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A call for action to positively redirect the developmental trajectory of children through "Promoting comprehensive and scientific evidence-based early prevention"**

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A call for action to positively redirect the developmental trajectory of children through "Promoting comprehensive and scientific evidence-based early prevention"

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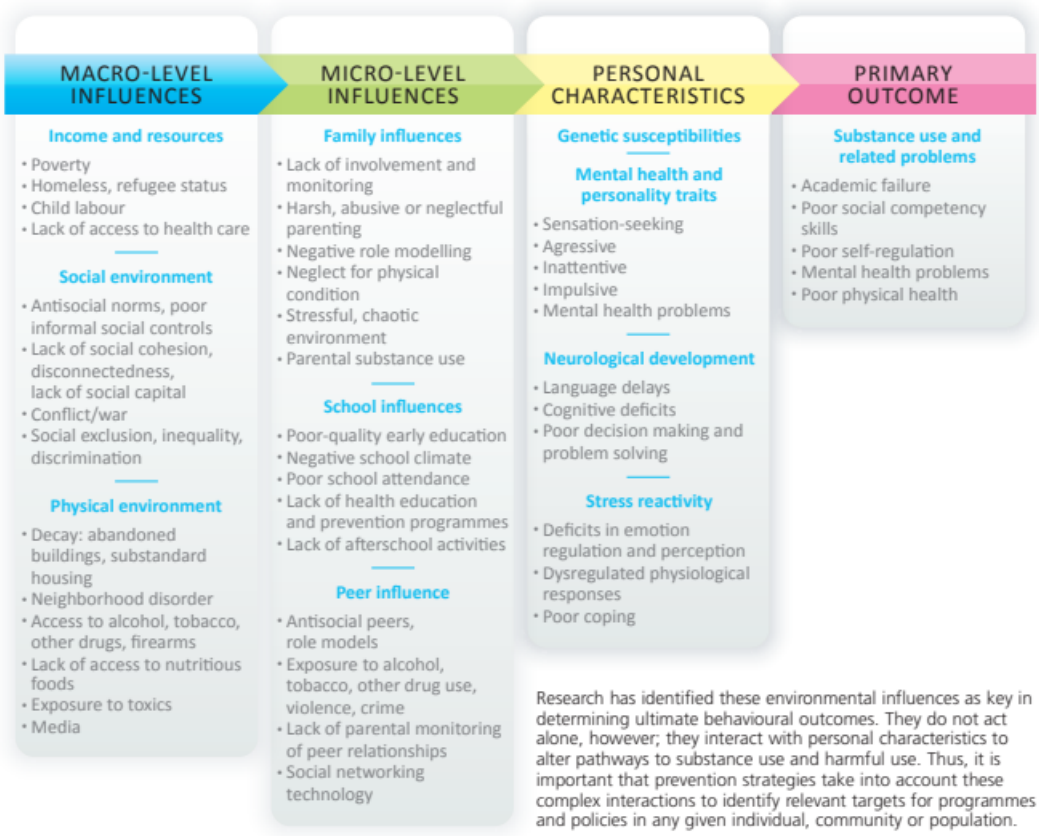
1. The culture of prevention per the UNODC/WHO International Standards on Drug Use Prevention

The science of prevention entails an understanding of the factors that influence substance use, a coalescence and a coordination of the vision of the stakeholders that can address these factors and a set of interventions that is guided by scientific evidence. The International Standards on Drug Use Prevention (the Prevention Standards), initially launched in 2013, dwell on this science to avail it to policy makers to better orient global prevention responses. The Prevention Standards summarise the available evidence on what constitutes an effective prevention response and describe the different types of evidence-supported prevention approaches. It guides prevention strategies and describes interventions and policies with positive outcomes. Concurrently, it identifies the major components and features of an effective national drug prevention system to ensure a truly effective investment in the future of children, youth, families, and communities.

The Prevention Standards call for a paradigm shift in the vulnerability framework addressed in the prevention responses. Such a paradigm applies a developmental perspective, one that understands the complex interactions between different factors that potentially contribute to a higher risk of substance use, referred to as vulnerability factors. The perspective of the Prevention Standards places the focus on the individual and his/her healthy development across their life span rather than on the psychoactive substance as the main area of concern. In such a model, the initiation of drug use at a young age is attributed to the interactions between un- on inappropriately addressed vulnerabilities at the individual level and the macro- and micro-environment surrounding the individual (Figure 1). Such an approach refutes the notion that the initiation of drug use is the simple result of “bad” personal free choice. Moreover, it delineates that drug prevention through awareness-raising or fear-raising messaging is not enough (and is sometimes counterproductive). Although the vulnerability can occur at many points along the life course, it tends to peak during critical life transition periods, this makes it also an opportune time to intervene. Life transitions such as pregnancy, birth, infancy, early childhood, entering preschool, entering school, adolescence and more, require specific developmental milestones to be attained and are as such prime opportunities to introduce skills, knowledge and competencies to facilitate smooth transition to and through each transition period. Achieving the milestones within the age frame is an important signal that development is evolving as expected and failure to

achieve the milestones may indicate the need for early intervention. This of course does not necessarily mean that the child who is below the average on the milestone will not achieve it eventually or will necessarily develop a problem. Milestones can be achieved later in development, though with greater difficulty and the vulnerability might be accentuated. The Prevention Standards reflects on interventions that focus on assisting individuals in meeting developmental milestones and helping them grow safely and healthily[4].

Figure 1. Risk factors in substance use and harmful use of substances.



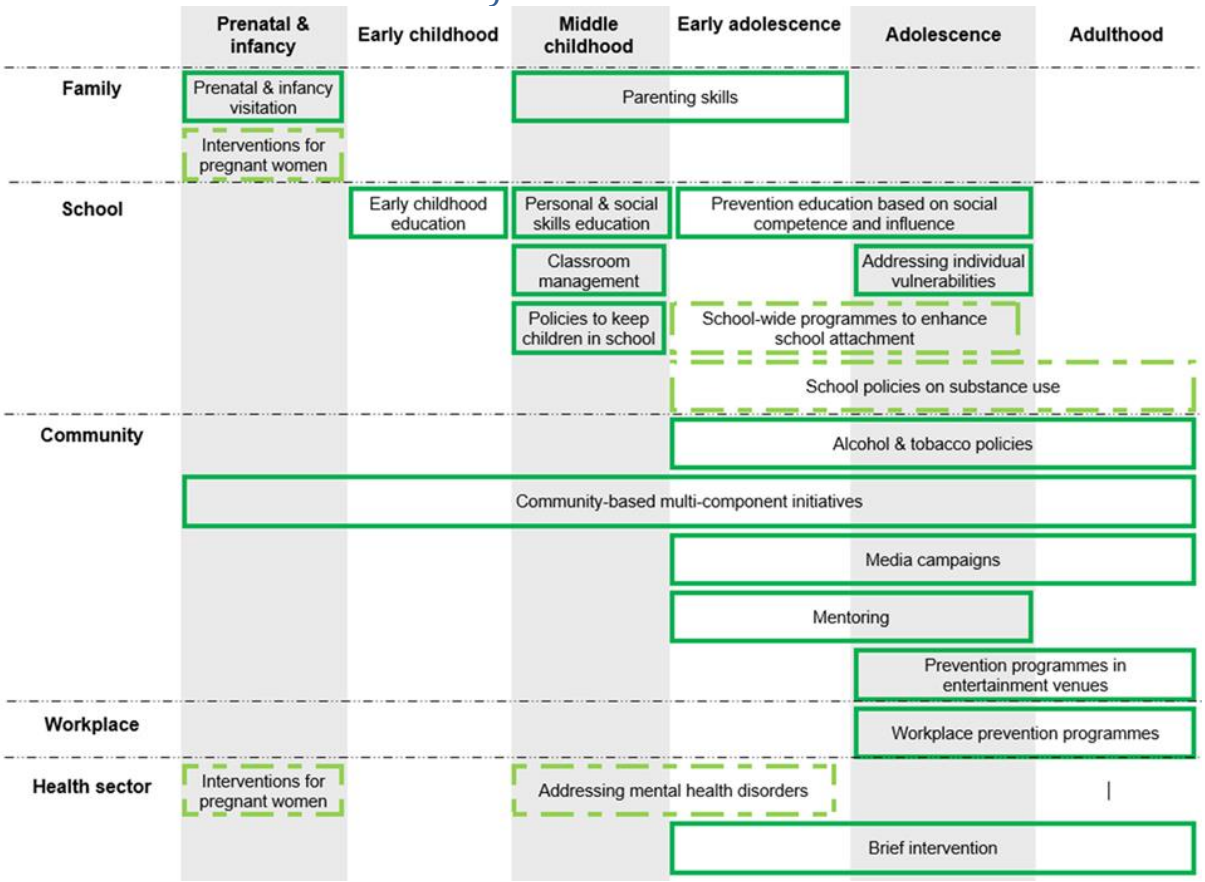
Source: *World Drug Report 2018*

The Prevention Standards drew attention to the importance individual and environmental vulnerabilities can have on i) the development and function of the brains of children; ii) the ability of children to make rational decisions, solve problems, control their impulses, perceive and process emotions accurately, gauge the consequences of their actions, and self-regulate their behaviour and emotions.

In 2018, a revision of the Prevention Standards was undertaken by UNODC following the (ROBIS - Risk of Bias In Systematic Reviews) modality to update and fine tune the scientific scoping review of the 2013 version. This resulted in the development of the UNODC/WHO

International Standards on Drug Use Prevention, 2nd Updated Edition of 2018. This edition generated further evidence of interventions with proven effectiveness in preventing substance use. Figure 2 summarizes the interventions reflected to be effective across the two versions of the Prevention Standards. The hard-lined boxed interventions are those of the 2013 version (all remain correctly identified) and the dashed-boxed interventions are those that were added in 2018, using the ROBIS criteria.

Figure 2. Interventions reflected as effective for prevention, per the UNODC/WHO International Standards on Drug Use Prevention comparing the 2013 (1st Edition – in hard-lined boxes) and the 2018 (2nd Updated Edition – in dashed-lined boxes).



Source: *International Standards on Drug Use Prevention, 2nd Edition*

These Standards reflected that prevention with effective evidence can start as early as the embryonic stages of development and continue throughout the life span with differential services and differential social institutions playing an influential role in supporting the healthy transition between the different developmental ages. These Standards, beyond the document of concern, were also accompanied by capacity building efforts from UNODC with policy makers globally, to sensitize them on the content and change their respective perceptions and responses for preventing drug use.

2. The Prevention Standards, the culture of prevention and the Commission on Narcotic Drugs (CND) resolutions

A shift in the culture of prevention aligned with science positively affects the initiative of decision-makers to create readiness, demand, and capacity for evidence-based prevention programming.

The science of prevention of drug use has been positively evolving with incremental evidence being generated on the etiological model to be addressed as well as the practical applications and initiatives that effectively address substance use. Such increasing efforts have been key in informing policymakers in the fields of health, education, welfare, and other contexts. Substance use continues to have a significant global toll on health, social and economic development. Its prevention as such remains high on the international political agenda.

The CND in its 2019 Ministerial Declaration on *Strengthening our Actions at the National, Regional and International Levels to accelerate the implementation of our Joint Commitment to Address and Counter the World Drug Problem* committed to effectively address and counter the world drug problem with concerted and sustained actions at the national and international level. The Commission also reiterated its resolve to strengthen effective, comprehensive, scientific evidence-based drug demand reduction initiatives including prevention. Moreover, all member states of the United Nations have adopted Agenda 2030 for Sustainable Development as a call to action to achieve peace and prosperity for both humanity and the planet. One of the specific goals outlined in this agenda is Sustainable Development Goal (SDG) 3.5, which seeks to strengthen measures aimed at preventing substance use.

Between 2008 and 2021, the CND has seen a consistent and positive increase in the proportion of resolutions calling for evidence-based prevention approaches to substance use. Noting that while prevention was not among the top priorities during the first years following the adoption of the 2009 Political Declaration, the resolutions started to reflect the importance of prevention more strongly after the period of development of the 1st Edition of the International Standards on Drug Use Prevention in 2013. The proportion of resolutions referring to prevention increased to 45% over 2013–2017 (compared to an average of below 20% prior to this period). The advent of the second version of the UNODC/WHO

International Standards on Prevention of Drug Use in 2018 re-invigorated the momentum and re-raised the number of resolutions covering prevention again to an average of 30% (Figure 3 and Table 1).

Moreover, a review of the operative paragraphs of the CND resolutions and thorough analysis assessing how the language deployed in these resolutions reflected conceptualization of actions aligned with and stressing on evidence-based prevention. Through this review, an ascending trend on articulation of evidence-based prevention was noted over time. Notably, this ascent also coincided with the release of the International Standards on Drug Use Prevention in 2013 and continued more sharply after the introduction of the 2nd version of the Prevention Standards in 2018 (Figure 3 and Table 1).

Figure 3. The percentages of the resolutions, and of their operational paragraphs, adopted by the CND between 2008 and 2021, that call for prevention of substance use and for evidence-based prevention approaches

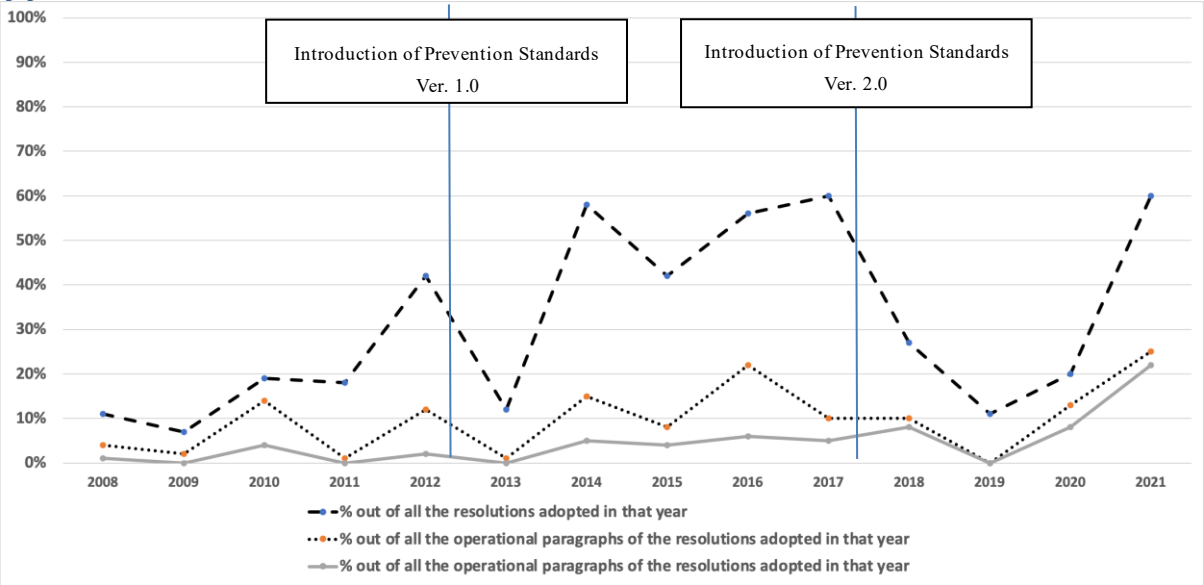


Table 1 The counts and percentages of the resolutions and of their operational paragraphs, adopted by the CND between 2008 and 2021, that call for prevention of substance use in general, and that call particularly for evidence-based approaches.

1. Resolutions and their operational paragraphs per year			2. Resolutions that mention prevention			3. Operational paragraphs that mention prevention			4. Operational paragraphs that mention evidence-based prevention		
Year	N of all the resolutions adopted in the given year	N of all the operational paragraphs of the resolutions adopted in the given year	N of the resolutions that mention prevention of substance use adopted in the given year	% out of all the resolutions adopted in that year	Mean %	N of the operational paragraphs mentioning the prevention of substance use adopted in the given year	% out of all the operational paragraphs of the resolutions adopted in that year	Mean %	N of the operational paragraphs that mention evidence-based prevention*	% out of all the operational paragraphs of the resolutions adopted in that year	Mean %
2021	5	103	3	60%	30%	26	25%	12%	23	22%	10%
2020	5	65	1	20%		9	13%		5	8%	
2019	9	135	1	11%		0	0%		0	0%	
2018	11	108	3	27%		11	10%		9	8%	
2017	10	170	6	60%	45%	17	10%	11%	9	5%	4%
2016	9	185	5	56%		40	22%		11	6%	
2015	12	144	5	42%		12	8%		6	4%	
2014	12	113	7	58%		17	15%		6	5%	
2013	17	171	2	12%		1	1%		0	0%	
2012	12	108	5	42%	19%	13	12%	7%	2	2%	1%
2011	17	136	3	18%		1	1%		0	0%	
2010	16	120	3	19%		17	14%		5	4%	
2009	14	118	1	7%		2	2%		0	0%	
2008	18	113	2	11%		5	4%		1	1%	

*Occasions when prevention is referred to as “evidence-based” or “science-based,” or when evaluation of effectiveness or scientific assessment is called for, or when the implementation of the UNODC Standards is called for.

Fig. 3 and table 1 are adapted and updated from a previous publication: Heikkilä H, Maalouf W, Campello G. The United Nations Office on Drugs and Crime’s Efforts to Strengthen a Culture of Prevention in Low- and Middle-Income Countries. Prev Sci. 2021 Jan;22(1):18-28.

3. The adoption of CND resolution 65/4, ‘Promoting comprehensive and scientific evidence-based early prevention’

Following the positive progress in the prevention content of resolutions passed between 2008 and 2021, the CND adopted resolution 65/4 “Promoting comprehensive and scientific evidence-based early prevention” during its regular meeting in March 2022[2]. This resolution is a landmark one that emphasized for the first time the importance of early prevention in addressing the global drug problem. The resolution reflected a clear understanding and appreciation that the initiation of drug use is developmental in nature. Hence, it emphasized appropriate support for milestones of development during early ages of growth as a cornerstone to effective prevention responses.

The resolution further stressed on the importance of comprehensive and scientific evidence-based approaches for such early prevention of drug use. It focused on and recognized the significant role that such comprehensive and evidence-based early interventions can play in

preventing or delaying the initiation of drug use in children and youth as well as preventing other negative and risky behaviour. By focusing on evidence-based strategies, in line with the Prevention Standards, and promoting cooperation among relevant stakeholders, the resolution seeks to ensure that prevention efforts implemented at the child's earlier developmental stages are effective, efficient, and sustainable. So, through this early prevention response lens, several vulnerabilities that alter the life course trajectory of children are addressed and re-oriented in a positive direction, supporting as such multiple SDGs.

Given the developmental nature of initiation of drug use, the CND resolution 65/4 also echoed the Prevention Standards in reflecting on the importance of gender considerations in such responses. This was namely since boys and girls have different developmental trajectories of growth and are differentially affected by external challenges and stressors.

Under this model, the CND resolution 65/4 incites Member States not only to value the importance of such responses but to allocate appropriate resources for the development, adaptation (to different contexts and cultures), implementation, and evaluation of scientific evidence-based early prevention programs. Furthermore, the resolution supports the development of programs in line with the Prevention Standards, with emphasis on social and emotional learning interventions that cover family, schools (early childhood education), as well as personal and social skills education and prevention education based on social competence and influence.

The resolution also entails specific requests for the United Nations Office on Drugs and Crime (UNODC), these requests are:

- The provision of technical assistance and capacity building programmes in family, community and educational and other health setting and social care setting for the purpose of early prevention
- The assistance of Member States in conducting and promoting research and data collection in educational setting to better understand the challenge of drug use initiation among children and youth and respond to it more effectively.

The development of guidelines and recommendations to help Member States and other relevant international and civil society organization, including youth-led organizations to make best use of the International Standards for the promotion and implementation of scientific evidence based early prevention in particular those focused on addressing the

impact of adverse childhood experiences, as well as individual and environmental, including risk and protective factors with a focus on early prevention responses and interventions.

The resolution also calls upon UNODC to facilitate the promotion and exchange of scientific evidence based good practices, challenges and experiences in early prevention between Member States.

4. Early childhood developmental milestones

Early childhood is a dynamic and complex period of human development that is not monolithic in nature. It is characterized by a range of experiences, developmental trajectories, and variations across different cultural, social, and economic contexts. This stage of development includes a broad range of domains such as cognitive, social-emotional, and physical development, all of which are interrelated and influenced by various environmental factors. These domains are differentially affected and requires different levels of support at different stages and ages of early childhood. Moreover, within each of these stages of early development, individual differences among children, including their temperament, personality, and genetic makeup are also at play. These differences influence how children experience and respond to their environments and shape their developmental pathways.

Therefore, recognizing the heterogeneity of early childhood is crucial for understanding the needs and experiences of young children and designing appropriate interventions and policies to support their development. The main developmental milestones to consider during early childhood are:

a. Pregnancy and foetal development

Even before the child is born, the environment starts playing a role on the developing foetus. The period of pregnancy, and eventually parenthood, are considered important developmental life stages as well as a period of major stress. Proper support for the expecting parents, including mental health and particularly substance use support is essential during this period. Valuably, the sensitivity of this transitional period of life makes the future caregiver receptive to address their potential substance use and substance use disorders. Substance use exposure, including alcohol, tobacco and the misuse of licit or the use of illicit

drugs, during pregnancy poses potential significant health risks on the foetus. Also, the risk of substance use is high enough, that its impact and related developmental deficiencies can be sustained, post-delivery (this might be the result of direct exposure to drugs cross-placenta or to second hand smoke or indirectly due to the general family environment that might have elevated level of child abuse, neglect and involvement). These deficiencies impede the developmental competencies of children and make them vulnerable of risky and negative behaviours at later ages.

b. Infancy and toddlerhood (0-3 years):

Once a child is born, the early childhood starting with infancy and toddlerhood (ranging between 0 to 3 years of age) is a crucial period for the future development of children. During this age, the brain of children grows and forms most of its vital and essential neural connections, which will be the basis for their future cognitive, social and emotional development. The Prevention Standards suggest that children at this age may develop vulnerabilities through the poor interaction with parents or caregivers who fail to nurture them. The quality of nutrition and health care provided by the caregiver also plays a significant influence. This relationship and interaction with the environment of the child is a two-way street with the child also playing an influence on his/her environment. The main milestones during this age include the development of safe attachment to the caregivers, age-appropriate communication skills and executive cognitive functions such as self-regulation and pro-social attitudes and skills. The best way to acquire these skills is by providing a context of support from family and community. Therefore, parents who lack the needed and appropriate parenting skills or who suffer from other difficulties associated with poor health, financial hardships, or other challenges (especially in a socially or economically marginalized environment or a dysfunctional family setting) may particularly struggle to provide their children with the support they need for healthy development.

c. Early Childhood - preschool (3-6 years)

During this childhood age range, 3-6 years, children start growing more rapidly, and their bodies undergo significant changes. Children learn how to talk, walk, run, jump, and engage in different physical activities. The language, physical and cognitive development during this stage sets the basis for activities at a later stage in their development (e.g., sports, other physical activities, acquiring new knowledge, developing the ability to think, understand and solve problems). While the child during this period may potentially be interacting with

preschool or other types of day care, parents and caregivers remain a main source of support of the child's social, emotional and cognitive competence development, including the establishment of structures and routines. Such support for the development of motor, cognitive and languages abilities during preschool significantly influence the child growing independence when integrating in a social structure outside the family (such as in the educational setting). The absence of such attentive, nurturing and supportive structures around the child at this age correlates with high level of stress that can impede the child's healthy brain development. The most significant transition in the next step of development is transitioning to school.

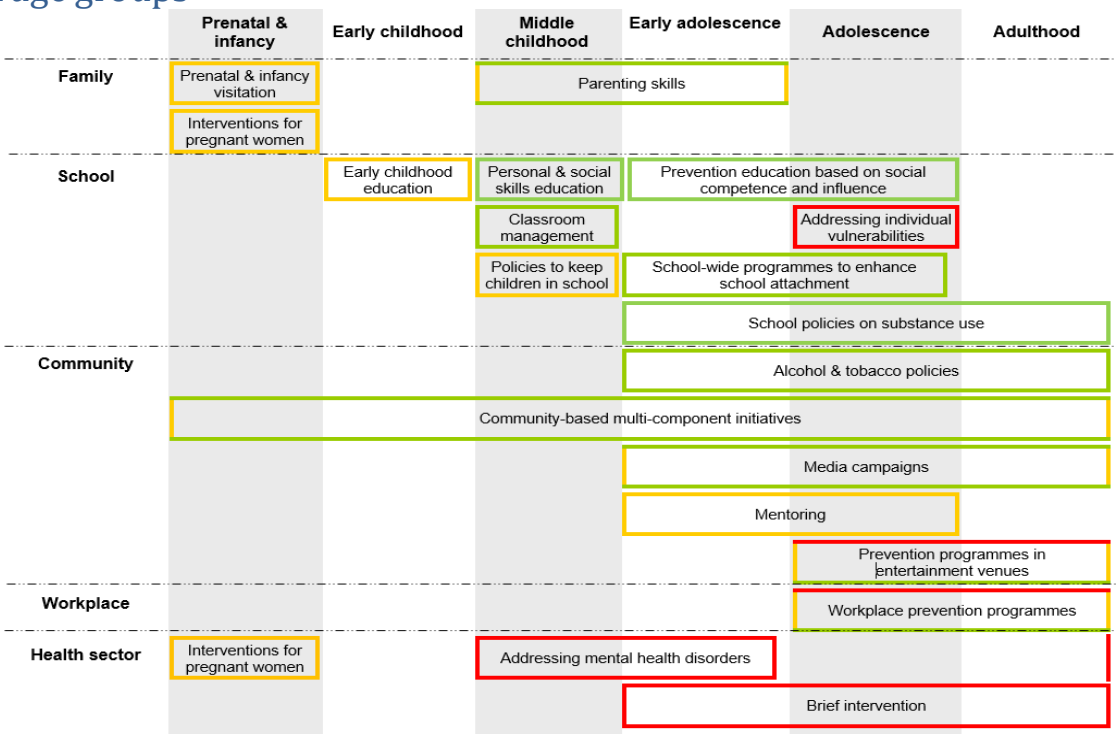
d. Middle childhood – transition to school (6-9 years):

During middle childhood, children spend a growing amount of time away from their families, most often at school and with other children the same age. This is a period of new transition and challenges occur. While the family influence as a social setting remains the functions of the educational settings including the school, and peer groups within it start to become more significantly interacting with, and influential on, the child. The rules of the behaviours and academic requirements start to change and require a different level of competencies for the child to be able to positively adapt to it. When it comes to ensuring a child's secure and healthy emotional, cognitive, and social development, factors such as community norms, school culture, and the quality of education start becoming more crucial. In middle childhood, social skills and pro-social attitudes become more important because they develop into crucial protective factors that influence not only the degree to which a kid of school age will be able to deal with school, but also the degree to which they will connect with their classmates. The continuous development of age-appropriate language and numeracy abilities, as well as impulse control and self-control, are among the primary developmental objectives that should be focused on throughout the middle childhood years. Also beginning at this age is the development of behaviour that is goal-directed, along with decision-making and school-based problem-solving abilities. The development of a healthy connection to school, cooperative play with peers, adaptive learning, and self-regulation may all be hindered by mental problems that have their beginnings at this time, including as anxiety disorders, Attention Deficit Hyperactivity Disorder (ADHD), and conduct disorders. Children who are raised in dysfunctional households often reach this age when they begin to form friendships with classmates who are engaged in potentially risky behaviours, which puts the children's own safety in jeopardy.

5. Overview of existing evidence in early prevention

The developmental needs of each age group can be organised by the setting where the intervention is delivered: family, school, community, workplace, and the health sector (Figure 4). These strategies are categorized as: universal (targeting everyone regardless of the level of risk of individual recipients), selective (targeting subpopulations at higher risk than the average population) and indicated (targeting individuals with symptomatic behaviours with early interventions preventing escalation of the problematic behaviours). It is clear that the proximal setting that is most influential at early stages of development is the family and the school setting.

Figure 4. Summary of the strategies of interventions at the different levels and age groups



Source: *UNODC WHO International Standards on Drug Use Prevention, 2nd Edition*

From the perspective of the Prevention Standards and given the developmental milestones required at each age, the below evidence-based responses have been documented to be effective in early prevention.

a. Prenatal and infancy

Prevention programs at the prenatal and infancy developmental stage include visits of trained nurses or social workers to expecting and new mothers to offer parenting skills and assistance with various issues such as health, housing, employment, and legal matters. These programs are typically designed to target specific groups of women who are facing particularly challenging circumstances, rather than being aimed at all women in general (selective prevention). The primary goal of these programs is to provide developmental support to those who need it most. Such programmes are also recommended by WHO to prevent child maltreatment.

Furthermore, given that pregnancy, motherhood and potential parenthood in general is a period of significant changes and potential stress, this makes it a period amenable to addressing any substance use or substance use disorders caregivers may have. During this period, it is recommended to have interventions addressing all pregnant women with information on the potential health risks associated with substance use. Given the high risk posed by the usage of psychoactive substances during pregnancy, it is important to prioritize the management of substance use and the treatment of pregnant women who have substance use disorders. Such management and treatment must adhere to rigorous clinical guidelines based on scientific evidence, as this approach is both necessary and beneficial for the health and well-being of both the mother and the future child. This strategy supports the healthy development of the foetus during pregnancy and maximizes healthy outcomes for both the mother and the child.

b. Early childhood-preschool

The main packages recommended with evidence per the standards for this age group are those availing early-childhood education support through the educational sector. These packages prioritize children growing in socially disadvantages communities (selective prevention). As the name implies these packages avail social and cognitive developments skills for preschool children through trained teachers to better prepare them for school. This is done while providing their caregivers with socio-economic support in preparation for their upcoming school years.

c. Middle Childhood – early school years

During this age, parenting skills programmes (at universal and selective level) are important. These are packages that avail skills in a simple way for caregivers to improve their warm child-rearing style, family bonding and attachment, set age-appropriate rules for acceptable behaviours, closely monitor free time and friendship patterns, help child acquire the skills for informed decisions. They give the potential for caregivers to play a more active role in the children's lives and friendships. Such packages are organized in a way that makes it easy and appealing for both caregivers and their children. They consist of a series of sessions, include activities for the caregivers, the children and the whole family and are delivered through trained facilitators. They are designed not to undermine the parents' authority or to lecture and provide information to parents about drugs and do not exclusively focus on the child but on the caregiver as well. WHO recommends such parenting skills programmes to support positive development, prevent child maltreatment, youth violence and manage behavioural disorders in children.

Personal and social skills education through the school setting is also valuable at this age. Such packages encourage an interactive engagement of children in activities guided by trained teachers to learn and practice a range of personal and social skills needed at this age of development. They are usually applied in a universal prevention context and include a series of structured sessions (sometimes over multiple years). They help children learn skills for coping with difficult situations in daily life in a safe and health way. Given the age context, discussion of drugs in not usually part of the curriculum. These packages do not only focus on building of self-esteem and on emotional education.

Classroom environment improvement packages are a set of packages that strengthen classroom management ability of teachers. This supports children becoming better students while reducing early aggressive and disruptive behaviours. They support teachers in availing strategies to deal with inappropriate classroom behaviours and acknowledging appropriate one through targeting the management of the whole class and through active engagement with students. They are often delivered through the first school years.

Policies to keep children in school, including improving school attendance, attachment to school and achievement of appropriate language and numeracy skills are important at this age too. Such policies may include building new school, providing nutrition in schools, providing economic incentives for families to send kids to school to encourage higher

attendance and retention of children in schools. WHO also supports the implementation of conditional financial incentives to keep children in schools as a strategy to prevent later youth violence.

Addressing mental health disorders is also key during this age. Emotional disorders (such as anxiety and depression) as well as behavioural problems (such as Attention Deficit Hyperactivity Disorder- ADHD, and conduct disorders) are associated with increased risk of substance use in later ages. Such mental health disorders usually start to be diagnosed within this age frame. Prevention strategies supporting children and parents to address such emotional and behavioural disorders as early as possible are as such particularly important. These strategies include psychological interventions such as Cognitive Behavioural Therapy, interpersonal therapy, parental education and training on caregiving skills and medical support to children suffering from ADHD.

Further to the evidence summarized in the UNODC/WHO International Standards on Drug Use Prevention, the National Institute on Drug Use (NIDA) published, in 2016, an overview of the available evidence, from NIDA-Funded Early Intervention for substance use prevention programs[40]. These interventions mostly echoed those reflected in the Prevention Standards. NIDA divided the packages that of concern based on target recipient (either universally or selective). The detailed summary of the individual packages listed are enclosed in the Appendix A.

According to the National Institute on Drug Abuse (NIDA), the prevention packages supported through their funded mechanisms with evidence of effectiveness on prevention (per below) are tailored to specific age groups and developmental stages of children, taking into consideration their cognitive, emotional, and social development. The packages typically include evidence-based interventions, such as parent training and school-based prevention programs at their core. They aim to enhance protective factors and reduce risk factors for substance use. By focusing on specific developmental stages, such prevention packages can effectively address the unique challenges and needs of children at each stage, ultimately promoting healthy behaviours and preventing substance use.

The risk addressed through specific age-appropriate strategies of NIDA-funded early intervention for substance use prevention programs are summarized in Table 2.

Table 2. Risk addressed through specific age-appropriate strategies

Age period	Risk	Intervention Strategy
Prenatal	Maternal substance use before and during pregnancy	Counselling through primary care and referral to treatment
	Inadequate prenatal care	In-home nurse visits
Infancy and toddlerhood	Inappropriate expectations of children	Parenting class on child development
	Harsh discipline	Parenting class on managing child behaviour
	Insecure attachment	Parent class on developing warm, supportive relationship
Early childhood-Preschool	Aggressive behaviour	Parent and teacher classes on setting limits and boundaries
	Poor emotional control	Preschools that each social-emotional learning
	Delayed School readiness	Preschool programs that highlight basic math and language concepts
Middle Childhood-Elementary school	Behavioural problems in the classroom	Training teachers on classroom management
	Academic problems	Academic tutoring
	Child acting out at school	Developing collaborative relationships between schools and home
	Poor social skills	Peer social groups

Replicated from NIDA Principle of Substance Abuse Prevention For Early Childhood: A Research-Based Guide[40]

Overall, all packages suggested in this NIDA's review are tested interventions in high-income context (mainly emanating from the United States of America). Additionally, these interventions tend to suggest individualised interventions which require additional and sometimes highly trained staff, to be able to deliver these interventions[40]. Therefore, there can be a challenge to implement such interventions in low- and middle-income countries context.

6. Gaps and needs

Despite the increased recognition of the role of early prevention in tackling the world drug problem, significant gaps persist at the level of both policymaking acknowledgment of and action towards such interventions as well as service provision of such packages, particularly in low- and middle-income countries (LMICs).

This first signals the need for tools for direct and comprehensive policy sensitization efforts on scientific evidence-based early prevention within the framework of the UNODC/WHO International Standards on Drug Use Prevention.

Moreover, the biggest share of existing evidence-based early prevention programs goes to high income countries. This indicates a scarcity of such programs designed for, adapted to, or implemented in LMICs. This means that our understanding of what works and what does not in terms of preventing the use of drugs and other related negative outcomes in the early developmental stages of children is limited to a narrow demographic.

Given that low- and middle-income countries often have different cultural, economic, and social contexts, it is crucial to develop, adapt and implement early prevention programs tailored to their specific needs. A preliminary review of the available literature highlights the need for two types of evidence-based early prevention packages in LMICs. One targeting each of the main proximal environmental institution affecting the child at early ages of development, the family and the school.

The first type of packages should target the family, specifically caregivers caring for children in early- (preschool) and middle- (early school) childhood period. In a fast-paced world, caregiving or parenting can be a challenging task. The responsibilities of raising a child come with many challenges, especially for children at these ages of development when they are rapidly developing and constantly learning, making it essential to provide them with a healthy, supportive and safe family environments. The aim of such a package is to provide the necessary parenting skills to create a healthy and safe environment for children of such ages and reduce parental and child stress. By targeting families and caregivers, these packages can help to improve the quality of life for both children and their caregivers.

Parenting skills play a critical role in creating a healthy and safe environment for children. They can help caregivers to understand the different stages of development that children go

through and how to support their growth. These skills can also help caregivers to identify potential health and safety risks, such as stress, and how to manage them on a daily basis. Additionally, parenting skills can help caregivers to create a supportive and nurturing environment that promotes healthy relationships, self-esteem, confidence, and resilience in children, which in turn reduces the risk of children engaging in risky behaviour as they move into their next developmental stage.

Similarly, it is as important to focus on prevention in schools/educational settings as much as within the family environment, as children at the age of 3-6 years old spend a significant amount of time in the classroom. Moreover, it is during this time that they develop the fundamental skills, knowledge and attitudes that are predictors for behaviour and success in later developmental stages. Therefore, it is essential that children are prepared for their school environment from an early age.

While there are many educational resources available for young children, there is a clear need for packages that are specifically designed for schools and educators, especially in LMICs. These packages should focus on preparing children aged 3-6 years for their school environment, as this is key to their healthy and safe development. Preparing children for school is about much more than just academics. It is about equipping them with the right social, emotional, and behavioural skills they need to thrive in a school/educational setting. This includes skills such as language, teamwork, communication, problem-solving, and self-regulation. It is also important that children are exposed to a positive and inclusive learning environment, where they feel safe and valued. At the same time, educators play a vital role in preparing children for school. They can help children to develop the skills they need to succeed by providing opportunities for hands-on learning, encouraging positive relationships with peers and adults, and creating a supportive and engaging learning environment. Educators can also help to build children's confidence and self-esteem, which is crucial for their overall development.

7. Conclusions

The Prevention Standards have been an instrumental tool for policy makers in orienting drug related responses globally. This positive influence has changed the narrative and the orientation of the resolutions pertaining to prevention of substance use and aligning them with science. The CND resolution 65/4 on "Promoting comprehensive and scientific evidence-based early prevention" has been a landmark call of action to this effect. While evidence supports the value and importance of such responses, essential gaps remain to take appropriate actions globally. One of the gaps includes availing policy making sensitization and strategy orientation tools to prioritize and better orient responses. The second gap is availing service provision tools tailored for low- and middle-income countries and addressing the main influential proximal environments around the child (the family and the school). These would be key ingredients in supporting a response to the valuable call for action of CND resolution 65/4. Such efforts in response for this call for action will redirect the trajectories of children globally and re-invigorate and strengthen the momentum on the Sustainable Development Goals on the road to 2030, particularly in this period of "Building up Better" post-COVID-19 pandemic.

Appendix A. Evidence-based early prevention packages recommended by NIDA according to the different age groups and developmental stages of children[40]

Program name	**Target population** *Context*	**How it is delivered**	**Impact / outcome**
Prenatal/infancy and toddlerhood period **Universal**			
Durham Connects[41]	Mother, Father (when possible), child *Family*	Brief, universal postnatal nurse home-visits Assess family needs Connect family to resources Aim to alleviate parent substance use and other problems and to prevent child abuse First: Population-level implementation Then triage and focus on individual families per individual needs	Durham RCT study had 5,000 families: outcome 50% less emergency medical care use during 0-12 months of child plus reductions in service usage in infancy[41]
Prenatal/infancy and toddlerhood period **Selective**			

Early steps, family check-up (FCU)[42]	Mother, child *Family*	2-5 years 3 sessions: parent interview & feedback session Optional: follow-up session (Every day parenting) Individual family intervention	Selected families through national family nutrition and health program (WIC). Outcome: reduced problem behaviours, especially among highest risk children; Positive parenting; Attenuated internalizing behaviour; increased self-regulation and improved language skills among children and reduced depressive symptoms in mothers[43] Selection bias.
Family spirit[44]	Mother, child *Family*	Pregnancy and early childhood (0-3 years) American Indian teen mothers/children Delivered by Native paraprofessionals in home visits N=43 lessons, weekly delivered (during pregnancy) Bi-weekly sessions during 0-3 months newborn age Monthly: 4-12 months child age Bi-monthly 12-36 months child age Individual family intervention	At 12 months post-partum: mothers had greater parenting knowledge, parenting self-efficacy, and home safety attitudes with fewer externalizing behaviours. Children had fewer externalizing problems. Sub-sample for mothers with any previous substance use history, pre-study, had their children with fewer externalizing and dysregulation problems, and fewer scored in the clinically "at risk" range for externalizing and internalizing problems[45,46]

Nurse family partnership	Mother, father (if present), child [47] *Family*	Selective prenatal and infancy home visitation program for young first-time mothers from low socio-economic backgrounds and their children through age 2. Help women to improve the outcomes of pregnancy by helping pregnant women improve their health (e.g., diet and discontinuing substance use). Program: 64 structured visits, from early period of pregnancy through the first 2 years post child's birth. Nurses adapt the content and frequently of visits to meet families' needs and aspirations.	Broad range of positive outcomes: immediate and intermediate outcomes (maternal, infant, and child health and reduced injuries, neglect, and maltreatment of children). Long-term effects on child outcomes (e.g., children had lower rates of substance use, delinquency, and involvement in the juvenile justice system at age 12 in rural and urban populations). Not effective when implemented by trained paraprofessionals. Nurse participation is a key aspect in the intervention[48,49]
Preschool period **Selective**			
Multi-dimensional treatment foster care for preschoolers (MTFC-P) [50]	Foster family, child *Family, school*	Targets 3-6 years old children in foster care. Aims to create optimal foster care conditions to facilitate developmental progress and address difficulties related to delayed maturation and behavioural and emotional problems. Delivered by family therapist and licensed psychologists. Parents receive 12 hours training, prior to bringing foster child into their home. Children receive weekly individualized skills training services and from a child therapist and attend a weekly therapeutic playgroup. Family therapists work with families to facilitate the transition out of foster care and into a permanent home.	Children showed secure behaviours, improved responses to feedback, reduced stress (measured through the level of the hormone cortisol) and improved sleep[51,52].

Transition to elementary school period **Universal**			
Caring school community program[53]	School, teacher, family, child *School, family*	It aims to strengthen protective factors and reduce risk factors among children making the transition to elementary school through strengthening the sense of community of the children, or connection to school. This is considered crucial to reduce substance use, violence and mental health problems and promoting academic motivation and achievement. Program includes a set of classroom, school and family involvement approaches that reinforce the development of skills by children across contexts.	A significant reduction in students' drug use and involvement in other problem behaviours in schools where the caring school community program was widely implemented by teachers over a period of 3 years[53].
Classroom-centred (CC) intervention[1]	Classroom, child *School*	It targets early aggressive or disruptive behaviour and poor academic achievement, with the long-term goal of reducing adolescent and adult antisocial behaviour and substance use. It enhances teachers' behaviour management program ("Good Behaviour Game") and an enhanced reading and mathematics curricula.	It decreased the level of conduct problems in middle and high schools. It delayed the onset of smoking tobacco in both males and females and was associated with an increased likelihood of high school graduation and a lower likelihood of special education use. Gender related impact: CC was stronger for males, showing a relatively high level of aggressive-disruptive behaviour in the early elementary school years[54,55].
Linking the interests of families and teachers (LIFT)[56]	Classroom, child, family *School, family*	Targets students in 1st and 5th grades. It is a multi-component intervention for improving school and family environments and reinforcing links between them. It aims to reduce the risk of aggressive child behaviour and rejection of aggressive children by their peers. The program includes 20x1-hour-long sessions, and a playground component based on the Good Behaviour Game.	Tested in randomized trial of 12 schools. LIFT improved parenting behaviours and child social skills. It reduced child physical aggression on the playground. Children, during middle and high school years, had lower rates of police arrest and substance use[57,58].

		Parent management training component that emphasizes on good discipline, supervision, and problem-solving during a group meeting, once a week for 6 weeks, as well as parent support between sessions.	
Raising health children (RHC)[59]	Family, child, classroom *School, family*	It targets children in grades 1-12 (through a school and home-based interventions). Teachers can receive one-on-one classroom-based coaching. Children learn social, emotional, and cognitive skills through classroom, after-school, and parent-youth sessions. It requires the availability of school-home coordinators to accompany parents and do check-in with them during the year.	High academic performance for the students. Strong commitment to school and an increased social competency. Low level of antisocial behaviour and less frequent substance use. Reduction in driving under the influence and riding with another driver under the influence were sustained through age 20. Promoted healthy behaviour and academic achievement, reduced substance use and antisocial behaviours and reduced drunk driving[60,61].
SAFEChildren[62]	Family, child *School, Family*	Designed specifically for 1st graders living in urban and marginalized / low-income. Provided twice weekly for 22 weeks and emphasizes phonetics as well as a step-by-step advancement in academic skills.	Improved reading level overall, improved parental monitoring and reduced child aggression. High risk children showed greater reduction in aggression and hyperactivities as well as improved leadership skills. Had an effect on ADHD symptoms from 1st-4th grade[63]. An additional version of SAFEChildren for 4th grade delivered booster sessions and showed lower rates of aggression than those only 1st grade intervention[64].
Seattle social development project[65]	School, parent/ family, child *School, family*	Developed for elementary school children, with a school component and voluntary family component, to increase pro-social bonds, strengthen attachments to school, and decrease delinquency. It covers family management (1st and 2nd grade), engagement in a child's education (2nd and 3rd grade), substance use prevention program. Teachers are trained to establish clear rules and reward compliance, teach the students' academic performance as well as social skills and increase contact with pro-social peers.	

		Children are taught interpersonal problem-solving skills to improve communication, decision-making, negotiation, and conflict resolution.	
Early risers "skills for success" risk preventive program[66]	Parent, child *School, family*	Designed for children at higher risk for the development of serious conduct problems including substance use. Age 6-10 years Risk factor, exposure to stressful life events and/or aggressive and disruptive behaviour. To deflect children from "early starter" developmental pathway toward normal development by improving their academic competence and behavioural self-regulation and encouraging positive peer affiliations. Teaches parents on discipline, nurturance, and involvement. It includes 2 child-focused components and 2 parent or family focused components delivered over 2-3 years period. It is a standards skills curricula including strategies tailored to address the individual needs and goals of children and their parents.	Gain of social skills, peer reputation, pro-social friendship selection, academic achievement, and parent discipline. Outcome in study replication in African American children: period of 6 years follow-up: gained social skills and parent discipline observed early on accounted, in part, for fewer oppositional defiant disorder symptoms among program participants. Outcome from a study in 2003: high fidelity across 28 schools and children had positive gains on outcomes[67].

Kids in transition to school (KITS)[51]	Child *School*	KITS aims to enhance psychosocial and academic readiness in children in the foster care system at the time of entering schools. KITS promotes pre-literacy skills and increases the capacity of the children in terms of their attention, effortful control, and social skills in classroom settings. KITS provides skills for the caregivers to be able to facilitate the transition of their children to kindergarten and to become involved in the schooling of their children. KITS is provided during the summer before and the first weeks of kindergarten through; i) a therapeutic playgroup; ii) caregiver psycho-educational support groups; and iii) behavioural consultation in the home, school, and community settings.	Children had lower levels of oppositional and aggressive behaviours in the classroom. Positive intervention effects on early literacy and self-regulatory skills[68,69]
Fast track prevention trial for conduct problems[70]	Family, school, class, child *School, family, community*	Delivered grades 1 through 10 for high-risk children for long-term antisocial behaviour. Fast track includes a universal classroom program (adapted from the Promoting Alternative Thinking Strategies (PATHS) curriculum) delivered in elementary school. Fast track is a class-room intervention; it builds skills in emotional understanding and communication, friendship, self-control, and social problem-solving. High-risk children, displaying elevated aggression at home and school, receive a selective intervention (as assessed in kindergarten). High-risk children receive social skills training and academic tutoring, and their parents receive group parent training and individual home visits. The children skills training includes academic and social competence as well as self-control skills. Parent training builds parents' self-control and targets skills to support the child's school adjustment, improve	By the end of 12th grade, Fast Track youth self-reported and official arrest records showed reduced delinquency, less attention deficit hyperactivity disorder and any externalizing disorder. At the end of elementary school: Children had reduced home and community problems, including past-year involvement in substance use behaviours. Fast Track did not have an effect on the onset of delinquent acts that included selling controlled substances. By the end of 12th grade: children had fewer visits to general health providers, paediatric providers,

		the child's behaviour, promote appropriate expectations for the child's behaviour, and improve parent-child interaction.	and emergency departments for emotional, behavioural, academic, drug, or alcohol problems. At age 25 years: less probability of alcohol abuse, marginally decreased binge drinking, did not affect heavy marijuana use, and significantly decreased serious substance use[71,72].
Incredible years ® Parents, Teachers, and Children's Training Series[73]	Family, child, classroom *School, family*	Implemented day care, preschool (2-5 years), and early primary grades (6-8 years). Target group: i) all children, parents and teachers: They receive a comprehensive training (parent training & school-based teacher training and child training components) ii) moderate to high-risk children, based on an elevated behaviour or conduct problems (identified by parents and teachers) => the treatment intervention is for children with behavioural/conduct problems. It trains parents on social and emotional coaching, use of praise and tangible incentives, and positive discipline methods that promote positive relationships and strengthen children's language development, social and emotional competence, school readiness skills, problem-solving, and anger management. Each child development stage has its own parent curricula: it teaches parents how to partner with day care providers and teachers to develop individualized behaviour plans. It consists of 2-hour parent group meetings with a group leader and/or counsellor for a total of 14-18 sessions or more (depending on the child's age, the parent's needs,	Parent programs: high rates of positive parenting behaviours; fewer children behaviour problems at home. Child program: improved social interactions and problem-solving with peers, increased in-school readiness behaviours, and decreased aggression and negative behaviour with peers. Teacher program: increased used of positive classroom management strategies, less negative or critical teaching, more focus on providing children with social emotional curriculum, and increased home-school collaboration[73,74].

		and whether the prevention or treatment version of the program is being used). Also, it has Dina Dinosaur Social Skills Program for young children: it teaches children school rules, strategies for success in school, feelings literacy, empathy training and emotional regulation, problem-solving skills, and friendship skills. Delivered by teachers 2-3 times/week (in preschool through 2nd grade; 3-8 years old) Incredible years teacher classroom management program: it trains teachers in effective classroom management strategies; how to collaborate with parents to promote consistency of learning from school to home. Target: all teachers or teachers who have challenging students. Six-day training / month for a year, including individualized coaching within the schools.	
Positive action (PA)[75]	Family, school, class, child *School*	PA is a multi-component, school-based, social emotional and character development program. Aims to improve academics and pro-social behaviours as well as decrease problem behaviours. PA targets classroom and the overall school climate as well as families and the community. It includes grade-specific curricula (pre-kindergarten through grade 12). Lessons include 6 categories: self-concept, physical and intellectual actions, social/emotional actions for managing oneself responsibly, getting along with others, being honest with oneself and others, and continuous curriculum through ongoing reinforcement of positive behaviours, posters, assemblies, newsletters, and other means. School counsellors work with selected higher-risk students and families to develop PA skills.	Improved academic achievement, lower rates of substance use, violence, sexual activity, and absenteeism. Effects of PA on child outcomes increase with multiple years of exposure to the program[76–78].

		Family component: trains caregivers with resources that parallel the classroom curricula to further reinforce the messages children are receiving at school. The PA helps establish media messages and civic engagement activities for the larger community in which the children live.	
Schools and homes in partnership (SHIP)[79]	Parent, child *School, family*	Targets high-risk children (aggressive behaviour problems or reading difficulties). Duration: 2 academic years. It includes parent training, a social behaviour intervention and reading instruction (12-16 sessions). First component: Contingencies for Learning Academic and Social Skills (CLASS). Second component: Dina Dinosaur Social Skills Program (under Incredible Years package): 2-hour after-school program using puppets and video tapes to model appropriate behaviour to children. Reading instructions component for students in general and additional instructions for students who are non-readers in the 3rd and 4th grades.	SHIP was assessed in North America, among European-American and Hispanic children (in English and Spanish). Reduced aggressive or anti-social behaviour, particularly for children with early aggressive behaviour problems. It improved reading abilities as well[80,81].

NIDA divides the childhood development into: i) Prenatal period; ii) Infancy and Toddlerhood (0 to 3 years); iii) Preschool (3 through 6 years) and iv) Transition to elementary school (6 through 8 years)

References

1. Kellam, S. G. & Rebok, G. W. Building developmental and etiological theory through epidemiologically based preventive intervention trials. *Prev. antisocial Behav. Interv. from birth through Adolesc*. 162–195 (1992).

2. United Nations Office on Drugs and Crime (UNODC). *Resolution 65/4: PRomoting comprehensive and scientific evidence-based early prevention*. (2022).

3. United Nations Office on Drugs and Crime (UNODC). *International Standards on Drug Use Prevention*. (2020).

4. Peterson, J. W., Loeb, S. & Chamberlain, L. J. The intersection of health and education to address school readiness of all children. *Pediatrics* **142**, (2018).

5. Krueger, R. F. *et al.* Etiologic connections among substance dependence, antisocial behaviour, and personality: Modeling the externalizing spectrum. *J. Abnorm. Psychol.* **111**, 411–424 (2002).

6. Hill, J. Biological, psychological and social processes in the conduct disorders. *J. Child Psychol. Psychiatry Allied Discip.* **43**, 133–164 (2002).

7. Lynam, D. R. & Henry, B. The role of neuropsychological deficits in conduct disorders. *Conduct Disord. Child. Adolesc.* 235–263 (2009). doi:10.1017/cbo9780511543852.010

8. Giancola, P. R. & Tarter, R. E. Executive cognitive functioning and risk for substance abuse. *Psychol. Sci.* **10**, 203–205 (1999).

9. Speltz, M. L., Greenberg, M. T. & Deklyen, M. Attachment in preschoolers with disruptive behaviour: A comparison of clinic-referred and nonproblem children. *Dev. Psychopathol.* **2**, 31–46 (1990).

10. Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T. P. & Sahebkar, A. The impact of stress on body function: A review. *EXCLI J.* **16**, 1057–1072 (2017).

11. Mcewen, B. S. & Gianaros, P. J. Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. *Ann. N. Y. Acad. Sci.* **1186**, 190–222 (2010).

12. Chermack, S. T., Stoltenberg, S. F., Fuller, B. E. & Blow, F. C. Gender differences in the development of substance-related problems: The impact of family history of alcoholism, family history of violence and childhood conduct problems. *J. Stud. Alcohol* **61**, 845–852 (2000).

13. Shay, N. L. & Knutson, J. F. Maternal depression and trait anger as risk factors for escalated physical discipline. *Child Maltreat.* **13**, 39–49 (2008).

14. Haynie, D. L. Contexts of Risk? Explaining the Link between Girls' Pubertal Development and Their Delinquency Involvement. *Soc. Forces* **82**, 355–397 (2003).

15. Jensen, P. S. Links Between Pubertal Timing and Neighborhood Contexts: Implications for Girls' Violent Behaviour. *Yearb. Psychiatry Appl. Ment. Heal.* **2006**, 7 (2006).

16. Jackson, A. P., Brooks-Gunn, J., Huang, C. C. & Glassman, M. Single mothers in low-wage jobs: Financial strain, parenting, and preschoolers' outcomes. *Child Dev.* **71**, 1409–1423 (2000).

17. Repetti, R. L., Taylor, S. E. & Seeman, T. E. Risky families: Family social environments and the mental and physical health of offspring. *Psychol. Bull.* **128**, 330–366 (2002).

18. Kumpfer, K., Molgaard, V. & Spoth, R. The Strengthening Families Program for the Prevention of Delinquency and Drug Use. *Prev. Child. Disord. Subst. Abus. Delinq.* 241–267 (2014). doi:10.4135/9781483327679.n11

19. A.M., S. & S.A., K. The levels and patterns of resilience among male street children in Dhaka City. *Int. J. Adolesc. Med. Health* **25**, 39–45 (2013).

20. Meltzer, E. C. *et al.* Discrepancy in diagnosis and treatment of post-traumatic stress disorder (PTSD): Treatment for the wrong reason. *J. Behav. Heal. Serv. Res.* **39**, 190–201 (2012).

21. Marshall, B. D. L. & Hadland, S. E. The immediate and lasting effects of adolescent homelessness on suicidal ideation and behaviour. *J. Adolesc. Heal.* **51**, 407–408 (2012).

22. Hudson, AL (Hudson, A. L. . & Nandy, K (Nandy, K. Comparisons of substance abuse, high-risk sexual behaviour and depressive symptoms among homeless youth with and without a history of foster care placement. *Contemp. Nurse* **42**, 178–186 (2012).

23. Fishbein, D. H. & Biglan, A. *Preventing poverty's impact and persistence*. (2013).

24. Fishbein, D. H. *An introduction to the etiology of drug use and substance abuse. Unpublished manuscript*. (2013).

25. Kuipers, M. A. G., van Poppel, M. N. M., van den Brink, W., Wingen, M. & Kunst, A. E. The association between neighborhood disorder, social cohesion and hazardous alcohol use: A national multilevel study. *Drug Alcohol Depend*. **126**, 27–34 (2012).

26. E., E., M., M.-D. & M.L., H. Influences of personal, injunctive, and descriptive norms on early adolescent substance use. *J. Drug Issues* **36**, 147–172 (2006).

27. The National Center on Addiction and Substance Abuse (CASA) at Columbia University. *National Survey of American Attitudes on Substance Abuse XVI: Teens and Parents*. (2011).

28. Martikainen, P., Kauppinen, T. M. & Valkonen, T. Effects of the characteristics of neighbourhoods and the characteristics of people on cause specific mortality: A register based follow up study of 252 000 men. *J. Epidemiol. Community Health* **57**, 210–217 (2003).

29. Almedom, A. M. Social capital and mental health: An interdisciplinary review of primary evidence. *Soc. Sci. Med.* **61**, 943–964 (2005).

30. L.H., M., M.W., K. & S.V., S. Social Environment and Physical activity: A review of concepts and evidence. *Soc. Sci. Med.* **63**, 1011–1022 (2006).

31. S.M., M., P.P., G., B., V. & H., F. Neighborhood social capital and individual health. *Soc. Sci. Med.* **72**, 660–667 (2011).

32. Winstanley, E. L., Steinwachs, D. M., Stitzer, M. L. & Fishman, M. J. Adolescent Substance Abuse and Mental Health: Problem Co-Occurrence and Access to Services. *J. Child Adolesc. Subst. Abus.* **21**, 310–322 (2012).

33. Ornelas, I. J., Perreira, K. M., Beeber, L. & Maxwell, L. Challenges and strategies to maintaining emotional health: Qualitative perspectives of mexican immigrant mothers. *J. Fam. Issues* **30**, 1556–1575 (2009).

34. A.G.T.T., T., R.M., L. & D.J., B. Perceived Discrimination and Substance Use in Hispanic/Latino, African-Born Black, and Southeast Asian Immigrants. *Cult. Divers. Ethn. Minor. Psychol.* **16**, 226–236 (2010).

35. Shonkoff, J. P. & Phillips, D. A. *From Neurons to Neighborhoods*. (National Academies Press, 2000). doi:10.17226/9824

36. Fox, G. From Neurons to Neighborhoods: The Science of Early Childhood Development. *J. Am. Acad. Child Adolesc. Psychiatry* **41**, 625–626 (2002).

37. Furr-Holden, C. D. M. *et al.* The growth of neighborhood disorder and marijuana use among urban adolescents: A case for policy and environmental interventions*. *J. Stud. Alcohol Drugs* **72**, 371–379 (2011).

38. Hill, T. D., Ross, C. E. & Angel, R. J. Neighborhood disorder, psychophysiological distress, and health. *J. Health Soc. Behav.* **46**, 170–186 (2005).

39. Bellinger, D. C. A strategy for comparing the contributions of environmental chemicals and other risk factors to neurodevelopment of children. *Environ. Health Perspect.* **120**, 501–507 (2012).

40. Robertson, E. B. & Sims, B. E. Principles of substance abuse prevention for early childhood: A research-based guide. *Natl. Inst. Drug Abus. Natl. Institutes Heal. U.S. Dep. Heal. Hum. Serv.* 94 (2016).

41. Dodge, K. A., Goodman, W. B., Murphy, R., O'Donnell, K. & Sato, J. Toward Population Impact from Home Visiting. *Zero Three* **33**, 17–23 (2013).

42. Shaw, D. S., Supplee, L., Dishion, T. J., Gardner, F. & Arnds, K. Randomized trial of a family-centered approach to the prevention of early conduct problems: 2-Year effects of the family check-up in early childhood. *J. Consult. Clin. Psychol.* **74**, 1–9 (2006).

43. Dishion, T. J. *et al.* The family check-up with high-risk indigent families: Preventing problem behaviour by increasing parents' positive behaviour support in early childhood. *Child Dev.* **79**, 1395–1414 (2008).

44. Mullany, B. *et al.* The Family Spirit Trial for American Indian Teen Mothers and Their Children: CBPR Rationale, Design, Methods and Baseline Characteristics. *Prev. Sci.* **13**, 504–518 (2012).

45. Barlow, A. *et al.* Effect of a paraprofessional home-visiting intervention on American Indian teen mothers' and infants' behavioural risks: A randomized controlled trial. *Am. J. Psychiatry* **170**, 83–93 (2013).

46. Barlow, A. *et al.* Home-visiting intervention to improve child care among American Indian Adolescent mothers: A randomized trial. *Arch. Pediatr. Adolesc. Med.* **160**, 1101–1107 (2006).

47. Olds, D. L. Prenatal and infancy home visiting by nurses: From randomized trials to community replication. *Prev. Sci.* **3**, 153–172 (2002).

48. Kitzman, H. J. *et al.* Enduring effects of prenatal and infancy home visiting by nurses on children: Follow-up of a randomized trial among children at age 12 years. *Arch. Pediatr. Adolesc. Med.* **164**, 412–418 (2010).

49. D.L., O. *et al.* Enduring effects of prenatal and infancy home visiting by nurses on maternal life course and government spending: Follow-up of a randomized trial among children at age 12 years. *Arch. Pediatr. Adolesc. Med.* **164**, 419–424 (2010).

50. Fisher, P. A. & Chamberlain, P. Multidimensional Treatment Foster Care: A program for intensive parenting, family support, and skill building. *J. Emot. Behav. Disord.* **8**, 155–164 (2000).

51. Pears, K. C., Fisher, P. A., Heywood, C. & Bronz, K. D. Promoting school readiness in foster children. *Contemp. Perspect. Soc. Learn. early Child. Educ.* 173–198 (2007).

52. Fisher, P. A., Kim, H. K. & Pears, K. C. Effects of Multidimensional Treatment Foster Care for Preschoolers (MTFC-P) on reducing permanent placement failures among children with placement instability. *Child. Youth Serv. Rev.* **31**, 541–546 (2009).

53. Battistich, V., Schaps, E., Watson, M., Solomon, D. & Lewis, C. Effects of the Child Development Project on students' drug use and other problem behaviours. *J. Prim. Prev.* **21**, 75–99 (2000).

54. Wang, Y. *et al.* The effect of two elementary school-based prevention interventions on being offered tobacco and the transition to smoking. *Drug Alcohol Depend.* **120**, 202–208 (2012).

55. Bradshaw, C. P., Zmuda, J. H., Kellam, S. G. & Ialongo, N. S. Longitudinal Impact of Two Universal Preventive Interventions in First Grade on Educational Outcomes in High School. *J. Educ. Psychol.* **101**, 926–937 (2009).

56. Reid, J. B., Eddy, J. M., Fetrow, R. A. & Stoolmiller, M. Description and immediate impacts of a preventive intervention for conduct problems. *Am. J. Community Psychol.* **27**, 483–518 (1999).

57. DeGarmo, D., Eddy, J. M., Reid, J. B. & Fetrow, R. A. Evaluating mediators of the impact of the Linking the Interests of Families and Teachers (LIFT) multimodal preventive intervention on substance use initiation and growth across adolescence. *Prev. Sci.* **10**, 208–220 (2009).

58. Eddy, J. M., Reid, J. B. & Fetrow, R. A. An elementary school-based prevention program targeting modifiable antecedents of youth delinquency and violence: Linking the Interests of Families and Teachers (LIFT). *J. Emot. Behav. Disord.* **8**, 165–176 (2000).

59. Catalano, R. F. *et al.* Raising healthy children through enhancing social development in elementary school: Results after 1.5 years. *J. Sch. Psychol.* **41**, 143–164 (2003).

60. Haggerty, K., Fleming, C., Catalano, R., Harachi, T. & Abbott, R. Raising healthy children: Examining the impact of promoting healthy driving behaviour with in a social development intervention. *Prev. Sci.* **7**, 257–267 (2006).

61. Brown, E. C., Catalano, R. F., Fleming, C. B., Haggerty, K. P. & Abbott, R. D. Adolescent substance use outcomes in the raising healthy children project: A two-part latent growth curve analysis. *Addict. Behav. New readings Etiol. Prev. Treat.* 159–185 (2005). doi:10.1037/11855-007

62. Tolan, P., Gorman-Smith, D. & Henry, D. Supporting families in a high-risk setting: Proximal effects of the SAFEChildren preventive intervention. *J. Consult. Clin. Psychol.* **72**, 855–869 (2004).

63. Fowler, P. J., Henry, D. B., Schoeny, M., Gorman-Smith, D. & Tolan, P. H. Effects of the SAFE Children preventive intervention on developmental trajectories of attention-deficit/hyperactivity disorder symptoms. *Dev. Psychopathol.* **754**, 1161–1179 (2014).

64. Tolan, P. H., Gorman-Smith, D., Henry, D. & Schoeny, M. The benefits of booster interventions: Evidence from a family-focused prevention program. *Prev. Sci.* **10**, 287–297 (2009).

65. J.D., H., R.F., C., R., K., R., A. & K.G., H. Preventing adolescent health-risk behaviours by strengthening protection during childhood. *Arch. Pediatr. Adolesc. Med.* **153**, 226–234 (1999).

66. August, G. J., Realmuto, G. M., Hektner, J. M. & Bloomquist, M. L. An integrated components preventive intervention for aggressive elementary school children: The Early Risers program. *J. Consult. Clin. Psychol.* **69**, 614–626 (2001).

67. August, G. J., Lee, S. S., Bloomquist, M. L., Realmuto, G. M. & Hektner, J. M. Dissemination of an evidence-based prevention innovation for aggressive children living in culturally diverse, urban neighborhoods: The Early Risers effectiveness study. *Prev. Sci.* **4**, 271–286 (2003).

68. Pears, K. C., Kim, H. K. & Fisher, P. A. Effects of a school readiness intervention for children in foster care on oppositional and aggressive behaviours in kindergarten. *Child. Youth Serv. Rev.* **34**, 2361–2366 (2012).

69. Pears, K. C. *et al.* Immediate Effects of a School Readiness Intervention for Children in Foster Care. *Early Educ. Dev.* **24**, 771–791 (2013).

70. Conduct Problems Prevention Research Group. Initial impact of the fast track prevention trial for conduct problems: II. Classroom effects. *J. Consult. Clin. Psychol.* **67**, 648–657 (1999).

71. Conduct Problems Prevention Research Group. The Effects of the Fast Track Preventive Intervention on the Development of Conduct Disorder Across Childhood. *Child Dev*. **82**, 331–345 (2011).

72. Conduct Problems Prevention Research Group. Impact of Early Intervention on Psychopathology, Crime, and Well-Being at Age 25. *Am J Psychiatry* **172**, 59–70 (2015).

73. Webster-Stratton, C., Reid, J. M. & Hammond, M. Preventing conduct problems and improving school readiness: evaluation of the incredible years teacher and child training programs in high-risk schools. *J. Clin. Child Adolesc. Psychol.* **33**, 105–124 (2004).

74. Webster-Stratton, C. & MJ, R. The incredible years parents, teachers and children training series: A multifaceted treatment approach for young children with conduct problems. in *Evidence-Based Psychotherapies for Children and Adolescents* (eds. Kazdin, A. & Weisz, J.) (NY: Guilford Publications, 2010).

75. Flay, B. R., Allred, C. G. & Ordway, N. Effects of the positive action program on achievement and discipline: Two matched-control comparisons. *Prev. Sci.* **2**, 71–89 (2001).

76. Beets PhD, MPH, M. W. *et al.* Use of a Social and Character Development Program to Prevent Substance Use, Violent Behaviours, and Sexual Activity Among Elementary-School Students in Hawaii. *Am. J. Public Health* **99**, 1438–1445 (2009).

77. Flay, B. & Allred, C. G. The Positive Action Program: improving academics, behaviour, and character by teaching comprehensive skills for successful learning and living. in *International Research Handbook on Values Education and Student Wellbeing* (eds. Lovat, T., Toomey, R. & Clement, N.) 471–501 (2010).

78. Snyder F, Vuchinich S, Acock A, Washburn I, Beets M, L. K. Impact of the Positive Action program on school-level indicators of academic achievement, absenteeism, and disciplinary outcomes: A matched-pair, cluster randomized, controlled trial. *J Res Educ Ef* **3**, 26–55 (2010).

79. Barrera, M. *et al.* Early elementary school intervention to reduce conduct problems: A randomized trial with Hispanic and non-Hispanic children. *Prev. Sci.* **3**, 83–94 (2002).

80. Smolkowski, K. *et al.* Schools and homes in partnership (SHIP): Long-term effects of a preventive intervention focused on social behaviour and reading skill in early elementary school. *Prev. Sci.* **6**, 113–125 (2005).

81. Gunn, B., Smolkowski, K., Biglan, A., Black, C. & Blair, J. Fostering the development of reading skill through supplemental instruction: Results for hispanic and non-hispanic students. *J. Spec. Educ.* **39**, 66–85 (2005).