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Development and Guiding Principles of the Icelandic Model for Preventing Adolescent Substance Use

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Adolescent substance use—the consumption of alcohol, tobacco, and other harmful drugs—remains a persistent global problem and has presented ongoing challenges for public health authorities and society. In response to the high rates of adolescent substance use during the 1990s, Iceland has pioneered in the development of the Icelandic Model for Primary Prevention of Substance Use—a theory-based approach that has demonstrated effectiveness in reducing substance use in Iceland over the past 20 years. In an effort to document our approach and inform potentially replicable practice-based processes for implementation in other country settings, we outline in a two-part series of articles the background and theory, guiding principles of the approach, and the core steps used in the successful implementation of the model. In this article, we describe the background context, theoretical orientation, and development of the approach and briefly review published evaluation findings. In addition, we present the five guiding principles that underlie the Icelandic Prevention Model's approach to adolescent substance use prevention and discuss the accumulated evidence that supports effectiveness of the model. In a subsequent Part 2 article, we will identify and describe key processes and the 10 core steps of effective practice-based implementation of the model.

Keywords: *adolescence; Icelandic model; implementation; practice-based evidence; prevention; substance use*

► INTRODUCTION

Preventing alcohol, tobacco, and other harmful drug use among youth remains an ongoing challenge, especially in many advanced economies of the world. From a public health perspective, the most sensible approach to prevention is to avert or delay the onset of alcohol, tobacco, and other drug use as long as possible. Early drug use impairs psychosocial and neurocognitive development and increases youth vulnerability to later use of licit and illicit substances, academic failure, high-risk sexual behavior, and mental health problems (Atherton, Conger, Ferrer, & Robins, 2016; Windle & Zucker, 2010), and is strongly predictive of later dependence (Kendler, Myers, Damaj, & Chen, 2013; Moss, Chen,

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& Yi, 2014). Nonetheless, despite the need for effective primary prevention, most programs and approaches fail to show long-term impact and societal benefits (Hopfer et al., 2010; Kumpfer, Smith, & Summerhays, 2008).

Although there are examples of prevention approaches that have demonstrated success, such as the Strategic Prevention Framework developed by Substance Abuse and Mental Health Services Administration (Anderson-Carpenter, Watson-Thompson, Chaney, & Jones, 2016) and Communities That Care (Hawkins et al., 2008), a separate noteworthy success story in primary prevention of substance use comes from Iceland. This article is the first of a two-part series that describes the theory- and practice-based processes associated with the successful implementation of the Icelandic Model for Primary Prevention of Substance Use. Here we discuss the development of the Icelandic Prevention Model (IPM), present a brief theoretical overview, and summarize the accumulated evidence of effectiveness of the approach in reducing rates of adolescent substance use in Iceland. This is followed by an introduction to the five guiding principles underlying the model. We conclude by placing the model and the evidence in support of its effectiveness in context within the wider literature of the field.

► MODEL DEVELOPMENT AND EVIDENCE OF EFFECTIVENESS

Context

In the 1990s, Iceland ranked comparatively high on adolescent alcohol, tobacco, and other harmful drug use as evidenced by results from the European School Project on Alcohol and Drugs (ESPAD)—a comparative study of 35 European countries conducted every 3 to 4 years (ESPAD Group, 2016). To illustrate, in 1999, the rate of ever smoking tobacco among 10th-grade youth in Iceland was 56% and 69% on average in Europe; the rate of drunkenness in the past 12 months was 56% in Iceland and 52% in Europe; and 15% had reported use of cannabis substances (hashish, marijuana) in Iceland, similar to other parts of Europe. For many years leading up to this point Iceland had been utilizing traditional methods of primary substance use prevention, namely, individual, school-based instructional and educational programs, with the aim of educating or leading youth away from initiating substance use (Palsdottir, 2003; Sigfusdottir, Thorlindsson, Kristjansson, Roe, & Allegrante, 2009). In response to the alarming rates of adolescent substance use in the mid-1990s and with sponsored funding from the government of Iceland and the Reykjavik City Council, a group of policy makers

and administrative leaders, elected officials, and social scientists came together to explore new ideas for initiating a different, bottom-up collaborative approach to substance use prevention that has since become known as the Icelandic Prevention Model (Sigfusdottir et al., 2009; Sigfusdottir, Kristjansson, Gudmundsdottir, & Allegrante, 2011).

Model Development

Since its formulation, the IPM has been grounded in classic theories of social deviance that were developed in sociology and criminology (Akers, 1977; Hirchi, 1969; Merton, 1938), rather than based in traditional health behavior change theories (Glanz, Rimer, & Viswanath, 2015). The mutual viewpoint of these deviance theories is that most individuals are capable of deviant acts but that only under certain environmental and social circumstances will those acts become common patterns of behaviors among dominant groups of adolescents. Major reasons for such behavioral patterns thus include (a) lack of environmental sanctions by the social environment (e.g., from parents and other adults), (b) low individual and/or community investment in traditional and positive values (e.g., high educational aspirations), and (c) lack of opportunities for participation in positive and prosocial development (e.g., organized recreational and extracurricular activities such as sports, music, drama, after school clubs, etc.). Thus, from this theoretical perspective, children are viewed as social products and not as rational individual actors, and hence alcohol, tobacco, and other drug use is viewed as attributes of the social environment (Sigfusdottir et al., 2009) and engrained in both risk and protective factors that comprise key determinants of the ongoing cycle of substance use.

Echoed by this theoretical view, the goal of the approach from the outset was to “mobilize society as a whole in the struggle against drugs” (Palsdottir, 2003), with emphasis on community engagement and collaboration leading to long-standing and gradual environmental and social change rather than short-term solutions. Rooted in research evidence from the social and behavioral sciences, the preventive cornerstone of the approach was to strengthen protective factors and mitigate risk factors at the local community level within each of the domains of parents and family, the peer group, the school environment, and leisure time outside of school (Nash, McQueen, & Bray, 2005; Scholte, Poelen, Willemsen, Boomsma, & Engels, 2008; Watkins, Howard-Barr, Moore, & Werch, 2006), all of which are potential domains of ongoing practice-based assessment and intervention (see Figure 1). The 10 core

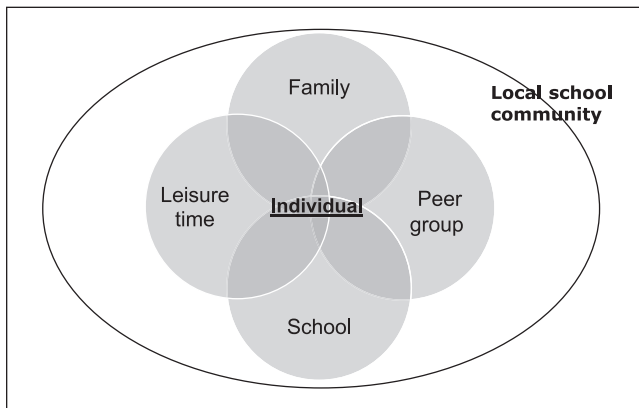


FIGURE 1 Domains of Community Risk and Protective Factors in the Icelandic Prevention Model

steps to this effective intervention process are outlined in the related second article within this issue of *Health Promotion Practice*.

Evaluation and Evidence of Effectiveness

Since the original development of the model, Iceland has led the decline in substance use in all of Europe. In 2015, the rate of ever smoking tobacco was 46% among 10th-grade adolescents in Europe but had plunged to 16% in Iceland; average rates of current alcohol use were 48% in Europe but 9% in Iceland; and average rates of lifetime use of cannabis substances remained at 16% in Europe, similar to 1999, but declined to 5% in Iceland (see Figure 2 for standard trend measures from the Youth in Iceland studies). In all instances, the 2015 rates in Iceland represented either the lowest or the second lowest of all 35 countries that participated in the ESPAD study that year (ESPAD Group, 2016). Corresponding to these changes in substance use, Iceland had also witnessed large reductions in risk factors and strengthening of protective factors. For example, 10th-grade students reporting parents knowing with whom they spend time in the evenings increased from ~50% in 2000 to just over 74% in 2016. Even more dramatic, while 80% of 10th-grade students reported having been “outside after midnight” once or more during the 7 days prior to the annual survey in 2000, this ratio had declined to approximately 31% in 2016. During the same time, participation in organized sports with a club or team four times per week or more often had increased from 26% in 2000 to approximately 37% in 2016 (Kristjansson et al., 2016). Using a quasi-experimental, group-based design, we conducted an evaluation to assess central elements of the IPM (Kristjansson,

James, Allegrante, Sigfusdottir, & Helgason, 2010). Municipalities that had consistently been a part of the model since 1997 formed the intervention group and were compared to those that had consistently been outside of the formal model. It should be noted that given the geographical isolation and small population of the country, potentially contaminating spillover effects from the model to outside areas could be expected. However, despite these challenges, the evaluation demonstrated a significant difference in group trends over time in smoking and alcohol use, parental monitoring, party lifestyle, and participation in organized sports, with the treatment group being favored in all instances.

Since the mid-1990s, much has changed in the adolescent environment in Iceland that has been influenced by widespread implementation of the model. Some of those changes are holistic and onetime alterations, while several notable others are ongoing and continuous. First, municipalities and schools that include over 80% of the country’s population now routinely utilize annually updated survey data to monitor trends and potential changes in substance use and risk and protective factors among youth and use this information to organize responses and set strategies for the year ahead. Second, most municipalities and many schools now employ designated personnel with dedicated time to engage in primary prevention activities. In addition, government-funded community nongovernmental organizations have been set up to strengthen and improve the collaborative aspect of parenting at the local school-community level. Finally, municipalities have as a matter of policy increased funding dramatically for recreational and extracurricular activities for children and adolescents, making such activities available to all through a user-friendly voucher system.

► **FIVE GUIDING PRINCIPLES**

The IPM is built on a foundation of five guiding principles (see Table 1). Each principle can be thought of as a unique dimension of an overall approach that provides direction for how each step in the community intervention process ideally should be implemented (see Kristjansson et al., 2019). Although different steps in the process may emphasize a given guiding principle more or less heavily, every step of the model should include each of these principles. When choosing among competing strategies, the guiding principles can be consulted as a means of identifying the strategy most in keeping with the intended design of the IPM and local needs. Below, is a brief summary of each of these principles and associated dimensions.

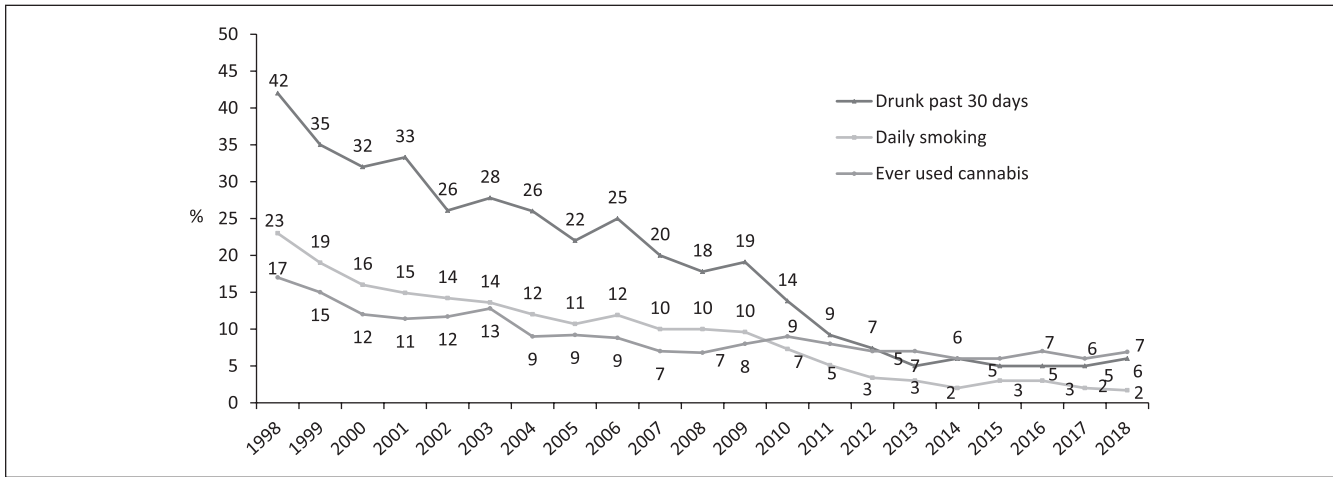


FIGURE 2 Annual Percentage of Self-Reported Substance Use Among Icelandic Adolescents, 1998-2018
 SOURCE: Kristjansson et al. (2016).

TABLE 1
The Five Guiding Principles of the Icelandic Prevention Model

Guiding Principle 1	Apply a primary prevention approach that is designed to enhance the social environment.
Guiding Principle 2	Emphasize community action and embrace public schools as the natural hub of neighborhood/area efforts to support child and adolescent health, learning, and life success.
Guiding Principle 3	Engage and empower community members to make practical decisions using local, high-quality, accessible data and diagnostics.
Guiding Principle 4	Integrate researchers, policy makers, practitioners, and community members into a unified team dedicated to solving complex, real-world problems.
Guiding Principle 5	Match the scope of the solution to the scope of the problem, including emphasizing long-term intervention and efforts to marshal adequate community resources.

Guiding Principle 1: Apply a Primary Prevention Approach That Is Designed to Enhance the Social Environment

The model focuses on preventing the initiation of substance use by altering the social environment in a manner that reduces the likelihood that young people will initiate substance use. This approach therefore addresses the underlying causes of substance use initiation. By working to increase social and environmental protective factors associated with preventing or delaying substance use and decreasing corresponding risk factors, the model prevents substance use by intervening on society itself and across a broad spectrum of opportunities for community intervention. This “society is the patient” approach (Myers, 2008) prioritizes thoughtfully and intentionally altering the social, organizational, and cultural characteristics of communities as the primary means of inoculating young people against substance

use. Within this principle, accessing and/or hiring appropriate personnel to guide local team-building and bridging the use of research evidence to practical implementation will be central.

Guiding Principle 2: Emphasize Community Action and Embrace Public Schools as the Natural Hub of Neighborhood/Area Efforts to Support Child and Adolescent Health, Learning, and Life Success

The model’s primary unit of intervention is the neighborhood, which is defined as the service area assigned to a local school. The model uses an ecological approach that addresses family, school, peer, and community social influences and other opportunities within each neighborhood. Although schools are not primarily responsible for strengthening the neighborhoods and areas they serve, they do represent an essential hub for local activities designed to support the

health, well-being, and success of children and adolescents. As a result, strengthening connections between families, schools, and the community-at-large, and unifying those groups into a cohesive team devoted to preventing substance use, represents a core strategy of the IPM. Securing the collaboration and commitment of schools for the collection of data to routinely monitor trends in both substance use and risk and protective factors is therefore essential.

Guiding Principle 3: Engage and Empower Community Members to Make Practical Decisions Using Local, High-Quality, Accessible Data and Diagnostics

Local community members make all model-driven decisions based on hard data and neighborhood and school-specific diagnostics. The model thus relies on local data to (a) capture, focus, and sustain community attention on local factors essential to preventing substance use (b) guide the selection of strategies and the development of community capacity necessary to address the complex problem of substance use.

To accomplish this, the model uses data that are local, high-quality, and made accessible through quick and efficient processing and dissemination. Local data amplify community interest in what is happening with the young people living in local areas and neighborhoods, as well as motivating community action to address local problems. High-quality data strengthen opportunities to accurately describe, diagnose, and inform community decision making. Accessible and current data promote meaningful participation from the whole community by presenting information in a clear manner that is easily understood by most community members. Using local, high-quality, and accessible data allows a local prevention team to accurately describe how community characteristics relate to substance use in each specific neighborhood or school, to identify possible priorities for intervention, and to support well-informed community members as they use hard data to choose strategies most likely to be successful in their individual communities. Collaborating with community-based researchers and supporting them to collect, process, and disseminate regular data is essential to this principle.

Guiding Principle 4: Integrate Researchers, Policy Makers, Practitioners, and Community Members Into a Unified Team Dedicated to Solving Complex, Real-World Problems

In many public and community health interventions, the connections between researchers, policy

makers, practitioners, and community members are more theoretical than functional and practical. Although they may share the same goal, each group tends to function in isolation from the others and at varying proximities from the problem itself. The IPM takes a team-science-to-practice approach to prevention that integrates researchers, policy makers, practitioners, and community members into a team that works to solve real-world problems in specific areas or neighborhoods over long periods of time. Thus, each group maintains close proximity to each other and the problem itself. While working together to implement each of the 10 Core Steps of the Icelandic Prevention Model (see Kristjansson et al., 2019), each group not only offers unique skills and experiences necessary for solving local problems related to substance use but also does so in a manner that seeks to both influence and be influenced by other team members. For example, using this approach, researchers are open to ideas from policy makers, practitioners, and community members and often rely on their practice-based insights to guide future directions in data collection and interpretation of existing data. Conversely, policy makers, practitioners, and community members come to rely on researchers when collecting data, making data-driven decisions, and evaluating community progress. By establishing this kind of functional team dynamic, the model aligns the expertise and efforts of researchers, policy makers, practitioners, and community members to maximize the practical, real-world impact of their collective capacity. Clarifying and maintaining the importance of collaboration is the crux of this principle.

Guiding Principle 5: Match the Scope of the Solution to the Scope of the Problem, Including Emphasizing Long-Term Intervention and Efforts to Marshal Adequate Community Resources

The model recognizes that the social conditions that promote substance use among young people emerge from multiple, complex sources over time. For example, previously established social norms related to substance use; community economic conditions; the prevalence of depression, anxiety, and addiction among adults; and a lack of interesting and accessible structured leisure time opportunities may all contribute to a rise in the rates of substance use and abuse among adolescents. The rise of any one of these contributing factors is complex and usually occurs over long periods of time. Therefore, solutions designed to counteract, mitigate, or eliminate these social conditions must account for the scope and magnitude of those initial problems. Problems that take 10 years to develop are seldom solved in 10 weeks or

even 10 months. More often, decade-long social problems may take years to address and require long-term vision and planning, sustained attention and commitment, adherence to an iterative and repetitive approach, and long-cycle or permanently committed financial resources. Since the model is based on an ongoing effort to alter society in a manner that protects young people from substance abuse, it must also prioritize creating the community capacity and long-term commitments necessary to achieve this goal. Understanding and appreciating that primary prevention as seen through the lens of the IPM is a long-term strategy will be necessary to live up to this guiding principle.

► DISCUSSION

The IPM in many ways mirrors what Livingood et al. (2011) have called for and labelled as an applied “toolkit approach” to health promotion. Rather than relying on universal and prescriptive interventions, the toolkit approach assumes that communities vary greatly in strengths, opportunities, and resources. For health promotion practice this means that although the influence of specific risk and protective factors operates similarly across individuals (Hemphill et al., 2011), their prevalence and significance differ at the school-community level (Hawkins, Van Horn, & Arthur, 2004). This is particularly important for primary substance use prevention because it underscores the appropriateness of community-wide diagnosis of risk and protective factors, and the local tailoring of intervention activities (Livingood et al., 2011).

Instead of attributing the risks of substance use initiation among children and adolescents to individual choices, the IPM is designed to maximize the odds of healthy individual choices as default and therefore for greater population impact than typically achieved through efforts limited to individual-level programs. This aligns with the premises of the Centers for Disease Control and Prevention Health Impact Pyramid (Frieden, 2010)—the five-layer pyramid that represents a spectrum of changes from population-level socioeconomic factors at the base of the pyramid, to the individual-level counseling and education at the apex of the pyramid—and assumes an inverse relationship between the increased individual effort needed at the top and the potential population impact at the bottom. Above changes in socioeconomic factors, the fourth layer in the pyramid concerns itself with “Changing the Context to Make Individuals’ Default Choices Healthy.” In the context of the Health Impact Pyramid, this is precisely the position and focus of the IPM. However, changing community norms and culture takes time, and time is

commonly a scarce resource to planners, funders, and elected officials who seek immediate answers or solutions to community problems. Thus, mutual agreement and understanding among stakeholders that the IPM is a long-term approach is essential for success.

In reviewing the five guiding principles of the IPM, it becomes apparent that individual elements of the model are not new. The key difference between the IPM and other prevention approaches concerns its processes and reliance on collaboration between representatives from sectors that usually do not interact or engage much with one another: researchers, policy makers, practitioners, and community stakeholders. At the local level, everyone is needed at the table to work in dialogue under the realization that each of these entities represents an important function in the system, and therefore each is also limited in their scope and strengths. Thus, a central theme in the approach is community engagement and collaboration to foster an environment that is resistant to substance use, assuming that the risk of substance use initiation among children and adolescents grows out of the social environment (Akers, Krohn, Lanza-Kaduce, & Radoceovich, 1979; Hirchi, 1969; Merton, 1938; Sigfusdottir et al., 2009). Thus, instead of facilitating behavior change at the individual level through educational and/or instructional programs, as is more common in traditional prevention work, the IPM assumes that changing the environment will generate less risk-prone individuals in the long term. It is therefore not a top-down program but a bottom-up community-building collaborative approach that is organized for long-term action, change, and maintenance of change.

In conclusion, the IPM has been in development and practice-based refinement for 20 years (Palsdottir, 2003; Sigfusdottir et al., 2009) and has demonstrated strong evidence of effectiveness in reducing substance use among Icelandic adolescents. Since the initiation of the *Youth in Europe* project in 2006 (Kristjansson, Sigfusson, Sigfusdottir, & Allegrante, 2013; Sigfusdottir, Kristjansson, & Agnew, 2012), the approach has been disseminated and scaled—in part or in whole—in several other countries, cities, and municipalities (Kristjansson et al., 2013; Kristjansson et al., 2017). During this time, we have learned which challenges most commonly impede full implementation and subsequent results. These challenges include inadequate organization and poor coalition building at the local level, limited funding and personnel with protected time to devote to primary prevention, low levels of political and administrative support and/or distrust in research, poor data collection preparation with schools and/or confusion about individual roles, low participation in community meetings and failure to garner wide community support and engagement, extended time between data collection and

report dissemination, confusion about data ownership and rights to distribution, limited interest in community engagement beyond informational meetings, lack of organizational and community-based strategies to identify and work on selected priorities, limited availability for structured leisure time activities and low commitment to improve/add opportunities, and insufficient time allowed to facilitate long-term changes. Part 2 in this series will examine these challenges and the respective steps we have found necessary to take in overcoming them when implementing primary prevention of adolescent substance use.

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