depictions as a criterion for rating program-

ming for young audiences. However, only about one-quarter of parents report frequent use of TV Parental Guidelines ratings, and less than 10% of US households have made use of the V-chip, a tool that allows parents to identify and block television programming that they believe may be harmful to their children.<sup>37</sup> Efforts to educate parents must be undertaken to increase the use of the TV Parental Guidelines rating system and the V-chip, in conjunction with modernizing the rating system to incorporate tobacco use depictions. Across the few programs that were sampled, almost 1 million youth were exposed to tobacco depictions on television over a single fall programming season. Public health practitioners and policy makers should discourage any tobacco depictions within youth programming. Further restrictions reducing youth exposure to tobacco use on television programming should be considered given the evidence linking smoking imagery in the media to initiation of youth smoking.

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