

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

THE AMERICAN BEVERAGE
ASSOCIATION, CALIFORNIA RETAILERS
ASSOCIATION, CALIFORNIA STATE
OUTDOOR ADVERTISING
ASSOCIATION,

Plaintiffs,

VS.

THE CITY AND COUNTY OF SAN
FRANCISCO,

Defendant.

Case No. 3:15-cv-03415 EMC

EXPERT REPORT OF DAVID HAMMOND, Ph.D.

Hearing Date: April 7, 2016
Time: 1:30 p.m.
Place: Crtrm. 5, 17th Fl.

Trial Date: None set

1 **I. INTRODUCTION**

2 **A. PROFESSIONAL QUALIFICATIONS**

3 1. As detailed in my CV, attached hereto as **Appendix C**, I am an Associate Professor
4 (tenured) in the School of Public Health & Health Systems at the University of Waterloo in Ontario,
5 Canada. I received my B.A. in Psychology from the University of British Columbia (Canada) and my
6 M.Sc. in Health Studies and Ph.D. in Psychology from the University of Waterloo (Canada). In
7 addition, I have served since 2005 as an Affiliated Scientist at the Propel Centre for Population Health
8 Impact (funded by the Canadian Cancer Society).

9 2. I serve on several prominent committees that help to steer cancer prevention and public
10 health research in Canada, including the Prevention & Risk Reduction Committee for the Canadian
11 Cancer Society, as well as the Council on Mission for the Heart & Stroke Foundation of Canada. In
12 both positions I provide strategic input into the chronic disease prevention strategy and research
13 activities. I also serve on the Policy Committee for the Society for Research on Nicotine & Tobacco—
14 the leading scientific organization in the area of tobacco research. One important function of this role
15 is to coordinate submissions to the US Food & Drug Administration (FDA) “dockets”, which
16 constitute the evidence base relied on by the FDA when drafting new regulations. I am an Assistant
17 Editor of the journal *Tobacco Control*. I also serve on the scientific team for the US National Institutes
18 of Health (NIH)/FDA-funded Population Assessment of Tobacco and Health (PATH) Study, which is
19 one of the largest studies ever conducted to assess tobacco use and its consequences.

20 3. I have served as an Advisor to the World Health Organization (WHO) for health
21 warning regulations under the WHO Framework Convention on Tobacco Control (FCTC). In this
22 capacity, I had the opportunity to draft treaty guidelines that now influence regulatory practice in
23 countries throughout the world. I have also represented civil society in the WHO FCTC Working
24 Group on tobacco product testing and regulations, which is tasked with establishing testing and
25 regulatory guidelines for the 180 countries that have ratified the treaty. I have also served as a
26 consultant on health warning regulations in a number of countries, including for Health Canada, the
27 UK Department of Health, the Commonwealth of Australia, the US Centers for Disease Control and
28 Prevention (CDC), the European Commission, and others. To date, my research has been cited in

1 regulatory reviews and consultation papers from well over a dozen countries. For example, I have
2 been invited to testify to several parliamentary bodies on health warnings and labeling regulations,
3 including the European Parliament.

4 4. I am among the most published researchers in the area of health warnings and product
5 labelling in the world, with more than 90 peer-reviewed publications on the topic, including
6 publications and empirical research on health warnings for food, beverages, alcohol, and tobacco
7 products. Overall, I have published 190 peer-reviewed journal articles, including articles as lead author
8 in journals such as *The Lancet*, the *Canadian Medical Association Journal*, *Cancer Epidemiology*,
9 *Biomarkers & Prevention*, and the *American Journal of Public Health*.

10 5. I have contributed to high-profile works on health warnings and consumer product
11 labeling on behalf leading international health agencies, including as a contributing author of the 2012
12 US Surgeon General's Report, monographs for the International Agency for Research on Cancer
13 (IARC) on the impact of tobacco control policies, World Health Organization reports, and reports for
14 the US Institute of Medicine (IOM). I am an author on more than 200 peer-reviewed conference
15 presentations at scientific conferences, and I have given more than 70 invited talks, including high
16 profile talks to leading academic institutions, international scientific and health organizations.

17 6. To date, I have been an Investigator on more than 50 research grants and contracts,
18 totaling more than \$60 million CAD. In the past five years, I have received grants as a Principal
19 Investigator from the Canadian Institutes of Health Research (CIHR), the US National Institutes of
20 Health (NIH), the Canadian Cancer Society Research Institute, the Public Health Agency of Canada,
21 and Health Canada. Currently, I hold more than \$30 million in active grant funding as a Principal or
22 Co-investigator.

23 7. My work has been recognized with several awards, including the *Canadian Medical*
24 *Association Journal's Top Canadian Achievements in Health Research Awards* in 2009, for my work
25 with Dr. Geoffrey Fong and Dr. Mary Thompson on the International Tobacco Control project, which
26 consists of cohort studies in 20 low-, middle- and high-income countries. I have also received the
27 *William E. Rawls Prize* from the Canadian Cancer Society for important advances in cancer control, as
28 well as the *Lise Manchester Award* from the Royal Statistical Society of Canada for statistical methods

1 to study matters of relevance to society. I have received prestigious awards from the Society for
2 Research on Nicotine and Tobacco—the leading society within my area of research—as well as
3 *Canada's Premier Young Researcher Award*, from the Canadian Institutes of Health Research. I
4 currently hold an *Applied Chair in Public Health* from the Canadian Institutes of Health Research and
5 the Public Health Agency of Canada. The *Applied Chair in Public Health* is a prestigious award given
6 to only 14 researchers in Canada and provides \$925,000 to support my research program.

7 8. Over the past ten years, I have conducted more than 200 media interviews related to my
8 research program. Coverage of my work has been featured in international media outlets, such as the
9 *New York Times*, CNN, the BBC, *The Economist*, *China Daily*, and others.

10 **B. SUMMARY OF INSTRUCTIONS**

11 9. I was asked by Counsel for the City of San Francisco to provide my expert opinion
12 related to consumer perceptions of the health warning for sugar-sweetened beverages (SSBs) required
13 under San Francisco Ordinance No. 100-15. The following is a summary of instructions:

- 14 • To examine if the health warning will be effective in increasing public awareness that
15 SSBs contribute to obesity, diabetes, and tooth decay.
- 16 • To examine if the health warning will be effective in deterring some people from
17 consuming SSBs.
- 18 • To examine the scientific literature with respect to how individuals will understand the
19 warning, including whether individuals will understand it to say that SSBs “uniquely”
20 contribute to obesity, diabetes, and tooth decay, or whether SSBs contribute more to
21 these diseases than other products with just as much sugar.
- 22 • To review the opinions provided in the reports of Dr. Peter N. Golder and Dr. Richard
23 A. Kahn, particularly with respect to whether these opinions are consistent with the
24 scientific literature in the domain of risk communication and consumer perceptions of
25 health warnings.

26 **C. MATERIALS RELIED UPON AND COMPENSATION**

27 10. The opinions expressed in this report are based on the following sources:

- 28 • Original data from my own research;
- Published scientific articles and official reports (e.g., the Institute of Medicine Reports,
etc.) on food and nutrition labelling; and
- Expert reports prepared for legal proceedings.

1 11. The opinions in this report are held to a reasonable degree of scientific and professional
2 certainty, and I reserve the right to supplement opinions based on new information and materials.

3 12. I am being compensated for my work in this case at my usual rate of \$300 USD per
4 hour. I have received administrative support from my staff at the University of Waterloo in preparing
5 this report.

6 **II. SUMMARY OF OPINIONS**

7 13. The following is a summary of my opinions in regards to the current proceedings:

- 8 • Health warnings on product advertisements are an effective way of informing the
9 public about the health consequences of consumer products.
- 10 • A mandated SSB warning on product advertisements represents an important and cost-
11 effective channel for informing consumers, particularly in comparison to public service
12 announcements or other means of reaching consumers.
- 13 • The San Francisco SSB warning adheres to international standards and evidence-based
14 practices for the design and appearance of health warnings.
- 15 • The message content of the San Francisco SSB warning is consistent with international
16 standards and best practices.
- 17 • There is no evidence to support claims that the SSB warning will confuse or mislead
18 consumers, including with respect to the risks of SSBs or by promoting false risk
19 perceptions about non-SSB products. In particular, there is no evidence to indicate that
20 individuals will understand the warning to say that SSBs “uniquely” contribute to
21 obesity, diabetes, and tooth decay.
- 22 • The SSB health warning would not “distort” or “overwhelm” messages in SSB
23 advertisements. The SSB warning would provide consumers with information on the
24 health consequences of SSBs, *in addition to* the information communicated in the
25 advertisement.
- 26 • Overall, the SSB warning has a high likelihood of achieving its public health goals, and
27 adheres to established regulatory practices for risk communications and designing
28 health warnings for consumer products.

1 **III. REVIEW OF THE SCIENTIFIC LITERATURE ON HEALTH WARNINGS FOR
2 CONSUMER PRODUCTS**

3 **A. GENERAL PRINCIPLES AND PURPOSES OF HEALTH WARNINGS FOR
4 CONSUMER PRODUCTS**

5 14. The primary objective of health warnings is to inform the public about a health hazard
6 or risk.¹ The Handbook of Warnings—a comprehensive review of the literature—identifies four main
7 purposes or functions of warnings:

8 First, warnings are a method for communicating important safety information.
9 The purposes is to provide people adequate information about hazards so that
10 they can make informed decisions on how to avoid getting themselves or others
11 hurt... Second, warnings are intended to influence or modify people's behavior
12 in ways that will improve safety... The third purpose follows from the
13 second...warnings are intended to reduce or prevent health problems... Fourth,
14 warnings can serve as a reminder to persons who may already know information
15 about the hazard.²

16 15. The purpose of the health warnings on SSBs articulated in the San Francisco ordinance
17 is consistent with these principles:

18 The City's purpose in requiring warnings for SSBs is to inform the public of the
19 presence of added sugars and thus promote informed consumer choice that may
20 result in reduced caloric intake and improved diet and health, thereby reducing
21 illnesses to which SSBs contribute and associated economic burdens. Posting
22 warnings that beverages are sugar-sweetened will inform the public before
23 purchases, which will help ensure that San Franciscans make a more informed
24 choice about the consumption of drinks that are a primary source of added
25 dietary sugar.³

26 **1. CONCEPTUAL FRAMEWORKS: HOW AND WHY HEALTH
27 WARNINGS "WORK"**

28 16. Several conceptual frameworks have been developed to illustrate the ways in which
29 health warnings impact consumer perceptions and behavior.⁴ These frameworks have drawn upon
30 models of information processing, as well as research on the processes and principles that affect
31

32 ¹ Laughery KR. Safety communications: Warnings. *Appl Ergon.* 2006; 37(4):467–478.

33 ² Wogalter MS. Purposes and scope of warnings. In: Wogalter MS, ed. *Handbook of Warnings*. Mahwah
34 (NJ): Lawrence Erbaum Associates; 2006. p. 3.

35 ³ San Francisco Ordinance NO. 100-15. Health Code – Sugar-Sweetened Beverage Warning for
36 Advertisements. File No. 150245.

37 ⁴ E.g., 1) Wogalter MS. Purposes and scope of warnings. In: Wogalter MS, ed. *Handbook of Warnings*.
38 Mahwah (NJ): Lawrence Erbaum Associates; 2006. 2) International Agency for Research on Cancer.
39 Measures to assess the effectiveness of restrictions on tobacco product labeling policies. In: IARC
40 Handbooks of Cancer Prevention, Tobacco Control, Volume 12: Methods for Evaluating Tobacco
41 Control Policies. Lyon, France; 2008. Accessible at: <http://www.iarc.fr/en/publications/pdfs-online/prev/handbook12/index.php>

1 attitude and behavior change in the field of social psychology.⁵ Briefly, the conceptual frameworks
2 highlight the importance of noticing and comprehension of warnings, which influence the extent to
3 which messages alter attitudes and beliefs (including health knowledge and perceptions of risk), as
4 well as downstream behavioral outcomes, such as the purchase and consumption of a consumer
5 product.⁶

6 17. The most fundamental principle across the different models and frameworks is the
7 concept of health warnings “salience”.⁷ The “salience” of a warning—the extent to which a health
8 warning is noticed and attended to by consumers—is the first and most important factor that
9 determines effectiveness: in short, warnings that are not noticed can have no impact.⁸ The “channel” or
10 medium of a message (such as an advertisement) must first “reach” the consumer, providing an
11

12 ⁵ 1) Strahan EJ, White K, Fong GT, Fabrigar LR, Zanna MP, Cameron R. Enhancing the effectiveness of
13 tobacco package warning labels: a social psychological perspective. *Tob Control*. 2002; 11(3):183-90.
14 2) Cialdini RB. *Influence: science and practice*. 3rd ed. New York: Harper Collins; 1993. 3) Eagly
15 AH, Chaiken S. *The psychology of attitudes*. Fort Worth (TX): Harcourt Brace Jovanovich; 1993. 4)
16 Petty RE, Cacioppo JT. The elaboration likelihood model of persuasion. In: Berkowitz L, ed.
17 *Advances in experimental social psychology*. Hillsdale (NJ): Erlbaum, 1986. p. 123–205. 5) Chaiken
18 S. Heuristic versus systematic information processing and the use of source versus message cues in
19 persuasion. *Pers Soc J Psychol*. 1980; 39:752–66. 2) Chaiken S. The heuristic model of persuasion.
20 In: Zanna MP, Olson JM, Herman CP, eds. *Social influence: the Ontario symposium*, vol 5. Hillsdale,
21 New Jersey: Erlbaum; 1987. p. 3–39. 3) Zuckerman A, Chaiken S. A heuristic-systematic processing
22 analysis of the effectiveness of product warning labels. *Psychol Marketing*. 1998;15:621–42.

23 ⁶ International Agency for Research on Cancer. Measures to assess the effectiveness of restrictions on
24 tobacco product labeling policies. In: IARC Handbooks of Cancer Prevention, Tobacco Control,
25 Volume 12: Methods for Evaluating Tobacco Control Policies. Lyon, France; 2008. Accessible at:
26 <http://www.iarc.fr/en/publications/pdfs-online/prev/handbook12/index.php>

27 ⁷ Anderson JR. *Cognitive psychology and its implications*. New York: WH Freedman; 1990.

28 ⁸ 1) Wogalter MS, Conzola VC, Smith-Jackson TL. Research-based guidelines for warning design and
29 evaluation. *Appl Ergon*. 2002; 33(3):219–230. 2) Hammond D. Health warning messages on tobacco
30 products: A review. *Tob Control*. 2011; 20(3):27-337. 3) Strawbridge JA. The influence of position,
31 highlighting, and embedding on warning effectiveness. In: Proceedings of the Human Factors Society
32 30th Annual Meeting. Human Factors Society, Santa Monica, CA; 1986. p. 716–720. 4) Young SL,
33 Wogalter MS. Comprehension and memory of instruction manual warnings: conspicuous print and
34 pictorial icons. *Human Factors*. 1990;32(6):637–649. 5) Barlow T, Wogalter MS. Alcoholic beverage
35 warnings in magazine and television advertisements. *J Consumer Res*. 1993;20:147–155. 6) Griffith
36 LJ, Leonard SD. Effectiveness of warning labels as a function of visual impressions. In: Proceedings
37 of Human Factors Society 39th Annual Meeting. Human Factors Society, Santa Monica, CA; 1995. p.
38 931. 7) Hopkins JS, Parseghian Z, Allen RW. A driving simulator evaluation of active warning signs.
39 In: Proceedings of Human Factors and Ergonomics Society 41st Annual Meeting. Human Factors
40 Society, Santa Monica, CA; 1997. p. 921–925.

1 opportunity for engagement with the message content.⁹ The salience of a warning must also be
2 sufficient to stand out from the “noise” of other information in the environment to engage information
3 processing among consumers.¹⁰

4 18. Health warnings must be cognitively processed to be effective. The extent to which
5 information is processed or elaborated upon has been shown to be the most important determinant of
6 memory and attitude change in response to new information. Once consumers attend to a message, the
7 depth of information processing of the message relies upon a number of factors, including attributes
8 of the message (e.g., complexity, legibility, pictorial elements) and characteristics of the message
9 receiver (e.g., motivation and ability to process the message).¹¹ Repeated exposure to message content
10 may be necessary to influence consumer attitudes and beliefs, as well as consumer behavior.¹²

11 **B. DESIGN FACTORS THAT INFLUENCE THE EFFECTIVENESS OF HEALTH
12 WARNINGS**

13 19. As noted above, the “salience” of a warning is the most important factor that
14 determines its effectiveness: warnings that do not attract attention and promote information processing
15 can have no impact. The warning design is fundamentally important in establishing the salience of a
16 warning.¹³

17 In order to accomplish the primary function of warnings—to provide people
18 with adequate information to inform decision making—warnings need aspects

19 ⁹ 1) Rice RE, Atkin CK, editors. Public communication campaigns. Thousand Oaks (CA): Sage; 2001. 2)
20 Lee NR, Kotler PA. Social Marketing: Influencing Behaviors for Good. Thousand Oaks (CA): Sage;
21 2011.

22 ¹⁰ Wogalter M, Leonard S. Attention and maintenance. In: Wogalter M, DeJoy D, Laughery K, eds.
23 Warnings and risk communication. London: Taylor & Francis; 1999: p. 130-55.

24 ¹¹ 1) Petty RE, Barden J, Wheeler SC. The Elaboration Likelihood Model of persuasion: Health
25 promotions that yield sustained behavioral change. In: DiClemente RJ, Crosby RA, Kegler MC, eds.
26 Emerging theories in health promotion practice and research. San Francisco (CA): Jossey-Bass; 2002:
27 p. 71-99. 2) Strahan E, White KS, Fong GT, Fabrigar L, Zanna M, Cameron R. Enhancing the
28 effectiveness of tobacco package warning labels: A social psychological perspective. Tob Control.
29 2002; 11:183-90. 3) Petty RE, Cacioppo J. The effect of involvement on response to argument
30 quantity and quality: Central and peripheral routes to processing. J Pers Soc Psychol. 1984;46:69-81.

31 ¹² Laughery K, Wogalter M. Designing effective warnings. In: Williges R, ed. Human Factors in
32 Ergonomics Reviews. Santa Monica (CA): Human Factors and Ergonomics Society; 2006: p. 241-71.

33 ¹³ International Agency for Research on Cancer. Measures to assess the effectiveness of restrictions on
34 tobacco product labeling policies. In: IARC Handbooks of Cancer Prevention, Tobacco Control,
35 Volume 12: Methods for Evaluating Tobacco Control Policies. Lyon, France; 2008. Accessible at:
36 <http://www.iarc.fr/en/publications/pdfs-online/prev/handbook12/index.php>

1 or characteristics to call attention to themselves usually by incorporating salient
2 features into their design.¹⁴

3 20. Indeed, the extent to which people notice, think about, comprehend and recall warnings
4 is highly dependent on the size, type, and location of the warning, as summarized below.

5 **1. HEALTH WARNING SIZE**

6 21. The size of a health warning is the most important design consideration that determines
7 the salience of a health warning. Research across a range of disciplines has demonstrated that larger
8 warnings are more effective. For example, ergonomics research has demonstrated the basic principle
9 that “bigger is better” in the context of safety warnings for workplace hazards, in part because larger
10 warnings allow for larger print and greater legibility for text warnings.¹⁵

11 22. Research on health warnings for tobacco products has produced considerable evidence
12 on the importance of health warning size. Studies have demonstrated that larger warnings increase
13 consumer attention to warnings,¹⁶ are easier to understand and facilitate information processing,¹⁷

14¹⁴ Wogalter MS. Purposes and scope of warnings. In: Wogalter MS, ed. Handbook of Warnings. Mahwah
15 (NJ): Lawrence Erlbaum Associates; 2006. p. 3.

15¹⁵ e.g. 1) Wogalter MS. Purposes and scope of warnings. In: Wogalter MS, ed. Handbook of Warnings.
16 Mahwah (NJ): Lawrence Erlbaum Associates; 2006. 2) Barlow T, Wogalter MS. Increasing the surface
area on small product containers to facilitate communication of label information and warnings.
Proceedings of Interface 1991, Human Factors and Ergonomics Society, Santa Monica, CA; 1991. p.
17 88–93. 3) Young SL, Wogalter MS. Comprehension and memory of instruction manual warnings:
conspicuous print and pictorial icons. Human Factors. 1990; 32(6):637–649.

16¹⁶ E.g., 1) Nilsson T. Legibility and visual effectiveness of some proposed and current health warnings on
17 cigarette packages. Prepared for Bureau of Tobacco Control, Health Canada; 1999. 2) Bansal-Travers
20 M, Hammond D, Smith P, Cummings KM. The impact of cigarette pack design, descriptors, and
warning labels on risk perception in the U.S. Am J Prev Med. 2011; 40(6):674-82. 3) Environics
Research Group. The health effects of tobacco and health warning messages on cigarette packages -
Wave 12 surveys - Survey of youth. Toronto, Canada: Prepared for Health Canada; 2007. 4)
22 Hammond D, Fong GT, Borland R, Cummings KM, McNeil AD, Driezen P. Text and graphic
23 warnings on cigarette packages: Findings from the International Tobacco Control Four Country
Study. Am J Prev Med. 2007; 32(3):210-7. 5) White V, Webster B, Wakefield M. Do graphic health
24 warning labels have an impact on adolescents' smoking-related beliefs and behaviors? Addiction.
2008; 103(9):1562-71. 6) Shanahan P, Elliott D. Evaluation of the effectiveness of the graphic health
25 warnings on tobacco product packaging, 2008. Canberra: Department of Health and Ageing,
Australian Government; 2009. 7) Argo JJ, Main KJ. Meta-analyses of the effectiveness of warning
26 labels. J Public Policy Mark. 2004; 23:193-208.

17¹⁷ 1) BRC Marketing & Social Research. Smoking health warnings study, Stage 2: Optimising smoking
health warnings - text, graphics, size and color testing. Prepared for Ministry of Health, New Zealand;
2004. 2) O'Hegarty M, Pederson LL, Nelson DE, Mowery P, Gable JM, Wortley P. Reactions of
young adult smokers to warning labels on cigarette packages. Am J Prev Med. 2006; 30(6):467-73. 3)

1 and consumers consistently indicate a preference for larger warnings.¹⁸ Larger warnings are also more
2 effective in communicating tobacco-related risks¹⁹ and increasing perceptions of risk.²⁰ Overall, the

3 Environics Research Group. Consumer research on the size of health warning messages: Quantitative
4 study of Canadian adult smokers. Toronto, Canada: prepared for Health Canada; 2008. 4) Cragg R,
5 Dawson Ltd. Health warnings on cigarette and tobacco packs: Report on research to inform European
standardization. London; 1990.

6 18) 1) Shanahan P, Elliott D. Evaluation of the effectiveness of the graphic health warnings on tobacco
product packaging, 2008. Canberra: Department of Health and Ageing, Australian Government; 2009.
7 2) Devlin E, Anderson S, Hastings G, MacFadyen L. Targeting smokers via tobacco product labelling:
Opportunities and challenges for Pan European health promotion. Health Promot Int. 2005; 21(1):41-
8 9. 3) BRC Marketing & Social Research. Smoking health warnings study, Stage 2: Optimising
smoking health warnings - text, graphics, size and color testing: prepared for Ministry of Health, New
9 Zealand; 2004. 4) O'Hegarty M, Pederson LL, Nelson DE, Mowery P, Gable JM, Wortley P.
Reactions of young adult smokers to warning labels on cigarette packages. Am J Prev Med. 2006;
10 30(6):467-73. 5) Environics Research Group. Canadian adult and youth opinions on the sizing of
11 health warning messages. Toronto, Canada: prepared for Health Canada, 1999. 6) Environics Research
12 Group. Consumer research on the size of health warning messages: Quantitative study of Canadian
13 youth smokers and vulnerable nonsmokers. Toronto, Canada: prepared for Health Canada; 2008. 7)
Environics Research Group. Consumer research on the size of health warning messages: Quantitative
14 study of Canadian adult smokers. Toronto, Canada: prepared for Health Canada, 2008.

15 19) 1) Fathelrahman A, Omar M, Awang R, Cummings K, Borland R, Bin Mohd Samin A. Impact of the
new Malaysian cigarette pack warnings on smokers' awareness of health risks and interest in quitting
smoking. International Journal of Environmental Research in Public Health. 2010; 7:4089-99. 2)
Bansal-Travers M, Hammond D, Smith P, Cummings KM. The impact of cigarette pack design,
16 descriptors, and warning labels on risk perception in the U.S. Am J Prev Med. 2011; 40(6):674-82. 3)
O'Hegarty M, Pederson LL, Nelson DE, Mowery P, Gable JM, Wortley P. Reactions of young adult
smokers to warning labels on cigarette packages. Am J Prev Med. 2006; 30(6):467-73. 4) Environics
17 Research Group. Canadian adult and youth opinions on the sizing of health warning messages.
Toronto, Canada: prepared for Health Canada; 1999. 5) Environics Research Group. Consumer
18 research on the size of health warning messages: Quantitative study of Canadian youth smokers and
vulnerable nonsmokers. Toronto, Canada: prepared for Health Canada; 2008. 6) Environics Research
19 Group. Consumer research on the size of health warning messages: Quantitative study of Canadian
adult smokers. Toronto, Canada: prepared for Health Canada; 2008. 7) Cragg R, Dawson Ltd. Health
20 warnings on cigarette and tobacco packs: Report on research to inform European standardization.
London; 1990. 8) Les Études de Marché Cratec. Quantitative study of Canadian youth smokers and
21 vulnerable non-smokers: Effects of modified packaging through increasing the size of warnings on
cigarette packages. Montreal: prepared for Health Canada; 2008. 9) Les Études de Marché Cratec.
Quantitative study of Canadian adults: Effects of modified packaging through increasing the size of
22 warnings on cigarette packages. Montreal: prepared for Health Canada, 2008. 10) Environics Research
23 Group. Testing the size of cigarette package health warnings: An online survey of Canadians, Study 2.
24 Toronto: Prepared for Health Canada; 2011.

25 20) 1) Swayampakala K, Thrasher J, Hammond D, et al. Pictorial health warning label content and
smokers' understanding of smoking-related risks – A cross-country comparison. Health Educ Res. In
press. 2) ITC Project. ITC Uruguay National Report. Findings from the Wave 1 to 3 Surveys (2006-
2011). Waterloo, Ontario, Canada: University of Waterloo; Centro de Investigación para la Epidemia
del Tabaquismo (CIET Uruguay); Universidad de la Republica, Facultad de Ciencias Sociales; 2012.

1 literature from tobacco warnings indicates that bigger warnings are easier to recall and more difficult
2 to ignore, and associated with greater impact. These outcomes have been documented and endorsed by
3 regulatory agencies, such as the FDA,²¹ the Institute of Medicine,²² the International Association for
4 Research on Cancer (IARC),²³ US Surgeon General's Reports,²⁴ the European Commission,²⁵ as well
5 as academic reviews of the literature.²⁶ The importance of increasing size is also asserted in the World
6 Health Organization's Framework Convention on Tobacco Control (FCTC), which has been ratified
7 by 180 countries to date. Article 11 of the FCTC establishes minimum requirements for the size of
8 health warnings on cigarettes packages.²⁷

9
10
11 3) White V, Webster B, Wakefield M. Do graphic health warning labels have an impact on
adolescents' smoking-related beliefs and behaviors? *Addiction* 2008; 103(9):1562-71. 4) Thrasher J,
12 Pérez-Hernández R, Arillo-Santillán E, Barrientos-Gutierrez I. *Hacia el consumo informado de tabaco*
en México: Efecto de las advertencias en población fumadora [Towards informed tobacco
13 consumption in Mexico: Effects of pictorial warning labels among smokers]. *Revista de Salud*
Pública de México. 2012; 54:242-53. 5) Hanahan P, Elliott D. Evaluation of the effectiveness of the
14 graphic health warnings on tobacco product packaging, 2008. Canberra: Department of Health and
Ageing, Australian Government; 2009. 6) Borland R, Hill D. Initial impact of the new Australian
15 tobacco health warnings on knowledge and beliefs. *Tob Control*. 1997; 6:317-25.

16 ²¹ U.S. Food and Drug Administration (FDA). Required Warnings for Cigarette Packages and
Advertisements. Washington (DC): US Food and Drug Administration; 2011.

17 ²² Institute of Medicine. Ending the tobacco problem: A blueprint for the nation. Washington (DC): The
National Academies Press; 2007.

18 ²³ International Agency for Research on Cancer. Measures to assess the effectiveness of restrictions on
tobacco product labeling policies. In: IARC Handbooks of Cancer Prevention, Tobacco Control,
Volume 12: Methods for Evaluating Tobacco Control Policies. Lyon, France; 2008. Accessible at:
<http://www.iarc.fr/en/publications/pdfs-online/prev/handbook12/index.php>

19 ²⁴ U.S. Department of Health and Human Services. Preventing tobacco use among youth and young
adults: A report of the Surgeon General. Atlanta (GA): U.S. Department of Health and Human
20 Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention
and Health Promotion, Office on Smoking and Health; 2012.

21 ²⁵ Sambrook Research International. A review of the science base to support the development of health
warnings for tobacco packages. Newport, England: prepared for European Commission, Directorate
General for Health and Consumers; 2009.

22 ²⁶ Hammond D. Tobacco packaging and labeling policies under the U.S. Tobacco Control Act: research
needs and priorities. *Nicotine Tob Res*. 2012; 14(1):62-74.

23 ²⁷ 1) World Health Organization. WHO Framework Convention on Tobacco Control. Geneva: World
Health Organization; 2005. <http://whqlibdoc.who.int/publications/2003/9241591013.pdf> 2) World
Health Organization. Guidelines for implementation of Article 11 of the WHO Framework
Convention on Tobacco Control (Packaging and labelling of tobacco products). November, 2008.
http://www.who.int/fctc/guidelines/article_11.pdf.

1 23. Recent reviews of health warnings for alcoholic beverages have highlighted the
2 importance of warning size. The relatively small size and location of alcohol warnings has been cited
3 as a primary reason why alcohol warnings are considerably less effective than health warnings on
4 tobacco products.²⁸ For example, an experimental study that examined alcoholic beverage warnings in
5 magazine and television advertisements concluded that warnings in ads can communicate information
6 if presented in a salient form; however, “less conspicuous warnings were generally no better than no
7 warnings.”²⁹

8 **2. CONTRAST & BORDER**

9 24. Extensive research has demonstrated that design features that increase the contrast of a
10 warning relative to the package or advertisement enhance the noticeability of warnings, and increase
11 information processing and message acceptance across a wide range of product domains.³⁰ In
12 particular, warnings that feature a prominent border to distinguish a warning from the surrounding
13 package or advertisement are more likely to attract attention compared to similar signs with thin or no
14 borders.³¹ Using borders also helps consumers to identify the information as a health warning.³²
15 Research has demonstrated that warnings featuring a black border and “white” background—the same
16 type of border required by the San Francisco ordinance for the SSB warning—result in greater
17 message recall.³³ Studies of alcohol and tobacco advertisements using eye-tracking methodology have

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²⁸ 1) Wilkinson C, Room R. Warnings on alcohol containers and advertisements: international experience
19 and evidence on effects. *Drug Alcohol Rev.* 2009; 28(4):426-35. 2) Al-hamdan M. The case for
20 stringent alcohol warning labels: lessons from the tobacco control experience. *J Public Health Policy.*
2014; 35(1):65-74.

21 ²⁹ Barlow T, Wogalter MS. Alcoholic beverage warnings in magazine and television advertisements. *J
22 Consumer Res.* 1993; 20:147-55.

23 ³⁰ 1) Braun CC, Silver NC. Interaction of signal word and color on warning labels: differences in
24 perceived hazard and behavioral compliance. *Ergonomics.* 1995; 38:2207-20. 2) Klein PB, Braun CC,
Peterson N, Silver NC. The impact of color on warnings research. *Proceedings of the Human Factors
Society 37th Annual Meeting, Human Factors and Ergonomics Society, Santa Monica (CA); 1993.* p.
940-4.

25 ³¹ Wogalter MS, Rashid R. A border surround a warning sign affects looking behavior: a field
26 observational study. In: *Proceedings of the Human Factors and Ergonomics Society 42nd Annual
Meeting. Human Factors and Ergonomics Society, Santa Monica (CA); 1998.* p. 1628.

27 ³² Laughery KR, Young SL. An eye scan analysis of accessing product warning information. In *Human
Factors and Ergonomics Society Annual Meeting Proceedings.* 1991; 35:585-9.

28 ³³ Truitt L, Hamilton WL, Johnston PR, Bacani CP, Crawford SO, Hozik L, Celebucki C. Recall of health
warnings in smokeless tobacco ads. *Tob Control.* 2002; 11(Suppl 2): ii59-63.

1 found that health warnings without distinctive design features are rarely viewed, and when they are
2 viewed, it is for a very small percentage of the overall ad viewing time.³⁴ For example, one study of
3 alcohol warnings without a contrasting border found that participants fixated on the health warning
4 message for an average of only 350 milliseconds—an insufficient amount of time to read or process
5 the warning.³⁵

6 25. The use of “bold” type also increases the contrast and legibility of a warning.³⁶ In
7 addition, the use of different text colors in a warning enhances consumer attention, particularly when
8 the color is distinguishable from the background and the surrounding colors of a package or
9 advertisement.³⁷

10 **C. MESSAGE CONTENT**

11 26. Health warning messages should include four primary components, each of which
12 serves a different purpose: (1) a signal word to attract attention, (2) identification of the hazard, (3)
13 identification of health consequences, and (4) instructions for avoiding the hazard.³⁸ (Note that the
14 fourth component is only necessary when the ways in which individuals can avoid the hazard is
15 unclear or requires some protective health behavior (such as wearing safety gear or safe operating

16 ³⁴ For example: 1) Fox RJ, Krugman DM, Fletcher JE, Fischer PM. Adolescents' attention to beer and
17 cigarette print ads and associated product warnings. *J Advert.* 1998; 27:57–68. 2) Thomsen SR, Fulton
18 K. Adolescents' attention to responsibility messages in magazine alcohol advertisements: an eye-
tracking approach. *J Adolesc Health.* 2007; 41:27–34.

19 ³⁵ Thomsen SR, Fulton K. Adolescents' attention to responsibility messages in magazine alcohol
20 advertisements: an eye-tracking approach. *J Adolesc Health.* 2007; 41 27–34.

21 ³⁶ Sanders MS, McCormick EJ. Human Factors in Engineering and Design (7th Edition), McGraw-Hill,
22 New York; 1993.

23 ³⁷ E.g., 1) Kline PB, Braun CC, Peterson N, Silver NC. The impact of color on warning research. In:
24 Proceedings of the Human Factors and Ergonomics Society 37th Annual Meeting. Human Factors and
25 Ergonomics Society, Santa Monica (CA); 1993. p. 940–4. 2) Braun CC, Sansing L, Kennedy RS,
26 Silver NC. Signal word and color specifications for product warnings: an isoperformance application.
Proceedings of the Human Factors Society 38th Annual Meeting. Human Factors and Ergonomics
27 Society, Santa Monica (CA): 1994. p. 1104–8. 3) Young SL. Increasing the noticeability of warnings,
effects of pictorial color, signal, icon and border. Proceedings of the Human Factors Society 36th
Annual Meeting. Human Factors Society, Santa Monica (CA); 1991. p. 580–584. 4) Gill RT, Barbera
28 C, Precht T. A comparative evaluation of warning label designs. Proceedings of Human Factors
Society 31st Annual Meeting. Human Factors Society, Santa Monica, CA; 1987. p. 476–8.

29 ³⁸ 1) Wogalter MS, Conzola VC, Smith-Jackson TL. Research-based guidelines for warning design and
evaluation. *Appl Ergon.* 2002; 33(3):219-30. 2) Laughery KR. Safety communications: Warnings.
Appl Ergon. 2006; 37(4):467–78.

1 practices for machinery). This section provides a brief summary of best practices in each of these
2 areas, along with an evaluation of the extent to which the San Francisco SSB warning (shown below)
3 adheres to these practices.

4 “WARNING: Drinking beverages with added sugar(s) contributes to obesity,
5 diabetes, and tooth decay. This is a message from the City and County of San
Francisco”

6 **1. SIGNAL WORD**

7 27. Health warnings should include a signal or “marker” word to attract attention and
communicate the level of hazard. Research has examined the degree to which individuals understand
8 different signal words and associate these words with different hazard levels. “Caution”, “Warning”,
9 and “Danger” are three of the most commonly used signal words. The signal word “Caution” is
10 typically used in situations and for products that may result in minor injury or damage. “Warning” is
11 commonly used for products that “might” result in serious injury, whereas “Danger” is typically used
12 for situations or products that “will” cause serious injury.³⁹ Therefore, the use of the signal word
13 “Warning” in the San Francisco ordinance is warranted in light of the serious health risks that “might”
14 occur from added sugar consumption.

15 **2. IDENTIFICATION OF HAZARD & HEALTH CONSEQUENCES**

16 28. Warning messages should clearly identify the cause or condition that leads to the health
effect. In the case of the San Francisco SSB warning, this is accomplished by the statement “Drinking
17 beverages with added sugar...” Warning messages should also identify the health outcome or nature of
the risk. Descriptions of health consequences or outcome should be explicit. For example, as
18 Wogalter et al. describe, a warning for a hazardous chemical could explicitly state that “Severe lung
19 injury can result” as opposed to a non-explicitly stated consequence: (e.g., “You could be injured”).⁴⁰
20 Warnings with more explicit health consequences have been associated with increased levels of
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27 ³⁹ Laughery KR. Safety communications: Warnings. Appl Ergon. 2006; 37(4): 467–78.
28 ⁴⁰ Wogalter MS, Conzola VC, Smith-Jackson TL. Research-based guidelines for warning design and
evaluation. Appl Ergon. 2002; 33(3): 219–30.

1 perceived dangerousness, hazard understanding, perceived injury severity, intent to act cautiously,
2 manufacturer's concern, and protective equipment use.⁴¹

3 29. The San Francisco SSB warning provides a clear, explicit identification of the health
4 outcomes from drinking beverages with added sugar in the phrase "...contributes to obesity diabetes
5 and tooth decay". As is the case with the San Francisco SSB warning, it is standard practice to
6 integrate statements of the cause and statements of the health consequences into the same sentence.⁴²
7 In fact, there are advantages to integrating these statements in terms of brevity. Warnings on
8 advertisements or packaging must be concise to ensure they are legible, and must display sufficiently
9 large font that consumers can process the information with minimum effort. For example, long
10 warnings messages with small font size on prescription drug labels are associated with lower levels of
11 readability and understanding.⁴³ This basic principle is articulated in a review of best practices for
12 warning labels:

13 There are several general rules to maximize warning effectiveness. As a result,
14 warnings should be brief. Longer warnings or those with nonessential
15 information are less likely to be read. Thus, the brevity criterion conflicts to
16 some extent with the explicitness criterion. Being explicit about every hazard
17 could result in very long warnings.⁴⁴

3. CREDIBILITY & ATTRIBUTION

18 30. The components of message content described above influence the credibility or
19 "believability" of a warning, which is an important characteristics associated message acceptance
20 among consumers.⁴⁵ A warning's attribution—a reference to the source of the warning—is also

21 ⁴¹ 1) Braun CC, Silver NC. Interaction of signal word and color on warning labels: differences in
22 perceived hazard and behavioral compliance. *Ergonomics*. 1995; 38:2207–20. 2) Dingus TA, Wreggit
23 SS, Hathaway JA. Warning variables affecting personal protective equipment use. *Saf Sci.* 1993;
24 16:655–73. 3) Laughery Sr KR, Vaubel KP, Young SL. Brelsford JW, Rowe AL. Explicitness of
25 consequence information in warnings. *Saf Sci.* 1993; 16:597–613.

26 ⁴² Wogalter MS, Conzola VC, Smith-Jackson TL. Research-based guidelines for warning design and
27 evaluation. *Appl Ergon.* 2002; 33(3):219–30.

28 ⁴³ Shrank W, Avorn J, Rolon C, Shekelle P. Effect of content and format of prescription drug labels on
29 readability, understanding, and medication use: a systematic review. *Ann Pharmacother.* 2007;
30 41(5):783–801.

31 ⁴⁴ Wogalter MS. Purposes and scope of warnings. In: *Handbook of Warnings*. Mahwah (NJ): Lawrence
32 Erbaum Associates; 2006. p. 8.

33 ⁴⁵ 1) Wogalter MS, Conzola VC, Smith-Jackson TL. Research-based guidelines for warning design and
34 evaluation. *Applied Ergonomics* 2002; 33(3): 219–230. 2) Hammond D. Health warning messages on

1 important in establishing message credibility and acceptance. For example, research indicates that
2 consumers perceived warnings to be credible when attributed to a well-respected government agency
3 or public health authority.⁴⁶ Therefore, the attribution to “...the City and County of San Francisco” is
4 an important component of the SSB warning in regards to establishing an appropriate attribution and
5 ensuring credibility.

6 **D. HEALTH WARNING “CHANNELS”: SSBs ON ADVERTISEMENTS**

7 31. Health warnings on advertisements are unique among public education efforts because
8 they are integrated with a product’s promotional materials.⁴⁷ This provides health warnings with
9 several advantages over other communication channels. First, health warnings on advertisements
10 ensure a broad reach. For communications to be effective, messages must reach their target
11 audiences.⁴⁸ As a result of appearing on advertisements, the health information in the SSB warning
12 message will be displayed in all locations covered by the San Francisco ordinance, including
13 advertisements placed on paper, posters, billboards, vehicles, transit shelters, and walls, and at
14 stadiums.

15 32. Second, an SSB warning on advertisements would help to ensure that consumers are
16 exposed to health information prior to making a purchase. The presence of SSBs on printed
17 advertisements and posters at the point-of-purchase (i.e., inside stores and retail outlets, or on vending
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19 tobacco products: A review. *Tob Control*. 2011; 20:327-337. 3) Hovland CI, Weiss W. The influence
20 of source credibility on communication effectiveness. *Public Opinion Quarterly*. 1951;15:635-50.

21 ⁴⁶ 1) BRC Marketing & Social Research. Smoking health warnings Stage 1: The effectiveness of different
22 (pictorial) health warnings in helping people consider their smoking-related behavior. Prepared for the
23 New Zealand Ministry of Health; May 2004. 2) Guttman N, Peleg H. Public preferences for an
24 attribution to government or to medical research versus unattributed messages in cigarette warning
25 labels in Israel. *Health Commun*. 2003; 15(1):1-25. 3) Health Canada. Toxics information on cigarette
26 packaging: Results of a survey of smokers. Prepared by Environics Research Group; May 2003. 4) Bansal-Travers M, Hammond D, Smith P, Cummings KM. The impact of cigarette pack design,
27 descriptors, and warning labels on risk perception in the U.S. *Am J Prev Med*. 2011; 40(6):674-82.

28 ⁴⁷ 1) Laughery KR, Young SL, Vaubel KP, Brelsford KW. The noticeability of warnings on alcoholic
beverage containers. *J Public Policy Mark*. 1993; 12:38–56. 2) Wogalter MS, Godfrey SS, Fontenelle
GA, Desaulniers DR, Rothstein PR, Laughery KR. Effectiveness of warnings. *Human Factors*. 1987;
29:599–612.

28 ⁴⁸ 1) Laughery K, Wogalter M. Designing effective warnings. In: Williges R, ed. *Human Factors in
Ergonomics Reviews*. Santa Monica (CA): Human Factors and Ergonomics Society; 2006: 241-71. 2)
Rice RE, Atkin CK, editors. *Public communication campaigns*. Thousand Oaks (CA): Sage; 2001.

1 machines) is particularly important in this regard, given that the point-of-purchase is a critical
2 environment for influencing consumer decision making.⁴⁹ An SSB warning on these advertisements
3 will help to ensure that consumers are exposed to health information at the time and in the setting in
4 which purchase decisions are made. The temporal proximity between exposure to health information
5 and consumer decision making increases the effectiveness of the health warning.⁵⁰ This is also
6 consistent with the stated objective of the SSB warning:

7 Posting warnings that beverages are sugar-sweetened will inform the public
8 before purchases, which will help ensure that San Franciscans make a more
9 informed choice about the consumption of drinks that are a primary source of
10 added dietary sugar.⁵¹

11 33. Third, mandated health warnings represent a highly cost-effective form of public
12 education. Most public health authorities have inadequate funds to pay for sustained advertising
13 campaigns with sufficient reach. In contrast, health warnings on advertisements represent a self-
14 sustaining medium for informing consumers at little additional cost to industry.

15 **E. EVIDENCE ON THE EFFECTIVENESS OF WARNINGS ON
16 ADVERTISEMENTS FOR FOOD, ALCOHOL & TOBACCO PRODUCTS**

17 34. A range of studies have tested the impact of health warnings on advertisements for
18 consumer products. This evidence is directly relevant to evaluating the efficacy and design of the San
19 Francisco SSB warnings.

20 1. **HEALTH WARNINGS ON ADVERTISEMENTS FOR TOBACCO
21 PRODUCTS**

22 35. Several studies have examined health warnings on advertisements for tobacco products.
23 Since 1972, US regulations have required that print advertisements and billboards for cigarettes
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⁴⁹ 1) Hammond D. Health warning messages on tobacco products: A review. *Tob Control*. 2011;
26 20(5):327-37. 2) Lee NR, Kotler PA. Social Marketing: Influencing Behaviors for Good. Thousand
27 Oaks (CA): Sage; 2011. 3) Harris JL, et al. Sugary Drink FACTS 2014. November 2014. Available at:
http://www.sugarydrinkfacts.org/resources/SugaryDrinkFACTS_Report.pdf

28 ⁵⁰ 1) Strahan EJ, White K, Fong GT, Fabrigar LR, Zanna MP, Cameron R. Enhancing the effectiveness of
29 tobacco package warning labels: a social psychological perspective. *Tob Control*. 2002; 11(3):183-90.
30 2) Wogalter MS. Purposes and scope of warnings. In: *Handbook of Warnings*. Mahwah (NJ):
31 Lawrence Erlbaum Associates; 2006.

32 ⁵¹ San Francisco Ordinance NO. 100-15. Health Code – Sugar-Sweetened Beverage Warning for
33 Advertisements. File No. 150245.

1 display health warnings with contrasting black text on a white background, surrounded by a border.⁵²
2 Several studies have tested the effectiveness of these warnings on ads. Warnings on print
3 advertisements for cigarettes have been shown to increase recall of health warning statements.⁵³
4 Research examining health warnings on smokeless tobacco advertisements have also demonstrated the
5 efficacy of a text warning on recall, as well as the importance of contrasting color, achieved through a
6 black border and “white” background, similar to the San Francisco ordinance.⁵⁴ Consistent with these
7 findings, a separate study indicated that health warnings on smokeless tobacco advertisements
8 influence perceptions of risk, attitudes towards the product, and recall of health warning information.⁵⁵
9 Two additional studies have demonstrated that increases in the salience of warnings through the use of
10 pictorials further increases the efficacy of health warnings that cover 20% of
11 cigarette advertisement space by increasing message processing and recall.⁵⁶

12 **2. HEALTH WARNINGS ON SUGAR-SWEETENED BEVERAGES**

13 36. One published study to date has examined the efficacy of health warnings on SSB
14 containers.⁵⁷ The between-subjects experiment was conducted among parents of small children and
15 examined the impact of different health warnings on a product selection task, health beliefs about
16 SSBs, and intention to purchase SSBs for their children in the future. The study is noteworthy because
17 one of the warnings tested in the study used message content and a presentation style very similar to
18 the San Francisco SSB warning. The message content of the warning was the same, with only minor
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20 ⁵² Lorillard et al., 80 F.T.C. 455, 460-65; 1972. Available at:

https://www.ftc.gov/sites/default/files/documents/commission_decision_volumes/volume-80/ftc_volume_decision_80_january_-_june_1972pages_408-477.pdf#page=48

21 ⁵³ Fischer PM, Richards JW Jr, Berman EJ, Krugman DM. Recall and eye tracking study of adolescents
22 viewing tobacco advertisements. JAMA. 1989; 261(1):84-9.

23 ⁵⁴ Truitt L, Hamilton WL, Johnston PR, Bacani CP, Crawford SO, Hozik L, Celebucki C. Recall of health
24 warnings in smokeless tobacco ads. Tob Control. 2002; 11(Suppl 2): ii59-63.

25 ⁵⁵ Popova L, Ling PM. Nonsmokers' responses to new warning labels on smokeless tobacco and
26 electronic cigarettes: an experimental study. BMC Public Health. 2014; 14:997.

27 ⁵⁶ 1) Strasser AA, Tang KZ, Romer D, Jepson C, Cappella JN. Graphic warning labels in cigarette
28 advertisements: recall and viewing patterns. Am J Prev Med. 2012; 43(1):41-7. 2) Klein EG, Shoben
AB, Krygowski S, Ferketich A, Berman M, Peters E, Rao U, Wewers ME. Does size impact attention
and recall of graphic health warnings? Tob Regul Sci. 2015;1(2):175-85.

⁵⁷ Roberto CA, Wong D, Musicus A, Hammond D. The influence of sugar-sweetened beverage health
warning labels on parents' choices. Pediatrics. 2016; pii: peds.2015-3185. [Epub ahead of print].

1 differences (“Safety Warning: Drinking beverages with added sugar[s] contributes to obesity, diabetes,
2 and tooth decay”). In addition, the health warning was displayed to participants above an image of the
3 beverage, very similar to the way the San Francisco warning would appear on advertisements: in black
4 and white text, with a border, and placed at the top of the warning, covering approximately 10% of the
5 image.

6 37. The results of the experiment indicated that, compared to beverages with no health
7 warning, parents exposed to the San Francisco SSB warning were significantly less likely to choose an
8 SSB for their child. Parents in the warning label condition also selected significantly fewer coupons
9 that could be used to purchase SSBs coupons, believed that SSBs were less healthy for their child, and
10 were less likely to intend to purchase SSBs in the future. Overall, the study provides empirical support
11 that the message content and design of the San Francisco warning is associated an improved
12 understanding of health harms associated with overconsumption of SSBs and may reduce the purchase
13 of SSBs—two of the primary objectives identified in the San Francisco ordinance.

14 **F. SUMMARY OF EMPIRICAL EVIDENCE**

15 38. There is an extensive evidence base on the effectiveness of health warnings on
16 advertisement and packaging for consumer products. This research indicates that health warnings can
17 be an effective means of informing consumers about the health risks of products, influencing attitudes
18 and beliefs, and promoting health behavior change. However, the evidence also suggests that health
19 warnings need to adhere to basic design standards in order to achieve this impact. These standards
20 have been incorporated into federal and international standards.

21 39. The San Francisco SSB warning incorporates each of the key components of an
22 effective health warning message in terms of message content, including the use of a signal word,
23 explicit statements on the cause and health consequences, and the use of an appropriate attribution to
24 enhance credibility, all of which are presented in a clear, concise warning message. The San Francisco
25 warning also adheres to international standards for maximizing the salience of this warning message,
26 including design features that distinguish the warning from the advertisement and ensure a sufficient
27 size to promote information processing among consumers.

IV. COMMENTS IN RESPONSE TO DR. GOLDER'S REPORT

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Dr. Golder's Report (hereafter referred to as the "Golder Report") provides opinions on how consumers will perceive the San Francisco SSB warning, as well as the potential impact on the warning on companies' brands and brand associations.⁵⁸ The following section examines several of the primary opinions expressed in the Golder Report.

A. "DISRUPTION" OF THE ADVERTISING & THE HEALTH WARNING AS THE PRIMARY MESSAGE

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The Golder Report suggests that the message in the SSB warning will "distort" and "overwhelm" the advertising message meant to promote SSBs:

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The prominence of the Warning Message and the severity of its message will cause many consumers to perceive the Warning Message as one of the primary messages of the advertisement, if not the primary message of the advertisement, detracting from — if not overwhelming — the carefully-designed message intended for the consumer. In simple terms, advertisements intended to convey carefully crafted themes and messages would be converted by the Warning Message into platforms that would weaken, neutralize, or even counteract those intended messages.⁵⁹

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According to the Ordinance, the Warning Message has to be at least 20 percent of the advertisement's total area, with the "WARNING" header in all capital letters, and a border the same width as the downstroke of the "W" and the same color as the warning text.(46) Due to its prominence, many consumers could perceive the Warning Message as the primary message of the advertisement; which would disrupt their processing of the advertisement's originally intended message. ...Some consumers will consider the Warning Message more heavily than other attributes, thus distorting their information search and evaluation of alternatives.⁶⁰

1. "SEVERE" NATURE OF THE WARNING

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As noted in Section III of this report, the design features identified by Dr. Golder as "severe"—the use of "warning" as a signal word, borders, size and contrasting colors—are all features that have been empirically demonstrated to enhance the effectiveness of the warnings, as described in Section III. These design features are also consistent with existing regulatory requirements for health warnings on consumer products: the use of black and white text, borders, signal words, and minimum

⁵⁸ Expert Report of Peter N. Golder. 12 January 2016. Submitted in American Beverage Association, California Retailers Association, California State Outdoor Advertising Association (plaintiffs) v. the City and County of San Francisco (defendant).

⁵⁹ Golder Report, ¶50.

⁶⁰ Golder Report, ¶52-3.

size have previously been established in food, alcohol, and tobacco labeling regulations.⁶¹ In fact, the “prominent” and “severe” design features identified in the Golder Report are considered to be the minimum standards for an effective health warning in different domains.

43. Dr. Golder is correct to highlight the “prominence” of the message as an important feature in the salience of a health warning: without this type of prominence the warning is likely to have little impact. Indeed, the Golder Report acknowledges that the design of the San Francisco warning will result in information processing of the warning message:

Empirical research has shown that increased message severity (warnings with intensified perceived threats) leads to a deeper, more focused processing of the warning message’s content.⁶²

44. By this logic, Dr. Golder’s logic, the best warning is one that is not noticed. Indeed, at different points, the Golder Report presents factors that increase the effectiveness of the warning as a “negative” outcome. For example, the Golder Report discusses the issue of message attribution:

Another study showed that consumers’ perceived source of a warning could influence how heavily they weight the warning message, finding that consumers were more likely influenced by a public source they believe to be impartial than by a commercial source.⁶³

45. Dr. Golder is also correct that health warnings attributed to public health authority is perceived as more credible and important compared to an unattributed message or a message attributed to the manufacturer of a consumer product. However, this is not a “negative” attribute for a health warning: presumably one would want a warning that is identified with a trusted public source.

2. “DISTORTION” OF ADVERTISING MESSAGE

46. There is no empirical evidence to suggest that the SSB warning would “distort” or “overwhelm” the advertising message. In fact, the scientific literature clearly establishes that the

⁶¹ 1) US Food and Drug Administration (FDA). Food Guidance Regulations. Available at: <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm064904.htm> 2) US Government Publishing Office. Alcoholic beverage health warning statement. Available at: <http://www.ecfr.gov/cgi-bin/text-index?c=ecfr;sid=33fc0c0194b58b6fe95208945b5c637a;rgn=div5;view=text;node=27%3A1.0.1.1.12;idno=27;cc=ecfr> 3) Lorillard et al., 80 F.T.C. 455, 460-65; 1972. Available at: https://www.ftc.gov/sites/default/files/documents/commission_decision_volumes/volume-80/ftc_volume_decision_80_january_-june_1972pages_408-477.pdf#page=48

⁶² Golder Report, ¶50.

⁶³ Golder Report, ¶60.

advertisement would remain the “primary” message and would have greater salience than the SSB warning. A paper published in the *Journal of the American Medical Association*—one of the leading medical journals in the world—demonstrated that advertising messages are still effective in the presence of health warnings on ads.⁶⁴ For example, recall of brand information in the advertisement remained very high in the presence of health warning. If it were true that health warnings “overwhelm” and “distort” advertisements as Dr. Golder suggests, there would be no reason for tobacco companies to persist with printed advertising. However, printed advertisements in the US have remained an important form of tobacco marketing more than 40 years after they were required to display warnings. Scientific literature on the effect of health warnings on cigarette packages also demonstrates that the primary advertising message continues to reach consumers in the presence of a health warning. Package design continues to effectively communicate brand imagery even in the presence of large pictorial warnings (e.g., 50% of the package)—warnings that are much more “severe” and “prominent” than the San Francisco SSB warnings.⁶⁵

47. Indeed, the San Francisco SSB warning is text-only and covers only 20% of the advertisement. It is simply not plausible to suggest that these warnings would “overwhelm” advertisements that use full color, pictures and brand imagery, and cover four-fifths of the advertising space. Research across a wide variety of domains has unequivocally demonstrated that pictorial information is far more salient compared to text-only information.⁶⁶ This fundamental principle has

⁶⁴ Fischer PM1, Richards JW Jr, Berman EJ, Krugman DM. Recall and eye tracking study of adolescents viewing tobacco advertisements. *JAMA*. 1989 Jan 6;261(1):84-9.

⁶⁵ U.S. Department of Health and Human Services. Preventing tobacco use among youth and young adults: A report of the Surgeon General. Atlanta (GA): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012.

⁶⁶ E.g., 1) Wogalter MS. Purposes and scope of warnings. In: *Handbook of Warnings*. Mahwah (NJ): Lawrence Erbaum Associates; 2006. 2) Hammond D. Health warning messages on tobacco products: A review. *Tob Control*. 2011; 20(3):27-337. 3) Kalsher MJ, Wogalter MS, Racicot BM. Pharmaceutical container labels and warnings: preference and perceived readability of alternative designs and pictorials. *Int J Ind Ergonomics*. 1996; 18:83–90. 4) Laughery KR, Wogalter KS. Warnings and risk perception. G. Salvendy (Ed.), *Handbook of Human Factors and Ergonomics* (2nd Edition), Wiley, New York; 1997. p. 1175–97. 5) Sojourner RJ, Wogalter MS. The influence of pictorials on the comprehension and recall of pharmaceutical safety and warning information. *Int J Cognitive Ergonomics*. 1998; 2:93–106.

1 also been demonstrated using eye tracking research that has specifically tested attention to text and
2 picture health warnings on advertisements. In short, Dr. Golder's suggestion that a black and white
3 text-only SSB warning covering 20% of an advertisement would have greater salience and
4 "overwhelm" a full color advertisement with images covering 80% of the advertising is contradicted
5 by the scientific literature in this area—none of which is actually cited in the Golder Report. Overall,
6 the health warning provides consumers with additional information; it does not interfere with a
7 consumer's ability to receive or understand an advertisement's primary message.

8 **B. OVER-ESTIMATES OF RISK**

9 48. Recent research conducted in the US has documented widespread misperceptions about
10 SSBs. Substantial proportions of parents identify SSB brands and product categories as healthy, and
11 the false belief that SSBs were healthy was significantly associated with purchasing SSBs for their
12 children.⁶⁷ In contrast, the Golder Report suggests that individuals already over-estimate the risks of
13 SSBs and that the warnings will exacerbate these over-estimates of risk.

14 Particularly because consumers tend to overestimate the risks associated with
15 warnings as described below, companies will avoid advertising that conveys
those negative messages about its brands.⁶⁸

16 Risk perceptions — especially for negative outcomes such as life-threatening
17 events and health consequences — have been demonstrated to be overvalued by
18 consumers. For example, Finucane, Slovic, and Mertz have shown that the risk
19 of the extremely rare event of contracting diseases from blood transfusions is
vastly overestimated by the general population. (51) Similarly, researchers have
observed that the perceived risk of rare fatal events, such as airplane crashes, is
multiple times higher than the actual risk (51).⁶⁹

20 49. Dr. Golder is correct that consumers often over-estimate the risk of very rare events that
21 are also easily imagined. However, this does not apply to behavioral risk factors, such as nutrition-
22 related chronic diseases, which are neither rare nor easily imagined. Indeed, the same publication cited
by Dr. Golder identifies diabetes as an “underestimated risk”.⁷⁰ This is consistent with other published

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25 ⁶⁷ Munsell CR, Harris JL, Sarda V, Schwartz MB. Parents' beliefs about the healthfulness of sugary drink
options: opportunities to address misperceptions. Public Health Nutr. 2015; 1–9.

26 ⁶⁸ Golder Report, ¶54.

27 ⁶⁹ Golder Report, ¶58.

28 ⁷⁰ Finucane ML, Slovic P, Mertz CK. Public Perception of the Risk of Blood Transfusion. In Slovic P.
The Feeling of Risk: New Perspectives on Risk Perception. Earthscan from Routledge, 2010: See page
30 and Chapter beginning on page 365.

1 research, including a recent review of risk perceptions for diabetes, which concludes that perceptions
2 of risk for preventive health behaviors for diabetes remains low.⁷¹ In fact, the book cited by Dr.
3 Golder contains an entire chapter on the importance of health warnings to address underestimates of
4 risk for behavioral risks factors. The editor of the book, Dr. Paul Slovic, has published extensively on
5 the importance of health warnings to address underestimates of risk for behavioral risk factors.⁷²

6 50. Later in his report, Dr. Golder repeats the suggestion that individuals over-estimate the
7 risks of SSBs and that health warnings will further “distort” consumer risk perceptions:

8 As a consequence, the characteristics or information associated with salient
9 events are weighted disproportionately more heavily by consumers in their
purchasing decisions than other available information, thus distorting their risk
perceptions.(53)⁷³

10 51. In support of this statement, Dr. Golder cites another of Dr. Slovic’s papers to imply
11 that consumers would overestimate the risks off SSBs, such as diabetes. However, the same paper
12 cited by Dr. Golder explicitly identifies diabetes as one of the “most underestimated” risks.⁷⁴ As
13 above, Dr. Golder’s argument is premised on perceptions of rare diseases that are irrelevant to the
14 health effects of SSBs. Indeed, the research Dr. Golder cites actually makes the argument that health
15 warnings are necessary and would be effective to address under-estimates of risk for conditions such
16 as diabetes.⁷⁵

17 52. Dr. Golder’s dubious use of scientific literature to support his opinion also includes
18 references to research on pharmaceutical drugs:

20 ⁷¹ Piccinino L, Griffey S, Gallivan J, Lotenberg LD, Tuncer D. Recent Trends in Diabetes Knowledge,
21 Perceptions, and Behaviors: Implications for National Diabetes Education. *Health Educ Behav.* 2015;
42(5):687-96.

22 ⁷² E.g., 1) Peters E, Romer D, Slovic P, Jamieson KH, Wharfield L, Mertz CK, Carpenter SM. The
impact and acceptability of Canadian-style cigarette warning labels among U.S. smokers and
23 nonsmokers. *Nicotine Tob Res.* 2007; 9(4):473-81. 2) Emery LF, Romer D, Sheerin KM, Jamieson
KH, Peters E. Affective and cognitive mediators of the impact of cigarette warning labels. *Nicotine
Tob Res.* 2014; 16(3):263-9.

24 ⁷³ Golder Report, ¶59.

25 ⁷⁴ Slovic P, Fischhoff B, Lichtenstein S. Rating the Risks. *Environment.* 1979; 21(3):14-39. See page 14.

26 ⁷⁵ E.g., 1) Peters E, Romer D, Slovic P, Jamieson KH, Wharfield L, Mertz CK, Carpenter SM. The
impact and acceptability of Canadian-style cigarette warning labels among U.S. smokers and
27 nonsmokers. *Nicotine Tob Res.* 2007; 9(4):473-81. 2) Emery LF, Romer D, Sheerin KM, Jamieson
KH, Peters E. Affective and cognitive mediators of the impact of cigarette warning labels. *Nicotine
Tob Res.* 2014; 16(3):263-9.

1 Studies on the effects of warning messages in other industries have confirmed
2 that consumers overestimate risks that they derive from warning messages. For
3 example, researchers found that, when presented with online advertisements
bearing a warning message for a hypothetical ADHD prescription drug,
consumers overestimated the risks associated with treating ADHD to such an
extent that they would rather not take the drug at all.(54)⁷⁶

4
5 53. The Kees et al. study cited by Dr. Golder is irrelevant to the issue of how SSB warnings
6 would influence consumer perceptions of risk.⁷⁷ The study examined the relative impact of warnings
7 on the risks of taking a prescription ADHD drug with the risks of leaving ADHD untreated. The
8 primary finding from the Kees et al. study was what the authors refer to as a bias of “omission”:
9 warnings that provide health warning on only one risk (the risk of taking the ADHD drug), but not the
10 other risk (the risk of inaction or not taking the ADHD drug) resulted in a greater perception of risk
11 from inaction than action:

12 We find evidence of a bias of omission; that is, the risks of treating a health
13 condition using a hypothetical prescription drug were perceived to be greater
14 than the risk of inaction. Interestingly, we found no evidence that the
15 presentation of a “black-box” warning or the warning strength affected the
16 broader construct of fair balance.⁷⁸

17 54. The study has no implications for SSB warnings and provides no support for Dr.
18 Golder’s opinion that SSB warnings would lead to false risk perceptions among consumers.

19 55. In the same paragraph quoted above, Dr. Golder also refers to study of prescription
20 anti-depressants:

21 When measuring the effect of “black box” warning messages on actual
22 antidepressant drugs for children and adolescents, observational studies found
23 that, due to incorrectly shifted risk perception based on the warning messages,
24 antidepressant prescriptions from physicians decreased and suicide rates instead
25 increased.⁷⁹

26 56. Unfortunately, the study cited by Dr. Golder was not a study of risk perceptions.⁸⁰ The
27 study did not “measure the effect of ‘black box’ warning messages”, nor did the study test any risk

28⁷⁶ Golder Report, ¶60.

29⁷⁷ Kees J., et al. Barely or Fairly Balancing Drug Risks? Content and Format Effects in Direct-to-
Consumer Online Prescription Drug Promotions. Psychol Mark. 2008; 25(7):675-91.

30⁷⁸ Kees,et al., page 675.

31⁷⁹ Golder Report, ¶60.

32⁸⁰ Gibbons RD, et al. Early Evidence on the Effects of Regulators’ Suicidality Warnings on SSRI
Prescriptions and Suicide in Children and Adolescents. Am J Psychiatry. 2007; 164(9):1356-63.

1 perceptions of any kind; indeed, nowhere in the paper does it mention that individuals overestimate the
2 risk from a warning. Rather, the study reports changes in prescription rates for antidepressants among
3 children over time. The authors conclude that a reduction in prescription rates may have been due to
4 concerns that the antidepressants caused suicide as a side-effect.

5 57. Overall, the Golder Report provides no empirical support for his opinion that,
6 “consumers’ risk perceptions are distorted by warning messages, such that consumers expect negative
7 outcomes (e.g., obesity, diabetes, tooth decay) to be much more likely than they in fact are.”⁸¹ In fact,
8 Dr. Golder’s opinion on over-estimates of risk is contradicted by the scientific literature, including the
9 same sources he cites in his report.

10 **C. IMPLICATIONS FOR PRODUCTS WITHOUT WARNINGS & PRODUCT
SUBSTITUTION**

11 **1. WHETHER HEALTH WARNINGS WILL CREATE FALSE BELIEFS
ABOUT PRODUCTS WITHOUT HEALTH WARNINGS**

12 58. The Golder Report states that warnings on SSB advertisements will lead to false beliefs
13 and erroneous risk perceptions for other, non-SSB products that do not display the warnings:

14 Consumers may infer that products without the Warning Message do not
15 contribute to the effects described on the warning. This effect of switching from
16 one consumption good to another one that satisfies the same consumption
motivation and/or usage situation (e.g., refreshment in heat, relaxation while
watching TV) has been established in the marketing literature.⁸²

17 59. The marketing literature cited by Dr. Golder is an experimental study of the effect of
18 warning labels on responsible gambling among video lottery terminal (VLT) players.⁸³ I am unable to
19 identify any aspect of the study or conclusion in the paper that addresses Dr. Golder’s claim that
20 consumers will infer that products without the SSB warning (such as candy bars) could not contribute
21 to tooth decay. For example, the conclusions of the study cited by Dr. Golder state:

22 Our results show that both higher threat warnings and the medical source of
23 warnings enhance Depth of Information Processing. It was also found that

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26 ⁸¹ Golder Report, ¶62.
27 ⁸² Golder Report, ¶61.

28 ⁸³ Munoz Y, Chebat JC, Amnon Suissa J. Using fear appeals in warning labels to promote responsible
gambling among VLT players: The key role of depth of information processing. J Gambl Stud. 2010;
26:593-609.

1 Depth of Information Processing affects positively attitude change and
2 compliance intentions.⁸⁴

3 60. I am unaware of any other empirical literature that supports Dr. Golder's speculation
4 that the SSB warning would lead consumers to believe that *only* added-sugar consumption from SSBs
5 could be associated with obesity, diabetes, and tooth decay. In fact, the wording of the SSB warning
6 uses the term "contributes", which clearly indicates that other factors are associated with the health
7 outcomes noted in the warnings. Overall, Dr. Golder's opinion regarding consumer perceptions of the
8 SSB warning is inconsistent both with the wording of the warning and the scientific literature on risk
9 communication.

9 **2. PRODUCT SUBSTITUTION**

10 61. Dr. Golder speculates that consumers may substitute SSBs for equally harmful products
11 as a result of the health warnings:

12 On the other hand, at least some consumers will take away from the City's
13 warning that products whose advertisements do not carry the warning message
14 are better choices even when they could contain more sugar and/or calories than
15 products whose advertisements do carry the Warning Message. This
16 consideration may be driven by simple decision-making heuristics as well as the
17 elaborate weighting processes — in both cases consumers will forego the
18 product with the Warning Message and turn their attention to other products
19 (e.g., a sugary snack rather than a can of soda).⁸⁵

20 62. No citation or empirical evidence is provided to support Dr. Golder's speculation. The
21 more plausible effect of the SBB warning is that it would enhance consumer awareness of the
22 unhealthy effects of added sugar in consumer products more generally. Therefore, consumers would
23 be more, rather than less, likely to avoid added sugar in other products. Indeed, the best available
24 evidence on how consumers respond to a policy measure targeting SSBs with regards to "product
25 substitution" is provided by a recent study published in the *British Medical Journal* that evaluated
26 changes beverages following the implementation of a SSB excise tax in Mexico.⁸⁶ The study examined
27 sales data collected before and one-year after the tax was implemented. The findings suggest that
28 reductions in SSBs were accompanied by increases in purchases of un-taxed, non-SSBs, driven mainly

26 ⁸⁴ Munoz et al., Page 593.

27 ⁸⁵ Golder Report, ¶62.

28 ⁸⁶ Colchero MA, Popkin BM, Rivera JA, Ng SW. Beverage purchases from stores in Mexico under the
excise tax on sugar sweetened beverages: observational study. *BMJ*. 2016; 352: h6704.

1 by increased sales of plain bottled water. In other words, as SSB purchases decreased in response to
2 the policy intervention, purchases of bottled water increased. The data from this study are particularly
3 informative given that they represent “real” changes in purchasing behavior, rather than hypothetical
4 purchasing patterns in an experimental setting. This pattern of product substitution in response to a
5 reduction in SSBs undermines Dr. Golder’s opinion.

6 **D. THE ABSENCE OF WARNING INFORMATION ON “LIFESTYLE” AND
7 OTHER RISK FACTORS**

8 63. The Golder Report criticizes the warning message for not including other risks of
9 obesity, diabetes or tooth decay:

10 The Warning Message tells consumers that drinking beverages with added sugar
11 contributes to developing diseases such as obesity, diabetes, and tooth decay,⁸⁷—
12 without giving any consideration to their other dietary or lifestyle decisions.⁸⁷

13 64. As described in Section III, the purpose of a consumer product health warnings is to
14 provide information on the health consequences specifically associated with a product, not all of the
15 risks associated with a particular health outcome. For example, health warnings for cigarettes and
16 many other countries warn about the risks of heart disease. Heart disease has multiple risk factors and
17 determinants, as is the case for obesity, diabetes and tooth decay; however, heart disease warnings on
18 cigarette packages are not mandated to communicate risk factors other than smoking, or to
19 communicate how smoking may interact with different risk factors. Similarly, the Government of
20 Canada requires a warning on smoking and diabetes, which is exclusively focused on the risk of
21 diabetes attributable to smoking and not on other “lifestyle” risk factors, such as diet. The same is true
22 for alcohol warnings in the U.S.: alcohol warnings indicate the risks to pregnancy, without discussion
23 other risk factors associated with the same health outcomes.

24 65. Overall, the focus on risks specific to SSB consumption in the San Francisco warnings
25 is consistent with the general principles and international regulatory practice for consumer product
26 warnings.⁸⁸ In short, the criticism in the Golder Report that the San Francisco warnings should contain
27 information on risk factors other than SSBs is unwarranted.

28 ⁸⁷ Golder Report, ¶9.

⁸⁸ Wogalter MS. Purposes and scope of warnings. In: Handbook of Warnings. Mahwah (NJ): Lawrence
Erbaum Associates; 2006.

1 **E. SUMMARY**

2 66. The primary criticism in the Golder Report appears to be that SSB warnings may work
3 as intended and influence the ways in which consumers perceive SSBs, such that they regard them as
4 less healthy and, therefore, less desirably. Dr. Golder rightly notes that the message content and
5 general design of the warnings increase the likelihood of these outcomes.

6 67. Outcomes that Dr. Golder identifies as negative—greater concern about health risks
7 and changes in attitudes beliefs and purchase of SSBs—are in fact positive health outcomes associated
8 with the objectives in the ordinance.

9 68. Dr. Golder’s opinion with respect to how consumers would understand and perceive the
10 SSB warning is not based on the most relevant scientific literature. For example, Dr. Golder’s opinion
11 that consumers overestimate the health consequences of SSBs—such as diabetes—and that warnings
12 increase the extent of this overestimation, is contradicted by the same sources cited by Dr. Golder in
13 support of this opinion. Nor is there any evidence to indicate that SSB warnings would “overwhelm”
14 or “cut-off consideration” of the message in the advertisement: the scientific literature on health
15 warnings clearly indicates that the primary advertising message would continue to reach consumers.

16 69. Overall, the opinions in the Golder Report are inconsistent with the extensive scientific
17 literature on consumer perceptions and the effectiveness of health warnings. Overall, Dr. Golder
18 appears to be unfamiliar both with the scientific literature on risk communication, as well as regulatory
19 practice and international standards for consumer product warnings. Indeed, I have reviewed Dr.
20 Golder’s CV and I have been unable to identify any publications or expertise in areas of risk
21 perceptions, risk communications, or health more generally.

22 **VI. COMMENTS IN RESPONSE TO DR. KAHN’S REPORT**

23 70. Dr. Richard Kahn’s Report (hereafter referred to as the “Kahn Report”) provides a
24 range of opinions on the validity of the San Francisco SSB warning, as well as consumer
25 perceptions.⁸⁹ My comments on the Kahn Report are restricted to Dr. Kahn’s opinions with respect to

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⁸⁹ Expert Report of Dr. Richard A. Khan. 12 January 2016. Submitted in American Beverage
28 Association, California Retailers Association, California State Outdoor Advertising Association
(plaintiffs) v. the City and County of San Francisco (defendant).

1 how consumers will perceive the warning, and not on evidence related “added sugar” or “natural
2 sugar”, or their respective influence on obesity and diabetes.

3 **A. THE ACCURACY OF SAN FRANCISCO HEALTH WARNING**

4 **1. WHETHER HEALTH WARNINGS WILL CREATE FALSE BELIEFS
ABOUT PRODUCTS WITHOUT HEALTH WARNINGS**

5 71. Dr. Kahn suggests that the SSB warning is “misleading and unhelpful to consumers”
6 primarily because it suggests that added sugar “uniquely” contributes to obesity and diabetes.⁹⁰

7 The Warning implies that consuming beverages with added sugar will uniquely
8 contribute to obesity and diabetes without any regard to how much is consumed,
or the consumer’s overall dietary and exercise pattern, or genetic makeup.⁹¹

9 72. Dr. Kahn also states that:

10 The Warning conveys the simplistic and inaccurate message that consuming a
11 single type of food item, at any level, will contribute to obesity and diabetes.⁹²

12 73. As noted in my response to the Golder Report, there is no empirical literature to support
13 the speculation that the SSB warning would lead consumer to believe that *only* added-sugar
14 consumption from SSBs could be associated with obesity, diabetes, and tooth decay. I note that Dr.
15 Kahn has not cited any empirical research or scientific literature in support of this opinion.

16 **2. NO SAFE AMOUNT OF SSBs**

17 74. Dr. Kahn suggests that, because the warning does not specify the “unsafe” amount of
18 SSB consumption, consumers will be misled:

19 The Warning is vague and does not help consumers make better informed
20 purchasing decisions because it does not provide the consumer with accurate
21 information. It does not tell the consumer that they need to only consume the
22 amount of calories equal to or less than the calories they expend to prevent
weight gain, i.e., maintain a healthy weight. Instead, the Warning singles out
one source of calories as contributing to obesity and diabetes and does not
specify how much an individual needs to consume before the sugar-sweetened
beverage(s) will (if at all) contribute to obesity and diabetes.⁹³

23 The Warning also implies that there is no safe amount of sugar-sweetened
24 beverages that can be consumed, which is contrary to the views of many
scientists (including me) and organizations, including the U.S. Food and Drug

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26 ⁹⁰ Khan Report, ¶15.

27 ⁹¹ Khan Report, ¶15.

28 ⁹² Khan Report, ¶81.

29 ⁹³ Khan Report, ¶80.

Administration (“FDA”) and the most recent 2015-2020 Dietary Guidelines for Americans.⁹⁴

The Warning also misleadingly conveys that there is no safe amount of sugarsweetened beverages that can be consumed, which is contrary to the views of many scientists and organizations.⁹⁵

4 75. The SSB warning makes no reference to specific amounts, nor does it indicate that
5 there is “no safe amount” of SSB. As described in Section III, the SSB warning adheres to best
6 practices in its statements on the cause and health consequences of the product risk. There is no
7 evidence of which I am aware—and no evidence cited in the Kahn Report—to suggest that consumers
8 would understand the warning message to indicate that there is “no safe amount” of SSBs that can be
9 consumed. Indeed, I find this speculation to be highly implausible and inconsistent with research on
10 health warnings in other domains.”⁹⁶ The evidence from the experimental study of SSBs by Roberto et
11 al. demonstrates the same principle with respect to SSBs: many consumers continued to select SSBs
12 even in the presence of a health warning, which is inconsistent with the principle that individuals
13 would believe “there is no safe level”.⁹⁷

14 76. Overall, there is no evidence from domains with an established history of health
15 warnings that consumers interpret and understand warnings in the manner that Dr. Kahn speculates: it
16 is not plausible that the San Francisco SSB warning would be interpreted by consumers to indicate that
17 there is “no safe amount of sugars sweetened beverages that can be consumed.”⁹⁸

3. THE ABSENCE OF WARNING INFORMATION ON “LIFESTYLE” AND OTHER RISK FACTORS

20 77. Dr. Kahn states that the SSB warning is “scientifically misleading” and provides
21 “confusing information to consumers” because it does not address other risk factors associated with
22 obesity and diabetes:

⁹⁴ Khan Report, ¶15.

⁹⁵ Khan Report, ¶73.

⁹⁶1) Fishbein M. Consumer beliefs and behavior with respect to cigarette smoking: A critical analysis of the public literature. A Report prepared for the Federal Trade Commission. Federal Trade Commission; May 1977.

⁹⁷ Roberto CA, Wong D, Musicus A, Hammond D. The influence of sugar-sweetened beverage health warning labels on parents' choices. *Pediatrics*. 2016; pii: peds.2015-3185. [Epub ahead of print].

98 Khan Report ¶73

1 The Warning is scientifically misleading and provides confusing information to
2 consumers. The Warning implies that consuming beverages with added sugar
3 will always contribute to obesity and diabetes without any regard to the
4 consumer's overall dietary and exercise pattern, two factors which strongly
influence weight gain and related conditions. And even if one knows all of that
information, one cannot single out a specific food or beverage as the source of
calories that tipped the scale, which is what the Warning incorrectly signals to
consumers.⁹⁹

5 78. As noted in my response to the Golder Report in Section IV, it is neither necessary nor
6 appropriate for consumer product warnings to address risk factors not specific to the consumer
7 product. Indeed, doing so would violate the requirements be brief and concise to maximize
8 comprehension and information processing.

9 **B. THE HEALTH WARNING WILL CREATE CONFUSION ABOUT SUGAR
10 METABOLISM**

11 79. Dr. Kahn suggests that the warning is misleading because it implies how the body
12 metabolizes added and natural sugar differently:

13 the Warning implies that the body metabolizes added sugar differently – and
14 in a more harmful way – than natural sugar, which is biologically incorrect. The
15 human body does not distinguish between sugars found in a food and those
16 added to a food, or between sugar added to solid food and sugar added to a
17 beverage.¹⁰⁰

18 80. The SSB warning makes no mention of sugar metabolism. Based on my own research
19 on how consumers perceive health warnings and the hundreds of other studies in the area, I find it
highly implausible that the San Francisco message would lead to any implications regarding
differences in sugar metabolism.

20 **C. SUMMARY**

21 81. I have reviewed Dr. Kahn's CV and publication list and I have not identified any
22 research or areas of expertise related to risk communication or health warnings, or indeed any
23 empirical work whatsoever with respect to consumer perceptions. The lack of expertise is reflected in

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⁹⁹ Khan Report, ¶72.

28 ¹⁰⁰ Khan Report, ¶15.

1 the failure to cite any of the relevant literature on consumer perceptions or risk communication when
2 providing opinions on how individuals would perceive San Francisco's SSB warning.

3
4 *David Hammond.*
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7 David Hammond, Ph.D.
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