POLICY FORUM
How Should Global Tobacco Control Efforts Be Prioritized to Protect Children in Resource-Poor Regions?
Stella Aguinaga Bialous, DrPH and Yvette van der Eijk, PhD

Abstract
The tobacco industry’s aggressive marketing of tobacco products and electronic (e-)cigarettes is well documented. Yet existing restrictions on tobacco and e-cigarette marketing are poorly implemented in most low- and middle-income countries. Ongoing challenges include weak implementation and enforcement of some aspects of the WHO Framework Convention on Tobacco Control and a lack of consensus among health professionals on how to address the tobacco industry’s health claims related to e-cigarettes and other novel tobacco products. We argue that, despite these challenges, countries must prioritize the implementation and enforcement of restrictions on tobacco and e-cigarette marketing as these products represent not only a serious public health threat but also a violation of children’s rights.

Need for Tobacco Regulation
The WHO (World Health Organization) Framework Convention on Tobacco Control (FCTC) entered into force in 2005 and, as of July 2019, it had 181 parties. The FCTC lays out a number of demand- and supply-side measures to reduce tobacco use, including restrictions on direct and indirect tobacco marketing. Parties to the FCTC acknowledge that tobacco marketing, which comes in many forms (advertising, events sponsorships, promotions, point of sale displays, attractive packaging, innovative product designs, social media advertising) serves to encourage youth tobacco use. Indeed, the greatest impediment to FCTC implementation has been the tobacco industry, as its political influence and strategies have served to block, delay, or weaken tobacco marketing restrictions, particularly in low- and middle-income countries (LMICs).
The FCTC has had significant success in promoting tobacco control globally and in reducing the prevalence of tobacco use in several countries.\textsuperscript{1,5,6,7} The 2019 \textit{WHO Report on the Global Tobacco Epidemic: Offer Help to Quit Tobacco Use} estimates that the global prevalence of tobacco use declined from 22.5\% in 2007 to 19.2\% in 2017, with middle-income countries experiencing a lower rate of decline than high- and low-income countries.\textsuperscript{1} Data from the 2019 report also indicate that tobacco use among youth remains high and that electronic (e-)cigarette use among youth has increased. The report estimates that 24 million 13- to 15-year-old children smoke and 13 million use smokeless tobacco products.\textsuperscript{1}

As discussed below, an ongoing challenge in curbing youth tobacco and e-cigarette use is the marketing of these products to young people. Comprehensive bans on tobacco and e-cigarette marketing are lacking but are essential to protecting young people from nicotine addiction and serious health problems in later life.\textsuperscript{1,8} We argue that tobacco and e-cigarette marketing is a violation of fundamental \textit{children’s rights} and that, accordingly, LMICs should prioritize the implementation of comprehensive bans on tobacco and e-cigarette marketing.

**Circumventing Marketing Restrictions**

Although many LMICs have restricted tobacco advertising, others have yet to implement a comprehensive approach to tobacco marketing.\textsuperscript{1} Displays at the point of sale are still common, despite the abundance of evidence showing that point-of-sale tobacco displays serve as advertisements and encourage youth smoking.\textsuperscript{3,10,11} The tobacco industry continues to vigorously oppose proposed legislation that would ban such advertising, as observed recently in South Africa.\textsuperscript{12,13}

Social media and other internet sites are an increasingly popular tobacco marketing venue that has yet to be addressed by tobacco control policies.\textsuperscript{14,15} A recent study of teenage internet users in Java, Indonesia, found that 80\% were exposed to cigarette adverts on YouTube, 58\% on websites, and 57\% on social media platforms such as Instagram. Smoking prevalence of 10- to 18-year-olds in Indonesia has also increased from 7\% (in 2013) to 9\% (in 2018).\textsuperscript{16} Youth, who are more frequently exposed to online and social media advertising than older adults, are particularly vulnerable to this marketing strategy, which often presents no disclosures that social media posts—which portray smoking as a normal, glamorous social activity—are sponsored adverts.
At the eighth session of the Conference of the Parties to the WHO FCTC in October 2018, the parties decided to create a working group that would recommend measures that could be added to existing policies to support the implementation of marketing restrictions, specifically by addressing social media and other online channels. However, other obstacles to tobacco control remain.

The use of flavors and innovative design features, such as flavor capsules, are an ongoing challenge for tobacco control, although the parties to the FCTC continue to support regulation of novel tobacco and vaping products. Tobacco companies increasingly rely on the use of flavors and product design features for market appeal, as marketing mediums, such as mass media or product packaging, become less available to them. Research has consistently found that tobacco companies add flavors, particularly menthol, to cigarettes to make them more attractive and palatable to youth—and also more addictive. Capsule cigarettes, which contain a crushable flavor capsule in the cigarette filter, are a novelty that appeals primarily to youth. Since their global launch in 2007, capsule cigarettes have grown rapidly in popularity, especially in Latin American countries. Nonetheless, very few countries have banned tobacco additives and flavors or regulated product engineering to ensure that tobacco products are not designed to appeal to youth.

Underregulation of Novel Tobacco Products
There is a range of policies addressing new tobacco products such as e-cigarettes, including pod-based products and heated tobacco products. Existing regulatory policies range from a ban on sales (in 28 countries), to regulation of or a ban on marketing (in 67 countries), to minimum age of purchase policies (in 36 countries, where the minimum age ranges from 16 years in Belgium to 21 years in Honduras and Palau). Other countries have not implemented any regulations at all. In the United States, the unregulated entry of these products in the market led to a reversal of progress towards eliminating tobacco use among youth. In 2011, 15.8% of US high school students reported smoking cigarettes in the past 30 days; this proportion fell to 8.1% in 2018. However, the proportion of high schoolers using nicotine increased overall from 24.2% in 2011 to 27.1% in 2018, as the proportion using e-cigarettes increased from 1.5% to 20.8% during the same period.

The promotion of these novel products as a safer alternative to cigarettes has created a chasm in the public health community that has served the tobacco industry well. The Conference of the Parties to the WHO FCTC has
recommended a range of policy options, including a ban on such products.\textsuperscript{28} One unifying agreement is that these new products must, if allowed in the market, at minimum be regulated in a way that prevents their use by youth.

Although research shows that these products may cause significant harm,\textsuperscript{8,29} measures to restrict their being marketed to, and accessed by, youth, have been unsuccessful. For example, in the United States, sales of these products to minors is banned, but that has not been sufficient to deter their increasing use among adolescents.\textsuperscript{30} Similarly, Canada experienced an increase in vaping among youth from 8.4\% in 2017 to 14.6\% in 2018 after it allowed these products in the market, despite regulations banning sales to minors.\textsuperscript{31,32}

In a July 2019 statement, the CEO of one such company (JUUL, creator of a pod-based vaping product) stated that he was sorry that children were using JUUL, which controls over 70\% of the vaping market in the United States, and admitted that more research was needed to understand the health impacts of vaping.\textsuperscript{33,34} With the launch of JUUL in several other countries, including Indonesia, policy measures should be implemented urgently to regulate the marketing and sales of these novel tobacco products, especially to youth.

**Tobacco and E-Cigarette Marketing and Children’s Rights**

The FCTC is based on human rights principles, notably that all people, including children, have a right to the highest attainable standard of health.\textsuperscript{35} The role of tobacco control in realizing this right is increasingly recognized.\textsuperscript{35,36,37,38}

Children’s rights are articulated in the 1989 Convention on the Rights of the Child (CRC), which all countries (except the United States) have ratified.\textsuperscript{39} Several articles of the CRC should be called on to support enforcement of stricter tobacco control measures (see Table). According to Article 6 of the CRC, governments should ensure that children survive and develop healthily, and Article 24 states that children have a right to “the highest attainable standard of health.”\textsuperscript{39} Article 33 of the CRC states that children should be protected from the illegal use of harmful drugs.\textsuperscript{39}
Nicotine is a toxic and highly addictive drug, yet it is widely available and marketed to youth in contravention of the CRC. By allowing tobacco companies to market their products via point-of-sale displays, social media influencers, and flavors and other product novelties, governments are failing to protect children from illegally using and developing a lifelong addiction to a toxic product that, for many of them, will result in chronic diseases and premature death.

Article 36 of the CRC states that children should be protected from exploitative activities that harm their welfare, yet the tobacco industry’s marketing messages exploit children’s impressionability and desire to fit into the adult world by portraying smoking—and, more recently, vaping—as a normal, glamorous adult activity. Tobacco companies have acknowledged this intent in their own internal communications. In the words of a 1973 tobacco industry report: “The fragile, developing self-image of the young person needs all of the support and enhancement it can get ... this self-image enhancement effect has traditionally been a strong promotional theme for cigarette brands.”40 The tobacco industry’s marketing activities are a textbook example of child exploitation for a corporation’s financial gain, with devastating impacts on children’s health and overall welfare. Therefore, a state’s failure to adequately restrict tobacco marketing constitutes a failure to adequately protect fundamental children’s rights, particularly their right to health and their right to be protected from harmful drugs and exploitation.
Moving Forward
The 2019 *WHO Report on the Global Tobacco Epidemic* demonstrates that progress has been made in implementing the FCTC. However, significant gaps remain, particularly in protecting vulnerable youth from tobacco and e-cigarette marketing, including marketing of flavored products.

Several countries provide examples of a tobacco policy agenda that protects youth. Point-of-sale tobacco advertising is banned in several countries, and others—such as Iceland, Thailand, Belarus, the United Kingdom, and Australia—also ban the display of tobacco products at the point of sale. In these countries, the bans are estimated to have reduced overall adult daily smoking prevalence by 7%. Indonesia recently implemented a ban on online tobacco advertising, after finding that at least 141 platforms—including Facebook, YouTube, and Google—were showing cigarette adverts. Bans on tobacco flavors or on sales of products with flavors (including menthol) have been implemented in Canada and parts of the United States and will be implemented in Turkey and the European Union in 2020. Several countries, such as Brazil, Singapore, and Australia, have banned the sale and marketing of all e-cigarettes and heated tobacco products. Proper enforcement of such policy measures is pivotal for their success.

Additionally, countries should continue or enhance efforts to monitor and evaluate tobacco use among youth (following the example of more than 70 countries that already do so), as well as strengthen efforts to monitor tobacco industry strategies to circumvent regulations. For example, the current youth prevention programs promoted by the tobacco and vaping companies are as ineffective as previous tobacco industry-sponsored “youth smoking prevention” initiatives.

Conclusion
Countries without comprehensive tobacco regulation still have a window of opportunity to prevent their children from becoming victim to tobacco or e-cigarette use. Countries that have yet to ban tobacco displays and point-of-sales advertising, ban social media and other online tobacco marketing, ban all tobacco additives and flavors, and ban or strictly regulate access to e-cigarettes and heated tobacco products should do so. However, to achieve the goal of tobacco control, gaps in policy implementation will need to be addressed, and tobacco and e-cigarette marketing bans will need to be strictly enforced. Although these measures may appear restrictive, they are necessary not only to protect children’s health but also their fundamental
rights to health and to be protected from harmful drugs and exploitation. Countries are morally and legally obligated to fulfil these measures as parties to the FCTC as well as to the CRC.

References
1. World Health Organization. *WHO Report on the Global Tobacco Epidemic: Offer Help to Quit Tobacco Use.* Geneva, Switzerland: World Health Organization; 2019. [https://apps.who.int/iris/bitstream/handle/10665/326043/9789241516204-eng.pdf?ua=1](https://apps.who.int/iris/bitstream/handle/10665/326043/9789241516204-eng.pdf?ua=1). Accessed December 12, 2019.
2. Conference of the Parties to the WHO Framework Convention on Tobacco Control. Guidelines for implementation of Article 13 of the WHO Framework Convention on Tobacco Control (Tobacco advertising, promotion and sponsorship). [https://www.who.int/fctc/guidelines/article_13.pdf](https://www.who.int/fctc/guidelines/article_13.pdf). Accessed October 12, 2019.
3. Bialous SA. Impact of implementation of the WHO FCTC on the tobacco industry’s behaviour. *Tob Control.* 2019;28(suppl 2):S94-S96.
4. Gilmore AB, Fooks G, Drope J, Bialous SA, Jackson RR. Exposing and addressing tobacco industry conduct in low-income and middle-income countries. *Lancet.* 2015;385(9972):1029-1043.
5. Hiilamo H, Glantz S. FCTC followed by accelerated implementation of tobacco advertising bans. *Tob Control.* 2016;26(4):428-433.
6. Hiilamo H, Glantz SA. Implementation of effective cigarette health warning labels among low and middle income countries: state capacity, path-dependency and tobacco industry activity. *Soc Sci Med.* 2015;124:241-245.
7. Gravely S, Giovino G, Craig L, et al. Tobacco control and change in smoking prevalence in 126 countries: an association study. *Lancet.* 2015;385(9972):915.
8. Conference of the Parties to the WHO Framework Convention on Tobacco Control. Decision FCTC/COP8(22): novel and emerging tobacco products. [https://www.who.int/fctc/cop/sessions/cop8/FCTC__COP8(22).pdf](https://www.who.int/fctc/cop/sessions/cop8/FCTC__COP8(22).pdf). Published October 6, 2018. Accessed December 12, 2019.
9. World Health Organization Europe. Evidence brief: tobacco point-of-sale display bans. [http://www.euro.who.int/__data/assets/pdf_file/0005/339233/who-evidence-brief-pos-ban-eng.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/339233/who-evidence-brief-pos-ban-eng.pdf). Published 2017. Accessed December 12, 2019.
10. He Y, Shang C, Huang J, Cheng K, Chaloupka F. Global evidence on the effect of point-of-sale display bans on smoking prevalence. *Tob Control*. 2017;27(e2):e98–e104.

11. Campaign for Tobacco Free Kids. Tobacco advertising, sponsorship and promotion: point of sale tobacco product displays. [https://www.tobaccofreekids.org/assets/global/pdfs/en/APS_posDisplay_en.pdf](https://www.tobaccofreekids.org/assets/global/pdfs/en/APS_posDisplay_en.pdf). Published November 2013. Accessed July 25, 2019.

12. World Health Organization. Enforce bans on tobacco advertising, promotion and sponsorship. [https://www.who.int/tobacco/mpower/publications/en_tfi_mpower_brochure_e.pdf](https://www.who.int/tobacco/mpower/publications/en_tfi_mpower_brochure_e.pdf). Accessed October 12, 2019.

13. Gallet A. Big Tobacco’s anti-smoking stance deserves nothing but contempt. *Africa Times*. December 5, 2018. [https://africatimes.com/2018/12/05/big-tobaccos-anti-smoking-stance-deserves-nothing-but-contempt/](https://africatimes.com/2018/12/05/big-tobaccos-anti-smoking-stance-deserves-nothing-but-contempt/). Accessed October 12, 2019.

14. Kaplan S. Big Tobacco’s global reach on social media. *New York Times*. August 24, 2018. [https://www.nytimes.com/2018/08/24/health/tobacco-social-media-smoking.html](https://www.nytimes.com/2018/08/24/health/tobacco-social-media-smoking.html). Accessed on October 22, 2019.

15. Czaplicki L, Kostygina G, Kim Y, et al. Characterising JUUL-related posts on Instagram [published online ahead of print July 2, 2019]. *Tob Control*.

16. Cahya GH. Indonesia: government bans online cigarette adverts. Southeast Asia Tobacco Control Alliance. [https://seatca.org/indonesia-government-bans-online-cigarette-adverts/](https://seatca.org/indonesia-government-bans-online-cigarette-adverts/). Published June 14, 2019. Accessed December 12, 2019.

17. Conference of the Parties to the WHO Framework Convention on Tobacco Control. Decision FCTC/COP8(17): tobacco advertising, promotion and sponsorship: depiction of tobacco in entertainment media. [https://www.who.int/fctc/cop/sessions/cop8/FCTC__COP8(17).pdf?ua=1](https://www.who.int/fctc/cop/sessions/cop8/FCTC__COP8(17).pdf?ua=1). Published October 6, 2018. Accessed December 12, 2019.

18. Scollo M, Bayly M, White S, Lindorff K, Wakefield M. Tobacco product developments in the Australian market in the 4 years following plain packaging. *Tob Control*. 2018;27(5):580–584.

19. Kreslake J, Wayne G, Alpert H, Koh H, Connolly G. Tobacco industry control of menthol in cigarettes and targeting of adolescents and young adults. *Am J Public Health*. 2008;98(9):1685–1692.

20. WHO Study Group on Tobacco Product Regulation. Advisory note: banning menthol in tobacco products. Geneva, Switzerland: World
Health Organization; 2016. https://apps.who.int/iris/bitstream/handle/10665/205928/9789241510332_eng.pdf?sequence=1. Accessed December 12, 2019.

21. Abad-Vivero EN, Thrasher JF, Arillo-Santillán E, et al. Recall, appeal and willingness to try cigarettes with flavour capsules: assessing the impact of a tobacco product innovation among early adolescents. *Tob Control*. 2016;25(e2):e113–e119.

22. Thrasher JF, Abad-Vivero EN, Moodie C, et al. Cigarette brands with flavour capsules in the filter: trends in use and brand perceptions among smokers in the USA, Mexico and Australia, 2012–2014. *Tob Control*. 2016;25(3):275–283.

23. Hoek J, Gendall P, Eckert C, et al. Young adult susceptible non-smokers’ and smokers’ responses to capsule cigarettes. *Tob Control*. 2019;28(5):498–505.

24. Thrasher JF, Islam F, Barnoya J, Mejia R, Valenzuela MT, Chaloupka FJ. Market share for flavour capsule cigarettes is quickly growing, especially in Latin America. *Tob Control*. 2017;26(4):468–470.

25. Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health. Country laws regulating e-cigarettes: a policy scan. http://tobacco.cleartheair.org.hk/wp-content/uploads/2015/10/E-cigarette_scan_May2015FINAL.pdf. Published May 2015. Accessed December 12, 2019.

26. Centers for Disease Control and Prevention. Youth and tobacco use. https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm. Reviewed December 10, 2019. Accessed October 12, 2019.

27. Cullen KA, Ambrose BK, Gentzke AS, Apelberg BJ, Jamal A, King BA. Notes from the field: use of electronic cigarettes and any tobacco product among middle and high school students—United States, 2011–2018. *MMWR Morb Mortal Wkly Rep*. 2018;67(45):1276–1277.

28. WHO Framework Convention on Tobacco Control. The Convention Secretariat calls Parties to remain vigilant towards novel and emerging nicotine and tobacco products. https://www.who.int/fctc/mediacentre/news/2019/remain-vigilant-towards-novel-new-nicotine-tobacco-products/en/. Published September 13, 2019. Accessed October 12, 2019.

29. Conference of the Parties to the WHO Framework Convention on Tobacco Control. Electronic nicotine delivery systems and electronic non-nicotine delivery systems (ENDS/ENNDS). https://www.who.int/fctc/cop/cop7/FCTC_COP_7_11_EN.pdf. Published August 2016. Accessed December 12, 2019.
30. US Food and Drug Administration. Vaporizers, e-cigarettes, and other electronic nicotine delivery systems (ENDS). https://www.fda.gov/tobacco-products/products-ingredients-components/vaporizers-e-cigarettes-and-other-electronic-nicotine-delivery-systems-ends. Reviewed September 12, 2019. Accessed October 12, 2019.

31. Hammond D, Eid JL, Rynard VL, et al. Prevalence of vaping and smoking among adolescents in Canada, England, and the United States: repeat national cross sectional surveys. BMJ. 2019;365:i2219.

32. Government of Canada. Vaping product regulation. https://www.canada.ca/en/health-canada/services/smoking-tobacco/vaping/product-safety-regulation.html. Updated July 31, 2019. Accessed October 12, 2019.

33. Picchi A. Juul CEO to parents of kids who vape: “I’m sorry.” CBS News. July 15, 2019. https://www.cbsnews.com/news/juul-ceo-kevin-burns-tells-parents-of-kids-who-vape-im-sorry/. Accessed October 22, 2019.

34. Peterson H. “Don’t vape. Don’t use Juul”: Juul CEO issues stark warning to nonsmokers as he admits long-term effects of vaping are unknown. Business Insider. August 29, 2019. https://www.businessinsider.com/juul-ceo-dont-vape-long-term-effects-unknown-2019-8. Accessed October 22, 2019.

35. van der Eijk Y, Bialous SA, Glantz S. The tobacco industry and children’s rights. Pediatrics. 2018;141(5):e20174106.

36. van der Eijk Y, McDaniel P, Glantz S, Bialous S. United Nations Global Compact: an “inroad” into the UN and reputation boost for the tobacco industry. Tob Control. 2018(e1):e66-e69.

37. Cabrera O, Gostin L. Human rights and the Framework Convention on Tobacco Control: mutually reinforcing systems. Int J Law Context. 2011;7(3):285-303.

38. Dresler C, Lando H, Schneider N, Sehgal H. Human rights-based approach to tobacco control. Tob Control. 2012;21(2):208-211.

39. Human Rights Office of the High Commissioner, United Nations. Convention on the Rights of the Child. https://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx. Adopted November 20, 1989. Effective September 2, 1990. Accessed October 22, 2019.

40. Bates C, Rowell A. Tobacco explained: the truth about the tobacco industry ... in its own words. London, UK: Action on Smoking and Health; 2019.
41. Glantz SA, Gardiner P. Local movement to ban menthol tobacco products as a result of federal inaction. *JAMA Intern Med.* 2018;178(5):711-713.

42. Oliveira da Silva A, Bialous S, Albertassi P, et al. The taste of smoke: tobacco industry strategies to prevent the prohibition of additives in tobacco products in Brazil. *Tob Control.* 2019;28(e2):e92-e101.

43. Brooks-Pollock T. Menthol cigarettes banned by EU under stringent new tobacco laws. *Independent.* May 19, 2016. [https://www.independent.co.uk/news/uk/home-news/the-eu-is-banning-menthol-cigarettes-a7037346.html](https://www.independent.co.uk/news/uk/home-news/the-eu-is-banning-menthol-cigarettes-a7037346.html). Accessed December 13, 2019.

44. Tobacco Control Legal Consortium. How other countries regulate flavored tobacco products. [https://www.publichealthlawcenter.org/sites/default/files/resources/International-Restrictions-on-Flavored-Tobacco-2015.pdf](https://www.publichealthlawcenter.org/sites/default/files/resources/International-Restrictions-on-Flavored-Tobacco-2015.pdf). Published 2015. Accessed December 13, 2019.

45. World Health Organization. *WHO Report on the Global Tobacco Epidemic, 2017: Monitoring Tobacco Use and Prevention Policies.* Geneva, Switzerland: World Health Organization; 2017. [https://apps.who.int/iris/bitstream/handle/10665/255874/978924152824-eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/255874/978924152824-eng.pdf?sequence=1). Accessed September 20, 2017.

46. World Health Organization. Tobacco industry interference with tobacco control. Geneva, Switzerland: World Health Organization; 2008. [https://www.who.int/tobacco/resources/publications/9789241597340.pdf](https://www.who.int/tobacco/resources/publications/9789241597340.pdf). Accessed on October 22, 2019.

47. Centers for Disease Control and Prevention. Evidence brief: tobacco industry sponsored youth prevention programs in schools. [https://www.cdc.gov/tobacco/basic_information/youth/evidence-brief/index.htm](https://www.cdc.gov/tobacco/basic_information/youth/evidence-brief/index.htm). Reviewed June 25, 2019. Accessed October 12, 2019.

**Stella Aguinaga Bialous, DrPH** is a professor in the Department of Social and Behavioral Sciences at the University of California San Francisco (UCSF) School of Nursing. She is affiliated with UCSF’s Center for Tobacco Control Research and Education as well as the Helen Diller Family Comprehensive Cancer Center. She has more than 25 years of experience in tobacco control and has been involved with the World Health Organization Framework Convention on Tobacco Control since its early development.
Yvette van der Eijk, PhD is a senior research fellow at the National University of Singapore Saw Swee Hock School of Public Health and has a research background in global tobacco control and public health ethics. Her research is primarily focused on supporting tobacco policies in Singapore and the role of industries in propagating noncommunicable disease burdens in Singapore and Southeast Asia.

Citation
AMA J Ethics. 2020;22(2):E135-146.

DOI
10.1001/amajethics.2020.135.

Conflict of Interest Disclosure
Dr Bialous has served as a consultant to the Secretariat of the WHO Framework Convention on Tobacco Control and has presented in a public hearing in Brazil on that country’s regulation of electronic nicotine delivery devices. Dr van der Eijk had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.