Centers for Disease Control and Prevention

Paying it Forward: Projecting the health and budgetary impact of TIPS like antitobacco media campaigns

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Tips Print Ad

- "As a smoker for 14 years who has always been trying to quit with various methods, this is what I needed--an honest wake-up call about what has happened to real people."

Erik

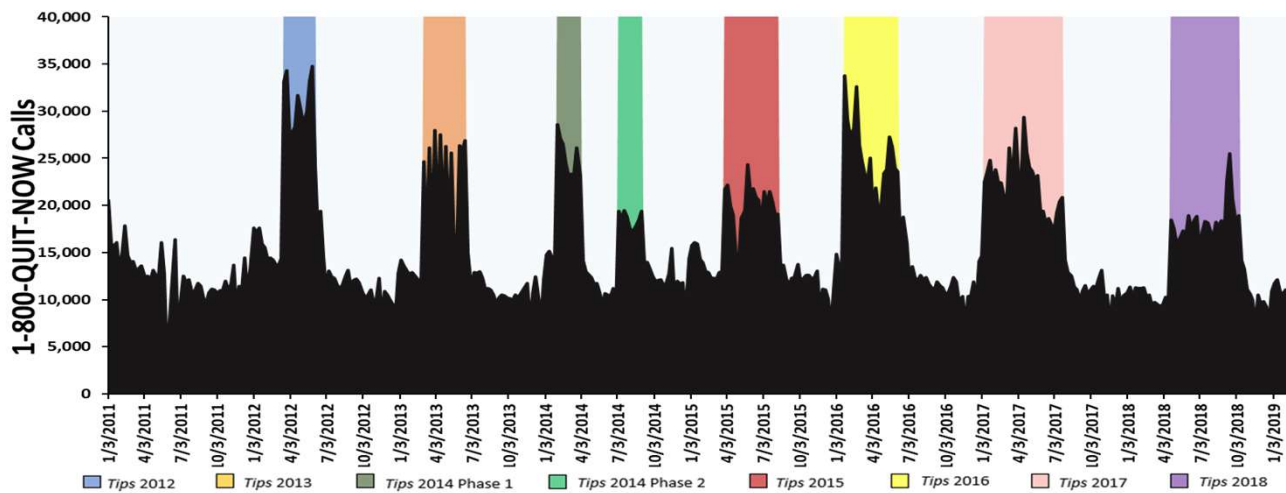(*Comment from CDC Info*)

Tips TV Ad

"Thank you for your anti-smoking campaign. It's real and it works. I quit smoking after seeing Terrie's video."
KD
(Comment from CDC Info)

Tips® Campaign Effectiveness

Objectives

- Quantify the potential impact of a TIPS-like continuous, extended duration national media campaign to increase cigarette smoking cessation

- Health impact

- Budgetary impact from multiple payer perspectives including: private insurers, Medicaid, and Medicare
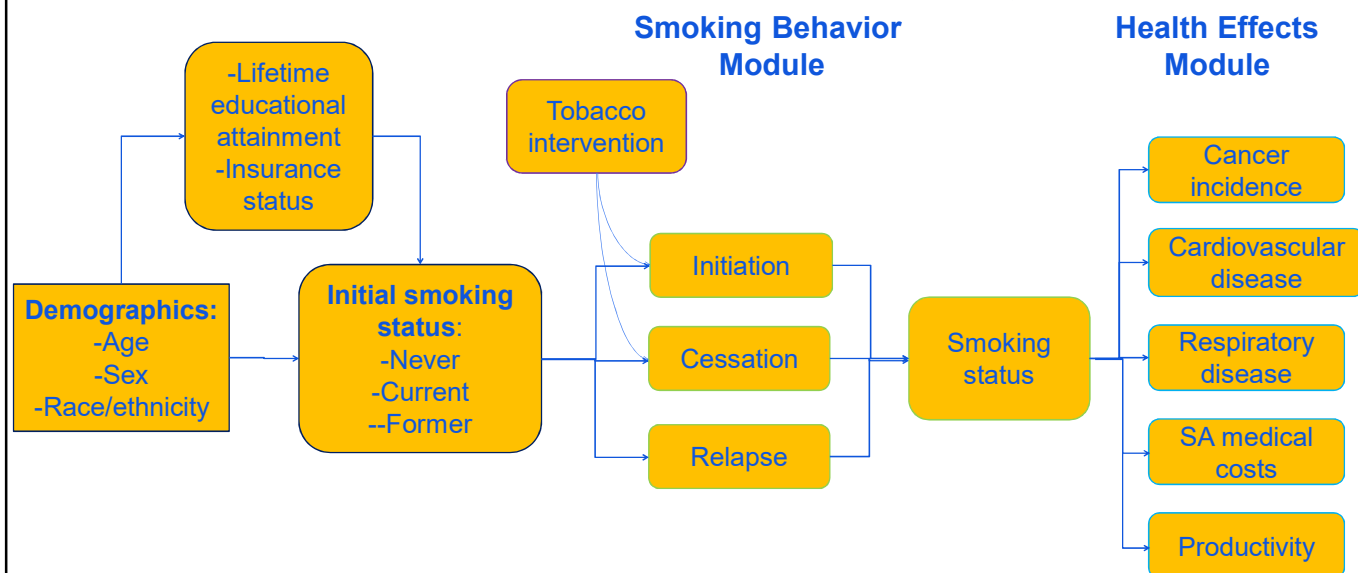
- Budgetary break-even points

Simulation

- We used the HealthPartners Institute's ModelHealth™: Tobacco microsimulation
- We simulated the course of cigarette smoking and its consequences for individuals with and without a national media campaign
- We compared campaign durations of 1, 5, and 10 years
- We summarized results for time horizons of 10 and 20 years

ModelHealth™: Tobacco microsimulation

At Model Initiation

Each Cycle

Smoking Behavior Module

Health Effects Module

- Lifetime educational attainment
- Insurance status

Tobacco intervention

Demographics:
- Age
- Sex
- Race/ethnicity

Initial smoking status:
- Never
- Current
-- Former

Initiation

Cessation

Relapse

Smoking status

Cancer incidence

Cardiovascular disease

Respiratory disease

SA medical costs

Productivity

Quit types

- Quit type is a person-level characteristic that can vary from year to year

Quit Type	Uninsured	Private	Medicaid	Medicare	Other
No assistance	60.8%	42.7%	38.4%	28.8%	38.5%
Brief counseling alone	18.3%	27.5%	32.7%	37.2%	32.2%
OTC NRT	14.5%	18.1%	19.1%	21.8%	19.6%
Rx NRT	1.5%	1.4%	1.0%	1.1%	0.7%
Bupropion	0.9%	1.6%	1.6%	2.5%	1.4%
Varenicline	4.0%	8.7%	7.3%	8.7%	7.7%

Relapse

Years since quit	Annual relapse
1	18.9%
2	13.3%
3	10.1%
4	7.8%
5	6.0%
6	4.5%
7	3.3%
8	2.2%
9	1.2%
10	0.4%
Cumulative	**51.3%**

Relapse probabilities are estimated as a function of time since quit is based upon literature review

[DHHS 1990, Gilpin 1997, Wetter 2004, Hughes 2008, Herd 2009]

Medication costs vary by primary insurance type

	Medicaid		All other insured	
	Copay	**Insurer**	**Copay**	**Insurer**
OTC NRT	$6.64	$211.59	$7.86	$180.21
Rx NRT	$2.89	$1,218.43	$111.84	$1,058.85
Bupropion	$3.50	$107.24	$18.55	$71.97
Varenicline	$5.88	$698.04	$42.23	$620.93

- Costs are based upon a 12 week course of treatment*
- Costs for Medicaid are based on FFS enrollees
- Costs for all other insured are based on private payer costs
- Source: 2014 MarketScan, adjusted to $2015

Smoking-attributable (SA) medical costs

- For current smokers, we estimated the association between smoking status and medical expenditures from NHIS-MEPS linked data by age group, sex, and primary insurer

- For former smokers, we applied an estimate of the relative harms of tobacco compared to current smokers as a function of time since quit as approximated from the 2012 CBO report

Example: 65-74 year old female, Medicare Insured	
Years since quit	**SA Medical costs**
0 (current smoker)	$ 3,009
1	$ 2,929
2	$ 2,607
3	$ 2,322
4	$ 2,068
5	$ 1,842
6	$ 1,640
7	$ 1,462
8	$ 1,303
9	$ 1,161
10	$ 1,035

Other inputs

- Smoking-attributable medical conditions are those identified as having SA mortality in updated SAMMEC [2014 SGR]
- Deaths for SA conditions by age group and sex, are apportioned by smoking status using RRs from SAMMEC and smoking status from NHIS
- SA morbidity is approximated using
  - SEER cancer incidence
  - Hospitalizations for relevant CVD, diabetes, and respiratory disease
  - Mortality RRs
- Productivity losses from premature mortality [Grosse 2009]
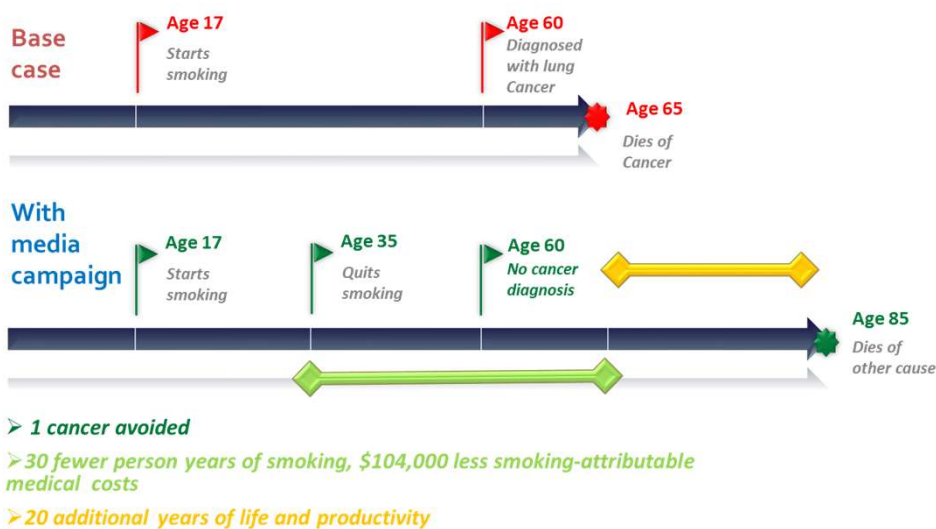
National media campaign information

- Costs
  - Based on 2012 *Tips*® results [Xu et al. 2015] we estimated campaign costs of $128.1m

- Benefits
  - 2012 *Tips*® increased quit attempts by 12% during the campaign [McAfee et al. 2013]
  - We applied the 12% quit attempt increase to cessation rates (RR of cessation = 1.12)
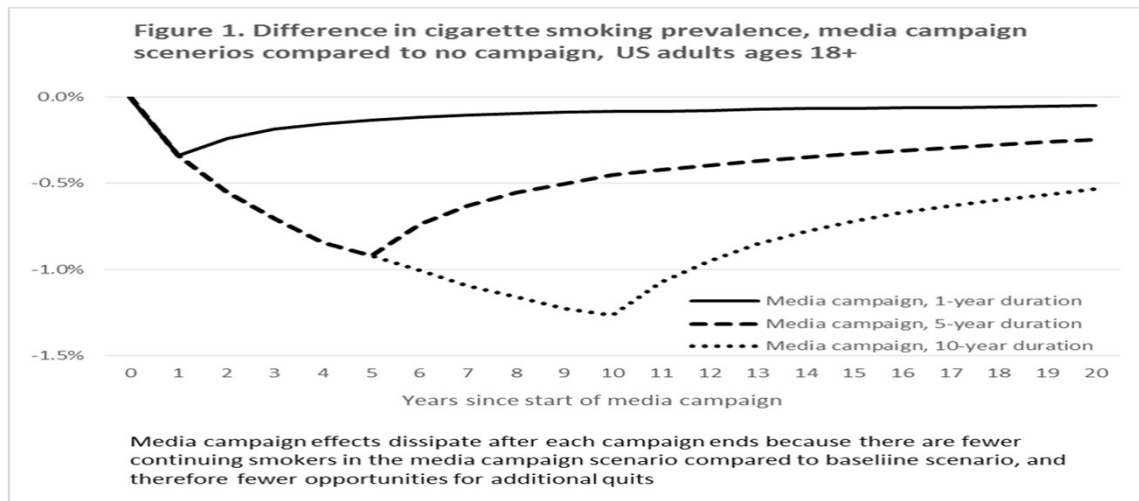
12% increase in cessation

- Example: 7% baseline probability
  - If random draw > .0784, then remains a smoker w/ or w/out intervention
  - If random draw <= .07, then quits w/ or w/out intervention
  - If random draw between .07 and .0784, quits only with intervention

0   .07 .0784   1

Snapshot: One life among millions modeled

Base case

Age 17 — Starts smoking

Age 60 — Diagnosed with lung Cancer

Age 65 — Dies of Cancer

With media campaign

Age 17 — Starts smoking

Age 35 — Quits smoking

Age 60 — No cancer diagnosis

Age 85 — Dies of other cause

➢ **1 cancer avoided**
➢ **30 fewer person years of smoking, $104,000 less smoking-attributable medical costs**
➢ **20 additional years of life and productivity**

Impact on smoking prevalence

Figure 1. Difference in cigarette smoking prevalence, media campaign scenerios compared to no campaign, US adults ages 18+

Media campaign, 1-year duration
Media campaign, 5-year duration
Media campaign, 10-year duration

Years since start of media campaign

Media campaign effects dissipate after each campaign ends because there are fewer continuing smokers in the media campaign scenario compared to baseliine scenario, and therefore fewer opportunities for additional quits

Impact on health events

Table 1. A 10-year cumulative difference in health events by duration of media campaign. Media campaign compared to no campaign US Adults				
Media Campaign Duration	Cancer Cases	CVD and Diabetes Hospitalizations	Respiratory Disease Hospitalizations	Deaths
During the first 10 years from campaign start				
1 year	-6,700	-41,400	-17,700	-4,600
5 years	-23,800	-172,100	-72,500	-16,800
10 years	-39,300	-251.600	-98,700	-23,500

Net budgetary impact by insurer type

Table 2. A 10-year difference in health care costs incurred by insurers by duration of media campaign compared to no campaign ($ millions)			
Media Campaign Duration	Private Insurers	Medicaid	Medicare
During the first 10 years from campaign start			
1 year	-170	-870	-360
5 years	-350	-3,000	-1,200
10 years	-180	-3,600	-1,370

Net societal economic impact

Table 3. A 10-year difference in health care costs and productivity losses by duration of media campaign compared to no campaign ($ millions)					
Media Campaign Duration	Media Campaign Costs	Net Medical Spending	Change in productivity losses	Net Direct Costs	Net Direct and Indirect Costs
During the first 10 years from campaign start					
1 year	130	-1,700	-1,570	-1,570	-3,140
5 years	640	-5,600	-4,420	-4,960	-9,370
10 years	1,280	-6,360	-5,320	-5,080	-10,400
*Includes net medical expenditures, media campaign costs and productivity gains.					

Break-even 10 years tips like campaigns produce net savings for Medicaid and Medicare within 2 years

Table 4. Number of years until cumulative economic benefits exceed campaign costs (break-even) by perspective					
Media Campaign Duration	Private Payers	Medicaid	Medicare	Societal (Direct Costs Only)	Societal (Direct and Indirect Costs)
During the first 10 years from campaign start					
1 year	6	2	2	3	3
5 years	7	2	2	5	4
10 years	9	2	2	5	4

Limitations

- Adult smoking behaviors based on 2013 NHIS

- Media campaign effect extrapolated from limited duration campaign to a continuous, longer duration campaign

- Model does not account for secondary impacts of media campaigns on e-cigarettes or other tobacco use

Conclusions

- Healthcare savings from ongoing national media campaigns will more than pay for themselves within 10 years

- Multi-year campaigns yield substantially higher benefits and cost savings compared with a one-year campaign

The findings and conclusion in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention