



THE ONTARIO TOBACCO RESEARCH UNIT
UNITÉ DE RECHERCHE SUR LE TABAC DE L'ONTARIO

Generating knowledge for public health

Youth Exposure to Tobacco in Movies in Ontario, Canada: 2004-2014

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Executive Summary

Movies are a powerful vehicle for promoting tobacco use. A substantial body of scientific evidence indicates that exposure to smoking in movies is a cause of smoking initiation and progression to regular smoking among youth. Higher exposure to onscreen tobacco increases the uptake of smoking among youth and undermines tobacco prevention efforts.

The Ontario Tobacco Research Unit collaborated with the Ontario Coalition for Smoke-Free Movies to examine the extent of onscreen tobacco exposure among Ontario youth, and estimate the impact of the exposure in terms of new smokers recruited, their tobacco associated mortality and healthcare costs. The amount of harm that would be averted if future movies with smoking received an adult (18A) rating was also estimated.

Key findings of the study include:

- Modeling based on youth exposure to smoking in movies in Ontario indicates that:
 - At least 185,000 children and teens aged 0-17 living in Ontario today will be recruited to cigarette smoking by their exposure to onscreen smoking.
 - These future Ontario smokers will incur at least \$1.1 billion in healthcare costs attributable to their exposure to onscreen smoking.
 - At least 59,000 of these smokers recruited to smoking by exposure to movies depicting tobacco imagery are projected to eventually die prematurely from smoking-related disease.
- Of 1564 top-grossing movies released in Ontario theatres from 2004 to 2014, 90% were youth-rated (11% General, 45% Parental Guidance, 35% 14A, persons younger than 14 must be accompanied by an adult). Ten percent were adult-rated.
- More than half of top-grossing movies (56%) featured tobacco. Of the movies with tobacco content, 86% were youth-rated in Ontario—a much higher share than in the US (54%). As a result, Ontario youth had unrestricted access to 60% more movies with smoking than their US counterparts and, therefore, substantially greater potential for exposure to smoking on screen.
- Top-grossing movies contained a total of 29,620 tobacco incidents. Eighty-five percent of tobacco incidents were found in movies youth-rated in Ontario, twice the percentage (42%) found in US youth-rated movies.

- Top-grossing movies delivered an estimated 8.9 billion in-theatre tobacco impressions to moviegoers in Ontario from 2004 to 2014. Eighty-seven percent of these tobacco impressions were delivered by youth-rated movies in Ontario whereas only 55% were delivered by youth-rated movies in the US.
- The Ontario Film Review Board's (OFRB) tobacco-related 'detailed observations' and 'content advisories' provided inadequate information about smoking in movies:
 - Nearly nine of every ten (87%) youth-rated top-grossing movies with smoking did not include an OFRB 'tobacco use' content advisory
 - One of every three (35%) youth-rated top-grossing movies with smoking did not carry an OFRB 'tobacco use' detailed observation.
- There is no evidence that mere labeling reduces the harms of youth exposure to onscreen tobacco. By contrast, in 2014, the US Surgeon General reported evidence that an adult-rating for movies depicting smoking would reduce youth smoking rate by 18%.
- An Ontario 18A rating for movies with smoking would avert more than 30,000 tobacco-related deaths and save more than half a billion dollars (\$568 million) in healthcare costs.
- The Smoke-Free Ontario Scientific Advisory Committee notes that an effective way to reduce youth exposure to onscreen tobacco in Ontario is to require adult ratings (18A) for movies with any tobacco imagery, a policy measure recommended by public health stakeholders and institutions provincially, nationally and internationally.

Introduction

Smoking among youth remains an important public health issue. In 2014, more than 18,000 Ontario youth aged 12-17 years were current smokers.¹

Exposure to smoking in movies causes smoking initiation and progression to regular smoking. A dose-response relationship between exposure to onscreen smoking and youth tobacco use has also been reported.^{2,3,4,5} A recent meta-analysis pooled five US studies to obtain an overall population attributable risk estimate of 37% (95% CI: 25%-52%) for adolescent smoking due to exposure to tobacco imagery in movies, meaning that 37% of youth smokers in the population are recruited to smoking due to seeing smoking in movies.^{5,6} The evidence is sufficient to conclude that there is a causal relationship between depictions of smoking in the movies and the initiation of smoking among young people.⁷ This summary of the evidence is based on a critical review of population and experimental studies which control for a large number of potential confounding variables including a wide range of characteristics of youth and their environments.

Smoking kills. Researchers have calculated that 32% of teens who smoke will eventually die from tobacco-induced diseases such as heart attack, stroke, lung and other cancers and emphysema.^{7,8}

In 2014, the Ontario Tobacco Research Unit collaborated with the Ontario Coalition for Smoke-Free Movies to examine the extent of exposure among Ontario youth to movies with tobacco imagery between 2004 and 2013. The study analyzed the proportion of top-grossing movies with tobacco imagery, total number of tobacco incidents and the tobacco impressions delivered to Ontario moviegoers, categorized by the Ontario Film Review Board (OFRB) movie rating. The OFRB's tobacco-related notations about onscreen tobacco content were compared to an independent database of movies' tobacco content. Finally, the distribution of tobacco incidents and tobacco impressions by youth-rated and adult-rated movies in Ontario and the US were compared. Results were documented in a previous report.⁹

In this report, we update previous estimates with 2014 data. In addition, the health impact of onscreen smoking on Ontario youth is assessed using a model published since our last report. In its January 2014 report, the US Surgeon General reported evidence that suggested eliminating smoking from youth-rated movies in the United States would reduce teen smoking rates by 18%.⁷ The US Centers for Disease Control and Prevention (CDC) subsequently estimated that applying

an adult rating (R in the US) would avert one million tobacco deaths among US children and teens (aged 0-17) alive today.¹⁰ Using the CDC model, we estimated the number of children and teens aged 0-17 living in Ontario today who will be recruited to smoking, and those who will ultimately die of tobacco-related diseases, because of exposure to onscreen smoking. This differs from the approach taken in our previous report, in which we estimated the number of current smokers aged 12 to 17 who would not have smoked if there had been no exposure to onscreen smoking. We also estimate the healthcare costs incurred by exposing Ontario youth to onscreen smoking. Finally, the number of tobacco-induced deaths and costs that would be averted by giving an 18A-rating to future movies with smoking are assessed.

Method

Data

This study focuses on top-grossing domestic movies—movies released in the domestic market (Canada and the US) that ranked among the ten highest grossing movies in any week of their first-run in-theatre release.

A tobacco incident is one occurrence of the use or implied use of a tobacco product (almost exclusively smoking) by an actor in a movie. Each screen appearance of tobacco is counted as one tobacco incident; incidents appearing in different ‘cuts’ may mean a single movie scene has multiple incidents.

The census of tobacco incidents in each of the movies in our sample was provided by independent monitors of the Thumbs Up! Thumbs Down! (TUTD) project at Breathe California of Sacramento-Emigrant Trails. TUTD has consistently tracked tobacco incidents and their characteristics since 1991 and expanded its sample to monitor all domestic top-grossing movies in 2002.

In-theatre tobacco impressions are an index of the total audience exposure to onscreen tobacco imagery. A single tobacco impression is counted as one person seeing one incident. Total tobacco impressions delivered by a movie are computed by multiplying the number of tobacco incidents in the movie by the paid admissions (tickets sold) to that movie. Paid admissions are calculated by dividing the domestic (Canada and US) box office gross sales for the movie by the average US ticket price in the year of the movie’s release. Box office gross sales data is available only at the domestic market level; sales are allocated to Ontario and the US based on their population share of the domestic market. Population data were obtained from statistical agencies.^{11,12}

In-theatre tobacco impressions substantially underestimate total exposure, because impressions generated by viewing movies on in-home and on-demand media are not included (due to lack of published data). However, in-theater impressions remain a useful index of overall exposure because a movie’s popularity on other platforms is associated with its popularity in theaters.

Movies screened in Ontario are required to be classified by the OFRB before release. The current ratings are: G (general - suits all ages), PG (parental guidance advised), 14A (persons younger than 14 must be accompanied by an adult), 18A (persons younger than 18 must be accompanied by an adult) and R (restricted to persons aged 18 or older) (Appendix 1). G, PG and 14A movies are considered youth-rating while 18A and R are adult-rated.

Ratings are currently assigned taking into consideration coarse language, violence, sexuality and other content, but not tobacco imagery. Aside from its ratings, which are required to be carried in movie advertising, the OFRB may choose to post information about specific movie content using 'detailed observations' and 'content advisories' (Appendix 2). Both notations can be viewed online by searching for the movie on the OFRB's web site; 'content advisories' also appear with the movie rating, on a movie's promotional material. Currently, tobacco-related 'detailed observations' include the notations 'tobacco use' or 'illustrated or verbal references to drugs, alcohol or tobacco'. The tobacco-related 'content advisory' is 'tobacco use'.

Analysis

Tobacco incidents, tobacco impressions and the OFRB's rating practices were analyzed with descriptive statistics using STATA software.

To assess the impact of exposure to smoking in movies on youth, we estimated the number of children and teens living in Ontario today who will become future smokers due to their exposure to onscreen smoking, their tobacco-related healthcare costs, and their future deaths that can be attributed to the exposure.

To project the number of young people aged 0-17 alive today (based on Ontario's 2014 population) who will become future smokers due to their exposure to onscreen tobacco, we have assumed that smoking patterns are constant over time, and that these future smokers will have the same smoking behaviour as contemporary Ontario adults aged 18-30. Multiplying Ontario's population aged 0-17 by the smoking prevalence of those aged 18-30, and then multiplying by the attributable risk for youth from onscreen smoking exposure (37%), yielded the projected number of children and teens alive today who will be recruited to smoke because of their exposure to onscreen smoking. Population count and smoking prevalence were from Statistics Canada and the attributable risk was from a meta-analysis of US studies.^{1,6,11}

In this study, healthcare costs to society attributed to exposure to onscreen smoking was obtained by multiplying the lifetime cost of a single smoker by the number of future smokers among Ontario children and teens aged 0-17 alive today who will be recruited because of their exposure. The lifetime cost of a smoker is the present value of costs incurred by a smoker over a lifetime that are in excess of the costs of a nonsmoker because of the adverse impact of smoking. Healthcare costs are best estimated using a life cycle approach, in which the cost differential between a smoker and a nonsmoker is tracked over the lifetime of a smoker. Since we were unable to locate a Canadian study of lifetime cost based on this approach, a US study was used. Sloan et al. estimated the costs for a 24 year old smoker to access physician, hospital and nursing home services over a life expectancy of 100, accounting for the effects of smoking and quitting on utilization of services, morbidity and mortality.¹³ Estimates were derived from the differential utilization of healthcare services by a smoker and a nonsmoker obtained from survey data, and the charges for these services. The stream of lifetime costs was discounted back to year 2000 when the study was conducted. Costs for other health services such as home care and the provision of drugs were not included because data were not available.

For our assessment, the lifetime cost per smoker calculated by Sloan et al. was first converted to Canadian dollars for the year 2000 using purchasing power parity for Gross Domestic Product to account for cross-border price differences. This amount was then inflated to 2015 dollars using the consumer price index (healthcare) for Ontario, resulting in a lifetime cost per smoker of CDN\$5,970.^{14,15} Appendix 3 shows the details in the derivation of this cost.

The number of smoking-related, premature deaths attributed to exposure to smoking in movies is estimated by multiplying the number of Ontarians aged 0-17 who will be recruited to smoking due to their exposure by the future probability of smoking-attributable mortality (PSAM) of 0.32.^{7,8}

To assess the number of premature deaths and costs that would be averted with a policy of 18A ratings for movies with smoking, we anticipated that the attributable risk of youth smoking due to exposure to onscreen smoking would drop from 37% to 18%. The reduction in costs and premature deaths resulting from the lowering of this attributable risk was counted as avoidable harm. The lowering of the attributable risk to 18% was based on US studies that showed that young people received about half of their exposure to onscreen smoking from youth-rated (G, PG, PG-13) movies and half from adult-rated movies.^{16,17} It follows that the attributed risk of youth smoking due to exposure to onscreen tobacco (37%) would drop by half to 18.5 percent if a policy

were to remove tobacco imagery from youth-rated movies (this figure was rounded to 18% for our calculations). This same assumption was used by the CDC in estimating that an adult rating for movies depicting smoking would avert one million tobacco deaths in the US.¹⁰

However, Ontario youth are at greater risk of exposure to onscreen tobacco than their US counterparts because most R-rated movies in the US that have a higher incidence of tobacco imagery are youth-rated by the OFRB. The risks from exposure are dose-related. Exposure to onscreen smoking may also have a larger impact on smoking initiation in Ontario than in the US because Canada has much stronger restrictions on conventional tobacco advertising. For these reasons, the attributable risk of youth smoking due to exposure to onscreen tobacco in Ontario is potentially greater than the US figure of 37%. The beneficial effects of instituting an adult-rating of future movies with smoking in Ontario may also be more important than the US models estimate. We acknowledge these potential deviations by characterizing Ontario results as being “at least” as large as the substantial numbers generated by the US models.

Results

Top-Grossing Movies 2004-2014

Between 2004 and 2014, 1564 top-grossing movies were released in Ontario, including 130 in 2014 (Table 1).ⁱ Ninety percent of these movies were youth-rated (11% rated G, 45% rated PG and 35% rated 14A) while 10% were adult-rated 18A/R (only one movie was R-rated). A list of these movies with their ratings, the number of tobacco incidents, tobacco impressions and the presence of the OFRB's tobacco-related notations can be found online (see [Top-Grossing Movies Released in the Domestic Market \(Canada and US\), 2004-2014](#) – Excel format).

Table 1: Number of Movies Released in the Domestic Market (Canada and US), by OFRB Rating and by Tobacco Imagery Status 2004-2014

Year ^a	Number of Domestic Movies by OFRB Rating					Tobacco Imagery	
	G	PG	14A	18A/R ^b	Total	Yes	No
2004	14	74	46	10	144	99	45
2005	24	67	40	12	143	97	46
2006	26	75	43	17	161	96	65
2007	17	58	59	23	157	106	51
2008	12	58	55	20	145	86	59
2009	10	61	60	13	144	70	74
2010	11	65	43	16	135	60	75
2011	20	64	40	10	134	62	72
2012	11	56	55	14	136	69	67
2013	11	55	59	10	135	73	62
2014	11	66	45	8	130	59	71
Total	167	699	545	153	1564	877	687
% of Total	11%	45%	35%	10%	100%	56%	44%

^a Numbers may not add up due to rounding.

^b The only R-rated movie in the sample was released in 2006.

ⁱ In this report, numbers by rating or by year may not add up to total due to rounding.

Movies with Tobacco Imagery

Between 2004 and 2014, 56% (877/1564) of the top-grossing movies released in Ontario featured tobacco imagery. As the restrictiveness of the movie ratings increase, the percentage of movies with onscreen smoking increases, from 17% (29/167) in G-rated movies, to 49% (340/699) in PG movies, 71% (385/545) in 14A and 80% (123/153) in movies adult-rated 18A or R.

The share of movies with tobacco imagery released annually declined from 69% in 2004 to 45% in 2014, so that nearly half of all rated movies still feature tobacco (Figure 1). The decline has been greater in youth-rated movies than in adult-rated movies.

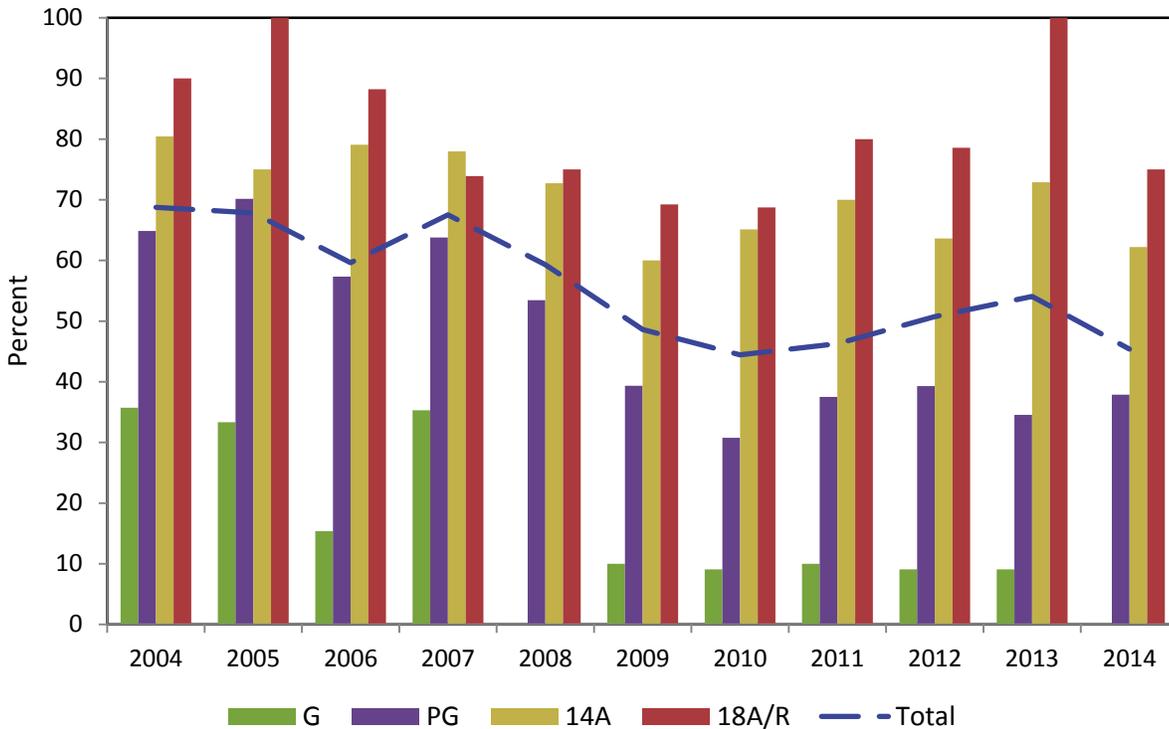
G-rated movies: The percentage of G-rated movies with tobacco imagery dropped to zero for the first time in 2008, then hovered around 10% and dropped to zero again in 2014. However, only 11% of all movies in the sample were G-rated.

PG-rated movies: The percentage of PG-rated movies depicting smoking in 2014 (38%) was substantially lower than a decade before (65%), but has not changed substantially since 2009.

14A-rated movies: Sixty-two percent of 14A movies featured tobacco imagery in 2014. The 2014 level was substantially lower than a decade before (80%), but the decline essentially halted in 2009.

18A/R-rated movies: The percentage of adult rated movies with smoking has been 70% or higher since 2004 and was 75% in 2014. Adult-rated movies accounted for 10% of all movies in our sample.

Figure 1: Percentage of Movies with Tobacco Imagery, by OFRB Rating, 2004-2014



Note: Tobacco imagery means tobacco incidents which are occurrences of the use or implied use of a tobacco product in a movie.

Tobacco Incidents

Total Tobacco Incidents

Between 2004 and 2014, the 1564 top-grossing movies released in Ontario contained a total of 29,620 tobacco incidents. Youth-rated movies contained 85% of these incidents: 2% in G-rated movies, 31% in PG-rated movies, and 53% in 14A-rated movies.

In 2014, there were fewer movies with smoking than in 2013, but the annual total number of tobacco incidents increased 11% during the same time period (2498 to 2770; see Figure 2).

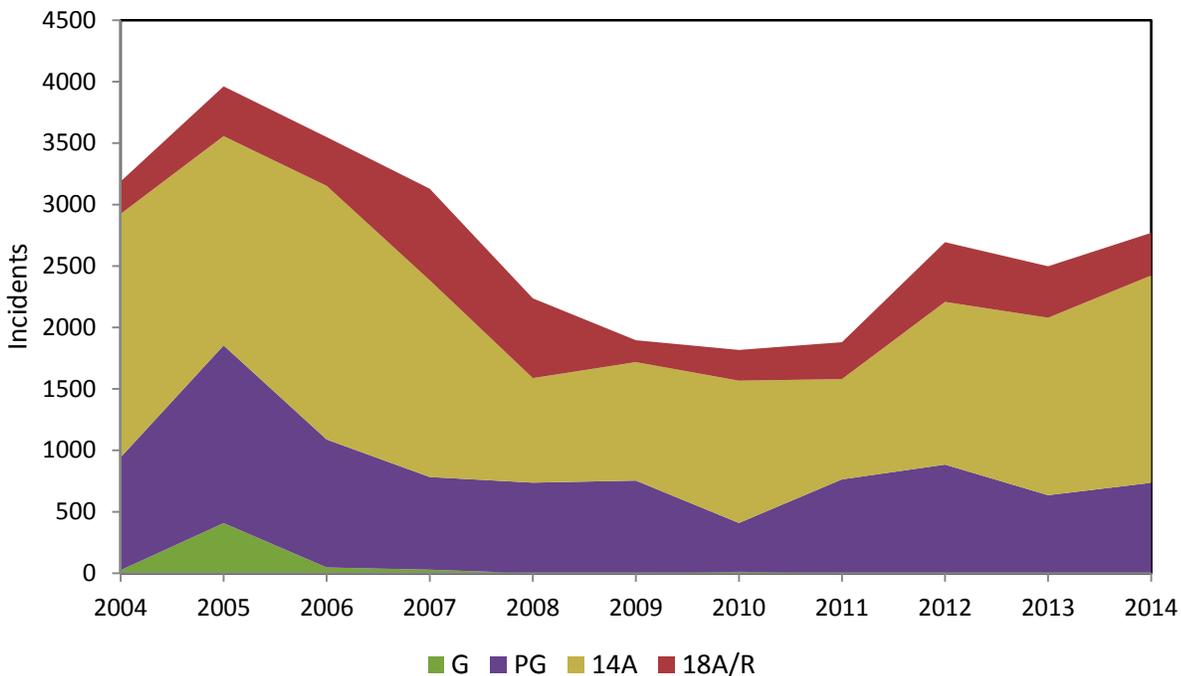
G-rated movies: The total number of tobacco incidents in G movies has been negligible since 2008, and there were none in 2014.

PG-rated movies: Tobacco incidents in PG movies increased 16% from 2013 to 2014 (634 to 736). PG movies accounted for 27% of all tobacco incidents in 2014, slightly lower than ten years earlier in 2004 (29%).

14A-rated movies: The total number of tobacco incidents in 14A movies doubled between 2011 and 2014 (816 to 1687). In 2004, as in 2014, more than half of all tobacco incidents were found in 14A movies.

18A/R-rated movies: Tobacco incidents in adult-rated films increased by nearly one-third between 2004 and 2014 (264 to 347 incidents). In 2014, 13% of all tobacco incidents were found in adult-rated movies, somewhat more than the 8% seen in 2004.

Figure 2: Total Tobacco Incidents in Top-Grossing Movies, by OFRB Rating, 2004-2014



Note: Total tobacco incidents are the total number of occurrences of the use or implied use of a tobacco product.

Tobacco Incidents per Movie

To account for fluctuations in the number of movies released annually, tobacco incidents divided by the total number of movies (with or without smoking) in each rating class were analyzed.

Between 2004 and 2014, the average 14A movie released in Ontario featured the same number of tobacco incidents as the average 18A/R movie (29 incidents per movie). Tobacco incidents per PG movie averaged fewer than half as many incidents (13) and G movies about one-tenth as many (3).

Overall, tobacco incidents per movie declined between 2005 and 2010. However, by 2014, incidents had rebounded to the levels last seen in 2006 (Figure 3).

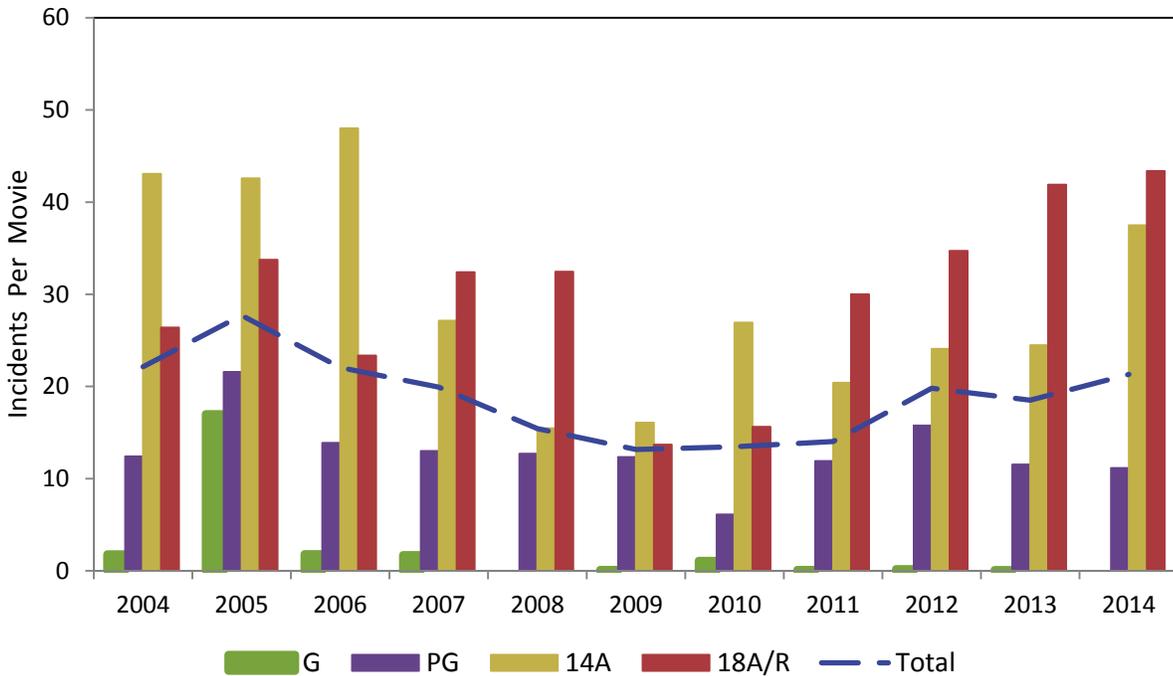
G-rated movies: Long negligible, there were no G-rated tobacco incidents in 2014.

PG-rated movies: Little changed in the number of tobacco incidents from 2004 to 2014.

14A-rated movies: Tobacco incidents per 14A movie nearly doubled between 2011 and 2014, with more tobacco incidents per movie in 2014 than in any year since 2006.

18A/R-rated movies: Tobacco incidents per adult rated movie tripled from 2009 to 2014, to a peak of 43 incidents per movie, the highest level for this rating category in the 2004-2014 survey period.

Figure 3: Number of Tobacco Incidents per Movie, by OFRB Rating, 2004-2014



Note: Tobacco incidents per movie for a rating is the total number of incidents observed in movies with the rating divided by the number of movies with that rating (with or without smoking).

Tobacco Impressions

Between 2004 and 2014, top-grossing movies delivered 8.9 billion tobacco impressions to moviegoers in Ontario. Eighty-seven percent of these impressions (7.7 billion) were delivered by youth-rated movies: 1% by G movies, 44% by PG movies and 42% by 14A movies.

Over the period under study, the vast majority of tobacco impressions have been consistently delivered by youth-rated movies in Ontario. In 2004, youth-rated movies delivered 93% (953/1024 million) of all tobacco impressions; in 2014, youth-rated movies delivered 92% (693/749 million).

Although in-theater tobacco impressions in 2014 (749 million) dropped by 27% compared to 2004 (1024 million), Ontario movie audiences still received three-quarters of a billion tobacco impressions in 2014 (Figure 4).

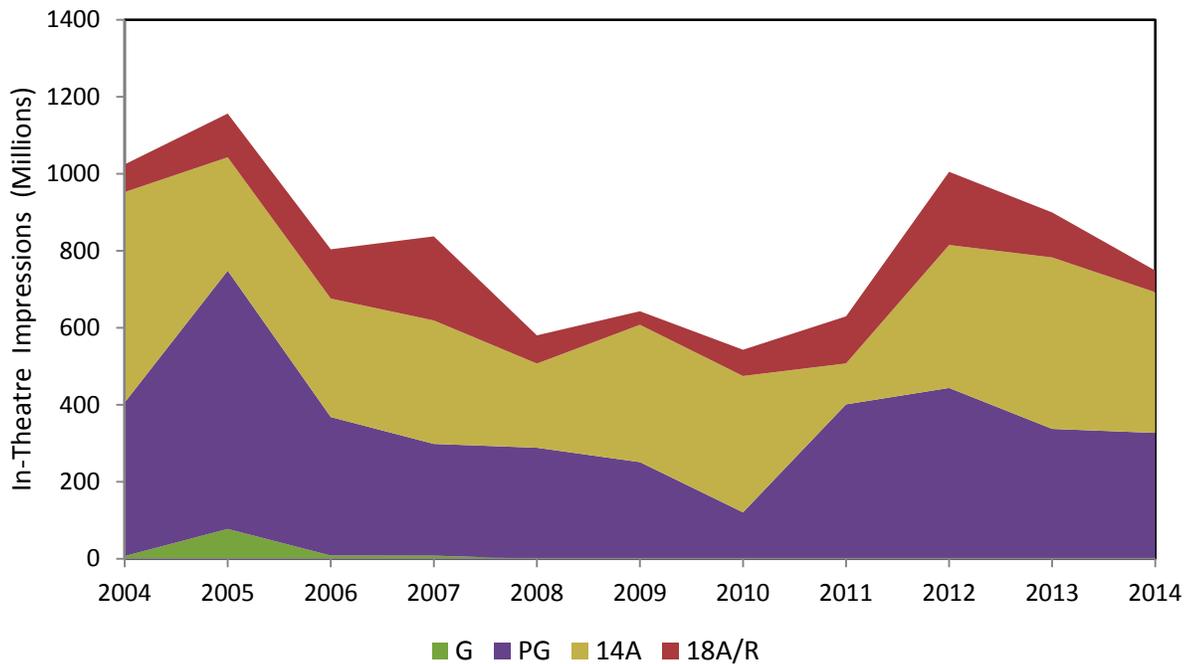
G-rated movies: Movies with this rating deliver a negligible share of impressions, none in 2014.

PG-rated movies: While PG movies delivered 18% fewer tobacco impressions in 2014 than in 2004 (399/327 million), their share of overall tobacco impressions was greater in 2014 (44%) than 2004 (39%).

14A-rated movies: 14A movies delivered 33% fewer tobacco impressions in 2014 than in 2004 (546/365 million). These movies accounted for about half of all tobacco impressions in 2004 (53%) as in 2014 (49%).

18A/R-rated movies: In 2014, adult-rated movies delivered 56 million tobacco impressions, a 22% decline from 2004 (72 million). Their share of overall tobacco impressions in 2014 (8%) was about the same as in 2004.

Figure 4: In-Theatre Tobacco Impressions, by OFRB Rating, Ontario, 2004-2014



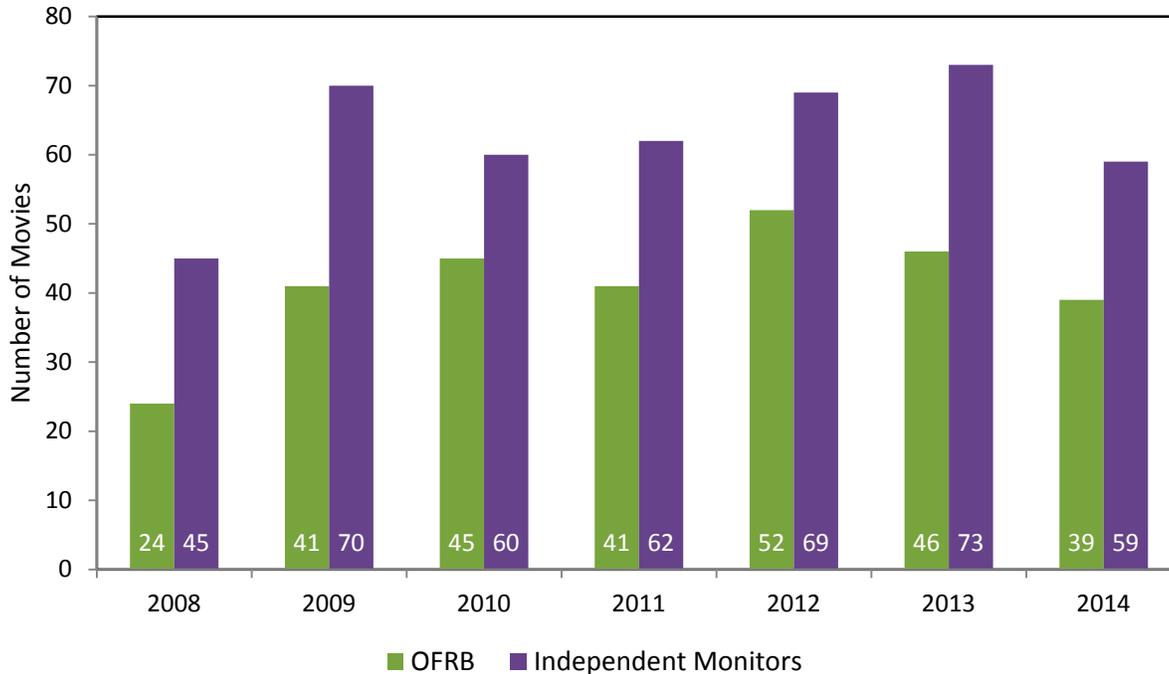
Note: In-theatre tobacco impressions of a movie are a measure of total audience exposure to onscreen tobacco imagery of the movie. It is obtained by multiplying the number of tobacco incidents in a movie by the paid admission to that movie.

Comparison of OFRB Tobacco-Related Labels with Reports of Independent Monitors

We compared the numbers of movies for which the OFRB provided tobacco-related ‘detailed observations’ or ‘content advisories’ with the number identified as having onscreen tobacco by independent monitors of the Thumbs Up! Thumbs Down! (TUTD) project at the Breathe California of Sacramento-Emigrant Trails.

From August 2008, when the OFRB began providing tobacco-related ‘detailed observations’, to December 2014, 879 top-grossing movies were released in Ontario. According to independent monitors, half of these movies (438/879) featured tobacco imagery, yet OFRB posted ‘tobacco use’ observations for only two-thirds (288/438) of the movies identified by independent monitors, leaving one-in-three movies (150/438) with no indication of tobacco content. Figure 5 compares the annual number of movies that the OFRB labelled with ‘tobacco use’ observations and the annual number deemed to include tobacco incidents by independent monitors, from 2008 to 2014.

Figure 5: Number of Movies with OFRB ‘Tobacco Use’ Detailed Observations vs. Movies Independently-Reported with Tobacco Incidents, August 2008-2014

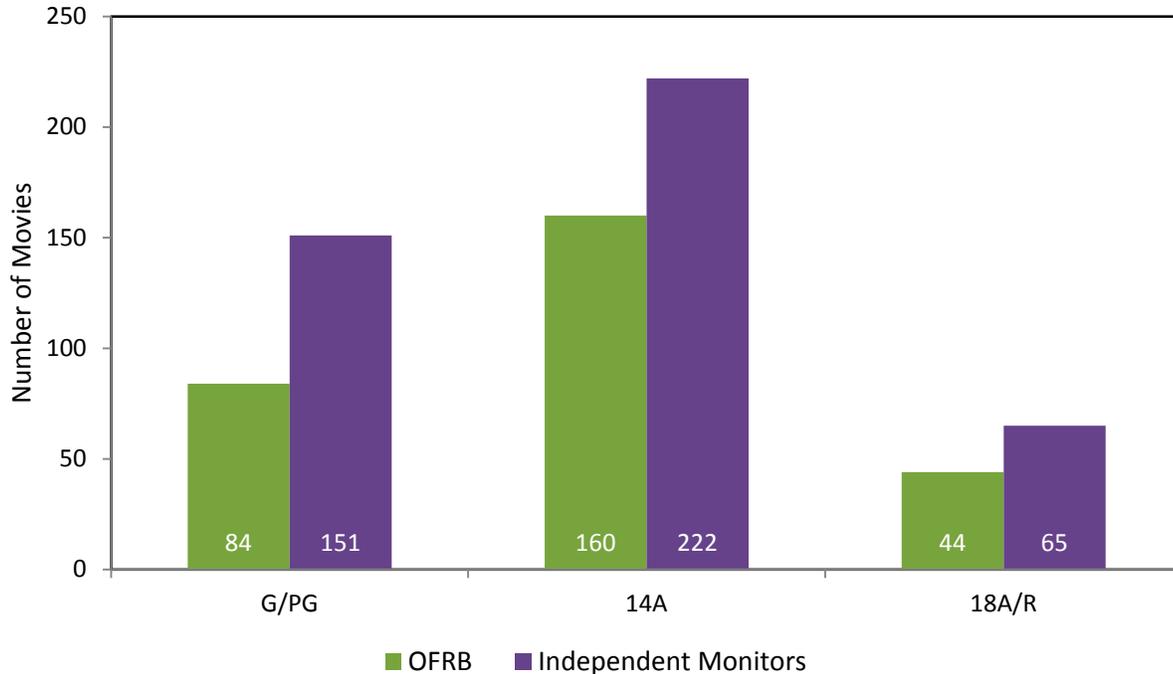


Note: Year 2008 was for August 15 to December 31, 2008.

Six movies (one in 2009, one in 2011 and four in 2013) for which the OFRB provided ‘tobacco use’ notations were classified as tobacco-free by independent monitors and are not included in this analysis. Independent monitors identified the substance represented on screen as marijuana, not tobacco.

Of the 438 movies featuring tobacco imagery between August 2008 and December 2014, 373 were youth-rated (151 rated G/PG and 222 rated 14A) and 65 were adult-rated (Figure 6). OFRB attached ‘tobacco use’ observations to 65% (244/373) of youth-rated movies with smoking and left about one-third (35%, 129/373) without any notation. Sixty-eight percent (44/65) of adult-rated movies with smoking were posted with OFRB’s ‘tobacco use’ observations.

Figure 6: Number of Movies with OFRB's 'Tobacco Use' Detailed Observations vs. Movies Independently-Reported with Tobacco Incidence, August 2008-2014, by OFRB Rating

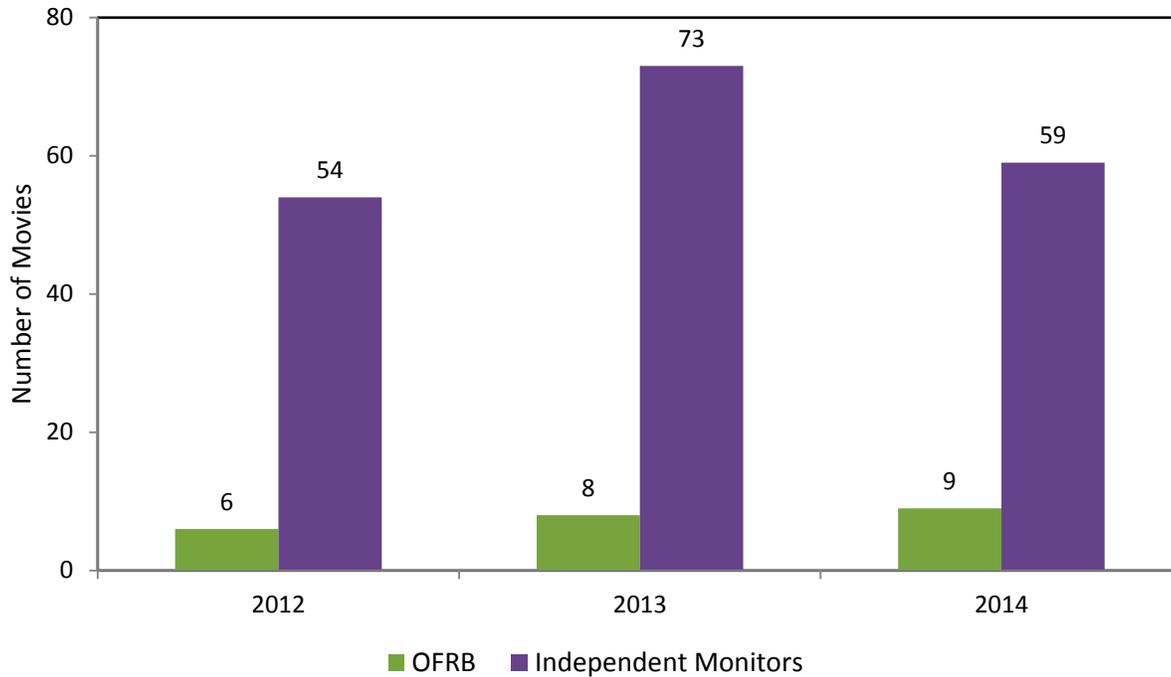


Note: Six movies (one in 2009, one in 2011 and four in 2013) for which the OFRB provided 'tobacco use' notations were classified as tobacco-free by independent monitors and are not included in this analysis. Independent monitors identified the substance represented on screen as marijuana, not tobacco.

Since August 2008, six out of ten (269/438) movies with tobacco imagery have lacked an 'illustrated or verbal references to drugs, alcohol or tobacco' notation from the OFRB. (Chart not shown for this detailed observation).

Of the 367 top-grossing movies released from March 2012 (when the OFRB began implementing tobacco use content advisories) to December 2014, 186 (51%) were identified by independent monitors as having tobacco imagery. The OFRB failed to provide 'tobacco use' advisories for 88% (163/186) of these movies, meaning that only 12% of top-grossing movies with tobacco imagery shown in Ontario carried any indication of their tobacco content on posters and other promotional material. Figure 7 compares the annual number of movies with the OFRB's 'tobacco use' advisories with the annual number that independent monitors identified featuring tobacco imagery, from 2012 to 2014.

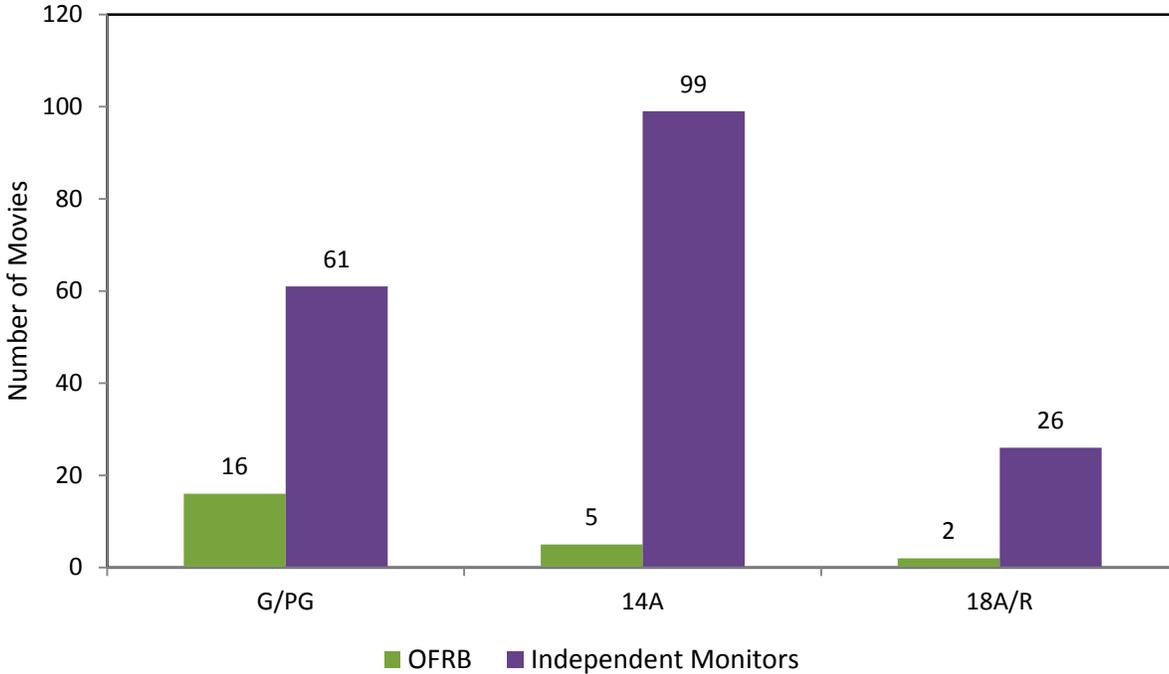
Figure 7: Number of Movies with OFRB 'Tobacco Use' Content Advisories vs. Movies Independently-Reported with Tobacco Incidents, March 2012-2014



Note: Year 2012 was from March 12 to December 31, 2012

Among the 186 movies that featured tobacco imagery between March 2012 and 2014, 160 were youth-rated (61 rated G or PG and 99 rated 14A) and 26 were adult-rated (Figure 8). The share with OFRB's 'tobacco use' advisories among youth-rated movies with smoking was 13% (21/160), slightly above the share among adult-rated movies with smoking (8%, 2/26). Anyhow, almost nine of every ten (87%, 139/160) youth-rated movies with smoking did not carry a 'tobacco use' content advisory.

Figure 8: Number of Movies with OFRB 'Tobacco Use' Content Advisories vs. Movies Independently-Reported with Tobacco Incidents, March 2012-2014, by OFRB Rating



Comparison between Ontario and the US

Ontario Film Review Board vs Motion Picture Association of America Rating

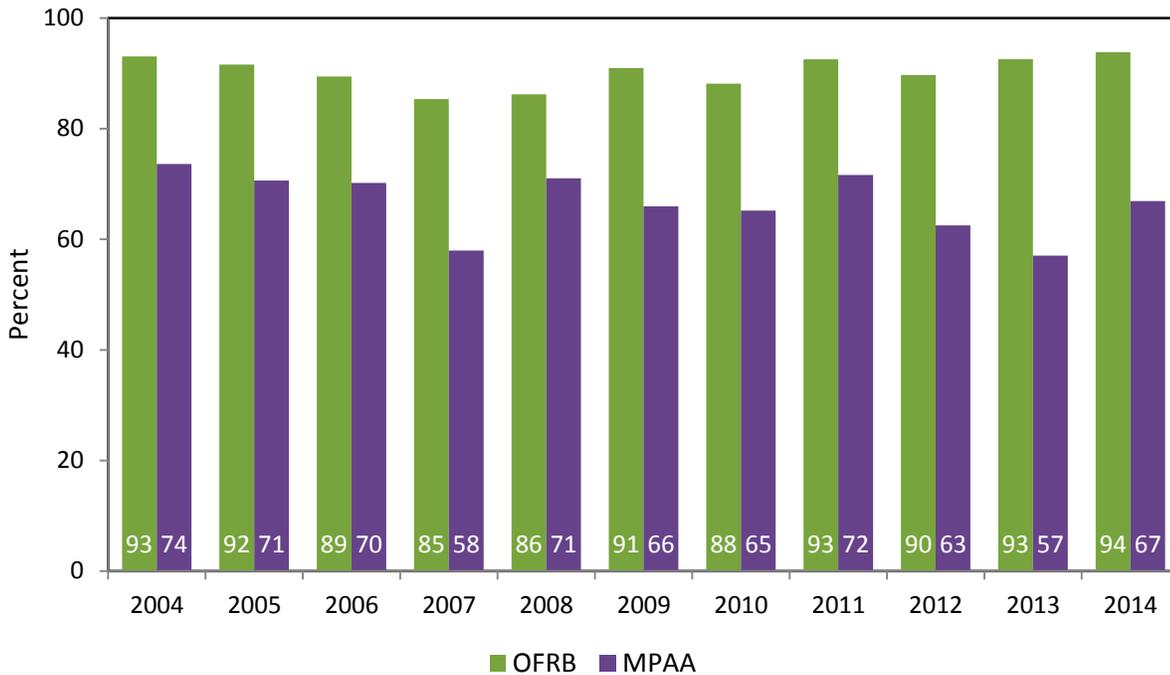
From 2004 to 2014, 71% (369/522) of movies adult-rated ‘R’ in the US were given a youth rating in Ontario. Ninety-seven percent (359/369) of these ‘down-rated’ movies were classified as 14A in Ontario.

As a result, the percentage of youth-rated movies in Ontario was substantially greater than in the US. Between 2004 and 2014, the OFRB rated 90% (1411/1564) of the top-grossing movies shown in both Ontario and the US as appropriate for youth (11% rated G, 45% rated PG and 35% rated 14A; Figure 9). In comparison, the Motion Picture Association of America (MPAA) rated 67% (1042/1564) of the same movie sample as appropriate for youth (3% rated G, 18% rated PG and 45% rated PG-13).ⁱⁱ Figure 9 shows the annual percentage of all movies that were youth-rated in Ontario and in US, from 2004 to 2014.

ⁱⁱ MPAA is the trade association for the major US movie studios, which runs the age-classification system in the US.

Of the 877 top-grossing movies with smoking released between 2004 and 2014, 86% (754/877) were youth-rated in Ontario whereas only 54% (471/877) were youth-rated in the US. Ontario youth had unrestricted access to 60% more (471-754/471) movies with tobacco imagery than their US counterparts and therefore substantially greater potential for exposure to smoking onscreen.

Figure 9: Percentage of Movies Youth-Rated, Ontario and US, 2004-2014

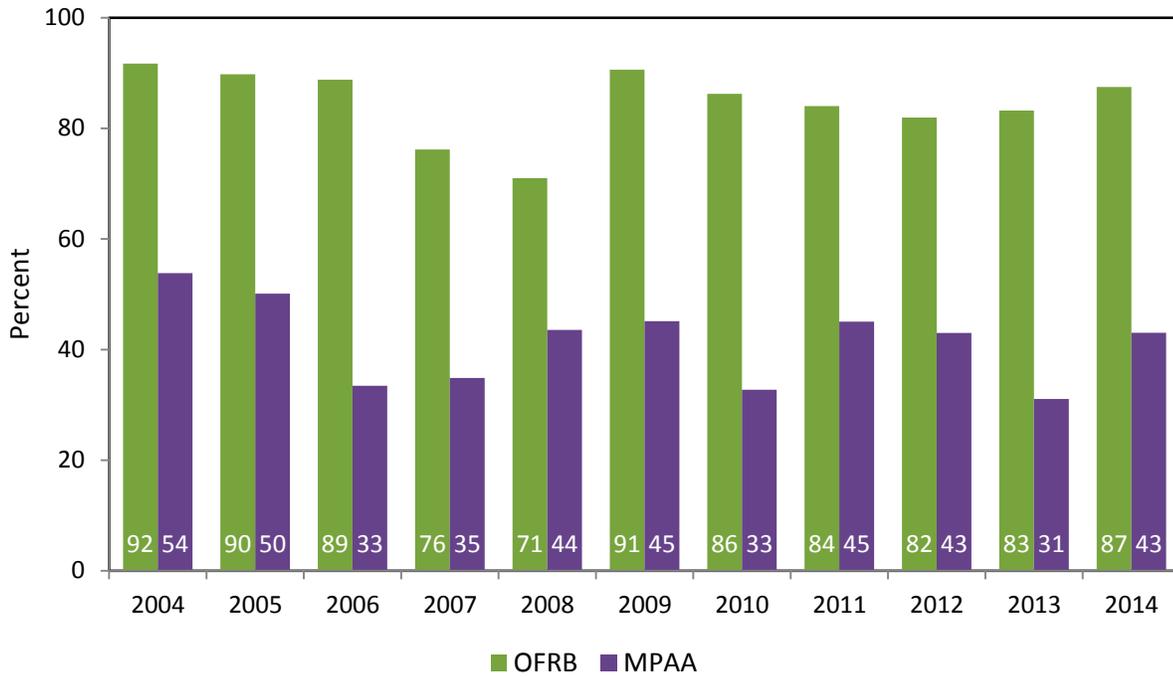


Tobacco Incidents

Since Ontario’s rating practices have made more than two-thirds of US R-rated movies accessible to young Ontario audiences and US R-rated movies average more tobacco incidents than PG-13 movies, the share of tobacco incidents found in youth-rated movies was substantially greater in Ontario than in the US.

In Ontario, from 2004 to 2014, youth-rated movies accounted for 85% (25,180/29,620) of all tobacco incidents: 2% in G-rated movies, 31% in PG movies and 53% in 14A movies. In the US, youth-rated movies accounted for 42% (12,378/29,620) — half the share of Ontario — with 4% in G-/PG-rated movies and 38% in PG-13 movies. The annual percentage of tobacco incidents found in youth-rated movies in Ontario and in US over time is shown in Figure 10.

Figure 10: Percentage of Tobacco Incidents in Youth-Rated Movies, Ontario and US, 2004-2014



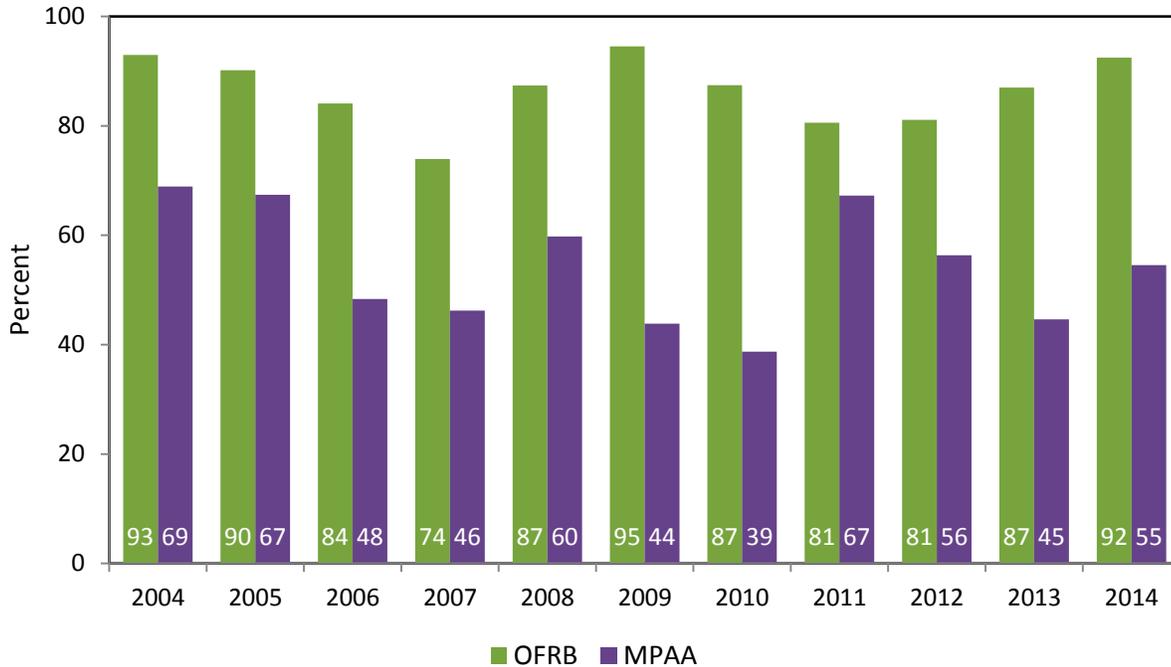
Note: The percentage of tobacco incidents in youth-rated movies is the share of all tobacco incidents found in youth-rated movies.

Tobacco Impressions

Because of the rating practice in Ontario, adolescents in Ontario were potentially exposed to substantially more onscreen tobacco impressions than their US counterparts.

From 2004 to 2014, youth-rated movies in Ontario delivered 87% (7.7/8.9 billion) of all in-theatre tobacco impressions, including 1% in G-rated movies, 44% in PG and 42% in 14A movies. In contrast, US youth-rated movies delivered 55% (115.3/208.7 billion) of all in-theatre tobacco impressions over the same period. Figure 11 shows the annual percentage of in-theatre tobacco impressions delivered by youth-rated movies over time in Ontario and in US.

Figure 11: Percentage of In-Theatre Tobacco Impressions Delivered by Youth-Rated Movies, Ontario and US, 2004-2014



Note: The percentage of in-theatre tobacco impression delivered in youth-rated movies is the share of the total audience exposure to onscreen tobacco exposed through youth-rate movies.

Onscreen Smoking’s Impact on Ontario Youth

At current levels, exposure to onscreen smoking will recruit more than 185,000 children and teens aged 0-17 living in Ontario today to become smokers (Table 2). Eventually, more than 59,000 of those recruited to smoking by this exposure will die prematurely from tobacco-induced diseases. Over the lifetime of those smokers recruited to smoking by their exposure to onscreen smoking, at least \$1.1 billion in tobacco-related healthcare costs will be incurred.

More than half of this exposure could be avoided if an adult-rating policy for movies with any tobacco content was immediately adopted in Ontario. Because the health effects and consequent costs of exposure are linearly dose-related (the more smoking that youth see on screen, the more likely they are to smoke, after controlling for other factors), reductions in exposure will lower overall youth smoking rates. The US Surgeon General reported that an adult rating (‘R’ in the US) for movies with tobacco imagery would reduce youth smoking rates by nearly one-fifth.⁷

It is projected that an adult rating (18A) for smoking in movies released in Ontario would avert at least 95,000 Ontario children and teens from becoming smokers, prevent more than 30,000 future tobacco deaths, and save more than half a billion dollars (\$568 million) in tobacco-related healthcare costs.

Table 2: Projected Number of Smokers, Healthcare Costs and Premature Deaths Attributed to Exposure to Smoking in Movies, Among Children and Teens Aged 0-17 Today, Ontario

OFRB rating policy	Projected future smokers for the cohort aged 0-17 in 2014 ^b	Attributable risk for smoking due to exposure to onscreen smoking ^c	Impact attributable to exposure to smoking in movies among the cohort aged 0-17 in 2014 ^a		
			Projected future smokers ^d	Projected healthcare costs, \$mil ^e	Projected premature deaths ^f
Current policy	500,685	0.37	185,254	\$1,106	59,281
If 18A ratings for movies with smoking	500,685	0.18	90,123	\$538	28,839
Adverse impact averted if 18A rating applied ^g			95,130	\$568	30,442

^a Numbers may not add up due to rounding.

^b Obtained by multiplying the population aged 0-17 in 2014 (2,678,895) with the prevalence of current smoking (past 30 days) among the cohort aged 18-30 in 2014 (18.69%). Population estimates were from Statistics Canada.¹¹ Smoking prevalence was from the Canadian Community Health Survey.¹

^c Attributable risk for smoking due to exposure to smoking in movies (37%) was from Glantz S et al.⁶ As discussed in the method section, R-rated movies with smoking will reduce the attributable risk from 37% to 18%.

^d Obtained by multiplying the attributable risk with the projected number of future smokers.

^e Obtained by multiplying the number of persons aged 0-17 today who will become smokers due to onscreen smoking with the lifetime cost per smoker (\$5970). See Appendix 3 for the derivation of the cost.

^f Obtained by multiplying the number of those aged 0-17 today who will become smokers due to onscreen smoking with the probability of smoking-attributable mortality (PSAM) of 32%.⁸

^g Adverse impact that can be averted if 18A rating were applied to all movies with smoking: the difference in impact due to the change of the attributable risk from 37% to 18%.

Because Ontario rating practices concentrate smoking in movies that are youth-rated, the effect of an adult-rating in Ontario is probably larger than the reduction posed in this model, which assumes only half of young audiences' exposure comes from youth-rated movies.

Discussion

This study indicates that from 2004 to 2014, more than half (56%) of top-grossing movies in Ontario featured tobacco imagery and 86% of them were youth-rated. Eighty-five percent of tobacco incidents and 87% of tobacco impressions delivered to Ontario theatre audiences came from movies that were youth-rated by the Ontario Film Review Board.

Our analytical model projects that, in the absence of an adult-rating for onscreen smoking, top-grossing movies will recruit more than 185,000 young Ontarians to smoke, of whom more than 59,000 will eventually die from tobacco-related cancers, strokes, heart disease and emphysema, incurring at least \$1.1 billion in healthcare costs. Adult ratings for movies that depict onscreen tobacco would save at least 30,000 lives and half a billion healthcare dollars.

Healthcare systems in Ontario and US are not the same, and in the absence of appropriate life-cycle cost estimates for Ontario, we used American estimates. Our estimates of the impact of youth exposure to onscreen tobacco are conservative. The risk from exposure to onscreen smoking for Ontario youth could be higher than 37% because traditional forms of tobacco advertising are more severely restricted in Ontario than in the US. As a result, onscreen smoking may account for an even larger share of young smokers. Also, an adult rating might reduce youth smoking by more than 18% because Ontario youth have access to 60% more movies depicting smoking than their US counterparts. This includes movies with heavier tobacco content that are rated R in the US for other reasons, so youth exposure may be substantially greater. Finally, estimates of healthcare costs do not include the costs of drugs and home care, for which data was not available.

The Smoke-Free Ontario Scientific Advisory Committee notes that an effective way to reduce youth exposure to onscreen tobacco in Ontario is to require adult ratings (18A in Ontario) for movies with any tobacco imagery.¹⁸ This policy measure has been recommended by public health stakeholders and institutions provincially, nationally and internationally.

Appendix 1: Movie Rating Systems

Figure 12: OFRB & MPAA Rating Systems

Ontario Film Review Board rating system		Motion Picture Association of America rating system	
	Suitable for viewers of all ages.	General Audiences 	Nothing that would offend parents for viewing by children.
	Parental guidance is advised. Theme of content may not be suitable for all children.	Parental Guidance Suggested 	Parents urged to give "parental guidance." May contain some material parents might not like for their young children.
	Suitable for viewing by persons 14 years of age and older. Persons under 14 must be accompanied by an adult. May contain: violence, coarse language and/or sexually suggestive scenes.	Parents Strongly Cautioned 	Parents are urged to be cautious. Some material may be inappropriate for pre-teenagers.
	Suitable for viewing by persons 18 years of age and older. Persons under 18 may attend but must be accompanied by an adult. May contain: explicit violence, frequent coarse language, sexual activity and/or horror.	Restricted 	Contains some adult material. Parents are urged to learn about the film before taking their young children with them.
	Admittance restricted to persons 18 years of age and over. Content not suitable for minors. May contain: frequent use of sexual activity, brutal/graphic violence, intense horror and/or other disturbing content.	No One 17 And Under Admitted 	Patently adult. Children are not admitted.

Source: <http://smokefreemovies.ca/content/our-current-ratings-system>

Figure 13: OFRB Rating Classification Guideline

Quick Reference Guide To The Elements						
	 General	 Parental Guidance	 14^A 14A	 18^A 18A	 Restricted	POSSIBLE INFO PIECES
Age Suitability	Suitable for All	Parental Guidance Advised	Persons younger than 14 must be accompanied by an Adult.	Persons younger than 18 must be accompanied by an adult	Restricted to persons 18 years of age or over	<ul style="list-style-type: none"> • Not Recommended for Children
Language	Infrequent use of mild profanity such as damn, damn, hell, ass and god.	Use of expletives, such as bastard, shit, f***k (X3), and/or limited slurs, mild sexual references. Blasphemy. Derogatory portrayals, such as fatso and tubby.	Coarse language and/or slurs directed to specific segments of society; excessive use of expletives; sexual references. Infrequent strong, aggressive language. Derogatory portrayals such as lard ass and those.	Very intense and aggressive coarse language usually accompanied by violence directed towards the person(s). Aggressive/frequent slurs/sexual references.	No restriction.	<ul style="list-style-type: none"> • Not Recommended for Young Children • Some Scary Scenes • Cartoon/ Animation Action
Violence (see Note 3)	Restrained portrayals of limited violence which may result in extremely limited bloodletting.	Restrained portrayals of non-graphic violence. The portrayals are not prolonged; there are no close-ups; bloodletting and/or tissue damage is limited.	Portrayals of graphic violence resulting in blood-letting and/or tissue damage which may or may not be fatal. Violence should be within the context of the film.	Frequent and/or prolonged portrayals of graphic violence resulting in bloodletting and/or tissue damage. Limited instances of brief, visually explicit portrayals of violence. Graphic torture/brutality. Graphic sexual violence.	Visually explicit portrayals of violence which may be characterized by extreme brutality, extreme bloodletting and extreme tissue damage, torture, horror and sexual violence.	<ul style="list-style-type: none"> • Mature Theme • Language May Offend • Coarse Language
Nudity	Non-sexual nudity with no close-ups (including still images.)	Nudity in a non-sexual context, non-exploitative close-up (including still images.)	Limited nudity in a brief sexual situation.	Limited instances of nudity in a sexual situation.	Nudity in a sexual situation.	<ul style="list-style-type: none"> • Language not evaluated • Subtitled
Sexual Activity	Limited embracing and kissing.	Embracing, kissing; mild sexual innuendo.	Fondling, implied sexual activity, sexual innuendo.	Limited instances of simulated sexual activity.	Simulated sexual activity, explicit sexual activity.	<ul style="list-style-type: none"> • Crude Content • Violence
Horror	Brief moments of mild horror in comedic, historic, or fantasy settings (i.e. dragons, giants, wicked witches.)	Scenes containing some grotesque images may be allowed in a fantasy or comedic context, but there will be no detailed and/or prolonged focus on gory images or suffering.	Occasional gory moments and some horrific/grotesque images, but these will not be detailed.	Gory or grotesque imagery may be more frequent or detailed, but will generally avoid prolonged focus.	Frequent detailed gory/grotesque images will have a more prolonged or graphic focus and greater frequency.	<ul style="list-style-type: none"> • Graphic Violence • Brutal Violence • Sexual Violence • Nudity
Psychological Impact (see Note 2)	Sensitive to scenes or situations related to a child's sense of security and well-being. Tobacco use. (May be used with any classification.)	Scenes and situations that may cause adverse psychological impact on children. May include frightening or emotionally upsetting situations involving threats, injury, illness, family problems, or death to young people, family member, and animals (particularly pets.) Bullying. Substance referencing. Visual reference. Crude Content.	Occasional upsetting scenes that will tend to be more frightening, intense, disturbing - particularly to younger viewers. Substance abuse. Frequent substance referencing.	Frequent upsetting, disturbing, or frightening scenes that may cause adverse psychological impact on some mature viewers. Detailed/graphic portrayals of substance abuse.	Scenes and situations may cause extreme adverse psychological impact. May involve intense and compelling terror, acts of degradation, threats of violence, and continuous acts of violence; situations could be accompanied by coarse, abusive, and degrading dialogue. Explicit substance abuse.	<ul style="list-style-type: none"> • Sexual Content • Explicit Sexual Content • Gory Scenes • Frightening Scenes • Disturbing Content • Substance Abuse • Tobacco Use
<p>Note 1: From time to time, guidelines may be set aside at the Panel's discretion (where social, historic and documentary significance warrants). The reason is to be identified on the Summary Report.</p> <p>Note 2: Psychological impact may be a state of mind, mood or feeling and/or other effects on the viewer, resulting from the treatment of scenes and situations within the film. Treatment may include intensity, degree, pace, atmosphere, tone, visual effects, and dialogue.</p> <p>Note 3: Portrayals of violence may include armed combat, natural disasters, accidents, hand-to-hand combat, weapons violence, and violent sports. The degree, frequency, and intensity of the acts of violence will be factors in the classification decision.</p>						

Source: http://www.ofrb.gov.on.ca/english/classification_guideline_en.pdf

Appendix 2: OFRB Tobacco-Related Detailed Observations and Content Advisories

Figure 14: Example Extracted from the OFRB Online Database

The screenshot shows the OFRB website interface. On the left is a search filter panel with the following sections:

- Enter a full or partial title to search for:** A text input field containing "gangster squad".
- By Type:** A dropdown menu set to "Feature".
- By Classification:** A list of checkboxes:
 - General
 - Parental Guidance
 - 14A
 - 18A
 - Restricted
 - Adult
- By Format:** A dropdown menu set to "All Formats".
- By Date Range:** Two date pickers:
 - From: Jan 1 1920
 - To: May 9 2014
- A "Submit" button and a "Search Instructions" link.
- A "Return to OFRB Site" button.

On the right, the title "GANGSTER SQUAD" is displayed above a table of details:

Date Classified:	Dec 20, 2012
Film Number:	2000105279
Distributor / Submitter / Exhibitor:	WARNER BROS. ENTERTAINMENT CANADA INC.
Running Time (min):	113
Format:	35MM
Language:	ENGLISH
Classification:	14A
Content Advisories:	<ul style="list-style-type: none"> - COARSE LANGUAGE - GRAPHIC VIOLENCE - TOBACCO USE
Detailed Observations:	<ul style="list-style-type: none"> - Occasional gory/grotesque images - Coarse language - Sturs - Sexual references - Illustrated or verbal references to drugs, alcohol or tobacco - Occasional upsetting or disturbing scenes - Embracing and kissing - Mild sexual innuendo - Tobacco use - Violent acts shown in clear, unequivocal and realistic detail with blood and tissue damage
Classification Restrictions:	
Exhibition Limitation - Time / Premises:	
Reconsideration:	

At the bottom of the page, contact information is provided: Ontario Film Review Board, 4950 Yonge Street, Suite 101B, Toronto ON M2N 6K1. Phone: (416) 314-3626 Fax: (416) 314-3632 Toll-free: 1-800-268-6024.

Appendix 3: Lifetime Healthcare Cost of a 24 Year Old Smoker in Ontario, 2015

Table 3: Lifetime Healthcare Cost of a 24 Year Old Smoker

Type of Exposure	Lifetime Healthcare Costs per Smoker ^a	
	US\$, year 2000 ^b	CDN\$, June, 2015 ^c
Due to smoking	3,109	4,999
Due to secondhand smoke ^d	604	972
Total lifetime cost	3,713	5,970

^a Lifetime healthcare costs related to the use of hospital, physician and nursing home services for a 24 year old smoker over a life expectancy of 100.

^b Lifetime costs of smoking in 2000 US\$ were from Sloan et al., tables 5.6 and 11.2 where costs were listed by sex.¹³ We computed costs for all sex using numbers of male (678,554) and female (514,733) in the sample as weights.

^c Lifetime cost of smoking in June 2015 CDN\$ was obtained from multiplying the costs in 2000 \$US with the purchasing power parity (GDP) conversion rates in 2000 (1.22747) and the Consumer Price Index, health care, Ontario (1.31=124.9/95.15).^{14,15}

^d Expenditure on infants (inclusive of pregnancy-related costs for smoking women) and children.

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