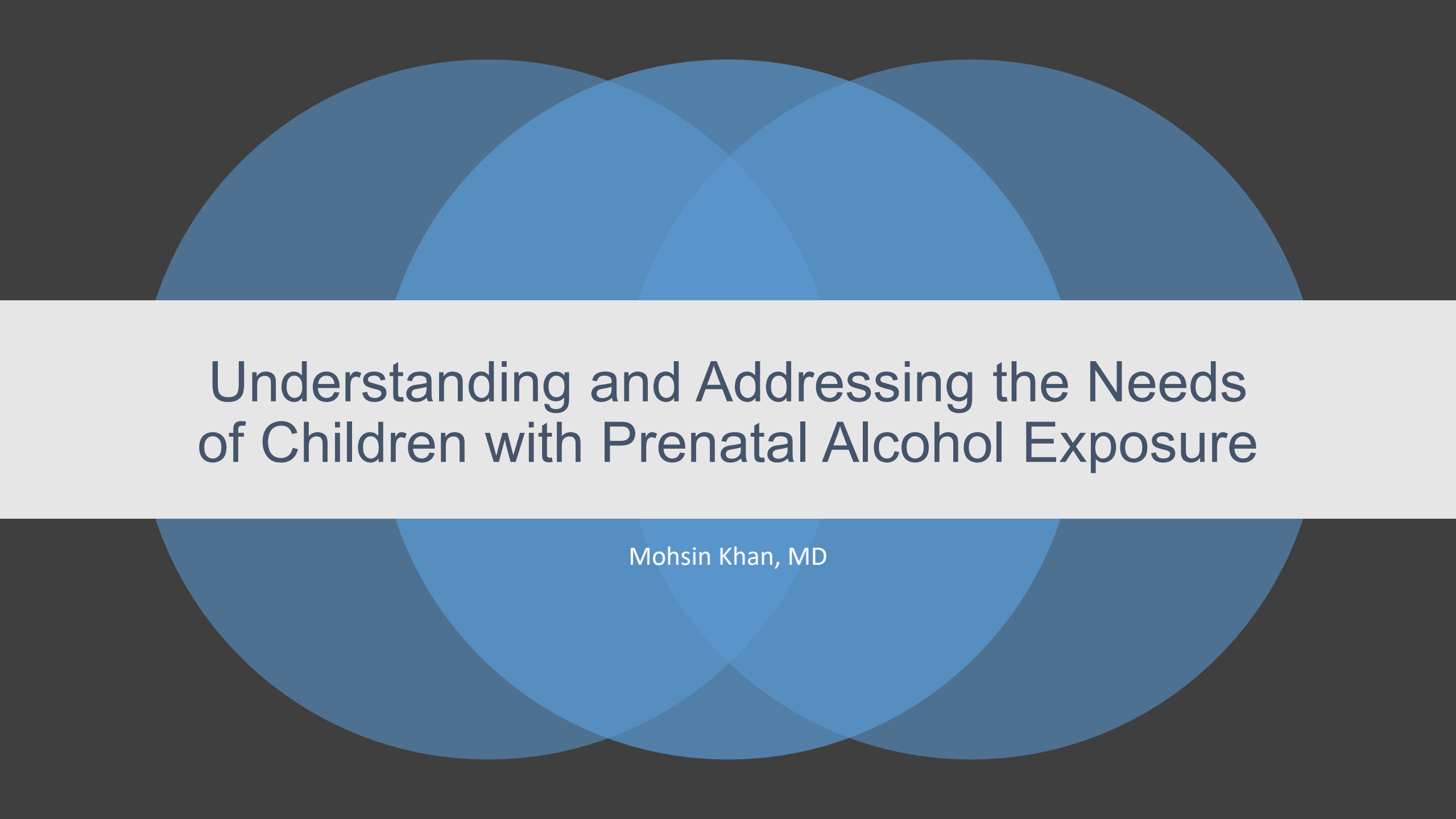




Understanding and Addressing the Needs of Children with Prenatal Alcohol Exposure

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Learning Objectives

- Provide a foundational understanding of Fetal Alcohol Spectrum Disorder (FASD)
- Explore intervention strategies for supporting individuals with FASD across home and school environments
- Review the role of medication in managing symptoms associated with FASD and discuss considerations for its use within a comprehensive care plan.

Disclosures

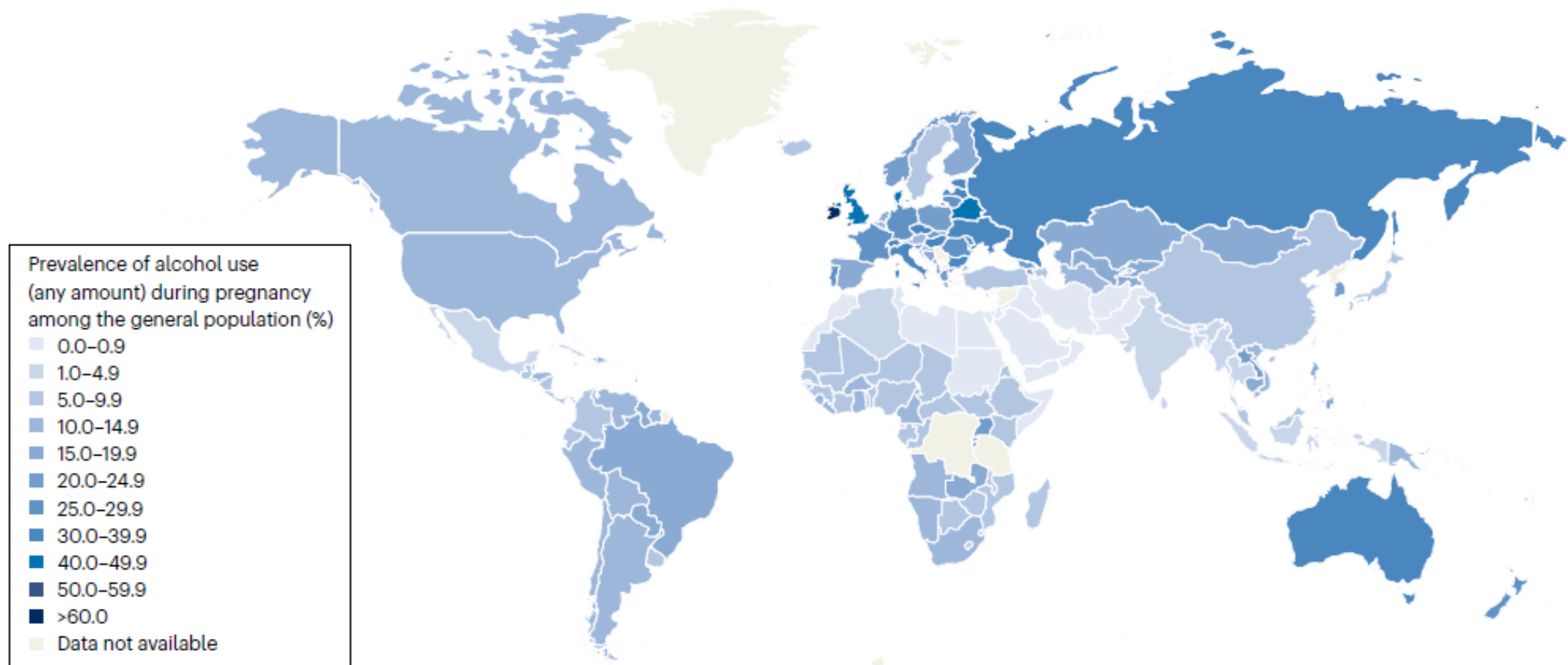
Nothing to report

Introduction

- Fetal alcohol spectrum disorder (FASD) is a preventable neurodevelopmental disorder caused by prenatal alcohol exposure, leading to lifelong cognitive, behavioral, and physical impairments (Xu, 2025).
- FASD is the leading cause of non genetic developmental disability in multiple countries (Akison, 2024).
- FASD is under-diagnosed globally, in part owing to the current lack of a unified diagnostic approach (Akison, 2024).
- Although regional studies have estimated FASD prevalence, findings vary widely, and no nationally representative estimates are reported (Xu, 2025).

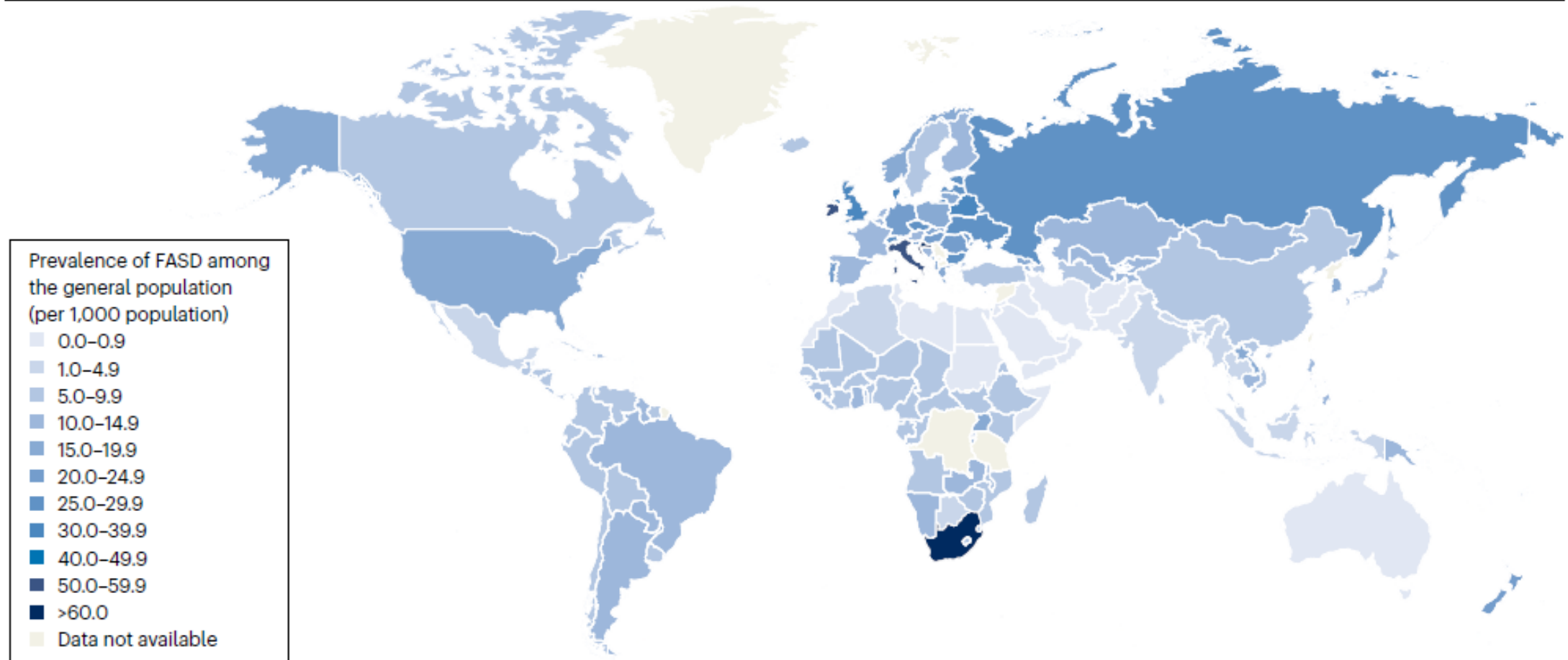
Prevalence of Alcohol Use during pregnancy in general population

Popova et al. 2023

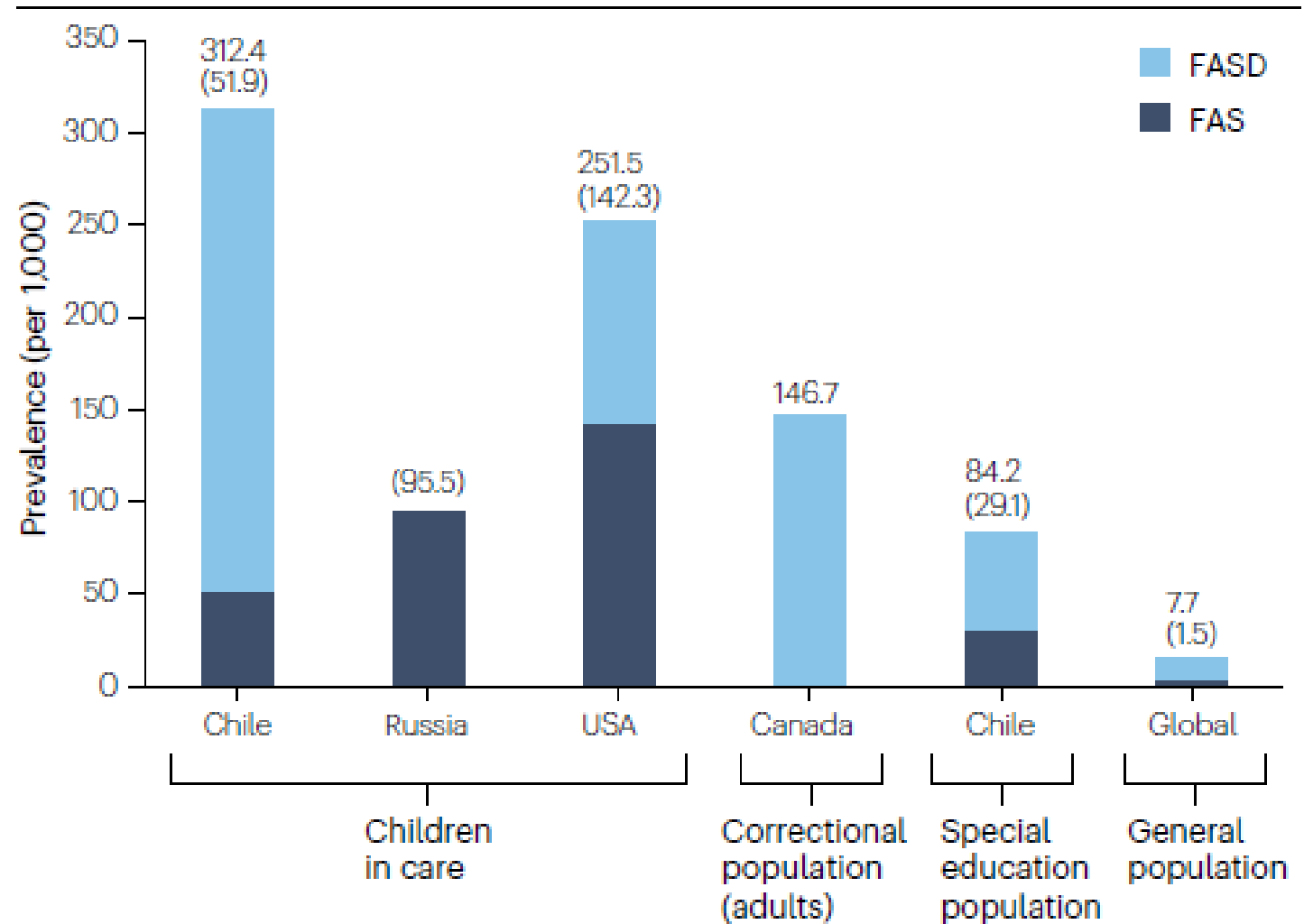


Prevalence of FASD among the general population

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Pooled
Prevalence of
FASD and FAS
among
selected
subpopulations



Presenting Features

- Due to the complex and heterogeneous nature of FASD, over ten different diagnostic criteria are currently employed internationally. This lack of standardized diagnostic criteria contributes to variations in the identification of FASD cases, making it difficult to establish accurate prevalence and impact.
- Key clinical components in diagnostic criteria are
 - Physical size
 - Dysmorphic features (i.e. characteristic facial features including small palpebral fissures, smooth philtrum and thin vermilion).
 - Functional neurodevelopmental outcomes (e.g. general intelligence, memory, attention, executive function)
 - Structural neurodevelopmental outcomes (e.g. head circumference, structural brain abnormalities)
 - Neurological outcomes (e.g. seizures of unknown origin, cerebral palsy, hearing and vision impairment)

Characteristics	Participants, No. (%) ^a			P value
	Overall	Without FASD	With FASD	
No. of participants	108 742	108 521	221	NA
Age, y				
0-5	41 057 (30.67)	41 018 (30.65)	39 (38.00)	.53
6-11	30 448 (33.48)	30 383 (33.51)	65 (22.93)	
12-17	37 237 (35.85)	37 120 (35.84)	117 (39.07)	
Sex				
Male	55 958 (51.19)	55 836 (51.17)	122 (64.20)	.17
Female	52 784 (48.81)	52 685 (48.83)	99 (35.80)	
Race and ethnicity ^b				
Hispanic	16 446 (26.99)	16 404 (26.96)	42 (41.46)	.10
Non-Hispanic Black	6551 (12.54)	6533 (12.54)	18 (16.47)	
Non-Hispanic White	70 136 (47.71)	70 025 (47.76)	111 (22.40)	
Non-Hispanic other ^c	15 609 (12.75)	15 559 (12.74)	50 (19.66)	
Parental education level				
<High school diploma	2738 (8.53)	2732 (8.50)	6 (22.88)	.44
High school diploma	13 665 (18.61)	13627 (18.62)	38 (14.61)	
≥College degree	92 339 (72.86)	92 162 (72.88)	177 (62.51)	

Prevalence of Diagnosed Fetal Alcohol Spectrum Disorder in Children and Adolescents. *Jama Pediatrics*, July 2025

Characteristics of Participants with and without Diagnosed FASD from 2022-2023 NSCH Data

FASD and Mental Disorders

- The rates of FASD found in the general population in studies (2%–5%) are one-fourth to one-tenth of the current rates of mental disorder (20%) in the general population (Kessler et al. 2003; Steel et al. 2014; Weyrauch et al. 2017).
- Current findings show that 75%–95% of people initially diagnosed with FASD will experience an additional mental disorder diagnosis, usually multiple diagnoses (Chasnoff et al. 2015).
- In a study with over 1,400 patients, Astley (2010) identified 82% with mental disorders. ADHD, the most representative diagnosis, was noted in almost 54% of the sample.

FASD and Mental Disorders

- At the mean age of 25.7 years, Barr et al. (2006) reported that one or more episodes of binge drinking were associated with double the odds of psychiatric disorders in the offspring.
- Famy et al. (1998) examined the rates of mental disorders among individuals with FASD (excluding intellectual disability). In adults with FASD (mean age 28.8; range 19–51 years), whose IQ was > 70 (mean IQ 86.6; range 73–110) assessed using a standardized instrument (SCID) to diagnose mental disorders and personality disorders, comorbid mental disorders were diagnosed among 92% of the sample. The rates of alcohol and drug use disorder (60%), major depressive disorder (44%), psychosis (40%), and avoidant personality disorder (48%) were the highest noted (Famy et al. 1998).

FASD and Mental Disorders

- Weyrauch et al. (2017) conducted a systematic review of 26 different studies that met criteria for reporting one of 15 DSM diagnoses. The sample included more than 5,000 participants, with a mean age of 10 years.
- ADHD was the most represented disorder, at 10 times the general population rates. Other mental disorders included anxiety, depression, PTSD, oppositional defiant disorder (ODD), and learning and intellectual disorders, with prevalence rates ranging from 10% to 45% (Weyrauch et al. 2017).

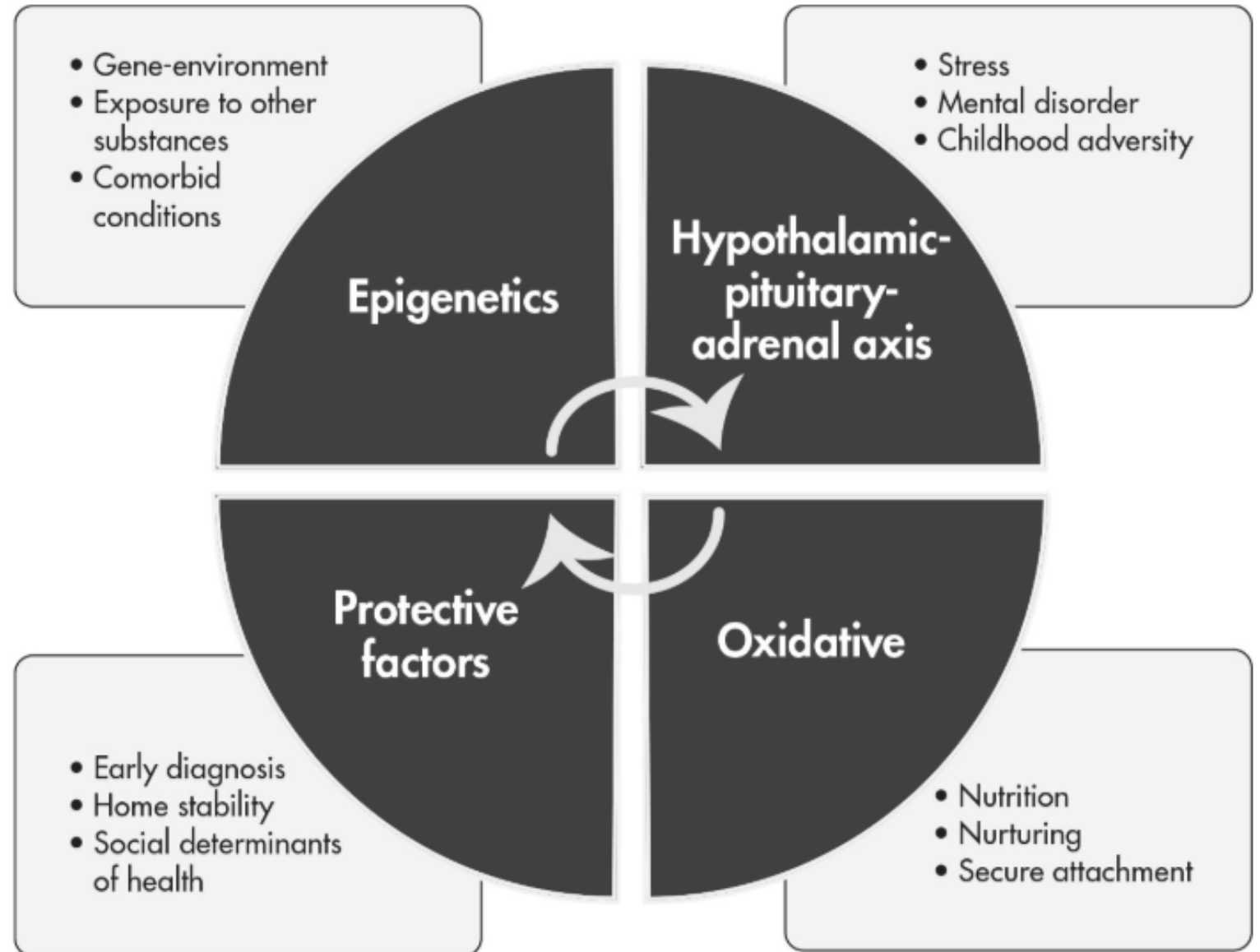
Lifelong issues associated with Prenatal Alcohol Exposure

Preconception	Alcohol dependence and social inequalities
Prenatal environment	Maternal depression, mental disorder, and domestic violence
Childhood	Sleep and mood disorders, externalizing, internalizing behavior, ADHD, oppositional defiant disorder, reactive attachment disorder
Adolescence	ADHD and conduct, mood, and substance use disorders
Adulthood	Personality and mood disorders, alcohol abuse, social anxiety
Elderly/Older adult	Early-onset neurocognitive disorders

Risk Factors

- While important, alcohol use by itself is not sufficient to account for the outcomes of many mental disorders found in individuals with prenatal alcohol exposure.
- Other factors related to the fetal environment that affect outcomes include the number of previous pregnancies, the mother's overall health status, and the mother's age. Additionally, several postnatal risk factors have been identified, such as childrearing practices, secure attachment, nurturing, and home stability.
- Social Determinants of health play a prominent role, and mental disorders are similarly over presented in this population.

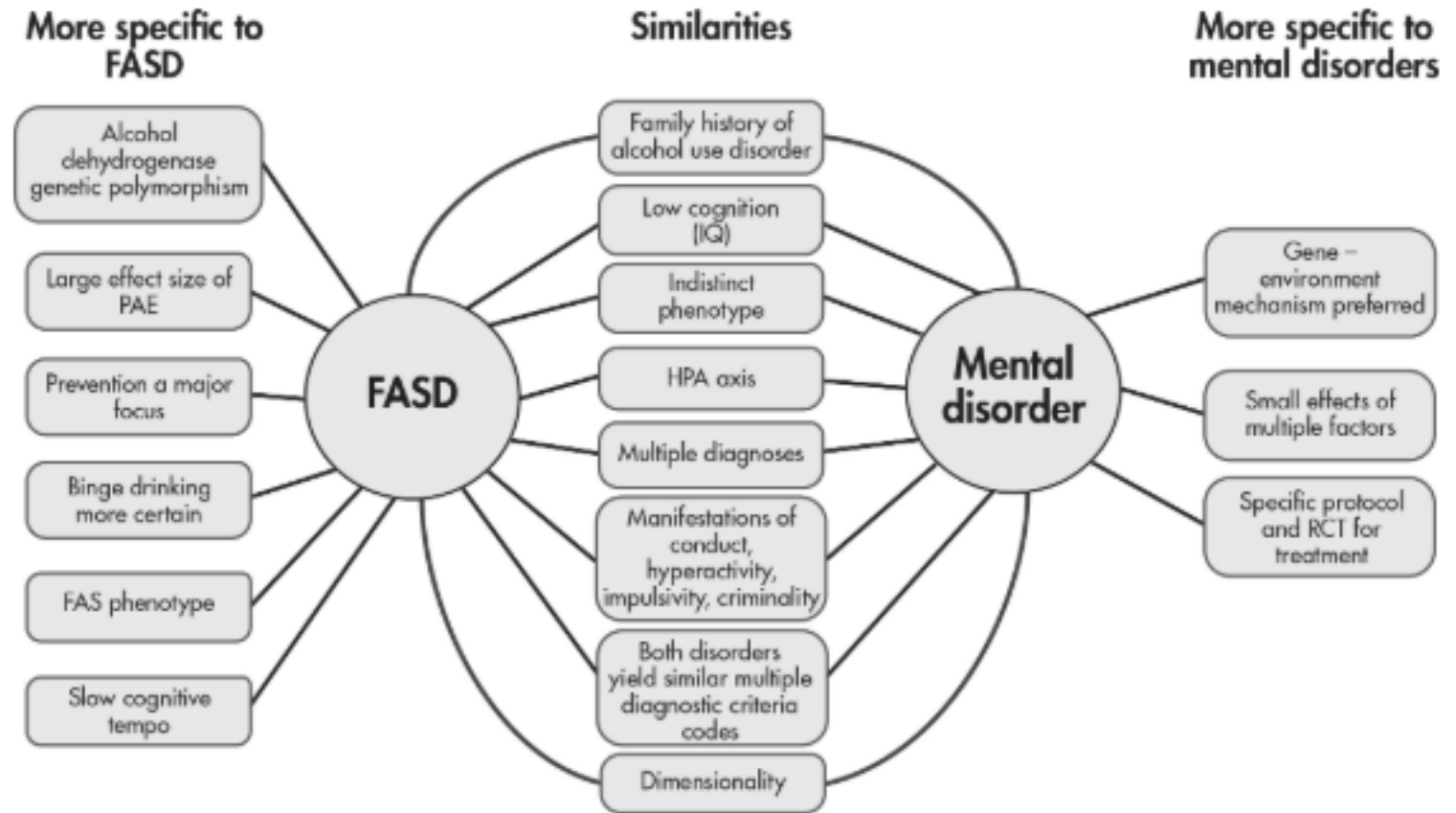
Suspected Etiological Mechanisms



Profiles of Mental Disorders with FASD

- Fundamental Problems in inability to cope with daily living because of their adaptive dysfunction.
- Due to combined executive dysfunction and learning deficits, individuals struggle to problem solve and meet their hygiene, social and financial needs.
- Any inordinate frequency or pattern of responding impulsively and showing repeated inability or reduced ability to learn from consequences, FASD consideration should be given.
- Impairments in planning, verbal reasoning, emotion regulation, memory and learning should require a careful FASD assessment.
- Wide spectrum of cognitive disabilities in patients with FASD make it challenging for specific profile to FASD.

Understanding the mechanisms of the relationship between PAE and Mental Disorder



Clinical and Psychological Findings

ADHD WITH PAE	ADHD WITHOUT PAE
Worse behavioral and cognitive deficits, full-scale IQ (verbal and performance), perceptual reasoning, verbal comprehension, and working memory	More externalizing behavior, hyperactivity, higher levels of atypicality and aggression
Weaker verbal comprehension	More impulsivity
Visual attention deficits	Increased focus and sustained attention
Slower reaction test	Increased risk of psychiatric diagnoses
Deficiency in shifting attention (planning, fluency, and set-shifting)	Synergistic effect on conduct disorder
Deficits in cognitive flexibility, response inhibition, planning, and concept formation	Synergistic effect on externalizing behavior
High rates of sluggish cognitive tempo	
Preference for dexamphetamine use	

Pharmacological Interventions

- Over the 5 decades that the disorder has been recognized, more efforts have been directed at characterizing its manifestations and long term prognosis.
- 1990s – randomized trials of stimulants initiated
- Prior to 1990s – study of metabolic effects of alcohol on pregnancy mothers and offspring in animal models to whom psychotropic medications had been prescribed dominated.
- 2018 – level of evidence for biological and psychopharmacological intervention is insufficient to propose specific guidelines.
- However, variations in neurocognitive deficits imply utilizing individual approaches in selecting effective medications

Pharmacological Interventions

- 2 systemic review Mela et al 2018 and Peadon et al 2009.
- Small studies (Total 329)
- Wide range of medications which precluded drawing any inference concerning specific benefits of medications.

Pharmacological Interventions

- Stimulants were the most prescribed.
- Frankel et al 2006 – Risperidone and olanzapine with positive outcomes in social skills.
 - Outcome was better for patients taking antipsychotic than for those taking stimulant alone or both stimulants and antipsychotics.
- Consequently, addition of Risperidone in case series taking several medications produced clinical improvement in behavioral symptoms.
- Effective responses were obtained with olanzapine and Risperidone in those with the consequences of PAE in improving social skills functioning, reducing short term aggressiveness, and treating features of conduct disorder.
- Antidepressants studied in few patients (11) effectively produced positive responses (82%) by reducing depressed mood.
- Mood stabilizers (carbamazepine, valproate, oxcarbazepine) were also reported as useful in patient with mood dysregulation and for some with seizure disorders.

Pharmacological Interventions

DOMAINS/CLUSTERS	CLINICAL FEATURES	BIOLOGICAL PATHOGENESIS	RECOMMENDED LIGANDS
Autonomic hyperarousal	Irritability	Noradrenergic activation of the autonomic nervous system	First-line: α -adrenergic agonist Second-line: SSRIs
	Hypervigilance		
	Insomnia	Hypothalamic-pituitary-adrenal axis abnormality	
	Anxiety and tension		
	Anger		
	Agitation		
	Aggression		
Neurocognitive: hyperactivity	Reduced pain threshold	Dopaminergic and noradrenergic abnormality	First-line: Amphetamine-based stimulant Second-line: Other stimulant and nonstimulant with noradrenergic and dopaminergic effect
	Restless movement		
	Impulsiveness		
	Inattention		
	Executive dysfunction		

Pharmacological Interventions

DOMAINS/CLUSTERS	CLINICAL FEATURES	BIOLOGICAL PATHOGENESIS	RECOMMENDED LIGANDS
Cognitive inflexibility	Low frustration tolerance Poor social skills Poor reasoning Poor reality testing Poor abstraction Poor perspective taking	Abnormalities in prefrontal cortex, basal ganglia, and anterior cingulate gyrus Sensitized mesolimbic dopamine system	First-line: Atypical neuroleptic Second-line: Other atypical neuroleptic
Mood dysregulation and anxiety and depression	Mood swings Excitability Anxiety Depression	Serotonergic deficits Gap junction abnormalities	First-line: Mood stabilizers Second-line: SSRIs
Others	Specific and nonspecific Combination of above features	Multiple explanations	First-line: Adjunct, choline supplementation, minocycline

Pharmacological Interventions

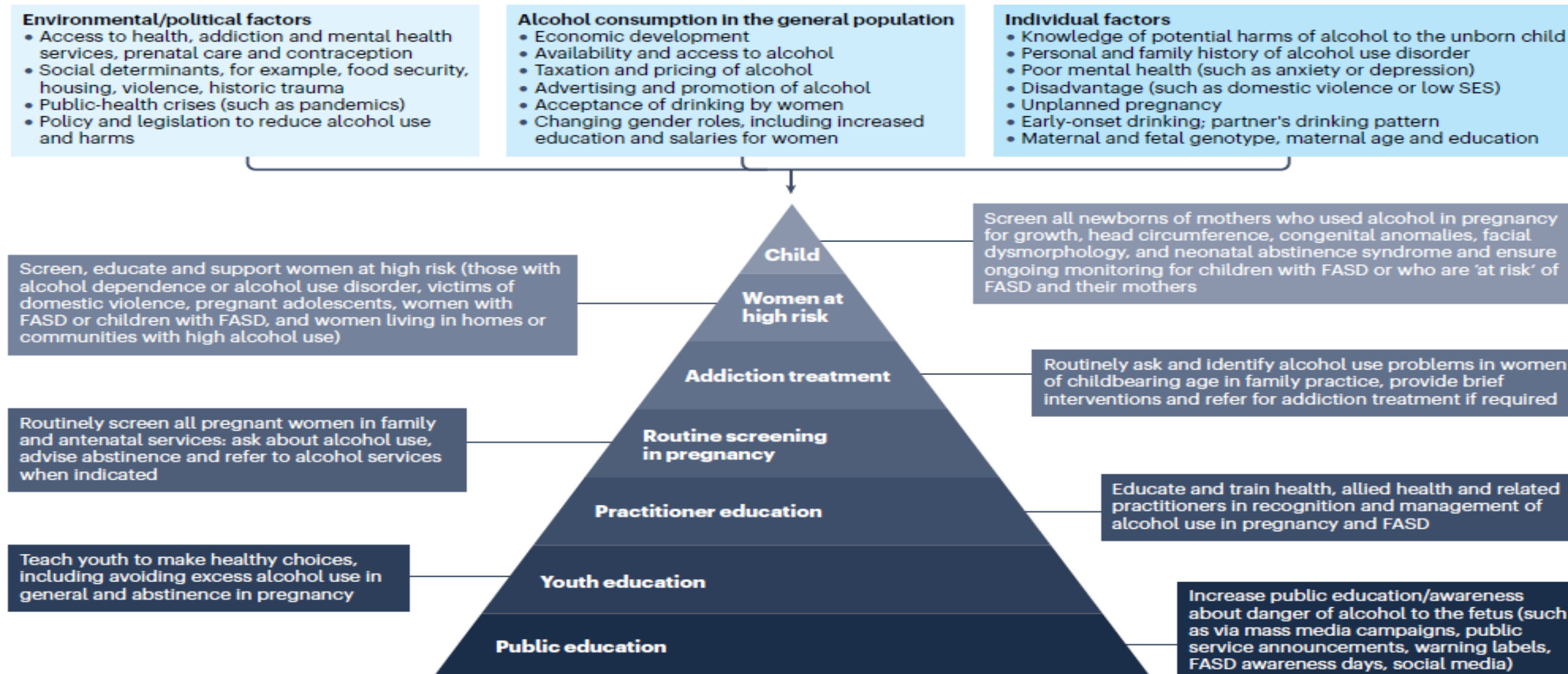
- Treatment has evolved over time with initial focus on ADHD type symptoms, then on symptomatic relief and now on ligand specific clusters.
- Current approach is guided by expected response of specific brain regions to neurotransmitters.
- Off label prescription implies that doses, monitoring and changes adhere to official standard guidelines for each medication. However, typical prescription strategies produce side effects in individual who are neurodiverse.

Pharmacological Interventions

- Antioxidants, essential amino acids and vitamins have been proposed as replacements for missing products from oxidative stress that are linked to deficits.
- Choline was associated with amelioration of deficits.
- In double blind controlled trial of choline supplementation in pregnant women irrespective of severity of alcohol use, results were considered promising.
- Additional research has supported its benefits in improving processing speed and executive function.

Cultural, socioeconomic and environmental factors influencing alcohol use in pregnancy and strategies for prevention of FASD.

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Key Take Aways

- FASD is common, preventable, and globally under-diagnosed due to inconsistent diagnostic criteria.
- Alcohol use during pregnancy—especially early binge drinking—is a major risk factor strongly linked to adverse neurodevelopmental outcomes.
- Mental health comorbidity is extremely high (75–95%), with ADHD, mood disorders, and behavioral disorders disproportionately represented.
- Executive dysfunction and adaptive living challenges are central to FASD, often requiring lifelong support.
- Medication may help with specific symptoms, but evidence is limited—treatment must be individualized and carefully monitored.
- Social, cultural, and environmental factors significantly influence both prenatal alcohol use and long-term outcomes.
- Early intervention, stable caregiving, and targeted supports remain critical to improving trajectories for individuals with FASD.

- **"It is not the child who is the slow learner [if they haven't learned after a thousand times]; it is the teacher who must find a new way." - Walter Barbe**

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Resources

- [Texas FASD Network – Face It, Embrace It, Conquer It](#)
- [FASD Collaborative Project](#)
- [Resource Library – Texas FASD Network](#)
- [Fact Sheets - FASD United](#)
- [FASD Family Navigator - FASD United](#)
- *Trying Differently Rather Than Harder* by Lynn Alsup, Nathalie Brassard, and Melissa Elligson