



Environmental Prevention: Why Do We Need It Now and How to Advance It?

Gregor Burkhart¹ · Samuel Tomczyk² · Ina Koning³ · Angelina Brotherhood⁴

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For most of its history, substance use prevention has been approached with interventions targeting individuals, social groups and populations beginning with informational strategies (from scaring/warning to “informed choices”), later on complemented with more effective developmental (Foxcroft, 2013) interventions that help young people to achieve the behavioural goals in each phase of their social and cognitive development. Typical examples of the latter are life-skills trainings, social-emotional learning and self-control trainings.

What all these traditional approaches to prevention have in common is that they address individuals (e.g., adolescents, parents), social groups (e.g., school classes, families, peer groups) or entire populations with the aim to induce mostly deliberate, intentional and motivated changes in behaviour, based on the assumption that people choose their behaviours consciously through rational decision-making. Yet, the contexts of behaviour as well as its frequently impulsive, habitual or even automatic aspects are less or not considered. People including adolescents (despite evidence for the contrary (Burkhart, 2011)) are conceived as being rational, able to reason and to self-moderate, even in arousing and exciting contexts that are inducive for unhealthy eating, substance use and problematic engagement with social media.

This challenge of considering the interaction of enticing contexts, individuals' intentions and their actual behaviour is rarely accounted for in informational and developmental approaches. Some aspects of developmental approaches (e.g. training skills) do address this aspect, yet they require individuals to remember the training at the crucial moment and to purposefully deviate from what might be the ‘easiest’ (e.g., expected by their peers) path of action: assuming again a fully conscious

✉ Gregor Burkhart
Gregor.burkhart@emcdda.europa.eu

¹ EMCDDA, Lisbon, Portugal

² Institute of Psychology, University of Greifswald, Greifswald, Germany

³ Interdisciplinary Social Science: Youth Studies, Utrecht University, Utrecht, Netherlands

⁴ Addiction Competence Centre, Austrian National Public Health Institute, Vienna, Austria

decision-maker. Hence occurs the well-known intention-behaviour gap (Faries, 2016), whereby people do not follow through on health-oriented intentions.

For long, health promotion has been the only model to address health behaviour at a higher systems level (i.e. above the level of individuals). It appeals to practitioners and some professionals because many interventions or policies can easily be framed as health promotion, but it also has a lack of practical clarity (what concretely shall be done?) and a lack of effectiveness, particularly for substance use prevention (Stewart-Brown, 2006). Environmental substance use prevention is an emerging approach that could overcome the limitations of traditional prevention as well as health promotion. Yet, questions of theory, practice and evaluation are to be addressed, as outlined below.

Theory

First attempts to define and to promote the concept of environmental prevention were made over the past ten years from within the European Society for Prevention Research (EUSPR) (e.g. Burkhart, 2011; Foxcroft, 2015), and nowadays the term is an established pillar of the EU Strategy and its Action Plans on Drugs (Council of the European Union, 2021). Key components of the model are already explicitly taken up in at least one member state's National Strategy on Alcohol and Drugs. Yet, despite an introduction in form of a technical paper by the European Monitoring Centre on Drugs and Drug Addiction (EMCDDA) with EUSPR involvement (Oncioiu et al., 2018) and additional work to identify and review relevant theories (Brotherhood, 2021) and policy implications (Becoña Iglesias, 2021), we do not yet have an overarching well-defined concept, which would integrate the main relevant applicable and underlying theories.

An updated definition of the underlying theories, a taxonomy of related behaviour change techniques (BCT) and a monitoring of the increasing body of research is needed. Building on previous work that describes and classifies BCT for successful behaviour change, including opportunities and relevant contexts (Armitage et al., 2021; Michie et al., 2011), it is therefore timely that the EUSPR will publish a position paper about environmental prevention, its scope and definition.

Already established characteristics of environmental prevention are that it.

- changes the context (physical, economic, social, regulatory etc.) of human behaviour instead of primarily targeting behavioural control. Example: changing serving size and shape or purchase opportunities instead of making appeals for moderate consumption.
- makes healthy behaviours easier or more attractive than harmful behaviour. Example: enterprises offer vouchers for purchasing bikes while charging fees for enterprise parking spaces.
- often induces a change of social norms, values and attitudes as secondary impact. Example: smoking bans have profoundly changed the social acceptance of smoking in general, also among those opposing them initially (Thrasher et al., 2009).

- can be used at different levels of context (micro, meso, macro) or in combination (e.g. family, school, neighbourhood, country). Example: curfew hours for minors as in Iceland and Croatia appear to make family management easier, reduce injuries and intoxications and reduce substance use among youth (Kristjansson et al., 2021).
- is particularly relevant in environments that contain many potential triggers for harmful behaviour, in the substance use field also known as ‘intoxicogenic environments’. Example: nightlife, social media, or areas with high density of gambling, alcohol, fast food or cannabis use opportunities and related cues.
- can be applied across numerous behaviour domains such as obesity, sedentarism, crime, violence, alcohol and other substance use, sexual and social media behaviour. Example: environmental strategies, such as changing playgrounds, providing outside gym equipment and facilitating commuting by bike have been applied effectively for increasing physical activity(e.g. D’Angelo et al., 2017; Sallis et al., 2016).

Though environmental prevention incorporates approaches such as ‘nudging’, relevant studies (Hummel & Maedche, 2019) often fail to describe and define relevant BCTs and thus mechanisms of (sustainable) change. Therefore, we still need a structured overview and explanation of underpinning theories, drawing also on recent theoretical developments (e.g. socio-spatial theory (Brotherhood, 2021) or Grounded-cognition theory of desire (Papies & Barsalou, 2015; Papies et al., 2020)), as well as a refined concept of how the components of the model interact and prospectively affect individual and collective behaviours in the short and long term. More clarity has to be achieved on potential moderators and mediators: for instance on whether social norms can be primary drivers (cues) of behaviour or if they are only affected secondarily by physical, economic and regulatory measures, or considering a broader range of mental processes beyond the strict ‘automatic/reflective’ dichotomy occasionally implied in dual-process theories (e.g. Thaler & Sunstein, 2008). An updated concept of ‘environment’ is needed that includes not only physical aspects (i.e., what can be seen, heard, smelled, touched, or tasted) but also how people experience environments (e.g. atmospheres) (Brotherhood, 2021). This would also open up a conceptual space in which target population perspectives can inform the development of environmental interventions and improve them.

Practice

For practice, we need an empirically grounded typology of environmental kernels and of cues, since environmental influences might not affect substance use in predictable/universal ways across substance use practices, situations or people (Best & Papies, 2017; Brotherhood, 2021).

The importance of working on a model that is more sophisticated yet has a clear narrative is manifold.

- *From an evidence perspective:* interventions have to be identifiable as “environmental” in order to be added to the evidence base, e.g. to registries like Xchange.¹ It is not obvious to everyone that municipal alcohol regulations in England (De Vocht et al., 2017a, 2017b) and in the Netherlands (de Goeij et al., 2017) as well as the STAD programme in nightlife settings (Skardhamar et al., 2016) or the Icelandic Model (Kristjansson et al., 2019) are all environmental prevention approaches. Simple and easy definitions are needed, particularly to distinguish environmental prevention from community-based prevention and media campaigns.
- *From an advocacy and ethical perspective:* a well explained concept helps to further the cause. Not only the industries (Burkhart, 2011; Petticrew et al., 2020; Swinburn et al., 2011) attack environmental prevention approaches, but also traditional prevention professionals are concerned over stigma (Williamson et al., 2014), manipulation and authoritarianism (Proctor, 2008). Such criticism on an apparently ethical basis fails to recognise the evidence that environmental interventions can contribute to a greater equity of health behaviours (Zhao & Stockwell, 2017), while traditional prevention approaches including health promotion require more personal agency and might therefore favour the cognitively well equipped. (Pechey et al., 2020). The chances for equity in prevention outcomes and an adequate use of the term “stigma (for conditions, but not behaviours) in public narratives have to be elaborated with more clarity and reason. In general, the evidence about the claimed stigmatizing effect of environmental prevention is inclusive and scarce, and more research is necessary to examine the interplay of personal and public stigma in preventive efforts, be they informational, developmental or environmental.

From a preparedness perspective: an increasing number of countries is considering the legalisation of cannabis, but prevention experts are seldom consulted in shaping the details of the regulatory frameworks. Consequently, upcoming proposals for cannabis legalisation in some countries seem to rely predominantly on outdated ineffective strategies, such as better education and awareness-raising for consumers while details on the necessary environmental measures are not even mentioned. Such missed opportunities to apply prevention science obviously play into the hands of future industry stakeholders whose arguments echo those of the established alcohol industry, i.e. that the application of liberal policies generates more revenue, that liberties should be prioritised over bureaucracy and control, and that education about responsibility is the best solution to alcohol-related problems (Sama et al., 2021). Only by more clarity and a better narrative, policy makers will understand that environmental prevention strategies are crucial evidence-based tools to address the regulatory challenges of cannabis legalisation while avoiding the failures of alcohol policy. COVID also has made it visible how deadly are the public health consequences if policy making shies away from effective but unpopular measures. People’s acceptance of macro level interventions to change behaviour is greatest for

¹ https://www.emccda.europa.eu/best-practice/xchange_en.

the least intrusive interventions, which are often the least effective, and for interventions targeting the behaviour of others, rather than the respondents themselves (Diepeveen et al., 2013). This raises serious doubt whether the paradigm of co-production and participatory development, which indeed can sometimes contribute to environmental changes (e.g. norms; (Koning et al., 2020)), is helpful to all forms of environmental prevention. We need to understand better how the perception of interventions as being fair and reasonable is shaped and the extent of co-production herein: they might be shaped by attitude and simply follow a cultural trend (Iceland).

Evaluation

From the perspective of the evidence, macro-level environmental prevention approaches (e.g. regulating alcohol and tobacco) appear to be more effective than any other approach in the substance use prevention field (UNODC, 2013). But less research evidence is available on meso/micro-level (Bronfenbrenner, 1977) environmental interventions, i.e. at municipal or school level.

A possible reason why evaluation of environmental prevention strategies have a lack of attention and visibility, also within the prevention sciences, might be that classical randomised controlled trials (RCTs) are difficult to carry out for these contexts; large-scale evaluations (e.g., involving cluster randomised trials with different communities or regions) are often very costly and time-consuming. Thus, the traditional gold standard of evidence realistically cannot always be applied to environmental prevention. We need to increase awareness that there are other acceptable and suitable methods of impact evaluation such as Interrupted Time Series, Repeated Cross-Sectional Designs, and repeated Quasi-Experimental Designs.

It appears that there is not a 'one size fits all' approach to evaluation of environmental prevention, because it includes so many different approaches (e.g. regulatory, physical...) at many different levels. We therefore need better insight into how to measure environmental change strategies' impact on multiple levels.

By now, the experiences with the COVID-19 pandemic should have made two things very clear: (1) how much environmental public health interventions (e.g. mask wearing, physical distancing and vaccine incentives) have been superior to individual pharmaceutical solutions in tackling this and other pandemics, yet how to get across these strategies remained a challenge; and (2) how small has been the contribution of information provision and education to the full uptake of protective behaviours such as proper mask-wearing or vaccines. These lessons can very well be applied to industrial epidemics (Jahiel & Babor, 2007) such as substance use, obesity, social media related challenges and the likes.

Now it is time to use this momentum and reinforce the message to policy- and decision-makers that individuals (particularly young people) are not always reasonable, rational and able to control any possible risk behaviour. Creating safe and healthy environments is a necessity to reduce harm and harmful behavioural pathways, e.g. into obesity, diabetes, substance use disorders and crime. Effective prevention requires an environmental component—i.e. complementing informational and developmental approaches. Otherwise, individual- or group-level interventions

struggle to achieve significant change in outcomes. We expect that environmental prevention can be improved by inclusion of additional theories and a clearer insight into the role of participatory narrative about it. This might also resolve its current perception as being predominantly coercive and restrictive if it can be framed not only as a means to reducing harmful behaviours but also to improving people's experience of social & cultural spaces. There is no neutral environment: if prevention science does not actively influence policies and the narratives about powerful concepts such as “culture”, “health”, “pleasure”, “socialising” and “ethics”, the old and emerging industries (cannabis, online gambling, social media and food) will continue to shape environments and the public narratives, as before.

Declarations

Conflict of Interest The authors are members of the Editorial Board of Journal of Prevention.

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References

- Armitage, C. J., Conner, M., Prestwich, A., de Bruin, M., Johnston, M., Sniehotta, F., & Epton, T. (2021). Investigating which behaviour change techniques work for whom in which contexts delivered by what means: Proposal for an international laboratory of Centres for Understanding Behaviour Change (CUBiC). *British Journal of Health Psychology*, 26(1), 1–14. <https://doi.org/10.1111/BJHP.12479>
- Becoña Iglesias, E. (2021). *La Prevención Ambiental en el Consumo de Drogas. ¿Qué medidas podemos aplicar?* Madrid. Retrieved from https://pnsd.sanidad.gob.es/profesionales/publicaciones/catalogo/catalogoPNSD/publicaciones/pdf/2021_PrevencionAmbientalDrogas.pdf
- Best, M., & Papies, E. K. (2017). Right here, right now: Situated interventions to change consumer habits. *Journal of the Association for Consumer Research*, 2(3), 333–358. <https://doi.org/10.1086/695443>
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32(7), 513–531. <https://doi.org/10.1037/0003-066x.32.7.513>
- Brotherhood, A. (2021). *Socio-spatial aspects of substance use and abstinence: 'Interpreted space' as a concept for environmental prevention*.
- Burkhart, G. (2011). *Environmental drug prevention in the EU. Why is it so unpopular?* *Adicciones* (Vol. 23). Retrieved from http://www.adicciones.es/files/editorial_Burkhart_23-2.pdf
- D'Angelo, H., Fowler, S. L., Nebeling, L. C., & Oh, A. Y. (2017). Adolescent physical activity: Moderation of individual factors by neighborhood environment. *American Journal of Preventive Medicine*, 52(6), 888–894. <https://doi.org/10.1016/j.amepre.2017.01.013>
- de Goeij, M. C. M., Harting, J., & Kunst, A. E. (2017). Stronger declines in youth alcohol consumption thanks to stronger integrated alcohol policies? A qualitative comparison of ten Dutch municipalities. *Substance Abuse Treatment, Prevention, and Policy*, 12(1), 13. <https://doi.org/10.1186/s13011-017-0091-8>
- De Vocht, F., Heron, J., Campbell, R., Egan, M., Mooney, J. D., Angus, C., Brennan, A., & Hickman, M. (2017a). Testing the impact of local alcohol licencing policies on reported crime rates in England. *Journal of Epidemiology and Community Health*, 71(2), 137–145. <https://doi.org/10.1136/jech-2016-207753>
- De Vocht, F., Tilling, K., Pliakas, T., Angus, C., Egan, M., Brennan, A., Campbell, R., & Hickman, M. (2017b). The intervention effect of local alcohol licensing policies on hospital admission and crime:

- A natural experiment using a novel Bayesian synthetic time-series method. *Journal of Epidemiology and Community Health*, 71(9), 912–918. <https://doi.org/10.1136/jech-2017-208931>
- Diepeveen, S., Ling, T., Suhrcke, M., Roland, M., & Marteau, T. M. (2013). Public acceptability of government intervention to change health-related behaviours: A systematic review and narrative synthesis. *BMC Public Health*, 13(1), 756. <https://doi.org/10.1186/1471-2458-13-756>
- Council of the European Union. (2021). EU Drugs Action Plan 2021–2025. *Official Journal of the European Union*, C 272(02). Retrieved from [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021XG0708\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021XG0708(01))
- Faries, M. D. (2016). Why we don't "Just Do It": Understanding the intention-behavior gap in lifestyle medicine. *American Journal of Lifestyle Medicine*, 10(5), 322. <https://doi.org/10.1177/1559827616638017>
- Foxcroft, D. R. (2015). Environmental, developmental and informational interventions: A novel prevention taxonomy to better organise and understand substance misuse prevention. *Addicta: the Turkish Journal on Addictions*, 1(2), 66–78. <https://doi.org/10.15805/addicta.2014.1.2.027>
- Foxcroft, D. R. (2013). Can prevention classification be improved by considering the function of prevention? *Prevention Science*. <https://doi.org/10.1007/s11121-013-0435-1>
- Hummel, D., & Maedche, A. (2019). How effective is nudging? A quantitative review on the effect sizes and limits of empirical nudging studies. *Journal of Behavioral and Experimental Economics*, 80, 47–58. <https://doi.org/10.1016/J.SOCEC.2019.03.005>
- Jahiel, R. I., & Babor, T. F. (2007). Industrial epidemics, public health advocacy and the alcohol industry: Lessons from other fields. *Addiction*, 102(9), 1335–1339. <https://doi.org/10.1111/j.1360-0443.2007.01900.x>
- Koning, I. M., De Kock, C., van der Kreeft, P., Percy, A., Sanchez, Z. M., & Burkhart, G. (2020). Implementation of the Icelandic Prevention Model: A critical discussion of its worldwide transferability. *Drugs: Education Prevention and Policy*. <https://doi.org/10.1080/09687637.2020.1863916>
- Kristjansson, A. L., Lilly, C. L., Thorisdottir, I. E., Allegrante, J. P., Mann, M. J., Sigfusson, J., Soriano, H. E., & Sigfusdottir, I. D. (2021). Testing risk and protective factor assumptions in the Icelandic model of adolescent substance use prevention. *Health Education Research*. <https://doi.org/10.1093/her/cyaa052>
- Kristjansson, A. L., Mann, M. J., Sigfusson, J., Thorisdottir, I. E., Allegrante, J. P., & Sigfusdottir, I. D. (2019). Implementing the Icelandic Model for preventing adolescent substance use. *Health Promotion Practice*. <https://doi.org/10.1177/1524839919849033>
- Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6, 42. <https://doi.org/10.1186/1748-5908-6-42>
- Oncioiu, S. I., Burkhart, G., Calafat, A., Duch, M., Perman-Howe, P., & Foxcroft, D. R. (2018). *Environmental substance use prevention interventions in Europe* (EMCDDA Tec). Lisbon. Retrieved from <http://www.emcdda.europa.eu/system/files/publications/7882/Environmental-substance-use-prevention-Interventions-in-Europe.pdf>
- Papies, E. K., & Barsalou, L. W. (2015). Grounding desire and motivated behavior: A theoretical framework and review of empirical evidence. *The psychology of desire* (pp. 36–60). The Guilford Press.
- Papies, E. K., Barsalou, L. W., & Rusz, D. (2020). Understanding desire for food and drink: A grounded-cognition approach. *Current Directions in Psychological Science*, 29(2), 193–198. <https://doi.org/10.1177/0963721420904958>
- Pechey, R., Hollands, G. J., Carter, P., & Marteau, T. M. (2020). Altering the availability of products within physical micro-environments: A conceptual framework. *BMC Public Health*, 20(1), 1–14. <https://doi.org/10.1186/S12889-020-09052-2/FIGURES/4>
- Pettigrew, M., Maani, N., Pettigrew, L., Rutter, H., & van Schalkwyk, M. C. (2020). Dark nudges and sludge in big alcohol: Behavioral economics, cognitive biases, and alcohol industry corporate social responsibility. *The Milbank Quarterly*, 1468–0009, 12475. <https://doi.org/10.1111/1468-0009.12475>
- Proctor, R. N. (2008). On playing the Nazi card. *Tobacco Control*, 17(5), 289–290.
- Sallis, J. F., Cerin, E., Conway, T. L., Adams, M. A., Frank, L. D., Pratt, M., Salvo, D., Schipperijn, J., Smith, G., Cain, K. L., Davey, R., Kerr, J., Lai, P. J., Mitáš, J., Reis, R., Sarmiento, O. L., Schofield, G., Troelsen, JI, Van Dyck, D., De Bourdeaudhuij, I., & Owen, N. (2016). Physical activity in relation to urban environments in 14 cities worldwide: A cross-sectional study. *The Lancet*, 387(10034), 2207–2217.

- Sama, T. B., Konttinen, I., & Hiilamo, H. (2021). Alcohol industry arguments for liberalizing alcohol policy in Finland: Analysis of Twitter data. *Journal of Studies on Alcohol and Drugs*, 82(2), 279–287. <https://doi.org/10.15288/jsad.2021.82.279>
- Skardhamar, T., Fekjær, S. B., & Pedersen, W. (2016). If it works there, will it work here? The effect of a multi-component responsible beverage service (RBS) programme on violence in Oslo. *Drug and Alcohol Dependence*. <https://doi.org/10.1016/j.drugalcdep.2016.10.019>
- Stewart-Brown, S. (2006). *What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach?* Copenhagen: WHO Regional Office for Europe. Retrieved from <http://www.euro.who.int/document/e88185.pdf>
- Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finewood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: Shaped by global drivers and local environments. *Lancet*, 378(9793), 804–814. [https://doi.org/10.1016/S0140-6736\(11\)60813-1](https://doi.org/10.1016/S0140-6736(11)60813-1)
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness* (2nd ed.). Yale University Press.
- Thrasher, J. F., Boado, M., Sebríe, E. M., & Bianco, E. (2009). Smoke-free policies and the social acceptability of smoking in Uruguay and Mexico: Findings from the International Tobacco Control Policy Evaluation Project. *Nicotine Tobacco Research*, 11(6), 591–599.
- UNODC. (2018). *International Standards on Drug Use Prevention*. Vienna: UNITED NATIONS. Retrieved from <https://www.unodc.org/unodc/en/prevention/prevention-standards.html>
- Williamson, L., Thom, B., Stimson, G. V., & Uhl, A. (2014). Stigma as a public health tool: Implications for health promotion and citizen involvement—A response to Bayer and Fairchild. *The International Journal on Drug Policy*, 26(7), 615–616. <https://doi.org/10.1016/j.drugpo.2015.04.004>
- Zhao, J., & Stockwell, T. (2017). The impacts of minimum alcohol pricing on alcohol attributable morbidity in regions of British Columbia, Canada with low, medium and high mean family income. *Addiction*, 112(11), 1942–1951. <https://doi.org/10.1111/add.13902>

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