



Trends In Top Box Office Movie Tobacco Use **1996-2004**

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FIRST LOOK REPORT 16

July 2006

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ACKNOWLEDGEMENTS

The authors would like to acknowledge funding from the National Cancer Institute and the American Legacy Foundation, thank our collaborators—Madeline Dalton, Michael Beach, Jennifer Tickle, and Todd Heatherton—and also the content coders—Daniel Nassau, Balvinder Rakhra, and Diana Nelsen—for their efforts and Jennifer Duke, Cheryl Heaton, Molly Green, and Stanton Glantz for their helpful comments.

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July 13, 2006

Dear Colleagues,

Two recent and significant national studies (Monitoring the Future, Youth Risk Behavior Survey) suggest that the historic 29-year decline in youth smoking prevalence has stalled. While more research is needed to confirm a reversal, we know that young lives are at stake and we must act now to ensure that these rates do not increase.

This we do know: tobacco remains the number one cause of preventable death in the United States and 80% of adult smokers begin before age 18. One of the major influences on the uptake of teen tobacco use is the glamorization of smoking in movies and on television - watching artists and entertainers they most admire smoke on-screen. This important new American Legacy Foundation® **First Look Report, Trends in Top Box Office Movie Tobacco Use: 1996-2004**, conducted by the Dartmouth Medical School, confirms that smoking continues to be depicted in nearly three-quarters of youth-rated movies. In addition, due to an increase in the percent of box office hits that are youth-rated, a higher proportion of tobacco use occurrences in movies now appear in youth-rated movies. Two studies conducted earlier by the Dartmouth Medical School found that one-third to one-half of youth smoking initiation is explained by exposure to smoking in movies.

Simply put, more must be done to ensure that smoking in movies is removed from films seen by our nation's youth. We have within our power one simple and effective way to jump start the decline in youth smoking - delete tobacco use in films from the list of influences that rob our youth of longer and healthier lives by removing smoking from G, PG and PG-13 movies unless they clearly depict the negative health effects. Together, we can ensure that movies continue to entertain and inspire our children and at the same time, save countless lives from tobacco addiction and premature death.

Sincerely,



The Honorable J. Joseph Curran, Jr.
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State of Maryland



Cheryl G. Heaton, Dr. P.H.
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The Honorable Thomas J. Miller
Attorney General State of Iowa



The Honorable William H. Sorrell
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The Honorable Lawrence G. Wasden
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Executive Summary

SINCE EXPOSURE TO SMOKING in movies is clearly linked to youth smoking, the public health community and the movie industry could benefit from objective quantitative data on movie smoking and how depictions of smoking in movies change over time. This report summarizes findings from a content analysis of the top 100 box office hits each year for nine years, from 1996 to 2004. The work was conducted at Dartmouth Medical School, with support from the National Cancer Institute and the American Legacy Foundation.

FINDINGS

Tobacco depictions in movies are declining.

- Overall, the proportion of movies containing tobacco use or imagery declined significantly, from 96% in 1996 to 77% in 2004.
- The largest decline is for brand appearances, for which there was a statistically significant downward trend from 22% of movies in the 2000 to 11% of movies by 2004.
- Similarly, for tobacco screen time there was a marginally significant decline among R-rated movies, but no decline within youth-rated movies.

However, tobacco continues to be depicted in a majority of movies.

- Tobacco is still depicted in three-quarters of youth-rated movies and 90% of R-rated movies.
- The amount of tobacco use or imagery (whether measured as a count of occurrences or as hours of screen time) contained in youth-rated movies has remained relatively stable from 1996. This may be explained by a downward ratings creep, in which a higher percentage of movies each year were rated in the youth category.
- In 2004, 74% of all top box office hits were youth-rated, compared with 51% in 1997. In addition, in 2004, 56% of smoking occurrences were portrayed in youth-rated movies, up from 31% in 1997.
- Smoking in youth-rated movies has a greater reach among adolescents because these movies are seen by three times as many youth as R-rated movies.

In light of these findings, the Smoke Free Movies Principle of giving an R-rating for smoking in movies makes sense. Along with the principles of certifying no pay offs, requiring strong antismoking ads, and eliminating the identification of tobacco brands, R-ratings for tobacco use in movies is necessary to reduce the impact of smoking in movies on youth.



Introduction

CONCERN ABOUT THE POTENTIAL IMPACT of motion pictures is as old as movies themselves. The cinema era began in 1895 with the invention of the first portable motion picture camera and the first presentation of moving photographic pictures to a paying audience in Paris. Very shortly thereafter, Thomas Edison's company made the first known motion picture commercial: an ad for Admiral Cigarettes. Within 11 years, New York City passed a local movie censorship law, and by 1921 the governor of New York State signed a state movie censorship law as "the only way to remedy what everyone concedes has grown to be a very great evil." In 1922 the Motion Picture Association of America (MPAA) was created, in large part to "stem the waves of criticism of American movies... and to restore a more favorable public image for the motion picture business." The modern rating system was adopted by the MPAA in 1968, when the US Supreme Court supported two decisions that maintained the power of cities and states to prevent children's exposure to books and films that could not be denied to adults. The modern rating system continues to rate movies for sex, language, and violence. Although fewer people see movies as a "great evil" in 2006, it is becoming clear that certain unrated movie exposures can influence health behaviors in adolescents.

Recent research has established an association between exposure to smoking in movies and adolescent smoking. [1-7] The presumed mechanism for the uptake of tobacco in response to viewing movies is through attitudinal changes: viewing smoking in the movies normal-

izes smoking (particularly among those youth that do not have others around them who smoke); it glamorizes smoking through the attractiveness of the actors and characters who smoke; and movie smoking promotes smoking as aiding in coping or relaxation. These attitude changes can lead to smoking experimentation, and some proportion of youth who experiment will go on to become established smokers. In addition, youth are avid consumers of movies: youth age 12-17 accounted for 19% of all box office revenues in 2004, and are also frequent viewers of videos and DVDs in the home. The evidence accumulated to date points to a strong, independent relationship between seeing smoking in movies and adolescent smoking initiation.[8, 9] Two studies assessing the fraction of youth smoking attributable to movies have found that exposure to smoking in movies explains one-third to one-half of adolescent smoking initiation.[1, 4] These reports have resulted in greater scrutiny of the movie industry by the public health community, leading some to call for the movie industry to incorporate smoking into its rating system.[10]

Since exposure to smoking in movies is clearly linked to youth smoking, the public health community and the movie industry could benefit from objective quantitative data on smoking in movies and how trends in movie smoking change over time. Just as quantitative measures of environmental pollutants in rivers and air are used to assess risk to health, quantitative measures of movie smoking could be used to assess adolescent risk for smok-

ing. Similarly, as measures of clean air and water are used to benchmark the effects of environmental legislation, so too can measurement of smoking in movies over time be used to assess the impact of public health campaigns aimed at reducing smoking depictions in movies.

Smoking in movies has been examined through content coding, in which selected movies or movie samples are analyzed according to a set of predefined criteria. These criteria have varied across studies, however there is general consensus on several points: smoking is depicted in the majority of movies;[11-17] the prevalence of movie smoking across movies increases as rating increases from “G” to “R”:[11, 16, 17] movie characters who smoke are more likely to be affluent, educated and powerful than typical smokers;[11, 14] and that smoking in movies is rarely depicted with any negative consequences to health.[11, 12, 15, 17] Most of the previously published content analyses have consisted of single assessments, involving only one or two years of movies or specific samples of movies such as by rating or genre, with insufficient data or without enough similarity of methods to allow assessment of trends over time. However, one trend study demonstrated that movie smoking in the 1980s and 1990s had risen to levels not seen since the 1950s.[18]

Since 1997, with support from the National Cancer Institute, researchers at Dartmouth Medical School have been content coding the top 100 box office hits for tobacco use. The aim of the original study was to accurately and objectively describe smoking in movies in order to quantify adolescents’ exposure to movie smoking portrayals and imagery, and to determine whether movies play a role in adolescent smoking initiation. The researchers spent two years developing their approach to the content coding and developed an automated computer system to allow direct data capture during the content coding process.[11, 19, 20] Through this content analysis, Dartmouth researchers have accumulated data on well over a thousand movies, involving tens of thousands of hours of content coding, and including the top 100 movies, based on box office revenues, from 1996 through 2004. Given that movies both reflect and shape societal norms, these data provide valuable insight into trends over time. The American Legacy Foundation is partnering with Dartmouth to publish a series of special reports on trends in movie smoking, of which this is the first. This report describes smoking in movies in the top 100 box office hits each year over a nine year period, from 1996 to 2004.



Data and Methods

Content Analysis: Trained content coders assess multiple aspects of the selected movies, from information about the movie production companies, distributors, producers, directors and cast, to the type of characters, genre, time period and major themes. Further, extensive quantitative and qualitative measurement of tobacco, alcohol and other substance use is recorded. Briefly, the content coders first watch each movie, identifying key scenes with smoking. They then count tobacco depictions on screen, which are defined as tobacco “occurrences.” Tobacco “occurrences” can be divided into “episodes” or “incidents.” An “episode” includes any handling or use of tobacco by a major or minor character. An “episode” is counted each time a character handles or uses tobacco, regardless of the length of the episode or the number of times the tobacco product appears on screen. If two characters use tobacco at the same time, this counts as two episodes. A tobacco “incident” includes background use of tobacco in a scene (such as background smoking by secondary characters in a bar) or background placement of tobacco products or signage (such as a Marlboro display in front of a store). Although we do count any signage or product, we do not count the appearance of smoking paraphernalia (e.g., ashtrays) as a tobacco incident. Whenever there is any doubt or disagreement among coders as to whether tobacco appears in a scene, the coders are instructed to be conservative and not count it. Coders also time the duration of tobacco on screen. The timer starts whenever a tobacco product, signage or tobacco smoke appears on screen and stops when it does not. For example, in a scene where one person is

smoking while talking to another, the timer would be off when the camera was directed at the non smoking character, unless side stream smoke or tobacco signage are also present in the camera shot.

Finally, the coders identify tobacco brands as part of the determination of a tobacco occurrence. Brand appearances range from tobacco signage, as described above, to logos on clothing, identifiable cigarette packaging in an actor’s hand or on a table, or labeling visible on a cigarette itself. Mention of a brand by name also counts as a brand appearance. As with counts of occurrences, coders are instructed not to identify a specific brand unless they are reasonably certain of the brand name. Reliability of the measures reported herein is included in Appendix 1.

Sample Frame: Content coding began in 1997 and includes the top 100 box office hits beginning from 1996. Box office success was determined by overall box office receipts, reported at the end of the first quarter of the following year. Identification of brand appearances was enhanced and expanded in 1999, and therefore we report trends for brand appearances starting in 2000.

Trend analysis: A single measurement of tobacco use in the movies would be inadequate to explore the various portrayals and their potential impact on youth. Thus, we conducted trend analyses. The trend analyses controlled for movie rating as determined by the Motion Picture Association of America when appropriate. We divided ratings into R-rated and youth-rated (which includes G, PG, and PG-13 rated movies). Further details of the trend analysis can be found in Appendix 2.

Results

Percent of Movies Showing Tobacco Use or Imagery

One simple and commonly used indicator is whether or not a movie depicts any tobacco use or imagery. Figure 1 illustrates the percent of the top 100 box office hits each year that contained one or more occurrences of tobacco use or imagery, categorized by R-rated and youth-rated movie groups (with youth-rated movies defined as G, PG, and PG-13). Across all years, a higher percentage of R-rated than youth-rated movies contained tobacco depictions. In 1996, 100% of R-rated movies and 93% of youth-rated movies contained at least one tobacco occurrence. By 2004, tobacco occurrences in R-rated movies had dropped to 88% and tobacco occurrences in youth-rated movies had dropped to 73%. The downward trend overall was statistically significant, indicating that the percent of movies portraying tobacco use and imagery has declined over time. When analyzed by movie rating, the downward trend for any tobacco use was statistically significant for youth-rated movies only. While these figures appear to be moving in the right direction, it is disturbing that nearly three-quarters of recently released youth-rated movies include tobacco depictions, and that almost ninety percent of R-rated movies, which are also seen by many teenagers, contain them.

Number of Tobacco Occurrences within Movies

Another way to quantify tobacco use and imagery in movies is to count tobacco occurrences. This gives a measure of how many tobacco depictions (use and

Figure 1: Percent of Movies with Tobacco Imagery, Top 100 Box Office Hits, by Year of Release and Rating

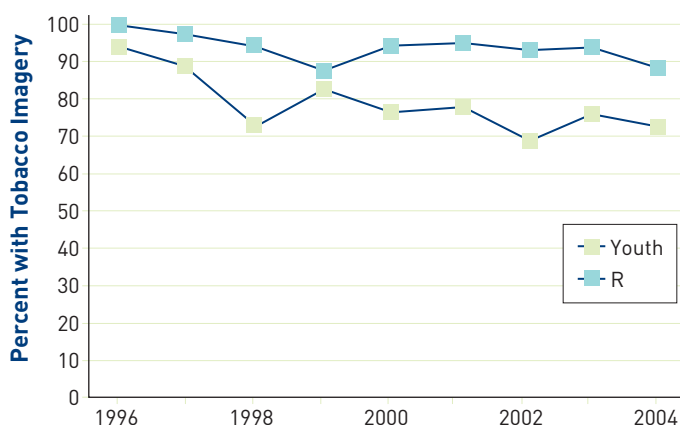
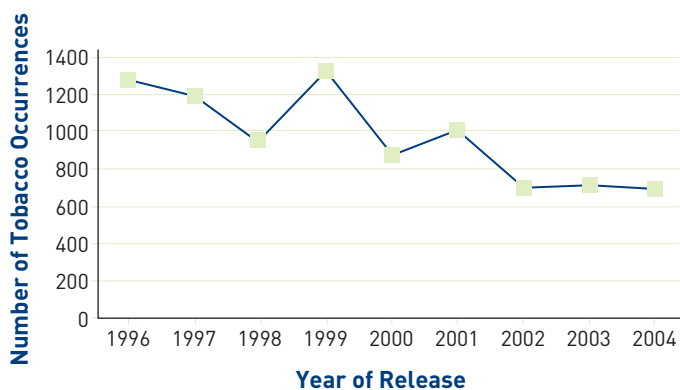


Figure 2: Number of Tobacco Occurrences, Top 100 Box Office Hits, by Year of Release



imagery) audiences are exposed to in the top 100 box office hits each year. As seen in Figure 2, the 100 most popular movies in 1996 depicted a total of 1263 tobacco occurrences, with a similar number in 1997 (1192). The downward trend was statistically significant ($p = 0.005$), with the total number of tobacco occurrences declining

to 697 in 2004. Despite the favorable downward trend, the top 100 box office hits continue to transmit hundreds of screen images of tobacco to audiences across the world each year.

A slightly different picture emerges when tobacco occurrences are grouped by movie rating. Figure 3 illustrates that the downward trend in tobacco occurrences overall is primarily accounted for by a downward trend in R-rated movies ($p = 0.02$), whereas the number of occurrences in youth-rated movies has not changed (p-value for trend not significant).

Screen Time Showing Tobacco Use or Imagery

Although tobacco use and imagery in movies is declining as measured by the number of movie occurrences, this does not necessarily indicate that the screen time allocated to depictions of tobacco is similarly dropping. In this sample of movies, tobacco screen time averaged 0.5% of the total movie run time, ranging from 0 to 25%. Tobacco depictions took up less than 2% of total movie run time in three-quarters of movies.

To address trend, the hours of on-screen tobacco depictions were summed for the top 100 box office hits each year. As shown in Figure 4, the total screen time for tobacco images in the top 100 box office hits ranges from two to upwards of four hours each year.

The downward trend for hours of tobacco screen time was marginally statistically significant ($p = 0.08$), indicating that the trend is not as strong as for tobacco occurrence counts. When viewed by rating (Figure 5), the overall trends look similar to trends for occurrences (Figure 3), with no downward trend for youth-rated movies and a downward trend for R-rated movies that approaches statistical significance ($p = 0.06$).

Appearance of Tobacco Brands in the Movies

Tobacco brands appeared in one third of movies released in the first half of the 1990s,[20] but have declined recently.[19] Our data indicate that percentage of movies that

Figure 3: Number of Tobacco Occurrences, Top 100 Box Office Hits, by Year of Release and Rating

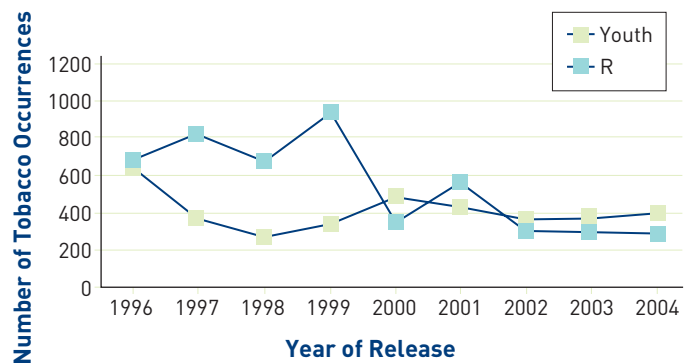


Figure 4: Hours of Tobacco Imagery, Top 100 Box Office Hits, by Year of Release

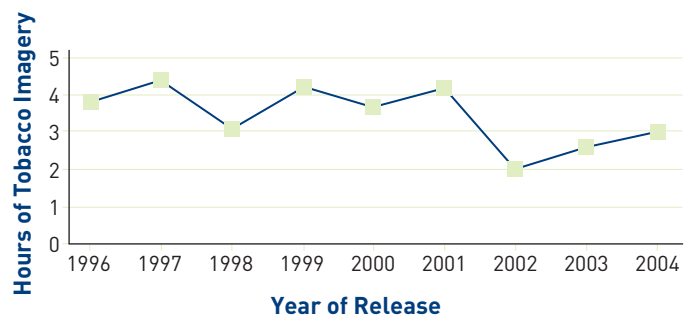
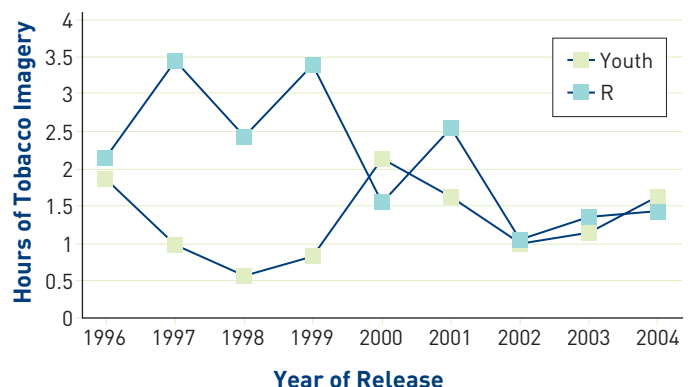


Figure 5: Hours of Tobacco Imagery, Top 100 Box Office Hits, by Year of Release and Rating



contained at least one brand appearance has decreased further since 2000 (Figure 6), when 22% of the top box office hits contained one or more brand appearances.

This number declined to 14% in both 2002 and 2003, and fell further to 11% in 2004 (p-value for trend = 0.02).

The total number of tobacco brands that appeared in the top 100 movies has also declined since 2000 (Figure 7). In the year 2000, the top 100 box office hits contained 53 clearly recognizable tobacco brands. This number decreased to 43 in 2001, 25 in 2002, 31 in 2003 and 24 in 2004 (p-value for trend = 0.046).

Tobacco brands appeared more often in R-rated movies than in movies with youth ratings. Among the top box office hits of 2004, 11 percent overall contained one or more tobacco brand appearances: twenty three percent of the R-rated movies, versus 7 percent of the youth-rated movies (Figure 8).

Percent of Tobacco Depictions from Youth-Rated Movies

Data reported up to this point reveal an encouraging downward overall trend in the portrayal of tobacco in the movies. However, this favorable trend is driven largely by a decline in tobacco use in R-rated movies. This is partly due to a ratings shift toward more youth-rated movies over time. This trend may have implications for youth exposure, because, as the movie industry has shifted toward releasing a higher proportion of its movies with a youth-rating, so has a higher share of movie smoking become youth-rated. For example, in 1997, only about half of the top box office hits were youth-rated, with 31% of tobacco occurrences in youth-rated movies. By 2004, nearly three-quarters of the top box office hits were youth-rated and 56% of smoking occurrences were portrayed in youth-rated movies.

This trend may have implications on the reach of movie tobacco use in the adolescent population. Reach is the size of the adolescent audience that sees any particular

Figure 6: Percent of Movies with One or More Brand Appearances, Top 100 Box Office Hits, by Year of Release

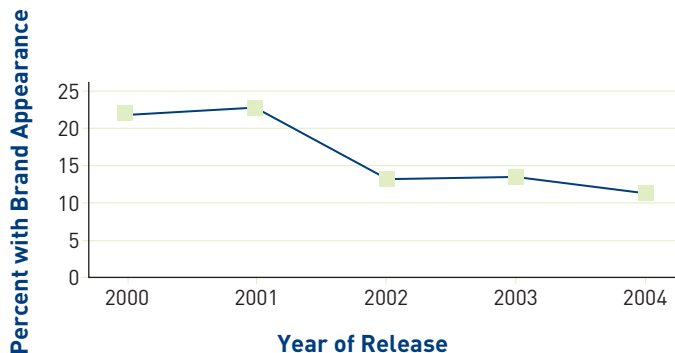


Figure 7: Number of Brand Appearances, Top 100 Box Office Hits, by Year of Release

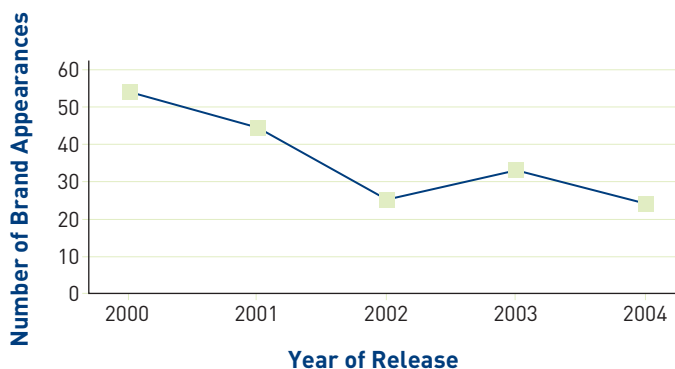
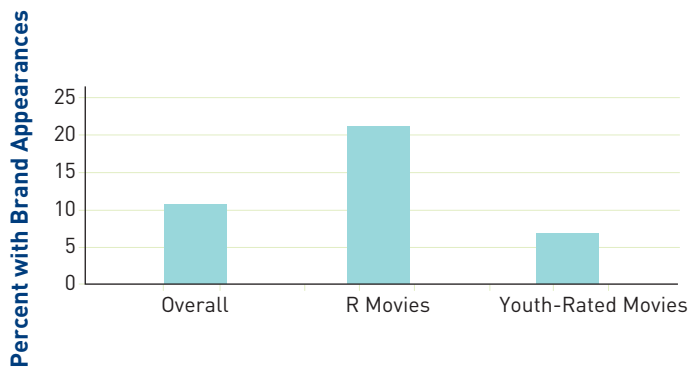


Figure 8: Percent of Top 100 Box Office Hits in 2004 with One or More Brand Appearances, by Rating



movie (and all the tobacco occurrences contained therein). Data on the viewing patterns of 534 of the top box office hits from the years 1998-2003[1] demonstrate that, on average, youth-rated movies were seen by 29% of youth vs. only 11% for R-rated movies. Thus, youth are more likely to be exposed to smoking in youth-rated movies



Summary

THIS REPORT DOCUMENTS a clear downward trend in movie smoking that persists across indices: the proportion of movies with tobacco depictions, the number of occurrences overall, screen-time devoted to tobacco, and the appearance of tobacco brands in movies. Although this downward trend in movie smoking is encouraging, it is important to remember that youth continue to be exposed to tobacco use in most of the movies they see, movies that contain hundreds of screen depictions of tobacco use and imagery each year. Tobacco continues to be depicted in the majority of youth-rated movies, and due to movie viewing habits of youth and the popularity of these films, they deliver millions of smoking impressions to adolescent viewers. Moreover, due to an increase in the percent of box office hits that are youth-rated, a higher proportion of movie tobacco use is now accessible to youth. Beginning in the mid-1990s, the MPAA appears to have “down-rated” movies, resulting in PG-13 ratings for many films that would have previously been rated R. This change is partly due to economic forces: in 1999, the average PG-13 summer blockbuster garnered \$35 million, whereas the similar R movie earned only \$20 million. However, this downward “ratings creep”[21] also shifted smoking depictions from mostly R-rated movies into many teen-rated (PG-13) movies, which are seen by a higher proportion of youth.

The American Legacy Foundation and others have called on the movie industry to rate smoking “R.” Since movies are financed and produced with a target audience

in mind, an R-rating for smoking would assure that movies intended for youth audiences would be smoke free. If new movies have a smoking mix similar to what is seen in this sample of films, an R-rating for smoking would reduce potential exposure to movie smoking in new releases by about 50% and result in a substantial reduction in exposure over time. From a health perspective, given the strong association between exposure to smoking in movies and adolescent smoking, the goal to incorporate smoking into the ratings system has some appeal. Further, as evidenced by the findings in this report of the minor amount of time during which tobacco is used and portrayed, it is unlikely that the creativity of the writers, directors and producers would be compromised by tobacco’s omission. Because the voluntary movie rating system is operated by the motion picture industry, the decision to alter the rating system rests primarily with the executives of 6 or 7 major studios. We suggest that public health initiatives continue to pursue programs and policies directed at the studio heads.

Tobacco advocates continue to voice concern about sanctioned tobacco advertising, such as pictures of smoking in magazines; however, there are a number of reasons to be even more concerned about smoking in movies. Since the Master Settlement Agreement of 1998, in which 46 State Attorneys General reached a settlement agreement with five tobacco companies for \$248 billion, public depictions of tobacco marketing have declined with the elimination of billboards and tobacco branded merchandise. In addition, smoke free workplace initiatives

have all but eliminated public indoor smoking in many parts of the country. These societal changes have reduced youth exposure to people modeling the use of tobacco. However, in all areas of the country, youth continue to be exposed to the glamorized real-time smoking depictions that remain common in the motion pictures they see. Smoking in movies is a major social influence on youth smoking, not only because the smoking contained in them is almost entirely live-action, but also because the user, a movie star, may be a powerful adolescent role model. In addition, whereas tobacco ads are recognized as advertising, and are therefore often viewed with skepticism, movie smoking is simply taken in as part of the movie viewing experience. This may be one of the reasons why exposure is so strongly linked with attitudes toward the behavior.[3] Recognizing the importance of smoking in movies as an influence on youth smoking, this report is an attempt to quantify that potential exposure and study trends over time. We look forward to continued annual publications that track movie tobacco depictions in years to come.



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Appendix 1: Reliability of the content analysis measures and technical aspects of data entry and data management

Reliability of Data

A 10% sample of movies is randomly selected to be double-coded. The purpose of the double coding is to assess inter-rater reliability. In addition the content coding supervisor meets regularly with the coders to resolve discrepancies and enhance reliability. Interrater agreement is excellent for the outcomes reported herein. For example, the correlation between coders' assessment of total tobacco exposure time in the double-coded sample is 0.998. Generally, we have high agreement on objective variables like timing of smoking and counting smoking occurrences.

Technical Aspects and Data Management

Content data are entered directly using a computer-linked DVD device. Using a Java-based graphical user interface client, coders use drop-down menus to enter information about the movie and use built-in timers to record start and stop intervals of tobacco use and imagery. Remote control of the DVD player and navigation through the movie are handled within the client application. Chapter times from the DVD are automatically detected by the client application, allowing for efficient navigation for the coder, who can move forward or backward in the film, frame by frame, at quarter or half speeds, real-time, or at faster speeds to allow for accurate timing in the film. Once a coder finishes a movie, automatic routines check for incomplete or inconsistent data. Any errors are reported to and resolved by the coder before closing out the dataset. For example, in the case where a cigarette brand exposure variable was coded "yes", the consistency routine would cross-check to be sure that a cigarette brand name is listed in the review of brand appearances. A completed movie is saved only after the coder resolves inconsistencies and the automated test of the movie review "passes". All data for each movie

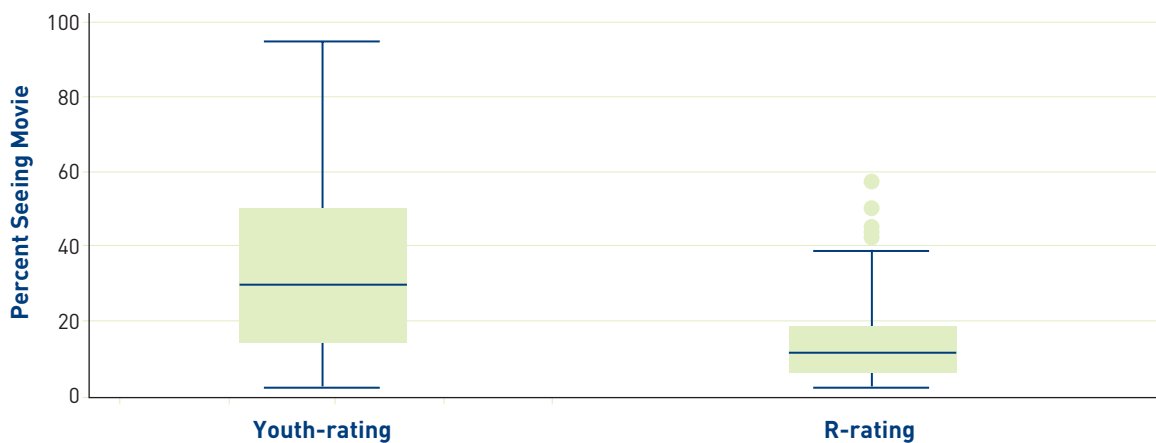
review are saved in a relational database, built using PostgreSQL and having a secure web front end for administrative tasks and data management. The design of the database facilitates the creation of analysis files from multiple perspectives. For example, data can be aggregated at the level of movie, actor, or character.

Appendix 2: Statistical evidence for trends

For analysis of trends, we used regression techniques with the independent variable of interest being year of release and controlling for Motion Picture Association Rating where appropriate. For the Figure 1 trend analysis, we used logistic regression, with the dependent variable being 0 if a movie contained no depictions of tobacco and 1 if the movie depicted tobacco. We conducted this analysis for the trend overall, and then by rating (for R-rated and youth-rated movies). For Figure 2, we used least squares regression with the dependent variable being the number of smoking occurrences from the top 100 box office hits for each year ($N = 9$). For Figure 3, repeated the analysis for Figure 2, grouped by R-rated and youth-rated. We repeated this procedure for Figures 4 and 5 using tobacco screen time as the dependent variable. For Figure 6, we used logistic regression with the dependent variable being a dichotomous outcome, whether or not the movie contained any brand placement, and including movies from years 2000-2004 ($N = 500$). For Figure 8, we used least squares regression with the dependent variable being the number of brand appearances from the top 100 box office hits each year from 2000-2004 ($N = 5$). The following table shows the regression results for each Figure.

Table Appendix 2: **Trend Analysis**

Fig	Dependent Variable	Rating Covariate?	Years Covered	N	Coefficient (95% CI)	P - value
1	0 = no tobacco 1 = tobacco	Yes	1996 - 2004	900	0.90 (0.84 - 0.95) Adjusted OR	<0.001
1a	0 = no tobacco 1 = tobacco	R-rated only	1996 - 2004	352	0.87 (0.72, 1.03) Adjusted OR	0.11
1b	0 = no tobacco 1 = tobacco	Youth- rated only	1996-2004	548	0.88 (0.81, 0.95) Adjusted OR	0.002
2	Summed occurrences	No	1996 - 2004	9	-0.75 (-120,-30) Beta coefficient	0.005
3a	Summed occurrences	R-rated only	1996 - 2004	9	-64 (-117, -12) Beta coefficient	0.02
3b	Summed occurrences	Youth- rated only	1997 - 2004	9	-10 (-40, 20) Beta coefficient	0.44
4	Summed time	No	1996 - 2004	9	-0.19 (-0.41, 0.03) Beta coefficient	0.08
5a	Summed time	R-rated only	1996-2004	9	-0.21 (-0.44, - 0.01) Beta coefficient	0.06
5b	Summed time	Youth- rated only	1996-2004	9	0.2 (-.15, 0.20) Beta coefficient	0.79
6	0 = no brand appearance 1 = brand appearance	Yes	2000-2004	500	0.81 (0.68, 0.96) Adjusted OR	0.02
7	Summed brand appearances	No	2000-2004	5	-7 (-14, -0.25) Beta coefficient	0.046

Appendix 3: Percent of U.S. Youth Aged 10-14 Years Seeing Popular Contemporary Movies,* by Movie Rating

* From Sargent, et al. Exposure to movie smoking: Its relation to smoking initiation among U.S. adolescents. Pediatrics 2005;116(5):1183-1191. Movies included top box office hits from 1998-2003: youth-rated N = 319, R-rated N = 213.

