

FDA, NIH, and other agencies must support research to increase reach and engagement in tobacco cessation interventions while also adopting comprehensive and integrated tobacco control policies that promote cessation to properly address health disparities among priority populations disproportionately impacted by smoking-related illness and death

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Advancing Smoking Cessation: FDA and NIH Priorities

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- 1. Because tobacco-related illness and death disproportionately impact certain population groups, FDA, NIH, and other agencies must prioritize advancing research that specifically supports increasing the reach of and access to tailored cessation programs while also increasing the reach of tobacco control policies that support cessation among priority populations to achieve health equity**

The burden of tobacco-related illness and death disproportionately impacts priority populations in the US including African Americans, American Indians/Alaska Natives (AI/AN), rural Americans, veterans, sexual and gender minorities,¹ people living with mental illness, people

¹ Lee JGL, DeMarco ME, Beymer MR, Shover CL, Bolan RK. Tobacco-Free Policies and Tobacco Cessation Systems at Health Centers Serving Lesbian, Gay, Bisexual, and Transgender Clients. *LGBT Health*. 2018 May/Jun;5(4):264-269. doi: 10.1089/lgbt.2017.0208. Epub 2018 Apr 16. PMID: 29658846; PMCID: PMC6913102.

with substance use disorders,^{2,3} people with criminal legal system involvement,^{4,5} and people living below the federal poverty line,^{6,7} including those facing deep poverty such as people experiencing homelessness.⁸

There are intersectional inequities in tobacco use and cessation among race and ethnic groups, as well as among those with mental health and substance use disorders. Compared to Non-Hispanic Whites, smoking rates are higher among those who identify as Non-Hispanic American Indian, Alaskan Native and White (24.4%), Non-Hispanic Asian and Black (34.8%), and Non-Hispanic American Indian (20.7%), Alaskan Native and Black (22.4%).⁹

Among people with criminal legal system involvement, 50% to 83% report current smoking, compared to 11.5% in the general population.¹⁰ Tobacco use rates among people with substance use disorders or any mental illness and criminal legal system involvement in the past year are between 60% and 80%.^{11,12} Mass incarceration is independently associated with current tobacco use; Black men and women are disproportionately impacted.^{13,14}

² Gudyish J, Wahleithner J, Williams D, Yip D. Tobacco-free grounds implementation in California residential substance use disorder (SUD) treatment programs. *J Addict Dis.* 2020 Jan-Mar;38(1):55-63. doi: 10.1080/10550887.2020.1713687. Epub 2020 Jan 25. PMID: 32186480.

³ Schroeder SA, Morris CD. Confronting a neglected epidemic: tobacco cessation for persons with mental illnesses and substance abuse problems. *Annu Rev Public Health.* 2010;31:297-314 1p following 314. doi: 10.1146/annurev.publhealth.012809.103701. PMID: 20001818.

⁴ Ahalt C, Buisker T, Myers J, Williams B. Smoking and Smoking Cessation Among Criminal Justice-Involved Older Adults. *Tob Use Insights.* 2019;12:1179173x19833357. doi:10.1177/1179173x19833357

⁵ Binswanger IA, Carson EA, Krueger PM, Mueller SR, Steiner JF, Sabol WJ. Prison tobacco control policies and deaths from smoking in United States prisons: population based retrospective analysis. *Bmj.* Aug 5 2014;349:g4542. doi:10.1136/bmj.g4542

⁶ Vijayaraghavan M, King BA. Advancing Housing and Health: Promoting Smoking Cessation in Permanent Supportive Housing. *Public Health Rep.* 2020 Jul/Aug;135(4):415-419. doi: 10.1177/0033354920922374. Epub 2020 Apr 30. PMID: 32353245; PMCID: PMC7383751.

⁷ Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. *Drug Alcohol Depend.* 2014 May 1;138:7-16. doi: 10.1016/j.drugalcdep.2014.03.001. Epub 2014 Mar 13. PMID: 24674707.

⁸ Vijayaraghavan M, Elser H, Frazer K, Lindson N, Apollonio D. Interventions to reduce tobacco use in people experiencing homelessness. *Cochrane Database Syst Rev.* Dec 3 2020;12:CD013413. doi:10.1002/14651858.CD013413.pub2

⁹ Dai, H. D., Subica, A., Mattingly, D. T., Harlow, A. & Leventhal, A. M. Association of Race-Ethnicity Intersection with Disparities in Cigarette Smoking in US Adults. *Nicotine Tob Res* (2024). <https://doi.org/10.1093/ntr/ntae041>

¹⁰ Binswanger IA, Carson EA, Krueger PM, Mueller SR, Steiner JF, Sabol WJ. Prison tobacco control policies and deaths from smoking in United States prisons: population based retrospective analysis. *Bmj.* Aug 5 2014;349:g4542. doi:10.1136/bmj.g4542

¹¹ Saloner B, Li W, Flores M, Progovac AM, Le Cook B. A Widening Divide: Cigarette Smoking Trends Among People With Substance Use Disorder And Criminal Legal Involvement. *Health Aff (Millwood).* Feb 2023;42(2):187-196. doi:10.1377/hlthaff.2022.00901

¹² Loretan CG, Wang TW, Watson CV, Jamal A. Disparities in Current Cigarette Smoking Among US Adults With Mental Health Conditions. *Prev Chronic Dis.* Dec 22 2022;19:E87. doi:10.5888/pcd19.220184

¹³ Bailey ZD, Okechukwu C, Kawachi I, Williams DR. Incarceration and Current Tobacco Smoking Among Black and Caribbean Black Americans in the National Survey of American Life. *Am J Public Health.* Nov 2015;105(11):2275-82. doi:10.2105/ajph.2015.302772

¹⁴ Woodard N, Butler J, Ghosh D, Green KM, Knott CL. The Association between State-Level Structural Racism and Alcohol and Tobacco Use Behaviors among a National Probability Sample of Black Americans. *Cancer*

Among those experiencing homelessness, tobacco prevalence is among the highest at 70%,¹⁵ which has substantial overlap with people with substance use disorders and serious mental illness. The population living with serious mental illness faces substantial socioeconomic disadvantage, with about 2.5 million living below the federal poverty line.^{16,17}

Sexual and gender minoritized populations in the US have more than doubled in the past decade, representing approximately 24 million people in the US.¹⁸ The prevalence of current cigarette use is higher among bisexual women (37.7%), lesbian women (31.7%), gay men (30.5%), and bisexual men (30.1%), compared to heterosexual women (16.6%) and heterosexual men (21.0%).¹⁹ The risk of tobacco use is heightened at the intersection of race, gender identity, and sexual minority status. Smoking risk is 21% higher among White, 55% higher among Black, 119% higher among Hispanic/Latinx, and 145% higher among multiracial/other race sexual minority women compared to White heterosexual women.²⁰ Transgender individuals are significantly more likely to report current use of any tobacco product (50.3% vs 23.5%) compared to cisgender counterparts.²¹

There are substantial tobacco-related health disparities among disproportionately impacted populations. Black men and women have a higher mortality rate for tobacco-related cancers, coronary heart disease, and stroke compared to white counterparts.²² Among AI/AN, lung cancer is 5.8% more common as compared to White counterparts. Sexual and gender minority populations have an increased risk of all-cause mortality, cardiovascular disease, and cancers in large part due to increased tobacco-related risk.^{23,24} Tobacco-related conditions are the leading

Epidemiol Biomarkers Prev. 2024 Feb 6;33(2):261-269. doi: 10.1158/1055-9965.EPI-23-0873. PMID: 38032218; PMCID: PMC10872984.

¹⁵ Vijayaraghavan M, Elser H, Frazer K, Lindson N, Apollonio D. Interventions to reduce tobacco use in people experiencing homelessness. *Cochrane Database Syst Rev*. Dec 3 2020;12:CD013413. doi:10.1002/14651858.CD013413.pub2

¹⁶ Serious Mental Illness Among Adults Below the Poverty Line. (n.d.). Retrieved April 12, 2022, from https://www.samhsa.gov/data/sites/default/files/report_2720/Spotlight-2720.html

¹⁷ Evins AE, Cather C, Maravic MC, Reyerling S, Pachas GN, Thorndike AN, Levy DE, Fung V, Fischer MA, Schnitzer K, Pratt S, Fetter MD, Deeb B, Potter K, Schoenfeld DA. A Pragmatic Cluster-Randomized Trial of Provider Education and Community Health Worker Support for Tobacco Cessation. *Psychiatr Serv*. 2023 Apr 1;74(4):365-373. doi: 10.1176/appi.ps.20220187. Epub 2022 Nov 9. PMID: 36349498.

¹⁸ Jones, J. M. U.S. LGBT Identification Steady at 7.2%. Gallup (2023). <https://doi.org/https://news.gallup.com/poll/470708/lgbt-identification-steady.aspx>

¹⁹ Li J, Berg CJ, Weber AA, Vu M, Nguyen J, Haardörfer R, Windle M, Goodman M, Escoffery C. Tobacco Use at the Intersection of Sex and Sexual Identity in the U.S., 2007-2020: A Meta-Analysis. *Am J Prev Med*. 2021 Mar;60(3):415-424. doi: 10.1016/j.amepre.2020.09.006. Epub 2020 Nov 17. PMID: 33218922.

²⁰ Schuler, M. S., Prince, D. M., Breslau, J. & Collins, R. L. Substance Use Disparities at the Intersection of Sexual Identity and Race/Ethnicity: Results from the 2015-2018 National Survey on Drug Use and Health. *LGBT Health* 7, 283-291 (2020). <https://doi.org/10.1089/lgbt.2019.0352>

²¹ Sawyer, A. N., Bono, R. S., Kaplan, B. & Breland, A. B. Nicotine/tobacco use disparities among transgender and gender diverse adults: Findings from wave 4 PATH data. *Drug Alcohol Depend* 232, 109268 (2022). <https://doi.org/10.1016/j.drugalcdep.2022.109268>

²² Jones, M. R., Joshi, C. E., Navas-Acien, A. & Platz, E. A. Racial/Ethnic Differences in Duration of Smoking Among Former Smokers in the National Health and Nutrition Examination Surveys. *Nicotine Tob Res* 20, 303-311 (2018). <https://doi.org/10.1093/ntr/ntw326>

²³ Caceres, B. A. et al. A Systematic Review of Cardiovascular Disease in Sexual Minorities. *Am J Public Health* 107, e13-e21 (2017). <https://doi.org/10.2105/AJPH.2016.303630>

²⁴ Helleberg, M. et al. Mortality attributable to smoking among HIV-1-infected individuals: a nationwide, population-based cohort study. *Clin Infect Dis* 56, 727-734 (2013). <https://doi.org/10.1093/cid/cis933>

causes of mortality among those with mental health and substance use disorders, and these rates are higher at the intersections of extreme poverty and criminal legal system involvement.^{25,26,27,28}

Some individuals smoke to alleviate the stress associated with living with structural, social, economic, and environmental inequities. Recognizing these health disparities and the stress associated as root causes of smoking must be an essential component of any culturally tailored cessation program and is essential to advance health equity.²⁹

FDA and NIH should expedite research, development, approval, and increased promotion of and access to cessation aids targeting the priority populations discussed above. **Cessation interventions must not only reach priority populations but must also resonate with the lived experiences of people who smoke and address the root causes of why people smoke.**

Some individuals smoke to alleviate stress associated with experiences living with social, economic, and environmental inequities. Cessation interventions should recognize the need to target stress as an underlying cause of smoking.³⁰ There is an urgent need for high-quality clinical trials that evaluate interventions that help people disconnect from and/or gain awareness of their stress, cravings, and tobacco use.^{31,32} Not only is there a need for such interventions but there is a need to rapidly integrate such approaches with standard cessation approaches to help people gain awareness about their smoking experience, which may benefit treatment-seeking people who smoke.³³

FDA must support community-based participatory research methods with culturally tailored interventions in conjunction with standard cessation approaches that include quitlines or provider-delivered behavioral counseling and pharmacotherapy. Culturally-tailored interventions with standard interventions may increase quitting more than standard

²⁵ Brown RT, Evans JL, Valle K, Guzman D, Chen YH, Kushel MB. Factors Associated With Mortality Among Homeless Older Adults in California: The HOPE HOME Study. *JAMA Intern Med.* Oct 1 2022;182(10):1052-1060. doi:10.1001/jamainternmed.2022.3697

²⁶ Baggett TP, Chang Y, Singer DE, et al. Tobacco-, alcohol-, and drug-attributable deaths and their contribution to mortality disparities in a cohort of homeless adults in Boston. *Am J Public Health.* Jun 2015;105(6):1189-97. doi:10.2105/AJPH.2014.302248

²⁷ Binswanger IA, Stern MF, Deyo RA, et al. Release from prison--a high risk of death for former inmates. *N Engl J Med.* Jan 11 2007;356(2):157-65.

²⁸ Aldridge RW, Story A, Hwang SW, et al. Morbidity and mortality in homeless individuals, prisoners, sex workers, and individuals with substance use disorders in high-income countries: a systematic review and meta-analysis. *Lancet.* Jan 20 2018;391(10117):241-250.

²⁹ Mills SD, Rosario C, Yerger VB, et al. Recommendations to advance equity in tobacco control. Tobacco Control, Published Online First: 19 December 2022. doi: 10.1136/tc-2022-057670

³⁰ Mills SD, Rosario C, Yerger VB, Kalb MD, Ribisl KM (2022). Advancing equity in tobacco control. *Journal Tobacco Control*, 0:1–8. doi:10.1136/tc-2022-057670

³¹ Sala M, Roos CR, Brewer JA, Garrison KA. Awareness, affect, and craving during smoking cessation: An experience sampling study. *Health Psychol.* 2021 Sep;40(9):578-586. doi: 10.1037/hea0001105. Epub 2021 Sep 27. PMID: 34570534; PMCID: PMC8629854.

³² Cancer Moonshot Initiative and AATCLC collaboration to promote the Spiral Up Lite App. Available at: <https://smokingcessationleadership.ucsf.edu/news/cancer-moonshot-initiative-and-aatclc-collaboration-promote-spiral-lite-app>. Retrieved on November 2, 2024.

³³ Mills SD, Rosario C, Yerger VB, Kalb MD, Ribisl KM (2022). Advancing equity in tobacco control. *Journal Tobacco Control*, 0:1–8. doi:10.1136/tc-2022-057670

interventions.³⁴ Culturally tailored interventions may include surface-level adaptations like delivering an intervention in different languages or deep-level adaptations that include context that may address specific risk factors or cultural norms for those communities.^{35,36}

Historical trauma and ethnic identity have deeply affected American Indian communities, contributing to smoking as a coping mechanism.³⁷ Generations of forced relocation, discrimination, and exclusion have limited educational and economic opportunities, increasing stress and trauma.^{38,39} For young AI adults, ethnic identity developed through exploring group membership, can protect against substance use and deepen awareness of historical trauma.^{40,41,42,43} While a strong cultural identity can buffer the harmful effects of discrimination, it can also amplify trauma linked to smoking and vaping risk.^{44,45} Therefore, cessation programs must emphasize the resilience of AI cultures while avoiding the reinforcement of helplessness associated with historical victimization.⁴⁶

³⁴ Leinberger-Jabari A, Golob MM, Lindson N, Hartmann-Boyce J. Effectiveness of culturally tailoring smoking cessation interventions for reducing or quitting combustible tobacco: A systematic review and meta-analyses. *Addiction*. 2024 Apr;119(4):629-648. doi: 10.1111/add.16400. Epub 2023 Dec 17. PMID: 38105395.

³⁵ Resnicow K, Soler R, Braithwaite RL, Ahluwalia JS, Butler J. Cultural sensitivity in substance use prevention. *J Community Psychol*. 2000; **28**(3): 271–290.

³⁶ Leinberger-Jabari A, Golob MM, Lindson N, Hartmann-Boyce J. Effectiveness of culturally tailoring smoking cessation interventions for reducing or quitting combustible tobacco: A systematic review and meta-analyses. *Addiction*. 2024 Apr;119(4):629-648. doi: 10.1111/add.16400. Epub 2023 Dec 17. PMID: 38105395.

³⁷ Soto C, Baezconde-Garbanati L, Schwartz SJ, Unger JB. Stressful life events, ethnic identity, historical trauma, and participation in cultural activities: Associations with smoking behaviors among American Indian adolescents in California. *Addictive Behaviors*. 2015 Nov 1;50:64–69.

³⁸ Hamby S, Schultz K, Elm J. Understanding the burden of trauma and victimization among American Indian and Alaska native elders: historical trauma as an element of poly-victimization. *J Trauma Dissociation*. 2020;21(2):172–186. PMID: 31752627

³⁹ Kirmayer LJ, Gone JP, Moses J. Rethinking historical trauma. *Transcult Psychiatry*. 2014 Jun;51(3):299–319. PMID: 24855142

⁴⁰ Soto C, Baezconde-Garbanati L, Schwartz SJ, Unger JB. Stressful life events, ethnic identity, historical trauma, and participation in cultural activities: Associations with smoking behaviors among American Indian adolescents in California. *Addict Behav*. 2015 Nov;50:64-9. doi: 10.1016/j.addbeh.2015.06.005. Epub 2015 Jun 9. PMID: 26103424; PMCID: PMC4515401.

⁴¹ Fu SS, Rhodes KL, Robert C, Widome R, Forster JL, Joseph AM. Designing and evaluating culturally specific smoking cessation interventions for American Indian communities. *Nicotine Tob Res*. 2014 Jan;16(1):42-9. doi: 10.1093/ntr/ntt111. Epub 2013 Jul 26. PMID: 23892826; PMCID: PMC7839929.

⁴² Smith SS, Rouse LM, Caskey M, Fossum J, Strickland R, Culhane JK, Waukau J. Culturally-Tailored Smoking Cessation for Adult American Indian Smokers: A Clinical Trial. *Couns Psychol*. 2014 Aug 1;42(6):852-886. doi: 10.1177/0011000014542601. Epub 2014 Jul 17. PMID: 26973352; PMCID: PMC4788464.

⁴³ Unger JB, Sussman S, Begay C, Moerner L, Soto C. Spirituality, Ethnic Identity, and Substance Use among American Indian/Alaska Native Adolescents in California. *Subst Use Misuse*. 2020;55(7):1194-1198. doi: 10.1080/10826084.2020.1720248. Epub 2020 Jan 30. PMID: 31996077; PMCID: PMC7453493.

⁴⁴ Smith SS, Rouse LM, Caskey M, Fossum J, Strickland R, Culhane JK, Waukau J. Culturally-Tailored Smoking Cessation for Adult American Indian Smokers: A Clinical Trial. *Couns Psychol*. 2014 Aug 1;42(6):852-886. doi: 10.1177/0011000014542601. Epub 2014 Jul 17. PMID: 26973352; PMCID: PMC4788464.

⁴⁵ Unger JB, Sussman S, Begay C, Moerner L, Soto C. Spirituality, Ethnic Identity, and Substance Use among American Indian/Alaska Native Adolescents in California. *Subst Use Misuse*. 2020;55(7):1194-1198. doi: 10.1080/10826084.2020.1720248. Epub 2020 Jan 30. PMID: 31996077; PMCID: PMC7453493.

⁴⁶ Woods C, Kim B, Guo K, Nyguen T, Taplayan S, Aronowitz T. Factors That Influence Substance Use Among American Indian/Alaskan Native Youth: A Systematic Mixed Studies Review. *J Am Psychiatr Nurses Assoc*. 2022;28(1):37–57. PMID: 34396829

Culturally tailored interventions delivered by navigators, peer support, health coaches, and community health workers that integrate lived experiences and social norms for those communities have been shown to be more effective than intervention not tailored to target communities.⁴⁷ Approaches may include messaging about family or including family in the delivery of cessation interventions in clinical and community-based settings.^{48,49} **Interventions that include lived experiences through peer-based interventions have shown to be particularly effective in populations with high rates of tobacco use and at the intersection of criminal legal system involvement, mental health and substance use, and extreme poverty.**^{50,51,52}

The disproportionate toll of tobacco-related burden on some subpopulation groups is a social injustice. Tobacco documents disclosing the social justice implications of predatorily promoted tobacco products could help those subpopulation groups quit smoking.⁵³ For example, African American smokers might be mobilized toward quitting after reviewing tobacco industry documents about racial targeting by the industry. It has also been shown that the use of tobacco documents revealing the tobacco industry's attempt to co-opt major African American leadership organizations and its pervasive marketing of menthol cigarettes in low-income African American communities may be an essential component of a culturally tailored cessation program.⁵⁴

FDA must promote multi-sectoral research that identifies approaches and best practices to integrate cessation services within systems and settings where priority populations engage. Using whole-person care approaches (i.e., a patient-centered approach to healthcare that

⁴⁷ Leinberger-Jabari A, Golob MM, Lindson N, Hartmann-Boyce J. Effectiveness of culturally tailoring smoking cessation interventions for reducing or quitting combustible tobacco: A systematic review and meta-analyses. *Addiction*. 2024 Apr;119(4):629-648. doi: 10.1111/add.16400. Epub 2023 Dec 17. PMID: 38105395.

⁴⁸ Daniel JA, Kim-Mozeleski JE, Poudel KC, Sun A, Burke NJ, Tsoh JY. Family Support and Readiness to Consider Smoking Cessation among Chinese and Vietnamese American Male Smokers. *J Smok Cessat*. 2021;2021:6678219. doi: 10.1155/2021/6678219. Epub 2021 May 8. PMID: 34178159; PMCID: PMC8232893.

⁴⁹ Tsoh JY, Burke NJ, Gildengorin G, Wong C, Le K, Nguyen A, Chan JL, Sun A, McPhee SJ, Nguyen TT. A Social Network Family-Focused Intervention to Promote Smoking Cessation in Chinese and Vietnamese American Male Smokers: A Feasibility Study. *Nicotine Tob Res*. 2015 Aug;17(8):1029-38. doi: 10.1093/ntr/ntv088. PMID: 26180229; PMCID: PMC4542845.

⁵⁰ Garver-Apgar CE, Morris CM, Pavlik J, Lenartz T, Hamm M. Peer-Facilitated Tobacco Cessation in a Prison Setting: A Proof of Concept Study. *Tob Use Insights*. 2023 Apr 6;16:1179173X231168511. doi: 10.1177/1179173X231168511. PMID: 37051590; PMCID: PMC10084529.

⁵¹ Ashford RD, Brown AM, Dorney G, McConnell N, Kunzelman J, McDaniel J, Curtis B. Reducing harm and promoting recovery through community-based mutual aid: Characterizing those who engage in a hybrid peer recovery community organization. *Addict Behav*. 2019 Nov;98:106037. doi: 10.1016/j.addbeh.2019.106037. Epub 2019 Jun 26. PMID: 31330467; PMCID: PMC6708724.

⁵² Pakhale S, Kaur T, Florence K, Rose T, Boyd R, Haddad J, Pettey D, Muckle W, Tyndall M. The Ottawa Citizen Engagement and Action Model (OCEAM): A Citizen engagement Strategy Operationalized Through The Participatory Research in Ottawa, Management and Point-of-care of Tobacco (PROMPT) Study: A Community Based Participatory Action Research Project in Inner City Ottawa. *Res Involv Engagem*. 2016 May 21;2:20. doi: 10.1186/s40900-016-0034-y. PMID: 29507759; PMCID: PMC5831885.

⁵³ Froelicher ES, Doolan D, Yerger VB, McGruder CO, Malone RE. Combining community participatory research with a randomized clinical trial: the Protecting the Hood Against Tobacco (PHAT) smoking cessation study. *Heart Lung*. 2010 Jan-Feb;39(1):50-63. doi: 10.1016/j.hrtlng.2009.06.004. Epub 2009 Jul 22. PMID: 20109986.

⁵⁴ Yerger VB, Daniel MR, Malone RE. Taking it to the streets: Responses of African American young adults to internal tobacco industry documents. *Nicotine Tob Res* 2005;7:163-72

considers their mental, physical, emotional and social health) through disease registries, there is a need for a systems-level quality improvement approach that increases coordination of tobacco treatment as people cycle in and out of mental health, medical, and institutional settings.^{55,56,57}

FDA must support intervention research that identifies best practices and approaches to integrate current systems of care, including community-based pharmacies, to increase the delivery of cessation services in rural and urban locales. Providing access to community-based pharmacies to provide cessation services and linking pharmacies to social services settings will increase access to cessation services for populations that are disconnected with medical care. Such approaches have been shown to reduce consumption and increase quit attempts among priority populations with high rates of tobacco use, mental health, substance use and extreme poverty.^{58,59,60,61}

A comprehensive approach to cessation recognizes not only that individuals should be encouraged to quit smoking using tailored and evidence-based strategies, but policies and programs that create new normalized environments where quitting smoking is easier and

⁵⁵ Chung K, Rafferty H, Suen LW, Vijayaraghavan M. System-Level Quality Improvement Initiatives for Tobacco Use in a Safety-Net Health System During the COVID-19 Pandemic. *J Prim Care Community Health*. 2022 Jan-Dec;13:21501319221107984. doi: 10.1177/21501319221107984. PMID: 35748431; PMCID: PMC9234926.

⁵⁶ Suen LW, Rafferty H, Le T, Chung K, Straus E, Chen E, Vijayaraghavan M. Factors associated with smoking cessation attempts in a public, safety-net primary care system. *Prev Med Rep*. 2022 Jan 19;26:101699. doi: 10.1016/j.pmedr.2022.101699. PMID: 35145838; PMCID: PMC8802046.

⁵⁷ Blonigen D, Hyde J, McInnes DK, Yoon J, Byrne T, Ngo T, Smelson D. Integrating data analytics, peer support, and whole health coaching to improve the health outcomes of homeless veterans: Study protocol for an effectiveness-implementation trial. *Contemp Clin Trials*. 2023 Feb;125:107065. doi: 10.1016/j.cct.2022.107065. Epub 2022 Dec 23. PMID: 36572239.

⁵⁸ Hartman-Filson M, Chen J, Lee P, Phan M, Apollonio DE, Kroon L, Donald F, Vijayaraghavan M. A community-based tobacco cessation program for individuals experiencing homelessness. *Addict Behav*. 2022 Jun;129:107282. doi: 10.1016/j.addbeh.2022.107282. Epub 2022 Feb 16. PMID: 35184003.

⁵⁹ De Los Reyes G, Ng A, Valencia Chavez J, Apollonio DE, Kroon L, Lee P, Vijayaraghavan M. Evaluation of a Pharmacist-Linked Smoking Cessation Intervention for Adults Experiencing Homelessness. *Subst Use Misuse*. 2023 Jul 3:1-9. doi: 10.1080/10826084.2023.2231060. Epub ahead of print. PMID: 37401115.

⁶⁰ Shen X, Bachyrycz A, Anderson JR, Tinker D, Raisch DW. Quitting patterns and predictors of success among participants in a tobacco cessation program provided by pharmacists in New Mexico. *J Manag Care Spec Pharm*. 2014 Jun;20(6):579-87. doi: 10.18553/jmcp.2014.20.6.579. PMID: 24856596.

⁶¹ Hudmon KS, Corelli RL, de Moor C, Zillich AJ, Fenlon C, Miles L, Prokhorov AV, Zbikowski SM. Outcomes of a randomized trial evaluating two approaches for promoting pharmacy-based referrals to the tobacco quitline. *J Am Pharm Assoc* (2003). 2018 Jul-Aug;58(4):387-394. doi: 10.1016/j.japh.2018.04.016. Epub 2018 May 18. PMID: 29779983; PMCID: PMC8838875.

acceptable are also essential.^{62,63,64} Policies that support cessation include state and local efforts to restrict or end tobacco sales.^{65,66} Federal media campaigns should be expanded and continuously funded at levels with high population exposure, as these campaigns increase cessation behavior, including to disparately affected focus population groups^{67,68,69,70} when they are sustained.⁷¹ Media campaigns should include communications tailored for priority populations, as such media campaigns have been shown to increase cessation in the general population.^{72,73}

There is strong evidence that tobacco treatment accompanied with smokefree policies in health care, social services, and behavioral health settings increase smoking cessation.⁷⁴ These policies with cessation supports have the greatest impact on increasing cessation behaviors among

⁶² Hafez AY, Gonzalez M, Kulik MC, Vijayaraghavan M, Glantz SA. Uneven Access to Smoke-Free Laws and Policies and Its Effect on Health Equity in the United States: 2000-2019. *Am J Public Health*. 2019 Nov;109(11):1568-1575. doi: 10.2105/AJPH.2019.305289. Epub 2019 Sep 19. PMID: 31536405; PMCID: PMC6775904.

⁶³ Vijayaraghavan M, Hartman-Filson M, Vyas P, Katyal T, Nguyen T, Handley MA. Multi-Level Influences of Smoke-Free Policies in Subsidized Housing: Applying the COM-B Model and Neighborhood Assessments to Inform Smoke-Free Policies. *Health Promot Pract*. 2023 May 20:15248399231174925. doi: 10.1177/15248399231174925. Epub ahead of print. PMID: 37209138.

⁶⁴ McCuistian C, Kapiteni K, Le T, Safier J, Delucchi K, Guydish J. Reducing tobacco use in substance use treatment: An intervention to promote tobacco-free grounds. *J Subst Abuse Treat*. 2022 Apr;135:108640. doi: 10.1016/j.jsat.2021.108640. Epub 2021 Oct 23. PMID: 34743925; PMCID: PMC8903046.

⁶⁵ Chapman S, Freeman B. Regulating the tobacco retail environment: beyond reducing sales to minors. *Tob Control*. 2009;18(6):496-501.

⁶⁶ Chaiton M, Dubray J, Guindon GE, Schwartz R. Tobacco Endgame Simulation Modelling: Assessing the Impact of Policy Changes on Smoking Prevalence in 2035. *Forecasting*. 2021; 3(2):267-275. <https://doi.org/10.3390/forecast3020017>

⁶⁷ Davis KC, Patel D, Shafer P, et al. Association Between Media Doses of the Tips From Former Smokers Campaign and Cessation Behaviors and Intentions to Quit Among Cigarette Smokers, 2012-2015. *Health Education & Behavior*. 2018;45(1):52-60. doi:10.1177/1090198117709316.

⁶⁸ McAfee T, Davis KC, Shafer P, et al. Increasing the dose of television advertising in a national antismoking media campaign: results from a randomised field trial. *Tobacco Control* 2017;26:19-2.

⁶⁹ Judith J Prochaska, PhD, MPH and others, The 2016 *Tips From Former Smokers*® Campaign: Associations With Quit Intentions and Quit Attempts Among Smokers With and Without Mental Health Conditions, *Nicotine & Tobacco Research*, Volume 21, Issue 5, May 2019, Pages 576–583,

⁷⁰ England L, Tong VT, Rockhill K, Hsia J, McAfee T, Patel D, Rupp K, Conrey EJ, Valdivieso C, Davis KC. Evaluation of a federally funded mass media campaign and smoking cessation in pregnant women: a population-based study in three states. *BMJ Open*. 2017 Dec 19;7(12):e016826. doi: 10.1136/bmjopen-2017-016826. PMID: 29259054; PMCID: PMC5778314.

⁷¹ Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behaviour. *Lancet* 2010;376(9748):1261–71. Durkin S, Brennan E, Wakefield M. Mass media campaigns to promote smoking cessation among adults: an integrative review. *Tobacco Control* 2012;21:127-138.

⁷² Durkin SJ, Brennan E, Wakefield MA. Optimising tobacco control campaigns within a changing media landscape and among priority populations. *Tob Control*. 2022 Mar;31(2):284-290. doi: 10.1136/tobaccocontrol-2021-056558. PMID: 35241601.

⁷³ Davis KC, Patel D, Shafer P, et al. Association Between Media Doses of the Tips From Former Smokers Campaign and Cessation Behaviors and Intentions to Quit Among Cigarette Smokers, 2012-2015. *Health Education & Behavior*. 2018;45(1):52-60.

⁷⁴ Hopkins DP, Razi S, Leeks KD, Priva Kalra G, Chattopadhyay SK, Soler RE, et al. Task Force on Community Preventive Services. Smoke-Free Policies to Reduce Tobacco Use: A Systematic Review. *American Journal of Preventive Medicine* 2010;38(2 Suppl):S275–89.

patients in hospitals,⁷⁵ residents in shelters,⁷⁶ subsidized housing,^{77,78} or residential drug treatment programs,^{79,80} and justice-involved individuals in correctional systems and reentry programs.⁸¹

Comprehensive and integrated tobacco control policies aimed at social equity,⁸² such as eliminating the sales and manufacturing of menthol⁸³ and other flavored tobacco products, provide powerful cessation opportunities for people who disproportionately use these products.⁸⁴ These policies are particularly relevant to priority populations living below the federal poverty line,^{85,86} those who identify as racial/ethnic or sexual gender minorities,⁸⁷ and

⁷⁵ Frazer K, McHugh J, Callinan JE, Kelleher C. Impact of institutional smoking bans on reducing harms and secondhand smoke exposure. *Cochrane Database Syst Rev*. 2016 May 27;2016(5):CD011856. doi: 10.1002/14651858.CD011856.pub2. PMID: 27230795; PMCID: PMC10164285.

⁷⁶ Martinez J, Jafry MZ, Chen TA, Businelle MS, Kendzor DE, Britton M, Vijayaraghavan M, Reitzel LR. Guest Support for Outdoor Smoke-Free Policies within a Homeless Shelter. *Int J Environ Res Public Health*. 2022 Feb 19;19(4):2408. doi: 10.3390/ijerph19042408. PMID: 35206595; PMCID: PMC8872137.

⁷⁷ Durazo A, Hartman-Filson M, Perez K, Alizaga NM, Petersen AB, Vijayaraghavan M. Smoke-Free Home Intervention in Permanent Supportive Housing: A Multifaceted Intervention Pilot. *Nicotine Tob Res*. 2021 Jan 7;23(1):63-70. doi: 10.1093/ntr/ntaa043. PMID: 32123908; PMCID: PMC7789947.

⁷⁸ Vijayaraghavan M, Benmarhnia T, Pierce JP, White MM, Kempster J, Shi Y, Trinidad DR, Messer K. Income disparities in smoking cessation and the diffusion of smoke-free homes among U.S. smokers: Results from two longitudinal surveys. *PLoS One*. 2018 Jul 27;13(7):e0201467. doi: 10.1371/journal.pone.0201467. Erratum in: *PLoS One*. 2018 Nov 21;13(11):e0208153. PMID: 30052671; PMCID: PMC6063424.

⁷⁹ McCuistian C, Kapiteni K, Le T, Safier J, Delucchi K, Guydish J. Reducing tobacco use in substance use treatment: An intervention to promote tobacco-free grounds. *J Subst Abuse Treat*. 2022 Apr;135:108640. doi: 10.1016/j.jsat.2021.108640. Epub 2021 Oct 23. PMID: 34743925; PMCID: PMC8903046.

⁸⁰ Marynak K, VanFrank B, Tetlow S, Mahoney M, Phillips E, Jamal Mbbs A, Schecter A, Tipperman D, Babb S. Tobacco Cessation Interventions and Smoke-Free Policies in Mental Health and Substance Abuse Treatment Facilities - United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2018 May 11;67(18):519-523. doi: 10.15585/mmwr.mm6718a3.

⁸¹ Saloner B, Li W, Flores M, Progovac AM, Lê Cook B. A Widening Divide: Cigarette Smoking Trends Among People With Substance Use Disorder And Criminal Legal Involvement. *Health Aff (Millwood)*. 2023 Feb;42(2):187-196. doi: 10.1377/hlthaff.2022.00901. PMID: 36745833; PMCID: PMC10157835.

⁸² Mills SD, Rosario C, Yерger VB, Kalb MD, Ribisl KM. Recommendations to advance equity in tobacco control. *Tob Control*. 2022 Dec 19;tc-2022-057670. doi: 10.1136/tc-2022-057670. Epub ahead of print. PMID: 36535756; PMCID: PMC10277310.

⁸³ Yерger V. What more evidence is needed? Remove menthol cigarettes from the marketplace-now. *Tob Control*. 2022 Jul;31(4):493-494. doi: 10.1136/tobaccocontrol-2021-056988. Epub 2021 Sep 16. PMID: 34535506.

⁸⁴ Froelicher ES, Doolan D, Yерger VB, McGruder CO, Malone RE. Combining community participatory research with a randomized clinical trial: the Protecting the Hood Against Tobacco (PHAT) smoking cessation study. *Heart Lung*. 2010 Jan-Feb;39(1):50-63. doi: 10.1016/j.hrtlng.2009.06.004. Epub 2009 Jul 22. PMID: 20109986.

⁸⁵ Vijayaraghavan M, King BA. Advancing Housing and Health: Promoting Smoking Cessation in Permanent Supportive Housing. *Public Health Rep*. 2020 Jul/Aug;135(4):415-419. doi: 10.1177/0033354920922374. Epub 2020 Apr 30. PMID: 32353245; PMCID: PMC7383751.

⁸⁶ Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. *Drug Alcohol Depend*. 2014 May 1;138:7-16. doi: 10.1016/j.drugalcdep.2014.03.001. Epub 2014 Mar 13. PMID: 24674707.

⁸⁷ Lee JGL, DeMarco ME, Beymer MR, Shover CL, Bolan RK. Tobacco-Free Policies and Tobacco Cessation Systems at Health Centers Serving Lesbian, Gay, Bisexual, and Transgender Clients. *LGBT Health*. 2018 May/Jun;5(4):264-269. doi: 10.1089/lgbt.2017.0208. Epub 2018 Apr 16. PMID: 29658846; PMCID: PMC6913102.

those with mental health and/or substance use disorders⁸⁸ where tobacco use is concentrated and contributes substantially to increased morbidity and mortality. **A coordinated and integrated approach that includes cessation-focused tobacco control policies with access to evidence-based cessation services could substantially reduce the tobacco-related burden in these populations.**

2. Cessation interventions tailored for African Americans should take into account the tobacco industry's deliberate and pervasive targeting of menthol products to this population.

The tobacco industry targeted African American communities with intensive and pervasive marketing campaigns to popularize menthol cigarettes.^{89, 90, 91} These efforts were successful, and African Americans who smoke cigarettes are more likely to smoke menthol cigarettes than people of other races or ethnicities who smoke.⁹² In a 2023 study of US adults, 73% of African American smokers used menthols, compared to 21% of White smokers.⁹³ A 2020 study found that 85% of African American adults who smoked used menthol.⁹⁴ Between 1980-2018, 1.5 million African Americans began smoking menthol cigarettes and as a consequence, 157,000 African Americans died prematurely of smoking-related harms.⁹⁵

Although people who use menthol cigarettes are more likely to make quit attempts than those who smoke non-menthol cigarettes, they are less successful at staying quit.⁹⁶ Quit success in the past 5 years was even worse among menthol-smoking African Americans.⁹⁶ This underscores the need for cessation programs targeted to African Americans who smoke menthol tobacco and who have the most difficulty quitting including public education and enhanced access to free smoking cessation services and products.

⁸⁸ Guydish J, Wahleithner J, Williams D, Yip D. Tobacco-free grounds implementation in California residential substance use disorder (SUD) treatment programs. *J Addict Dis.* 2020 Jan-Mar;38(1):55-63. doi: 10.1080/10550887.2020.1713687. Epub 2020 Jan 25. PMID: 32186480.

⁸⁹ Wailoo K. *Pushing cool: big tobacco, racial marketing, and the untold story of the menthol cigarette.* University of Chicago Press; 2021 Nov 2.

⁹⁰ Anderson SJ. Marketing of menthol cigarettes and consumer perceptions: a review of tobacco industry documents. *Tob Control.* 2011;20(Suppl2):ii20-ii28.

⁹¹ Advertising Created & Continues to Drive the Menthol Tobacco Market: Methods Used by the Industry to Target Youth, Women, & Black Americans. Jackler RK, Ramamurthi D, Willett J, Chau C, Muoneke M, Zeng A, Chang M, Chang E, Bahk JR, Ramakrishnan A. *SRITA Research Paper.* October 4, 2022.

⁹² Substance Abuse and Mental Health Services Administration. *National Survey on Drug Use and Health, 2019.* Substance Abuse & Mental Health Data Archive; 2019. Accessed November 2, 2023. <https://www.samhsa.gov/data/report/2019-nsduh-annual-national-report>

⁹³ Cheng YJ, Tsai J, Cornelius ME, Mahoney M, Neff LJ. Sociodemographic and Temporal Differences in Menthol Cigarette Use Among US Adults Who Smoke, 1999–2018. *Prev Chronic Dis* 2023;21:230291. DOI: <http://dx.doi.org/10.5888/pcd21.230291>

⁹⁴ Delnevo CD, Ganz O, Goodwin RD. Banning Menthol Cigarettes: A Social Justice Issue Long Overdue. *Nicotine Tob Res.* 2020 Oct 8;22(10):1673-1675. doi: 10.1093/ntr/ntaa152. PMID: 33030210; PMCID: PMC7542641.

⁹⁵ Mendez D, Le TTT. Consequences of a match made in hell: the harm caused by menthol smoking to the African American population over 1980–2018. *Tob Control.* 2022;31:569–571.

⁹⁶ Levy DT, Blackman K, Tauras J, et al. Quit attempts and quit rates among menthol and nonmenthol smokers in the United States. *Am J Public Health.* 2011;101(7):1241–1247.

Cessation education and services should be addressed every time a tobacco policy is introduced or implemented, and policies should be considered an opportunity to increase cessation behaviors. A comprehensive approach to supporting tobacco cessation should include coordination with and strong support for the FDA to remove menthol and its analogs as an additive from all commercial tobacco products (FDA's proposed rule would remove menthol as a characterizing flavor from cigarettes and cigars, but not from e-cigarettes). Policies such as menthol and flavored tobacco prohibitions significantly increase cessation.⁹⁷ Based on the impact of the menthol ban in Canada, the projected number of people who smoke who would quit after a US menthol ban would be 790,000 individuals who smoke daily (including 200,000 African Americans) and 1,340,000 individuals who smoke daily or non-daily (including 381,000 African Americans).^{98,99} **Implementation of such a policy should be strongly supported, and implementation should be accompanied by cessation promotion campaigns as well as barrier-free access to cessation services. A strong tobacco control policy with widespread access to cessation services reinforces each other to create an environment that strongly supports cessation and mitigates the risk of relapse to tobacco use.**

FDA/NIH must also support research that identifies effective approaches to increase implementation and enforcement of policies restricting menthol and flavored tobacco products. Such implementation and enforcement approaches are especially necessary for priority populations where local implementation of a flavor ban had minimal effects in reducing the use of menthol tobacco products or increasing cessation.¹⁰⁰ These findings call for a need for the FDA to support regional and national policies that restrict menthol and flavored tobacco and research that identifies effective implementation and enforcement approaches that restrict access and availability of menthol-based tobacco products. The implementation and enforcement of strong tobacco control policies that restrict menthol and flavored tobacco are likely to support cessation.

3. FDA, NIH, and other agencies must address the significant and unmet need for cessation treatments for people living with moderate and severe mental illness and substance use disorders.

People living with severe mental illnesses include those living with schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder, and some trauma and stress disorders. Individuals with severe mental illness are more likely to experience higher nicotine

⁹⁷ Fong GT, Chung-Hall J, Meng G, Craig LV, Thompson ME, Quah ACK, Cummings KM, Hyland A, O'Connor RJ, Levy DT, Delnevo CD, Ganz O, Eissenberg T, Soule EK, Schwartz R, Cohen JE, Chaiton MO. Impact of Canada's menthol cigarette ban on quitting among menthol smokers: pooled analysis of pre-post evaluation from the ITC Project and the Ontario Menthol Ban Study and projections of impact in the USA. *Tob Control*. 2022 Apr 28:tobaccocontrol-2021-057227.

⁹⁸ Fong GT, Chung-Hall J, Meng G, Craig LV, Thompson ME, Quah ACK, Cummings KM, Hyland A, O'Connor RJ, Levy DT, Delnevo CD, Ganz O, Eissenberg T, Soule EK, Schwartz R, Cohen JE, Chaiton MO. Impact of Canada's menthol cigarette ban on quitting among menthol smokers: pooled analysis of pre-post evaluation from the

⁹⁹ ITC Project and the Ontario Menthol Ban Study and projections of impact in the USA. *Tob Control*. 2022 Apr 28:tobaccocontrol-2021-057227. doi: 10.1136/tobaccocontrol-2021-057227.

¹⁰⁰ Guydish JR, Straus ER, Le T, Gubner N, Delucchi KL. Menthol cigarette use in substance use disorder treatment before and after implementation of a county-wide flavoured tobacco ban. *Tob Control*. 2021 Nov;30(6):616-622. doi: 10.1136/tobaccocontrol-2020-056000. Epub 2020 Nov 11. PMID: 33177211; PMCID: PMC8110613.

dependence and their smoking is associated with significant morbidity and premature mortality in comparison to individuals without mental illnesses.^{101, 102}

Many people who smoke who have severe mental illness desire to quit smoking, and are interested in engaging with cessation services,¹⁰³ but few are offered advice or treatments with demonstrated effectiveness.¹⁰¹ Long-term quit rates among this population are lower than in individuals without mental health illnesses and they are less likely to receive the support they require compared to individuals who smoke without mental health conditions.^{102, 104} Behavioral counseling and pharmacotherapy, although found to be effective among people with mental illness, remain underutilized among adults with serious mental illness.¹⁰⁵

Studies have shown a general reticence among healthcare providers because of the concern that smoking may be used as a coping mechanism and misperceptions around medications being contraindicated for people with mental illness and serious mental illness, and providers' lack of training in providing tobacco treatment.^{106,107} Interventions that increase training and education of healthcare providers to provide behavioral counseling and pharmacotherapy—particularly the use of varenicline—with community health workers showed increased abstinence at 2-year follow-up among people with severe mental illness, compared to only provider education or usual care.¹⁰⁸ These and other studies that show that people with severe mental illness do not have worsening psychiatric symptoms or quality of life should reduce reticence among providers to address smoking cessation.¹⁰⁹

¹⁰¹ Evins, A. Eden. Integrated Smoking Cessation Treatment for Smokers with Serious Mental Illnesses, Massachusetts, 2017-2020. Inter-university Consortium for Political and Social Research [distributor], 2024-10-03. <https://doi.org/10.3886/ICPSR39152.v1>

¹⁰² Huddleston L, Shoesmith E, Pervin J, Stevens R, Gilbody S, Ratschen E. Effectiveness and experience of implementing digital interventions to promote smoking cessation among adults with severe mental illness: A systematic review and meta-analysis. *Nicotine and Tobacco Research*. 2024 Oct 9;ntae237.

¹⁰³ Travaglini LE, Li L, Brown CH, Bennett ME. Predictors of smoking cessation group treatment engagement among veterans with serious mental illness. *Addict Behav*. 2017 Dec;75:103-107. doi: 10.1016/j.addbeh.2017.07.005. Epub 2017 Jul 10. PMID: 28728038; PMCID: PMC5616105.

¹⁰⁴ Siru R, Hulse GK, Tait RJ. Assessing motivation to quit smoking in people with mental illness: a review. *Addiction*. 2009 May;104(5):719-33.

¹⁰⁵ White SA, Stone E, Murphy KA, Daumit GL, McGinty EE. Smoking Cessation Medication Prescribing for Smokers With and Without Mental Illness. *Psychiatr Serv*. 2023 Apr 1;74(4):332-340. doi: 10.1176/appi.ps.202100690. Epub 2022 Nov 9. PMID: 36349496; PMCID: PMC10066821.

¹⁰⁶ White SA, Stone E, Murphy KA, Daumit GL, McGinty EE. Smoking Cessation Medication Prescribing for Smokers With and Without Mental Illness. *Psychiatr Serv*. 2023 Apr 1;74(4):332-340. doi: 10.1176/appi.ps.202100690. Epub 2022 Nov 9. PMID: 36349496; PMCID: PMC10066821.

¹⁰⁷ Siegel SD, Laurenceau JP, Hill N, et al: Assessing barriers to providing tobacco use disorder treatment in community mental health settings with a revised version of the Smoking Knowledge, Attitudes, and Practices (S-KAP) instrument. *Addict Behav* 2021; 114:106735

¹⁰⁸ Evins AE, Cather C, Maravic MC, Reyerling S, Pachas GN, Thorndike AN, Levy DE, Fung V, Fischer MA, Schnitzer K, Pratt S, Feters MD, Deeb B, Potter K, Schoenfeld DA. A Pragmatic Cluster-Randomized Trial of Provider Education and Community Health Worker Support for Tobacco Cessation. *Psychiatr Serv*. 2023 Apr 1;74(4):365-373. doi: 10.1176/appi.ps.20220187. Epub 2022 Nov 9. PMID: 36349498.

¹⁰⁹ Brady DJ, Phalen PL, Roche DJO, Cowan T, Bennett ME. A reduction in cigarette smoking improves health-related quality of life and does not worsen psychiatric symptoms in individuals with serious mental illness. *Addict Behav*. 2024 Apr;151:107949. doi: 10.1016/j.addbeh.2023.107949. Epub 2023 Dec 26. PMID: 38176326; PMCID: PMC10863476.

FDA must promote intervention research specific to populations living with serious mental illness. These studies should assess increased engagement with standard cessation services including varenicline, which historically has had lower use among people with serious mental illness. **Additionally, there is a need for novel approaches that capitalize on social connectivity, reduce social isolation, and improve physical activity as additional support to reduce cravings and withdrawal symptoms, which are part of the process of smoking cessation.**^{110,111,112}

Cessation programs are especially needed for people living with substance use disorders. Standard treatments need to be integrated into all mental health and substance use treatment facilities where rates of screening and treatment of tobacco use is low.¹¹³ In 2016, among mental health treatment facilities, only 48% reported screening for tobacco use, and even fewer offered counseling (27%), nicotine replacement therapy (25%), and only 48% offered tobacco-free grounds.¹¹⁴ Among substance use treatment facilities, 64% reported screening for tobacco use, 47% offered counseling, 26% offered NRT, and 35% had tobacco-free grounds.¹¹⁵ Providing training and support for substance use treatment facilities to integrate tobacco treatment was associated with reduced smoking prevalence and an increase in the use of pharmacotherapy,¹¹⁶ and should be encouraged. **FDA/NIH must support research that identifies new approaches to increase implementation of tobacco-free grounds and tobacco cessation treatment and to address institutional barriers to addressing tobacco use in these environments.**

Several treatments show promise for people with co-occurring substance use disorders, particularly substances that are highly co-prevalent with tobacco use. Contingency management has been shown to be highly effective in the treatment of substance use disorders and tobacco use

¹¹⁰ Leutwyler H, Hubbard E, Humfleet G, Souza R, Balestra D, Wallhagen M. The Whole Package: A Multi-Component Smoking Cessation Intervention for Adults With Serious Mental Illness: A Qualitative Study. *Tob Use Insights*. 2024 May 21;17:1179173X241253229. doi: 10.1177/1179173X241253229. PMID: 38779493; PMCID: PMC11110503.

¹¹¹ Meza BPL, Pollack CE, Tilchin C, Jennings JM, Latkin CA, Cather C, Dickerson F, Evins AE, Wang NY, Daumit GL, Yuan C, Gudzone KA. Social networks of people with serious mental illness who smoke: potential role in a smoking cessation intervention. *J Ment Health*. 2024 Apr 8;1-10. doi: 10.1080/09638237.2024.2332807. Epub ahead of print. PMID: 38588708; PMCID: PMC11458813.

¹¹² Leutwyler, H., Hubbard, E., Bussell, T., Balestra, D., Cooper, B., Souza, R., and Humfleet, G. "A pilot randomized controlled trial of a multi-component smoking cessation intervention for adults with serious mental illness", *Games for Health*, 2024, In press.

¹¹³ Marynak K, VanFrank B, Tetlow S, Mahoney M, Phillips E, Jamal Mbbs A, Schecter A, Tipperman D, Babb S. Tobacco Cessation Interventions and Smoke-Free Policies in Mental Health and Substance Abuse Treatment Facilities - United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2018 May 11;67(18):519-523. doi: 10.15585/mmwr.mm6718a3. PMID: 29746451; PMCID: PMC5944973.

¹¹⁴ Marynak K, VanFrank B, Tetlow S, Mahoney M, Phillips E, Jamal Mbbs A, Schecter A, Tipperman D, Babb S. Tobacco Cessation Interventions and Smoke-Free Policies in Mental Health and Substance Abuse Treatment Facilities - United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2018 May 11;67(18):519-523. doi: 10.15585/mmwr.mm6718a3. PMID: 29746451; PMCID: PMC5944973.

¹¹⁵ Marynak K, VanFrank B, Tetlow S, Mahoney M, Phillips E, Jamal Mbbs A, Schecter A, Tipperman D, Babb S. Tobacco Cessation Interventions and Smoke-Free Policies in Mental Health and Substance Abuse Treatment Facilities - United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2018 May 11;67(18):519-523. doi: 10.15585/mmwr.mm6718a3. PMID: 29746451; PMCID: PMC5944973.

¹¹⁶ McCuistian C, Lisha NE, Campbell B, Cheng C, Le J, Guydish J. Reducing tobacco use in substance use treatment: The California tobacco free initiative. *Addict Behav*. 2024 Aug;155:108025. doi: 10.1016/j.addbeh.2024.108025. Epub 2024 Mar 30. PMID: 38593596.

disorders, particularly in populations like pregnant women and mothers of young children and among those experiencing homelessness and with other substance use disorders like alcohol use and methamphetamine use which are highly linked with tobacco use.¹¹⁷ The VA health system has a highly successful contingency management disseminated across 100 VA hospitals that has reached many thousands of veterans for substance use treatment.¹¹⁸ **There is a significant opportunity to integrate contingency management for substance use treatment with that of tobacco use, particularly populations at the intersections of extreme poverty and substance use.**

The FDA and NIH must prioritize research that addresses: (a) dissemination and implementation of contingency management approaches with standard cessation care for disproportionately impacted populations including those in community mental health and substance use clinics, homeless services, and re-entry programs serving adults experiencing incarceration; (b) the use of contingency management not only for cessation abstinence but also for reduction outcomes and treatment engagement in priority populations, (c) the use of digital technologies to provide cash transfers for people living in rural areas, for American Indian and Alaskan Native populations, and for individuals who otherwise would not want to seek or engage in clinical care for substance use treatment.^{119,120}

People living with mental illnesses and substance use disorders are disproportionately impacted by smoking-related morbidity and mortality. To reduce these health disparities and advance health equity, FDA, NIH, and other agencies should support research and focus resources on developing cessation treatments and programs for these populations.

4. Research on cessation treatments for sexual and gender minorities.

LGBTQ+ individuals have higher rates of tobacco use compared to heterosexual, cisgender individuals,¹²¹ and smoking prevalence among LGBTQ+ youth and young adults is alarmingly high compared to their non-LGBTQ+ peers.¹²² LGBTQ+ individuals have a higher prevalence of

¹¹⁷ Higgins ST. Behavior change, health, and health disparities 2023: Contingency management for treating substance use disorders and promoting health in vulnerable populations. *Prev Med.* 2023 Nov;176:107746. doi: 10.1016/j.ypmed.2023.107746. Epub 2023 Oct 26. PMID: 37898183.

¹¹⁸ DePhilippis D, Khazanov G, Christofferson DE, Wesley CW, Burden JL, Liberto J, McKay JR. History and current status of contingency management programs in the Department of Veterans Affairs. *Prev Med.* 2023 Nov;176:107704. doi: 10.1016/j.ypmed.2023.107704. Epub 2023 Sep 17. PMID: 37717740.

¹¹⁹ Hirschak KA, Echo-Hawk H, Parent S, Peavy KM, Webb K, Bajet K, Richardson M, Granbois A, Herron JL, Catron K, King K, Parsells E, Freese TE, Thomas LR, Rawson R, Clark HW, Roll J, McDonnell MG. The urgent need for contingency management among Tribal communities in the United States: Considerations for implementation, policy, and sovereignty. *Prev Med.* 2023 Nov;176:107662. doi: 10.1016/j.ypmed.2023.107662. Epub 2023 Aug 11. PMID: 37573952; PMCID: PMC10840817.

¹²⁰ Higgins ST. Behavior change, health, and health disparities 2023: Contingency management for treating substance use disorders and promoting health in vulnerable populations. *Prev Med.* 2023 Nov;176:107746. doi: 10.1016/j.ypmed.2023.107746. Epub 2023 Oct 26. PMID: 37898183.

¹²¹ Cornelius ME, Loretan CG, Jamal A, et al. Tobacco Product Use Among Adults - United States, 2021. *MMWR Morb Mortal Wkly Rep.* 2023;72(18):475-483. doi:10.15585/mmwr.mm7218a1

¹²² Baskerville NB, Dash D, Shuh A, Wong K, Abramowicz A, Yessis J, Kennedy RD. Tobacco use cessation interventions for lesbian, gay, bisexual, transgender and queer youth and young adults: a scoping review. *Preventive medicine reports.* 2017 Jun 1;6:53-62.

mental health and substance use disorders compared to their heterosexual counterparts.^{123,124,125} The minority stress model attributes these disparities to the excess stress stemming from experiences of discrimination,^{126,127} victimization (particularly during childhood),¹²⁸ and psychological distress, which may be associated with increased use of tobacco and substance co-use.

Because of the disproportionate impact of the disproportionately high rates of tobacco use among LGBTQA+ adults, young adults, and youth and the associated health impacts, FDA, NIH, and other agencies must develop cessation programs targeting this population. **LGBTQ+ individuals have emphasized the importance of tailoring smoking cessation interventions to meet their needs.**¹²⁹ LGBTQ+-tailored interventions should include participants and counselors who identify with LGBTQ+ identities, focus on centering lived experiences, take place in LGBTQ+-safe spaces, and encourage connections among LGBTQ+ individuals.¹³⁰ While studies have shown that tailored and non-tailored interventions may have similar cessation outcomes, tailored interventions are more accessible, acceptable, and are preferred by LGBTQ+ individuals.^{131,132} Tailoring interventions can also focus on anti-smoking messaging that targets young adult, cisgender and transgender, sexual minority women.¹³³ Tailored anti-smoking messages were associated with increase quit intentions, and decreased intent to purchase cigarettes, marketing receptivity, pro-industry attitudes among this population. Moreover, tailored messaging that

¹²³ Abrahao, A. B. B. et al. The impact of discrimination on substance use disorders among sexual minorities. *Int Rev Psychiatry* 34, 423-431 (2022). <https://doi.org/10.1080/09540261.2022.2094223>

¹²⁴ Meyer, I. H. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull* 129, 674-697 (2003). <https://doi.org/10.1037/0033-2909.129.5.674>

¹²⁵ Evans-Polce, R. J., Kcomt, L., Veliz, P. T., Boyd, C. J. & McCabe, S. E. Alcohol, Tobacco, and Comorbid Psychiatric Disorders and Associations With Sexual Identity and Stress-Related Correlates. *Am J Psychiatry* 177, 1073-1081 (2020). <https://doi.org/10.1176/appi.ajp.2020.20010005>

¹²⁶ McCabe, S. E., Bostwick, W. B., Hughes, T. L., West, B. T. & Boyd, C. J. The relationship between discrimination and substance use disorders among lesbian, gay, and bisexual adults in the United States. *Am J Public Health* 100, 1946-1952 (2010). <https://doi.org/10.2105/AJPH.2009.163147>

¹²⁷ McCabe, S. E. et al. Sexual Orientation Discrimination and Tobacco Use Disparities in the United States. *Nicotine Tob Res* 21, 523-531 (2019). <https://doi.org/10.1093/ntr/ntx283>

¹²⁸ Hughes, T., McCabe, S. E., Wilsnack, S. C., West, B. T. & Boyd, C. J. Victimization and substance use disorders in a national sample of heterosexual and sexual minority women and men. *Addiction* 105, 2130-2140 (2010). <https://doi.org/10.1111/j.1360-0443.2010.03088.x>

¹²⁹ Bruce Baskerville, N. et al. A qualitative study of tobacco interventions for LGBTQ+ youth and young adults: overarching themes and key learnings. *BMC Public Health* 18, 155 (2018). <https://doi.org/10.1186/s12889-018-5050-4>

¹³⁰ Bruce Baskerville, N. et al. A qualitative study of tobacco interventions for LGBTQ+ youth and young adults: overarching themes and key learnings. *BMC Public Health* 18, 155 (2018). <https://doi.org/10.1186/s12889-018-5050-4>

¹³¹ McQuoid, J. et al. Tobacco Cessation and Prevention Interventions for Sexual and/or Gender Minority-Identified People and the Theories That Underpin Them: A Scoping Review. *Nicotine Tob Res* 25, 1065-1073 (2023). <https://doi.org/10.1093/ntr/ntad018>

¹³² Matthews, A. K. et al. Evaluation of a Randomized Clinical Trial Comparing the Effectiveness of a Culturally Targeted and Nontargeted Smoking Cessation Intervention for Lesbian, Gay, Bisexual, and Transgender Smokers. *Nicotine Tob Res* 21, 1506-1516 (2019). <https://doi.org/10.1093/ntr/nty184>

¹³³ Tan ASL, Chen JT, Keen R, Scout N, Gordon B, Applegate J, Machado A, Hanby E, Liu S, Zulkiewicz B, Ramanadhan S, Obedin-Maliver J, Lunn MR, Viswanath K, Potter J. Culturally Tailored Anti-Smoking Messages: A Randomized Trial With U.S. Sexual Minority Young Women. *Am J Prev Med*. 2024 May;66(5):840-849. doi: 10.1016/j.amepre.2023.12.001. Epub 2023 Dec 7. PMID: 38065403; PMCID: PMC11034759.

influences young adult sexual minority women's beliefs and attitudes towards the tobacco industry mediated quit intentions in this population.¹³⁴

Given the high rates of poly-tobacco and nicotine product use and dual use of nicotine-containing products with other substances, including alcohol and cannabis, there is a need for interventions that target multiple substance use among LGBTQ+ individuals and that utilize frameworks that integrate multiple substance use practices.^{135,136,137,138} These interventions must not only focus on individual-level behavior change but must also integrate place, context, and policy as root causes of inequities that drive tobacco use and cessation practices in LGBTQ+ populations. **Such interventions are especially needed for youth and young adult populations where there is a high prevalence of co-use behaviors.**^{139,140}

5. Cessation trials that include approaches to increase reach, engagement with cessation treatment, and cessation behaviors in priority populations must measure longitudinal cessation outcomes, as well as characterize the trajectories of cessation behaviors.

Smoking cessation clinical trials rely on the gold standard of self-reported abstinence with biochemical verification at a 3- or 6-month timepoint following treatment initiation or end of treatment.¹⁴¹ All currently approved FDA cessation products have shown greater quit rates maintained for at least four weeks, starting at 6 weeks, compared to placebo. NRT has been shown to be superior to placebo for up to 6 months and varenicline for up to one year.¹⁴² A methodological study suggests that relying on only one measure of abstinence as the primary indicator of the success of a cessation intervention neglects that abstinence may take place at

¹³⁴ Zulkiewicz, B., Chen, J.T., Hanby, E.P. *et al.* Anti-industry beliefs and attitudes mediate the effect of culturally tailored anti-smoking messages on quit intentions among sexual minority women. *Sci Rep* **14**, 28084 (2024). <https://doi.org/10.1038/s41598-024-78207-7>

¹³⁵ Nguyen N, McQuoid J, Neilands TB, et al. Same-day use of cigarettes, alcohol, and cannabis among sexual minority and heterosexual young adult smokers. *Psychol Addict Behav* 2021;35(2):215-23. doi: 10.1037/adb0000678 [published Online First: 2020/08/18]

¹³⁶ Dermody SS, Marshal MP, Cheong J, et al. Adolescent Sexual Minority Girls Are at Elevated Risk for Use of Multiple Substances. *Subst Use Misuse* 2016;51(5):574-85. doi: 10.3109/10826084.2015.1126743

¹³⁷ Dermody SS. Risk of polysubstance use among sexual minority and heterosexual youth. *Drug Alcohol Depend* 2018;192:38-44. doi: 10.1016/j.drugalcdep.2018.07.030

¹³⁸ Hequembourg AL, Blayney JA, Bostwick W, et al. Concurrent daily alcohol and tobacco use among sexual minority and heterosexual women. *Subst Use Misuse* 2020;55(1):66-78. doi: 10.1080/10826084.2019.1656252

¹³⁹ Kecojevic A, Jun H-J, Reisner SL, et al. Concurrent polysubstance use in a longitudinal study of US youth: associations with sexual orientation. *Addiction* 2017;112(4):614-24. doi: <https://doi.org/10.1111/add.13681>

¹⁴⁰ McQuoid J, Keamy-Minor E, Ling P. A Practice Theory Approach to Understanding Poly-Tobacco Use in the United States. *Crit Public Health* 2020;30(2):204-19. doi: 10.1080/09581596.2018.1541226 [published Online First: 2020/09/29]

¹⁴¹ George Kypriotakis, Steven L Bernstein, Krysten W Bold, James D Dziura, Donald Hedeker, Robin J Mermelstein, Andrea H Weinberger, An Introduction and Practical Guide to Strategies for Analyzing Longitudinal Data in Clinical Trials of Smoking Cessation Treatment: Beyond Dichotomous Point-Prevalence Outcomes, *Nicotine & Tobacco Research*, Volume 26, Issue 7, July 2024, Pages 796–805, <https://doi.org/10.1093/ntr/ntae005>

¹⁴² US Department of Health and Human Services. Smoking Cessation. A Report of the Surgeon General. Atlanta, GA: US 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 2020.

different times during the study period.¹⁴³ Moreover, **there is a need for research that explores trajectories of quitting behaviors to understand the conditions and psychological predictors that might be linked with successful cessation or relapse to smoking.** For example, among adults enrolled in a clinical trial of behavioral counseling and pharmacotherapy, negative affect, craving and composite withdrawal symptoms during treatment engagement for smoking cessation was associated with an increase risk of subsequent relapse.¹⁴⁴ In another study of treatment-seeking adults who smoke, two other psychological metrics that were linked with abstinence was self-efficacy to quit and perceived control over withdrawal symptoms.¹⁴⁵ In another study of treatment seeking adults, participants who were abstinent at 6-months follow-up had lower craving and withdrawal symptoms, and were more likely to rely on substitute activities or environmental reinforcers that mitigated risk of relapse.¹⁴⁶ Other mechanistic outcomes that may influence smoking cessation, including negative beliefs about cravings and ruminations around smoking that may be linked with negative affect, may also influence cessation experiences.¹⁴⁷

Cessation trials for priority populations should consider multiple measures of abstinence, use of multiple tobacco products, and behavioral measures linked with quitting success or relapse to smoking. Abstinence outcomes measures must determine ahead of time whether the definition of abstinence includes abstinence from all tobacco products, including noncombustible and alternative tobacco products, or abstinence from all combustible tobacco products but “allowing” use of noncombustible and alternative products, or abstinence from all combustible and smokeless products but “allowing” use of alternative tobacco products.¹⁴⁸ **Cessation trials must, at minimum, measure abstinence from all tobacco products, with enough data collected to assess abstinence from combustible, non-combustible and alternative tobacco products including e-cigarettes.** Given the increased health risks associated with dual use of

¹⁴³ George Kyriotakis, Steven L Bernstein, Krysten W Bold, James D Dziura, Donald Hedeker, Robin J Mermelstein, Andrea H Weinberger, An Introduction and Practical Guide to Strategies for Analyzing Longitudinal Data in Clinical Trials of Smoking Cessation Treatment: Beyond Dichotomous Point-Prevalence Outcomes, *Nicotine & Tobacco Research*, Volume 26, Issue 7, July 2024, Pages 796–805, <https://doi.org/10.1093/ntr/ntae005>

¹⁴⁴ Robinson JD, Li L, Chen M, Lerman C, Tyndale RF, Schnoll RA, Hawk LW, George TP, Benowitz NL, Cinciripini PM. Evaluating the temporal relationships between withdrawal symptoms and smoking relapse. *Psychol Addict Behav*. 2019 Mar;33(2):105-116. doi: 10.1037/adb0000434. Epub 2019 Jan 7. PMID: 30614717; PMCID: PMC6405298.

¹⁴⁵ Schnoll RA, Martinez E, Tatum KL, Glass M, Bernath A, Ferris D, Reynolds P. Increased self-efficacy to quit and perceived control over withdrawal symptoms predict smoking cessation following nicotine dependence treatment. *Addict Behav*. 2011 Jan-Feb;36(1-2):144-7. doi: 10.1016/j.addbeh.2010.08.024. Epub 2010 Sep 24. PMID: 20869812; PMCID: PMC2981675.

¹⁴⁶ Schnoll RA, Hitsman B, Blazekovic S, Veluz-Wilkins A, Wileyto EP, Leone FT, Audrain-McGovern JE. Longitudinal changes in smoking abstinence symptoms and alternative reinforcers predict long-term smoking cessation outcomes. *Drug Alcohol Depend*. 2016 Aug 1;165:245-52. doi: 10.1016/j.drugalcdep.2016.06.017. Epub 2016 Jun 25. PMID: 27372219; PMCID: PMC4943211.

¹⁴⁷ Nosen E, Woody SR. Acceptance of cravings: how smoking cessation experiences affect craving beliefs. *Behav Res Ther*. 2014 Aug;59:71-81. doi: 10.1016/j.brat.2014.05.003. Epub 2014 Jun 12. PMID: 25014920.

¹⁴⁸ Piper ME, Bullen C, Krishnan-Sarin S, Rigotti NA, Steinberg ML, Streck JM, Joseph AM. Defining and Measuring Abstinence in Clinical Trials of Smoking Cessation Interventions: An Updated Review. *Nicotine Tob Res*. 2020 Jun 12;22(7):1098-1106. doi: 10.1093/ntr/ntz110. PMID: 31271211; PMCID: PMC9633719.

cigarettes and e-cigarettes **compared to just smoking**,¹⁴⁹ sustained dual use of both cigarettes and e-cigarettes should not be an acceptable clinical trial outcome.

Abstinence outcome measures must include point prevalence abstinence measures that are either 7-day or 30-day and capture at least a 24-hour intention to quit smoking. While ideally outcomes should be biochemically verified using carbon monoxide assessment or cotinine assessments, it is important to recognize that biochemical verification may not be feasible for some priority populations or contexts.¹⁵⁰ **To the extent possible, abstinence outcomes should also include an extended abstinence measure that includes prolonged abstinence measures that include a grace period and lapses in smoking or repeated point prevalence abstinence measures that reflect the realities of quitting smoking.**

6. Cessation products and programs must be developed for youth, and youth must be included in clinical studies using appropriate safeguards.

Although data from the 2024 National Youth Tobacco Survey (NYTS)¹⁵¹ on youth tobacco use show a decline in current use of any tobacco product, 2.25 million middle and high school students reported current use of any tobacco product. The decline of youth e-cigarette use from 2.13 million youth in 2023 to 1.63 million youth in 2024 was hailed by FDA as a great success in preventing e-cigarette use;¹⁵² however, it appears that youth e-cigarette users may have migrated to nicotine pouch use, which has become the second most common currently used tobacco products, with nearly one million (890,000) youth who reported ever using nicotine pouches and 480,000 reporting current use of nicotine pouches in 2024. The current use of nicotine pouches overall increased from 1.5% (400,000 students) in 2023 to 1.8% in 2024, the only category that saw an increase in use. Of these current youth nicotine pouch users, 22.4% reported using nicotine pouches daily, and 29.3% reported using nicotine pouches at least 20 of the last 30 days. While 380,000 youth (1.4%) reported current cigarette use, double this number (760,000 youth, 2.8%) reported current use of any combustible tobacco product, and 840,000 (3.0%) reported current use of multiple tobacco products.¹⁵¹

The NYTS data demonstrated alarming racial and ethnic disparities, with 31.7% of American Indian or Alaska Native (AI/AN) youth reporting ever using any tobacco product as compared with 19.0% ever use among all youth, 22.5% using e-cigarettes (14.0% all youth), 11.2% cigarettes (5.8% all), 6.1% cigars (3.9% all), 91% nicotine pouches (3.5% all), 6.0% other oral

¹⁴⁹ Glantz SA, Nguyen N, Oliveira da Silva AL. Population-Based Disease Odds for E-Cigarettes and Dual Use versus Cigarettes. *NEJM Evid.* 2024 Mar;3(3):EVIDoA2300229. doi: 10.1056/EVIDoA2300229. Epub 2024 Feb 27. PMID: 38411454.

¹⁵⁰ Piper ME, Bullen C, Krishnan-Sarin S, Rigotti NA, Steinberg ML, Streck JM, Joseph AM. Defining and Measuring Abstinence in Clinical Trials of Smoking Cessation Interventions: An Updated Review. *Nicotine Tob Res.* 2020 Jun 12;22(7):1098-1106. doi: 10.1093/ntr/ntz110. PMID: 31271211; PMCID: PMC9633719.

¹⁵¹ Jamal A, Park-Lee E, Birdsey J, et al. Tobacco Product Use Among Middle and High School Students — National Youth Tobacco Survey, United States, 2024. *MMWR Morb Mortal Wkly Rep* 2024;73:917–924. DOI: <http://dx.doi.org/10.15585/mmwr.mm7341a2>

¹⁵² US Food & Drug Administration, FDA News Release, Youth E-Cigarette Use Drops to Lowest Level in a Decade, September 05, 2024. Available: <https://www.fda.gov/news-events/press-announcements/youth-e-cigarette-use-drops-lowest-level-decade>

nicotine products (3.1% all), 7.7% smokeless tobacco (2.9% all), 4.4% hookah (2.4% all), 3.9% heated tobacco products (1.6% all) 4.8% pipe tobacco (1.5% all), 16.4% any combustible tobacco product (9.4% all), and 17.2% multiple tobacco products (8.6% all).¹⁵¹ The 2024 NYTS data provide sufficient evidence that too many youth are regularly using one or more addictive nicotine products and need help quitting.

Many youth report symptoms of nicotine dependence and seek support for cessation.¹⁵³ Adolescents who use e-cigarettes are at risk for nicotine addiction, toxicant exposure, and transitioning to cigarettes; however, there are few interventions dedicated specifically to youth vaping cessation.¹⁵⁴ In addition to assessing interest in quitting and quit attempts among adolescents in general, it is important to research quitting among groups that experience tobacco-related health disparities, including sociodemographic minorities and individuals with mental health symptoms.¹⁵⁴

For example, in a 2023 cross-sectional study that aimed to investigate vaping behavior and quit attempts among university students who use e-cigarettes in which 31.3% of participants identified as Hispanic, there was a higher likelihood of prior vaping experience and a higher number of quit attempts in the last year (4.36 quit attempts among Hispanics vs 3.15 among Whites).¹⁵⁵

A 2024 study investigating factors associated with intentions to quit vaping and quit attempts among adolescents¹⁵⁶ found that risk perceptions of vaping was a protective factor for quit intentions, and risk factors for quit intentions included e-cigarette marketing, dual use of e-cigarettes and other tobacco products, vaping due to feeling anxious or stressed, vaping for nicotine buzz, nicotine dependence, and identifying as Gay or Lesbian, bisexual, or Hispanic. Similar associations were observed with quit attempts except that e-cigarette marketing, vaping due to feeling anxious or stressed, vaping dependence, and identifying as Hispanic were not significant. The paper concluded that developing tailored vaping cessation programs could enhance quit success.¹⁵⁶

The rise in nicotine pouch use among youth is especially concerning. They are discreet, smokeless, and come in flavors that are especially appealing to youth, and they have been aggressively promoted to youth using influencers and social media channels. Nicotine pouches are sold to underage youth online and are available in various strengths of nicotine that exceed doses in approved nicotine replacement therapies (e.g. 2mg or 4 mg nicotine gum or lozenges).

¹⁵³ Sanchez S, Kaufman P, Pelletier H, Baskerville B, Feng P, O'Connor S, Schwartz R, Chaiton M. Is vaping cessation like smoking cessation? A qualitative study exploring the responses of youth and young adults who vape e-cigarettes. *Addictive Behaviors*. 2021 Feb 1;113:106687.

¹⁵⁴ Smith TT, Nahhas GJ, Carpenter MJ, Squeglia LM, Diaz VA, Leventhal AM, Dahne J. Intention to quit vaping among United States adolescents. *JAMA pediatrics*. 2021 Jan 1;175(1):97-9.

¹⁵⁵ Roh T, Fields S, Sahu R, Trisha NF, Carrillo G. Vaping Behavior and Intention to Quit among Undergraduate Students in a Hispanic-Serving University. *J Community Health*. 2024 Oct;49(5):820-828. doi: 10.1007/s10900-024-01364-3. Epub 2024 May 18. PMID: 38762685.

¹⁵⁶ Ma H, Daisy Dai H. Factors associated with intentions to quit vaping and quit attempts among Adolescents: A structural equation modeling approach. *Addict Behav*. 2024 Oct;157:108074. doi: 10.1016/j.addbeh.2024.108074. Epub 2024 May 24. PMID: 38852380.

For example, ZYN pouches come in 3 or 6 mg/pouch,¹⁵⁷ and FRE are sold in strengths of 6, 9, 12, and 15 mg per pouch.¹⁵⁸ Because nicotine pouches are relatively new in the US (Zyn entered the US market in 2014), their short- and long-term health consequences of using nicotine pouches are not clear. However, nicotine is highly addictive, and the flavors in nicotine pouches may increase their appeal, while their alkaline agents may increase delivery of nicotine, especially among youth.¹⁵⁹ Highly addictive nicotine pouches can prime the brain for addiction to other substances, can harm the developing adolescent brain, and is toxic to developing fetuses.¹⁵⁹ Increased impulsivity and ADHD-type cognitive impacts are also associated with nicotine's impact on the developing adolescent brain.¹⁶⁰

Nicotine pouches are aggressively marketed to youth and the meteoric rise in nicotine pouch sales and use among underage youth mimics the explosion in e-cigarette use after Juul's aggressive marketing tactics targeting youth. To address the health impacts associated with a new generation of addicted, young nicotine pouch users, FDA, NIH, and other federal agencies must develop cessation programs to help people quit nicotine pouches.

In developing youth cessation programs, FDA should include research that specifically investigates impacts on youth, so long as strict protocols are set and enforced to ensure scientific integrity and protect youth.¹⁶¹ Empirical evidence related to harm perceptions, product appeal, and the addictive potential of nicotine products among youth must be collected. This evidence should be provided to FDA by tobacco companies in their premarket tobacco product and modified risk tobacco product applications; however, the FDA must ensure that the evidence is objective, reliable, and protected from industry influence and follow specific safeguards. Research on adolescent perceptions as they relate to intentions to use and actual use patterns is essential.¹⁶¹

There is potential for electronic channels including social media platforms and peer support for youth vaping cessation interventions. In 2022, over 95% of adolescents had smartphones, and 97% reported using the internet daily.¹⁶² Adolescent and young adults were most interested in electronic channels to assist with e-cigarette cessation,¹⁶³ and in 2020, 48.4% young adults

¹⁵⁷ <https://nicokick.com/us/nicotine-pouches/zyn>

¹⁵⁸ https://frepouch.com/collections/nicotine-pouches?gad_source=1&gclid=Cj0KCQiA_qG5BhDTARIsAA0UHSLNfOIA-ZGJp_Ge9bJsMDNxR9xjP-0zTiStlcHPNgByWHuM3HBhl4saAvStEALw_wcB

¹⁵⁹ Stanfill S, Tran H, Tyx R, Fernandez C, Zhu W, Marynak K, King B, Valentín-Blasini L, Blount BC, Watson C. Characterization of Total and Unprotonated (Free) Nicotine Content of Nicotine Pouch Products. *Nicotine Tob Res.* 2021 Aug 18;23(9):1590-1596. doi: 10.1093/ntr/ntab030. PMID: 34233354.

¹⁶⁰ Winickoff JP, Evins AE, Levy S. Vaping in Youth. *JAMA.* 2024;332(9):749–750. doi:10.1001/jama.2024.13403

¹⁶¹ Halpern-Felsher B, Henigan D, Riordan M, Boonn A, Perks SN, Krishnan-Sarin S, Vallone D. The Importance of Including Youth Research in Premarket Tobacco Product and Modified Risk Tobacco Product Applications to the Food and Drug Administration. *J Adolesc Health.* 2020 Sep;67(3):331-333. doi: 10.1016/j.jadohealth.2020.06.020. Epub 2020 Jul 14. PMID: 32674965.

¹⁶² Vogels EA, Gelles-Watnick R, Massarat M. Teens, Social Media and Technology 2022. Pew Research Center; 2022. <https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/>.

¹⁶³ Garey L, Scott-Sheldon LAJ, Olofsson H, Nelson KM, Japuntich SJ. Electronic Cigarette Cessation among Adolescents and Young Adults. *Subst Use Misuse* 2021;56(12):1900-1903.

endorsed social media for vaping cessation.¹⁶⁴ Social media platforms have several advantages, including integration into adolescents' daily life, convenient use anywhere at any time, scalability to wide audiences, and cost-effective delivery, making this a potentially ideal medium to deliver vaping cessation support to adolescents.^{165,166} Systematic reviews of social media smoking cessation interventions including on Facebook, Twitter,¹⁶⁷ and WhatsApp found that they were feasible, acceptable, and achieved increases in quit attempts, greater abstinence, and reduction in relapse.^{168,169,170,171} Eighty percentage of adolescents reported that what they see on social media makes them feel more connected to what's going on in their friends' lives, and 67% say these platforms make them feel as if they have people who can support them through tough times.¹⁷² A 2022 review of social media behavioral interventions found they effectively raised awareness and called for more to promote behavior change through social support.¹⁷³ Since teens seek peer support and connection on social media, a program that emphasizes and leverages peer support fits with what adolescents regularly seek on social media, and fills a gap left by programs that primarily emphasize information. Social media's popularity among priority populations such as people of color¹⁷⁴ and sexual and gender minoritized (SGM) youth¹⁷⁵ signals the potential to improve health equity, but studies have mixed outcomes, highlighting a key gap in the literature that call for more studies on examining impact of such interventions in priority youth populations.¹⁷⁶

7. Cessation products and programs must be developed for vaping cessation. Cessation trials and programs that include e-cigarettes for cessation must collect data on serious adverse effects from e-cigarettes, longitudinal health outcomes from using e-cigarettes, and must advocate for complete cessation of all tobacco products.

¹⁶⁴ Berg CJ, Romm KF, Patterson B, Wysota C, Abroms LC. Appeal of novel cessation intervention approaches among young-adult users of traditional and alternative tobacco products. *Tob Use Insights* 2021;14:1179173x211041123.

¹⁶⁵ Naslund JA, Kim SJ, Aschbrenner KA, McCulloch LJ, Brunette MF, Dallery J, et al. Systematic review of social media interventions for smoking cessation. *Addict Behav* 2017;73:81-93.

¹⁶⁶ Thrul J, Tormohlen KN, Meacham MC. Social media for tobacco smoking cessation intervention: a review of the literature. *Current addiction reports* 2019;6(2):126-138.

¹⁶⁷ Pechmann C, Delucchi K, Lakon CM, Prochaska JJ. Randomised controlled trial evaluation of Tweet2Quit: a social network quit-smoking intervention. *Tob Control* 2017;26(2):188-194.

¹⁶⁸ Naslund JA, Kim SJ, Aschbrenner KA, McCulloch LJ, Brunette MF, Dallery J, et al. Systematic review of social media interventions for smoking cessation. *Addict Behav* 2017;73:81-93.

¹⁶⁹ Luo T, Li MS, Williams D, Phillippi S, Yu Q, Kantrow S, et al. Using social media for smoking cessation interventions: a systematic review. *Perspect Public Health* 2021;141(1):50-63.

¹⁷⁰ Thrul J, Tormohlen KN, Meacham MC. Social media for tobacco smoking cessation intervention: a review of the literature. *Curr Addict Rep* 2019;6(2):126-138.

¹⁷¹ Yang Q. Are Social Networking Sites Making Health Behavior Change Interventions More Effective? A Meta-Analytic Review. *J Health Commun* 2017;22(3):223-233.

¹⁷² Anderson M, Vogels EA, Perrin A, Raine L. Connection, Creativity and Drama: Teen Life on Social Media in 2022. *Pew Research Center*; 2022.

¹⁷³ Ghahramani A, de Courten M, Prokofieva M. "The potential of social media in health promotion beyond creating awareness: an integrative review". *BMC Public Health* 2022;22(1):2402.

¹⁷⁴ Vogels EA, Gelles-Watnick R, Massarat M. Teens, Social Media and Technology 2022. *Pew Research Center*; 2022. <https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/>.

¹⁷⁵ Berger MN, Taba M, Marino JL, Lim MSC, Skinner SR. Social Media Use and Health and Well-being of Lesbian, Gay, Bisexual, Transgender, and Queer Youth: Systematic Review. *J Med Internet Res* 2022;24(9):e38449.

¹⁷⁶ Welch V, Petkovic J, Pardo Pardo J, Rader T, Tugwell P. Interactive social media interventions to promote health equity: an overview of reviews. *Health Promot Chronic Dis Prev Can* 2016;36(4):63-75.

No tobacco products, including e-cigarettes, are safe at any level of use. E-cigarettes are widely available and have been advertised as a smoking cessation aid. However, there is no single e-cigarette product that is currently FDA-approved for cessation.

Observational data based on consumer use of cigarettes and clinical trial research using e-cigarettes as a cessation treatment is mixed on whether e-cigarettes increase long-term cessation. Observational studies have not shown an increase in smoking cessation with e-cigarettes.^{177,178} One study showed that dual users versus exclusive cigarette users were more likely to attempt to quit; however, few dual users quit smoking at one-year follow-up, with 48.8% reporting dual use, 43.9% reporting current cigarette smoking, 5.9% reporting exclusive e-cigarette use, and only 1.4% reporting quitting both products.¹⁷⁹ In contrast, results from randomized controlled trials show an increase in tobacco cessation with e-cigarettes. A meta-analysis of randomized controlled trials with older forms of nicotine-containing e-cigarettes and in controlled settings have shown that e-cigarettes are as effective as varenicline and bupropion for smoking cessation.¹⁸⁰ In some RCTs, even as nicotine-containing e-cigarette use was associated with more combustible tobacco cessation than NRT, most trial participants continued to use nicotine-containing e-cigarettes at the study endpoints and beyond, sustaining nicotine addiction.^{181,182} Further, most of these studies did not explore the safety of e-cigarettes and health outcomes from e-cigarettes beyond one year, leaving an unanswered question on the safety of e-cigarettes, long-term efficacy of e-cigarettes in the setting of continued nicotine use, and long-term health outcomes of e-cigarettes.¹⁸³ There is also a potential risk of youth and young adult populations initiating e-cigarettes and tobacco use.¹⁸⁴

Although complete switching to use of e-cigarettes from cigarettes reduces exposure to tobacco-related toxicants compared to smoking cigarettes,¹⁸⁵ the use of e-cigarettes is not without harm,

¹⁷⁷ Wang RJ, Bhadriraju S, Glantz SA. E-cigarette use and adult cigarette smoking cessation: a meta-analysis. *Am J Public Health*. 2021;111(2):230–46.

¹⁷⁸ Chen R, Pierce JP, Leas EC, *et al* Effectiveness of e-cigarettes as aids for smoking cessation: evidence from the PATH Study cohort, 2017–201 *Tobacco Control* 2023;**32**:e145–e152.

¹⁷⁹ Piper ME, Baker TB, Benowitz NL, Jorenby DE. Changes in use patterns over 1 year among smokers and dual users of combustible and electronic cigarettes. *Nicotine Tob Res*. 2020;22(5):672–80.

¹⁸⁰ Lindson N, Theodoulou A, Ordóñez-Mena JM, Fanshawe TR, Sutton AJ, Livingstone-Banks J, Hajizadeh A, Zhu S, Aveyard P, Freeman SC, Agrawal S, Hartmann-Boyce J. [Pharmacological and electronic cigarette interventions for smoking cessation in adults: component network meta-analyses](#). *Cochrane Database of Systematic Reviews* 2023, Issue 9. Art. No.: CD015226. DOI: 10.1002/14651858.CD015226.pub2.

¹⁸¹ Hajek P., Phillips-Waller A., Przulj D. A randomized trial of E-Cigarettes versus nicotine replacement therapy. *N. Engl. J. Med*. 2019;380(7):629–637. doi: 10.1056/NEJMoa1808779.

¹⁸² Auer R, Schoeni A, Humair JP, Jacot-Sadowski I, Berlin I, Stuber MJ, Haller ML, Tango RC, Frei A, Strassmann A, Bruggmann P, Baty F, Brutsche M, Tal K, Baggio S, Jakob J, Sambiagio N, Hopf NB, Feller M, Rodondi N, Berthet A. Electronic Nicotine-Delivery Systems for Smoking Cessation. *N Engl J Med*. 2024 Feb 15;390(7):601–610. doi: 10.1056/NEJMoa2308815. PMID: 38354139.

¹⁸³ I-Hamdani M, Manly E. Smoking cessation or initiation: The paradox of vaping. *Prev Med Rep*. 2021 Mar 23;22:101363. doi: 10.1016/j.pmedr.2021.101363. PMID: 33868902; PMCID: PMC8044675.

¹⁸⁴ Pierce J.P., Chen R., Leas E.C., White M.M., Kealey S., Stone M.D., Benmarhnia T., Trinidad D.R., Strong D.R., Messer K. Use of e-cigarettes and other tobacco products and progression to daily cigarette smoking. *Pediatrics*. 2021;147(2) doi: 10.1542/peds.2020-025122. e2020025122.

¹⁸⁵ Goniewicz M.L., Smith D.M., Edwards K.C., Blount B.C., Caldwell K.L., Feng J., Wang L., Christensen C., Ambrose B., Borek N., van Bommel D., Konkel K., Erives G., Stanton C.A., Lambert E., Kimmel H.L., Hatsukami

and has been shown to be associated with heart and lung disease among young people and adults.^{186,187} Proponents of e-cigarette use for cessation recommend complete switching to non-combustible products to minimize the harmful effects of dual use.¹⁸⁸ Complete switching is also necessary to decrease exposure to tobacco-related carcinogens; longitudinal data from the PATH study showed no significant decrease in biomarkers of exposure among people who smoke who became dual users of cigarettes and e-cigarettes.¹⁸⁹ Dual use among current e-cigarette users is high, with approximately a third also using cigarettes.¹⁹⁰ The most common group includes “predominant smokers” of cigarettes and e-cigarettes,¹⁹¹ who may be vaping to circumvent smoke-free policies or to try to quit smoking without completely quitting.¹⁹² Dual use should be measured and reported in all clinical trials of e-cigarettes for smoking cessation.

Minoritized populations are especially impacted by dual use, where 7.6% of American Indian/Alaskan Native populations (7.6%) and multiracial individuals (10.4%) have comparable or higher rates than Whites (8.8%).¹⁹³ Dual use is more common among LGBT adults than non-LGBT adults.¹⁹⁴ Dual use is also associated with worse psychiatric symptom severity,^{195,196}

D., Hecht S.S., Niaura R.S., Travers M., Lawrence C., Hyland A.J. Comparison of nicotine and toxicant exposure in users of electronic cigarettes and combustible cigarettes. *JAMA Netw. Open.* 2018;1(8):e185937. doi: 10.1001/jamanetworkopen.2018.5937.

¹⁸⁶ Landman S.T., Dhaliwal I., Mackenzie C.A., Martinu T., Steele A., Bosma K.J. Life-threatening bronchiolitis related to electronic cigarette use in a Canadian youth. *CMAJ.* 2019;191(48):E1321–E1331. doi: 10.1503/cmaj.191402.

¹⁸⁷ Outbreak of lung injury associated with use of e-cigarette, or vaping, products. Atlanta (GA): Centres for Disease Control and Prevention; 2019 [last edited 2020 Feb. 25]. Available from: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html (accessed 2020 Sep. 7)

¹⁸⁸ Dai H, Benowitz NL, Achutan C, Farazi PA, Degarege A, Khan AS. Exposure to Toxicants Associated With Use and Transitions Between Cigarettes, e-Cigarettes, and No Tobacco. *JAMA Netw Open.* 2022;5(2):e2147891. doi:10.1001/jamanetworkopen.2021.47891

¹⁸⁹ Dai H, Benowitz NL, Achutan C, Farazi PA, Degarege A, Khan AS. Exposure to Toxicants Associated With Use and Transitions Between Cigarettes, e-Cigarettes, and No Tobacco. *JAMA Netw Open.* 2022;5(2):e2147891. doi:10.1001/jamanetworkopen.2021.47891

¹⁹⁰ Mayer M, Reyes-Guzman C, Grana R, Choi K, Freedman ND. Demographic characteristics, cigarette smoking, and e-cigarette use among US adults. *JAMA Netw Open.* 2020;3(10):e2020694–e.

¹⁹¹ Borland R, Murray K, Gravely S, Fong GT, Thompson ME, McNeill A, et al. A new classification system for describing concurrent use of nicotine vaping products alongside cigarettes (so-called ‘dual use’): findings from the ITC-4 Country Smoking and Vaping wave 1 survey. *Addiction.* 2019;114:24–34.

¹⁹² Coleman SRM, Piper ME, Byron MJ, Bold KW. Dual Use of Combustible Cigarettes and E-cigarettes: a Narrative Review of Current Evidence. *Curr Addict Rep.* 2022 Dec;9(4):353–362. doi: 10.1007/s40429-022-00448-1. Epub 2022 Oct 17. PMID: 36467719; PMCID: PMC9718538.

¹⁹³ Mayer M, Reyes-Guzman C, Grana R, Choi K, Freedman ND. Demographic characteristics, cigarette smoking, and e-cigarette use among US adults. *JAMA Netw Open.* 2020;3(10):e2020694–e.

¹⁹⁴ Al Rifai M, Mirbolouk M, Jia X, Nasir K, Pickett JK, Nambi V, et al. E-cigarette use and risk behaviors among lesbian, gay, bisexual, and transgender adults: the Behavioral Risk Factor Surveillance System (BRFSS) survey. *Kansas J Med.* 2020;13:318.

¹⁹⁵ Weinberger AH, Zhu J, Barrington-Trimis JL, Wyka K, Goodwin RD. Cigarette use, e-cigarette use, and dual product use are higher among adults with serious psychological distress in the United States: 2014–2017. *Nicotine Tob Res.* 2020;22(10):1875–82.

¹⁹⁶ Kaplan B, Thrul J, Cohen JE. Association of cigarette and electronic nicotine delivery systems use with internalizing and externalizing problems among US adults: findings from wave 3 (2015–2016) of the PATH study. *PLoS ONE.* 2021;16(6): e0253061. 10.1371/journal.pone.0253061.

psychological distress,¹⁹⁷ and more internalizing and externalizing symptoms.¹⁹⁸ While there are dependence scales that assess nicotine dependence for specific products (e.g., cigarettes or e-cigarettes), there is a need for scales that assess dual dependency, and these may offer insights into vaping cessation and smoking cessation.^{199,200,201,202}

Taken together, these studies highlight a need for robust clinical trials and observational studies that assess all tobacco product cessation including e-cigarette cessation as well as long-term safety, toxicity, and side effects of e-cigarettes. Additionally, there is a need for vaping cessation interventions that address dual use of e-cigarettes and cigarettes, with measurement of abstinence outcomes from both products.

Conclusion:

In summary, FDA and NIH must prioritize research that:

- Addresses the root causes of tobacco products use and supports the development of interventions that use anti-racist frameworks to address the high rates of stress stemming from a long-standing history of systemic racism.
- Promotes multi-sectoral intervention research that uses community-based participatory research and integrates lived experience-driven solutions with standard approaches of behavioral counseling and pharmacotherapy.
- Promotes interventions for cessation tailored to African American populations and that are linked with policies restricting the sales and use of menthol-based tobacco products, as well as intervention that increase implementation and reinforcement of menthol based policies.
- Promotes research that identifies approaches to better integrate cessation-supporting tobacco control policies with cessation services.
- Promotes dissemination and implementation of contingency management for smoking abstinence and adherence to treatment with opportunities for digital enhancement to reach populations in rural settings, for American Indian and Alaskan Native populations, those experiencing extreme poverty, and pregnant women.

¹⁹⁷ Weinberger AH, Zhu J, Barrington-Trimis JL, Wyka K, Goodwin RD. Cigarette use, e-cigarette use, and dual product use are higher among adults with serious psychological distress in the United States: 2014–2017. *Nicotine Tob Res.* 2020;22(10):1875–82.

¹⁹⁸ Kaplan B, Thrul J, Cohen JE. Association of cigarette and electronic nicotine delivery systems use with internalizing and externalizing problems among US adults: findings from wave 3 (2015–2016) of the PATH study. *PLoS ONE.* 2021;16(6): e0253061. 10.1371/journal.pone.0253061.

¹⁹⁹ Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerström test for nicotine dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict.* 1991;86(9):1119–27.

²⁰⁰ Morean ME, Krishnan-Sarin S, Sussman S, Foulds J, Fishbein H, Grana R, et al. Psychometric evaluation of the Patient-Reported Outcomes Measurement Information System (PROMIS) Nicotine Dependence Item Bank for use with electronic cigarettes. *Nicotine and Tobacco Res.* 2020;22(11):2123.

²⁰¹ Piper ME, Baker TB, Benowitz NL, Smith SS, Jorenby DE. E-cigarette dependence measures in dual users: reliability and relations with dependence criteria and e-cigarette cessation. *Nicotine Tob Res.* 2020;22(5):756–63.

²⁰² Coleman SRM, Piper ME, Byron MJ, Bold KW. Dual Use of Combustible Cigarettes and E-cigarettes: a Narrative Review of Current Evidence. *Curr Addict Rep.* 2022 Dec;9(4):353-362. doi: 10.1007/s40429-022-00448-1. Epub 2022 Oct 17. PMID: 36467719; PMCID: PMC9718538.

- Supports the development of tailored interventions for LGBTQ+ populations that address multiple tobacco and substance use behaviors, including tobacco use, vaping, and co-use with alcohol and cannabis.
- Requires cessation trials to measure abstinence from all tobacco products, including combustible, non-combustible and alternative tobacco products. Cessation trials must also measure abstinence outcomes through point prevalence and prolonged abstinence measures. Recognizing that smoking cessation is a chronic relapsing and remitting condition, cessation trials must measure mechanistic outcomes on the pathway to quitting success, including reduction in cravings, withdrawals, self-efficacy, and confidence to quit.
- Includes targeted interventions for dual users of cigarettes and e-cigarettes with measures of dual dependency and abstinence outcomes for both cigarettes and e-cigarettes.
- Includes specific cessation programs for youth, and that include youth in clinical studies using appropriate safeguards against industry influence and to protect scientific integrity.