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Background and Aims

- Eye tracking can be used to study tobacco health warnings, product packaging, and communication campaigns
- Eye tracking provides a direct measure of attention, an essential precursor to tobacco regulatory measures such as information processing, recall, and message perceptions
- Use of eye tracking in tobacco regulatory science is growing, but evidence generated has not been comprehensively examined
- This review synthesizes eye tracking evidence in tobacco control regulation and communication and examines gaps amenable to eye tracking methodologies

Methods

- We searched PubMed, PubMed Systematic Review, CINAHL, EMBASE, ProQuest Dissertations and Theses, Cochrane, PsycINFO, Web of Science, Google Scholar, Business Source Premier, Communication and Mass Media Complete, and Educational Resources Information Center
- Inclusion criteria: 1) eye tracking outcomes reported and 2) tobacco control focus
- CM and KJ independently reviewed each title and abstract, then each article considered for full text review
- References of included articles were hand searched for other relevant studies
- Quality assessment conducted using Cochrane risk of bias tool

Results

Figure 1. PRISMA flow diagram

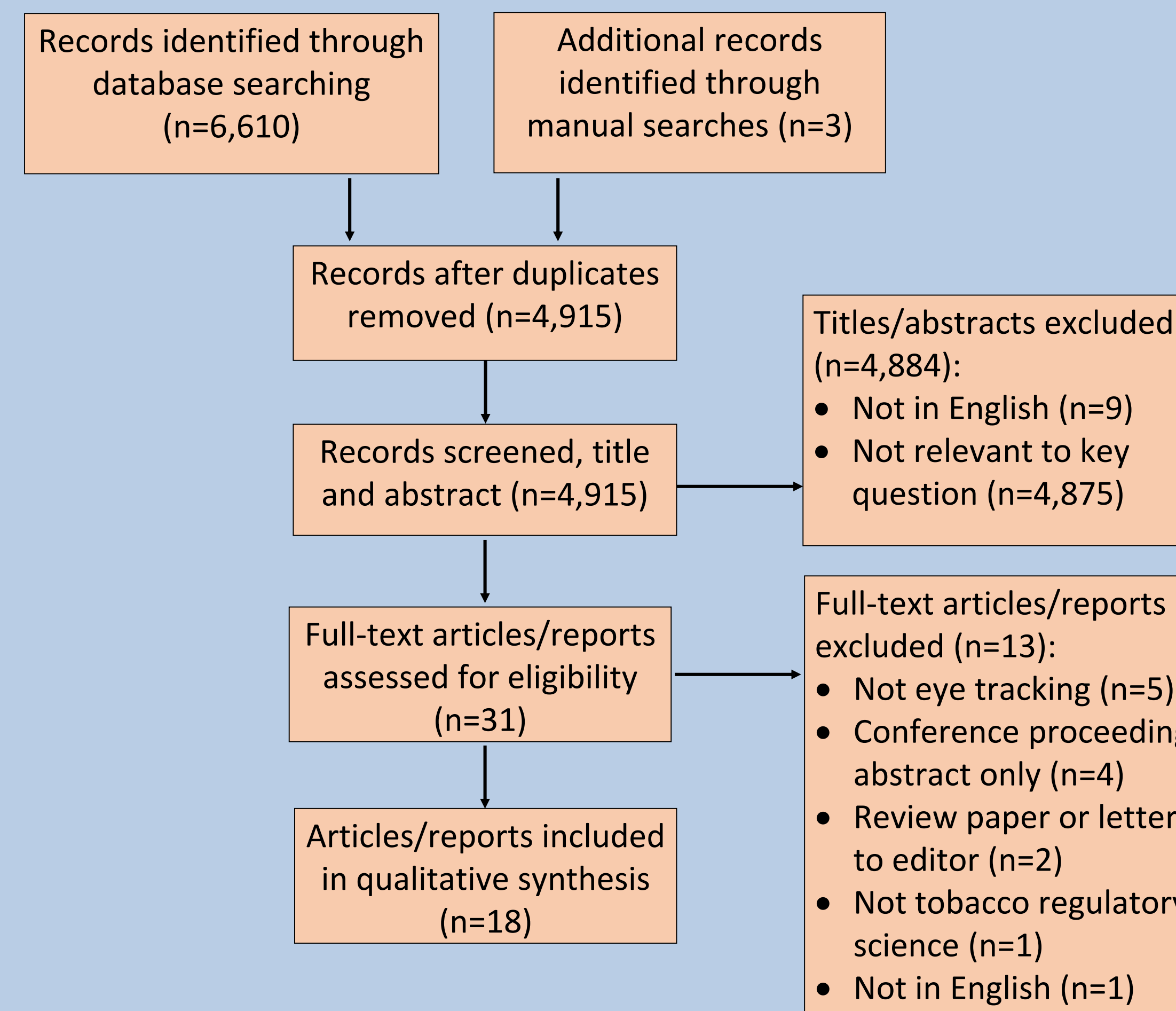


Table 1. Summary of included studies

Characteristic		n (%)
Year of publication	1980s	6% (1)
	1990s	11% (2)
	2000s	6% (1)
	2010-2016	78% (14)
Study sample size	22 (min) - 35	28% (5)
	36 - 60	28% (5)
	61 - 99	17% (3)
	100 - 199	11% (2)
	200 - 326 (max)	17% (3)
Sample type	Convenience	100% (18)
	Probability	0% (0)
Area of tobacco control*	Packaging	38% (7)
	Warning	94% (17)
	Point of sale	6% (1)
	Advertising	50% (9)
	Other communication	17% (3)
Location of study	USA	44% (8)
	UK	22% (4)
	Europe (Germany =1, Netherlands = 1, Hungary =1, Romania = 1, Spain = 1)	28% (5)
	Taiwan	6% (1)
Tobacco use status	Tobacco users	33% (6)
	Non-tobacco users	6% (1)
	Both tobacco and non-tobacco users	50% (9)
	Not reported	11% (2)
Study design	Within	22% (4)
	Between	33% (6)
	Within and between	39% (7)
	Neither	6% (1)
Stimulus	Static or print image	94% (17)
	Dynamic or video image	6% (1)
Outcomes reported	Only eye tracking measures	67% (12)
	Survey measures related to eye tracking	33% (6)

*Categories not exclusive

Results

Health warnings in tobacco advertising

- Viewing time of the warning label is important predictor of recall
- Graphic warnings increase attention compared to text-only warnings
- New text warnings in different format than existing text warnings (e.g., added color, stylized font) may be more effective at increasing attention

Tobacco product packaging

- Smokers attended more to coping text warnings and non-smokers attended more to high risk text warnings
- Non-smokers and non-daily smokers showed more attention to warnings and less to branding on plain cigarette packs compared to branded packs; daily smokers did not show this pattern

General tobacco communication

- Messages evoking emotion increased attention compared to more neutral messages
 - Smokers who intended to quit soon viewed gain-framed messages longer; smokers who did not intend to quit viewed loss-framed messages longer
- Point of sale**
- Smokers and non-smokers showed high attention to the tobacco power wall in a retail setting, regardless of purchase behavior

Discussion

- Findings demonstrate 4 main points:
 - 1) Consumers often spend little time attending to health warnings on ads and product packaging
 - 2) Plain packaging appears to increase consumer attention toward warnings
 - 3) Eye tracking measures (e.g., dwell time on warning) were consistently associated with warning recall
 - 4) Limited use of eye tracking methodology to evaluate point of sale regulations or tobacco communication campaigns
- Comparability between studies is currently limited by lack of consistency in reporting metrics
- Eye tracking offers an objective and quantifiable assessment of the connections between attention, decision making, and behavior

Please Contact Clare Meernik if you have questions about this research
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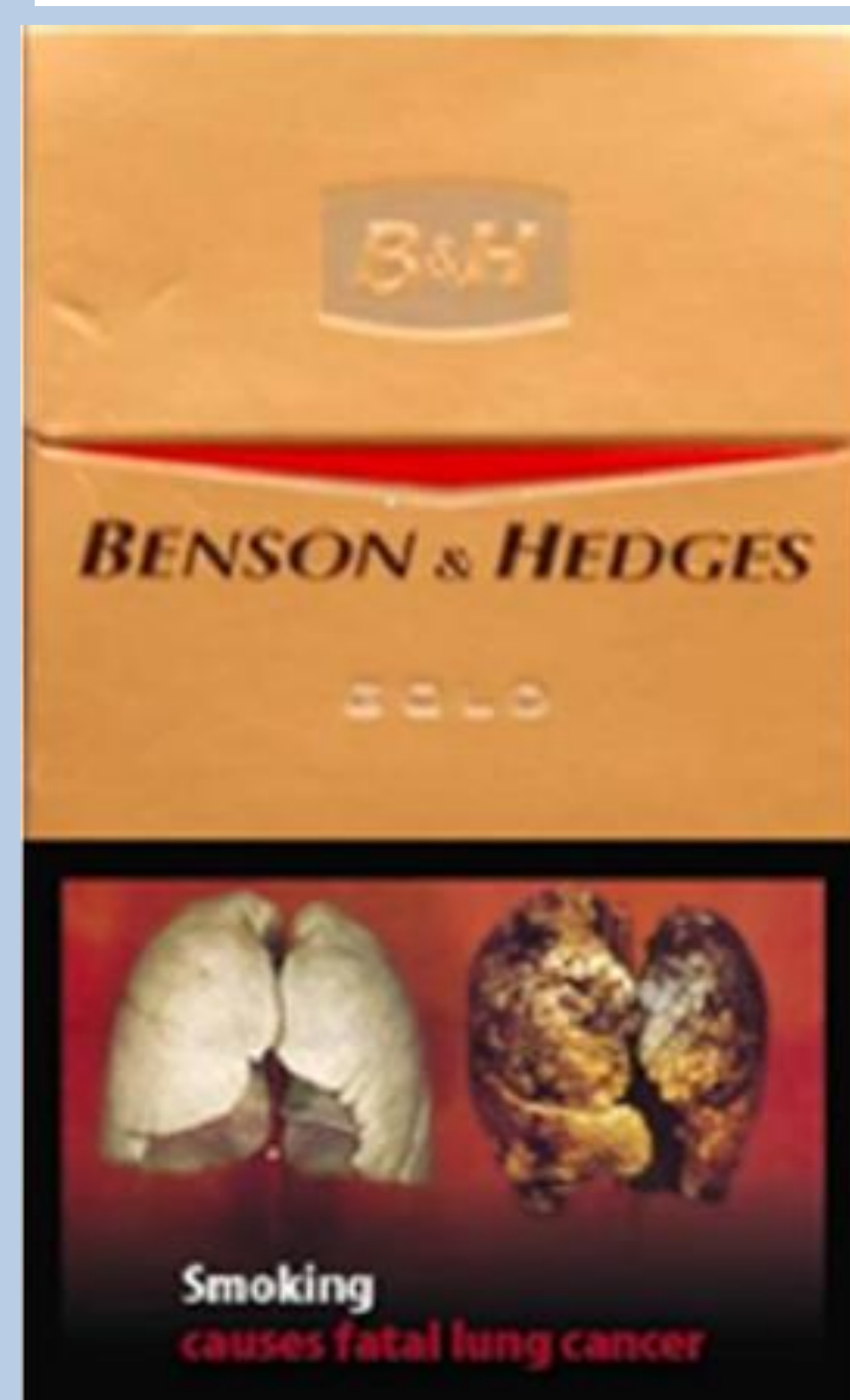


Image from Maynard OM, Attwood A, O'Brien L, et al. Avoidance of cigarette pack health warnings among regular cigarette smokers. *Drug Alcohol Depend.* 2014;136:170-174.

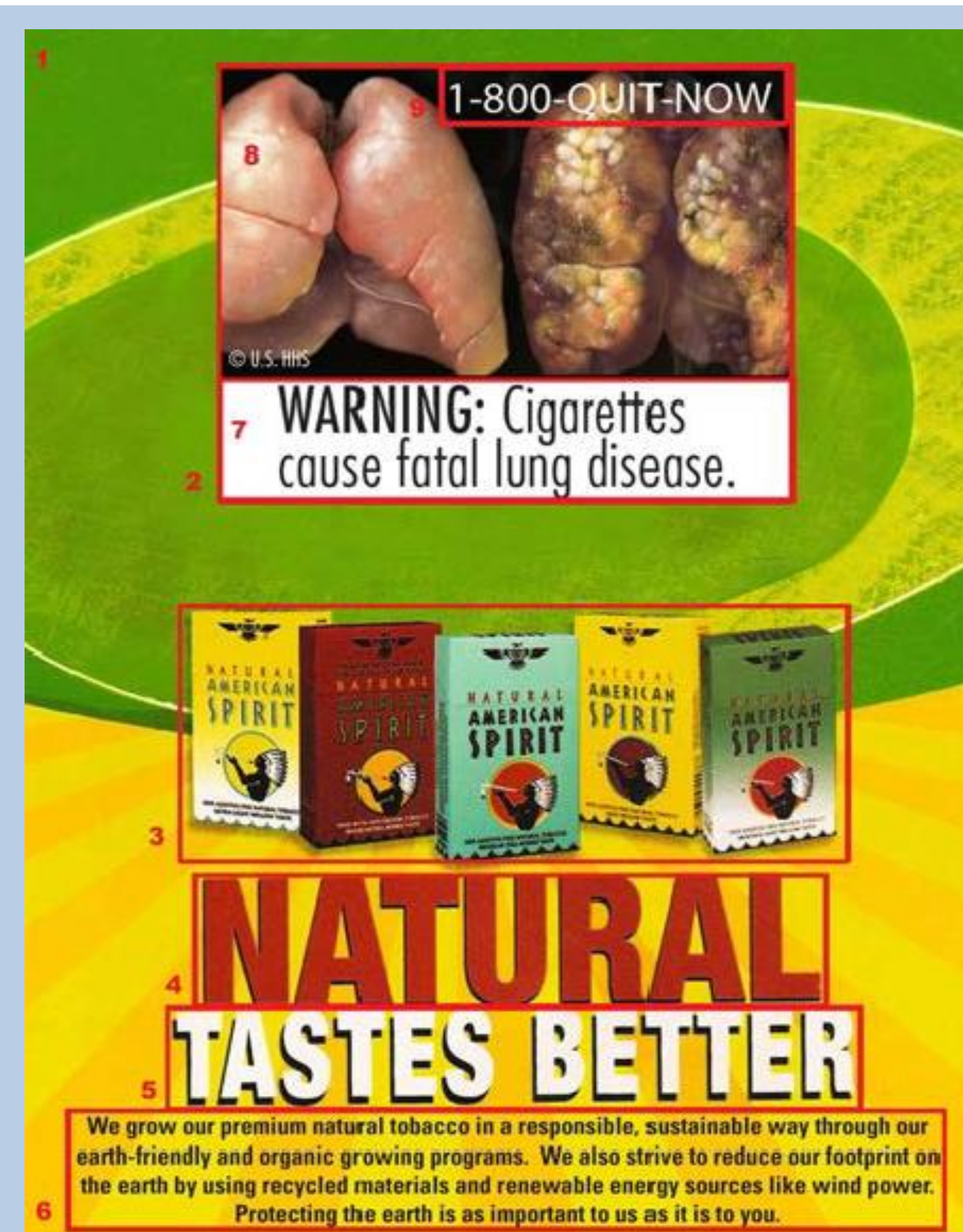


Image from Klein EG, Shoben AB, Krygowski S, et al. Does Size Impact Attention and Recall of Graphic Health Warnings? *Tobacco Regul Sci.* 2015;1(2):175-185.