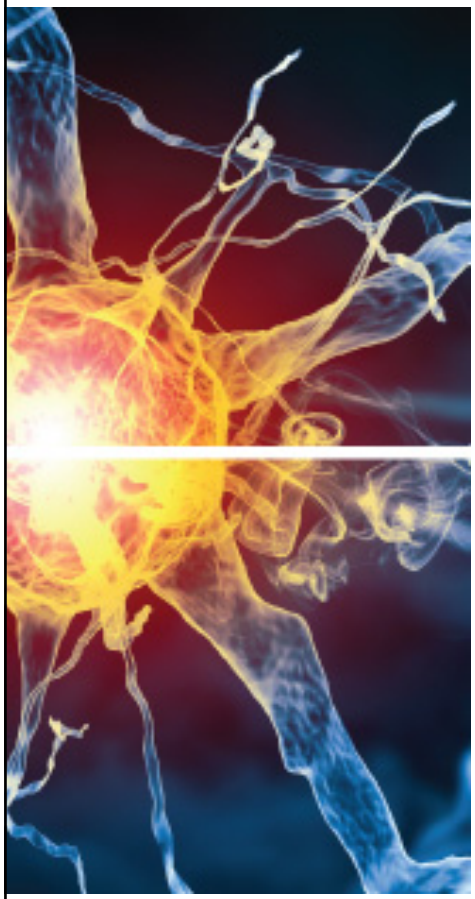
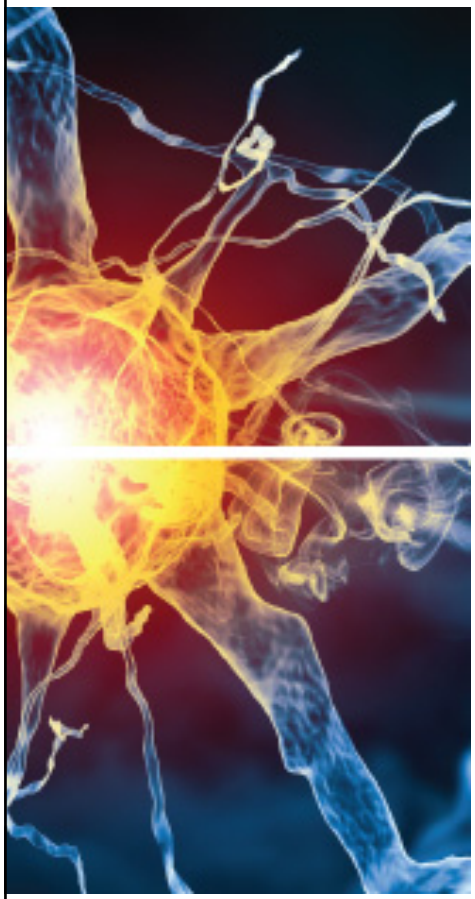


Exposure to Childhood Adversities and Psychiatric Disorders



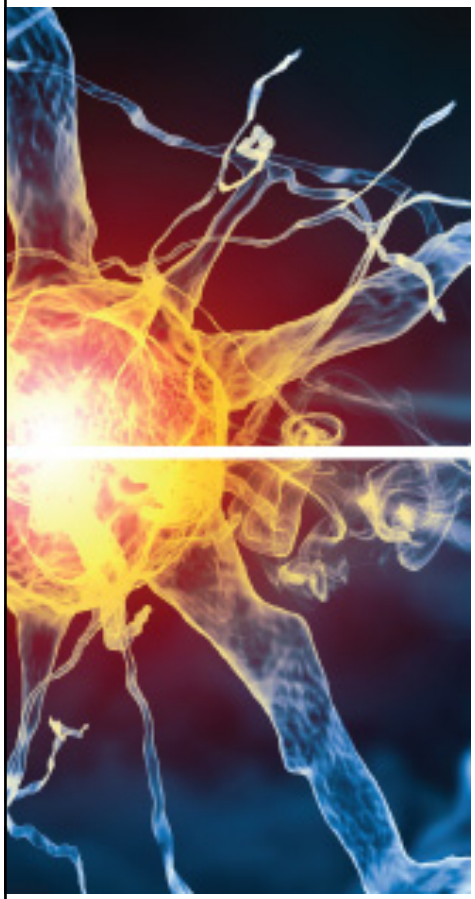
Cristiane S. Duarte, PhD, MPH

Lambert Associate Professor of Child Psychiatry
Division of Child and Adolescent Psychiatry
Columbia University
New York State Psychiatric Institute
NY, NY

Cristiane S. Duarte, PhD, MPH

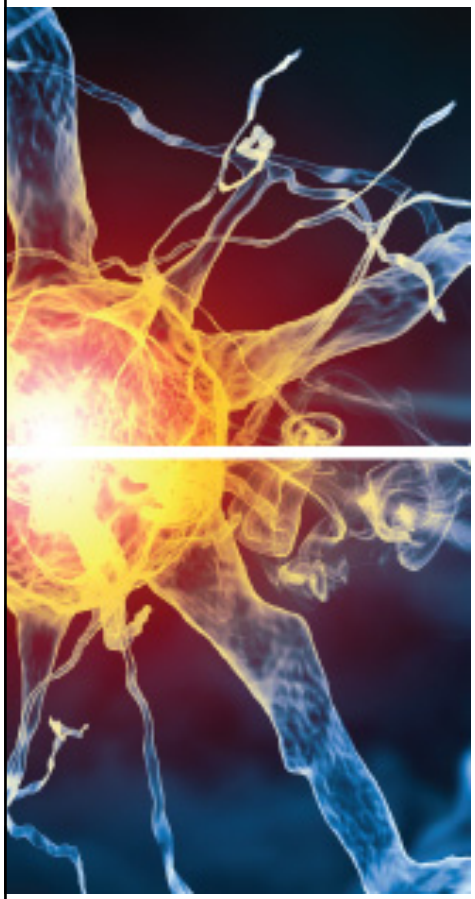
Disclosures

- Dr. Duarte has no disclosures to report.



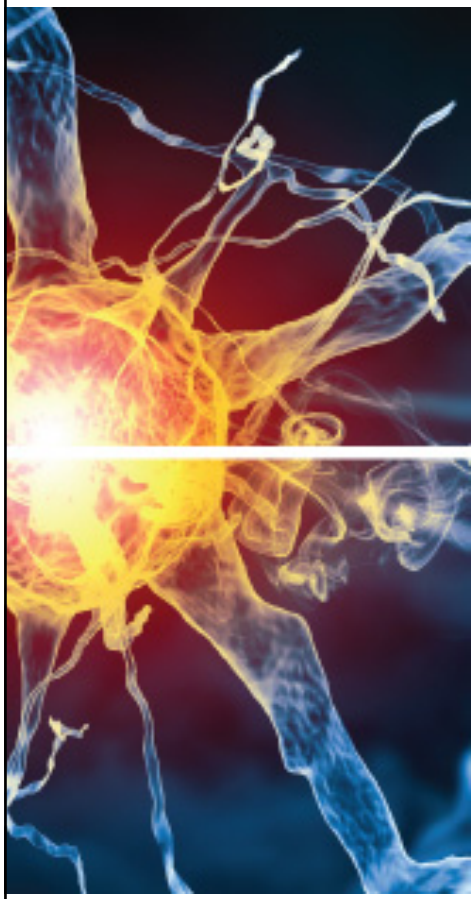
1 Learning Objective

Outline the prevalence of childhood adversities in the general population



2 Learning Objective

Describe mechanisms by which childhood adversities may lead to psychiatric disorders



3 Learning Objective

Review strategies for the prevention and treatment of psychiatric disorders

Agenda

- Childhood Adversities: Definition and Prevalence
- Childhood Adversities and Psychiatric Disorders
- Prevention and Treatment
- Expanding developmental reach: The Next Generation

Adverse Childhood Experiences (ACES)*: Definition

- Maltreatment (physical, sexual and emotional abuse; neglect by parents or caregivers)
- Parental death and divorce/separation
- Parental maladjustment (parental alcoholism, drug use, mental illness or suicide attempt, incarceration)

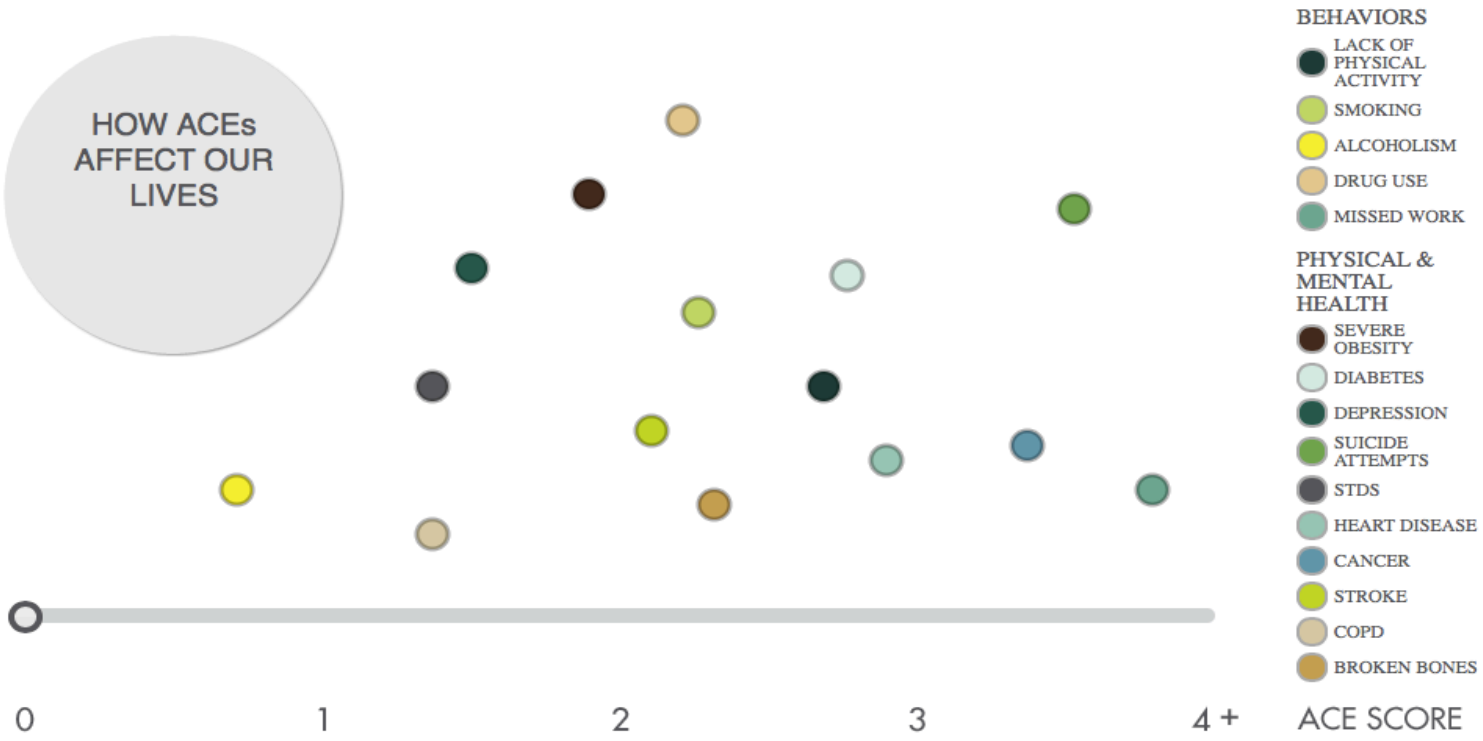
ACES – EXPANDED (WHO and others*)

All ACES in CDC/Kaiser, plus:

- Peer violence
- Witnessing/exposure community and collective violence
- Being discriminated against

Felitti VJ, et al. *Am J Prev Med.* 1998;14(4):245-258.
Cronholm PF, et al. *Am J Prev Med.* 2015;49(3):354-361.

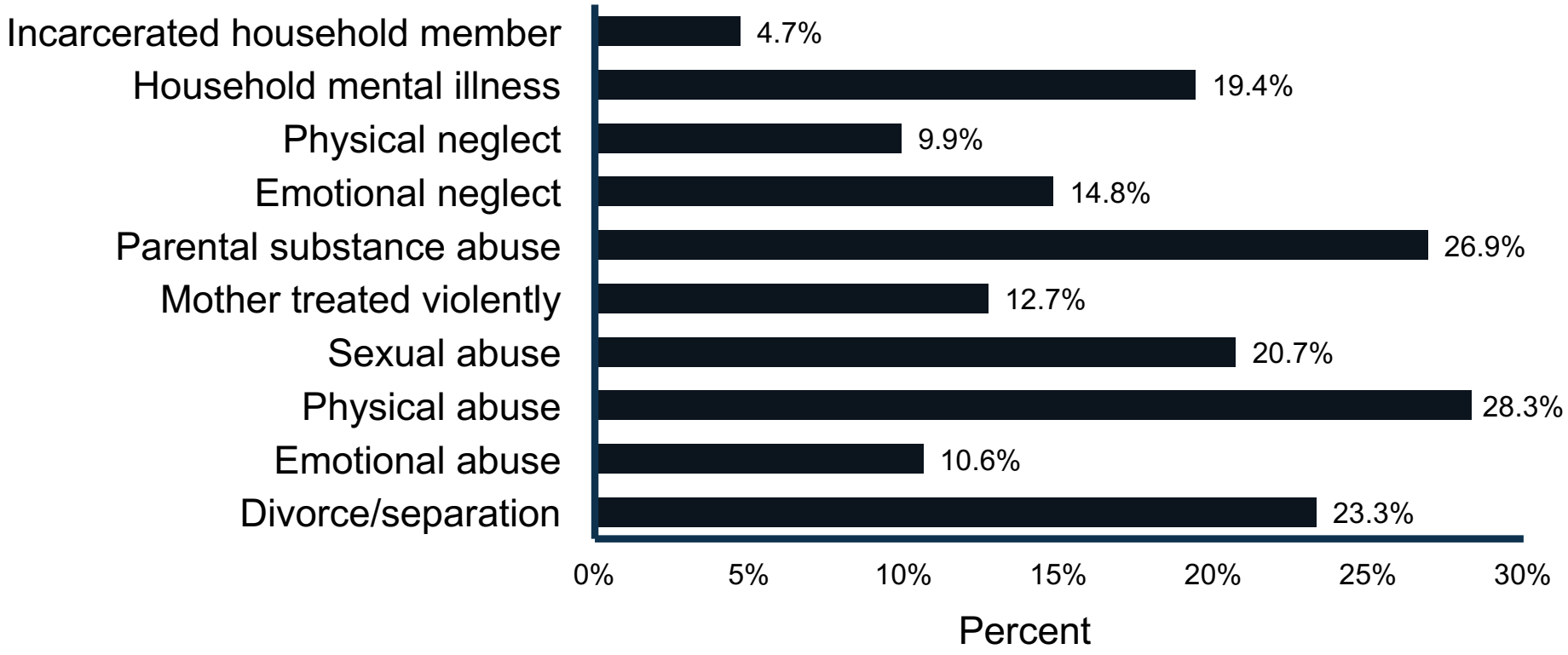
ACEs and Risk for Behavioral, Physical and Mental Problems



*Having an ACE score of zero does not imply an individual could not have other risk factors for these health behaviors/diseases.

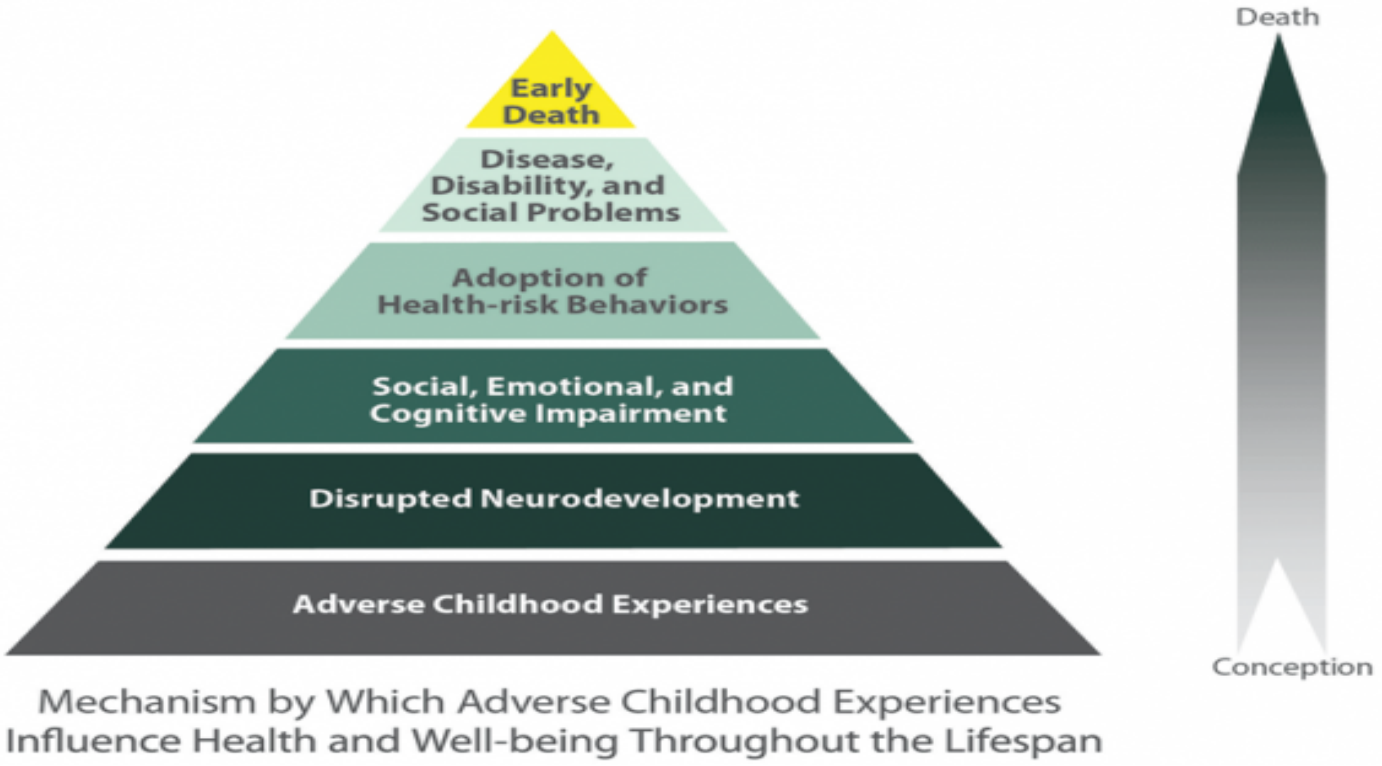
Felitti VJ, et al. *Am J Prev Med.* 1998;14(4):245-258.

Prevalence of ACEs: Adults



Felitti VJ, et al. *Am J Prev Med.* 1998;14(4):245-258.

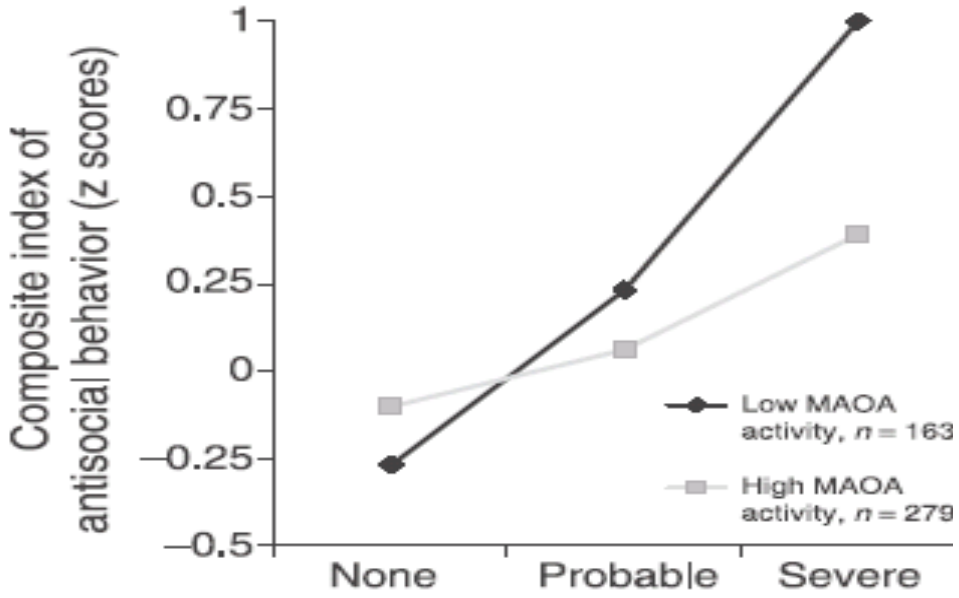
ACES: Mechanisms



Mechanism by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

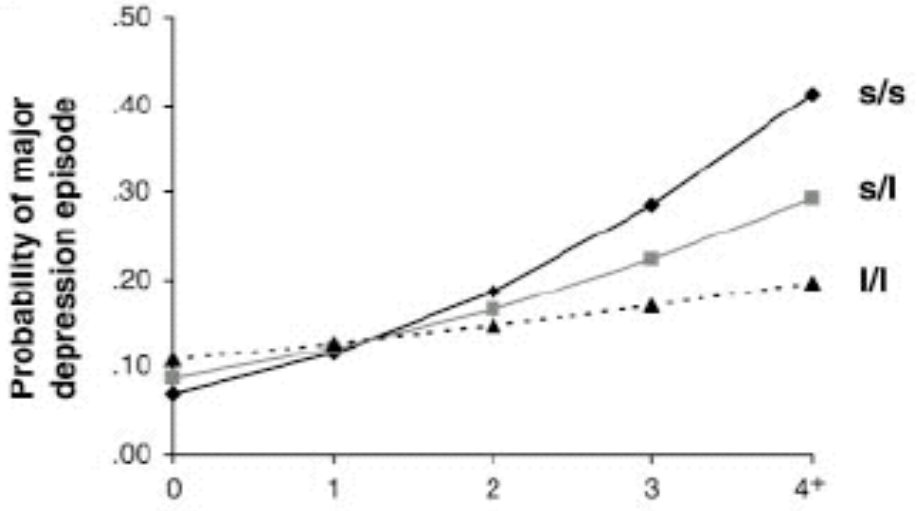
Felitti VJ, et al. *Am J Prev Med.* 1998;14(4):245-258.

Childhood Adversities & Genes



Childhood Maltreatment

Caspi A, et al. *Science*. 2002;297(5582):851-854.

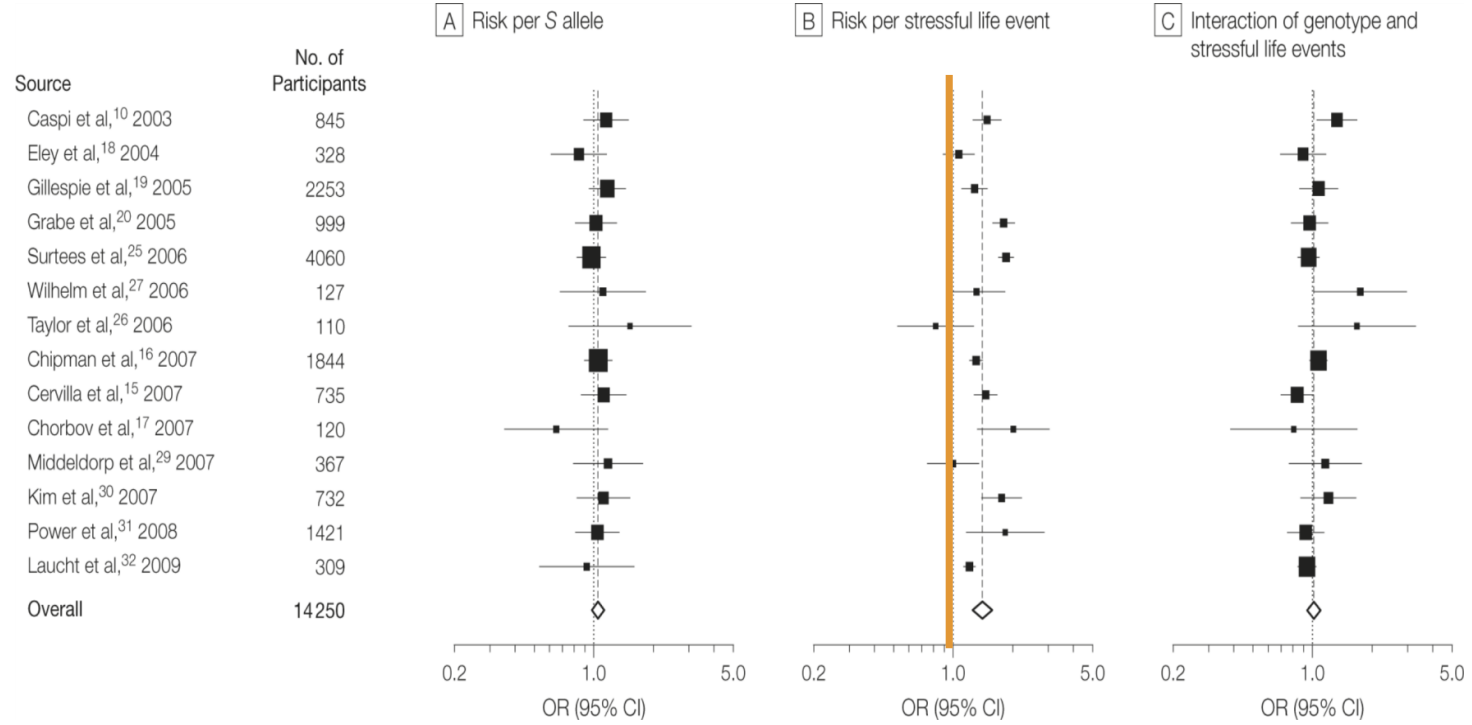


Number of Stressful Life Events

Caspi A, et al. *Science*. 2003;301(5631):386-389.

Childhood Adversities & Genes

Interaction Between the Serotonin Transporter Gene (5-HTTLPR), Stressful Life Events, and Risk of Depression: A Meta-analysis



Risch N, et al. *JAMA*. 2009;301(23):2462-2471.

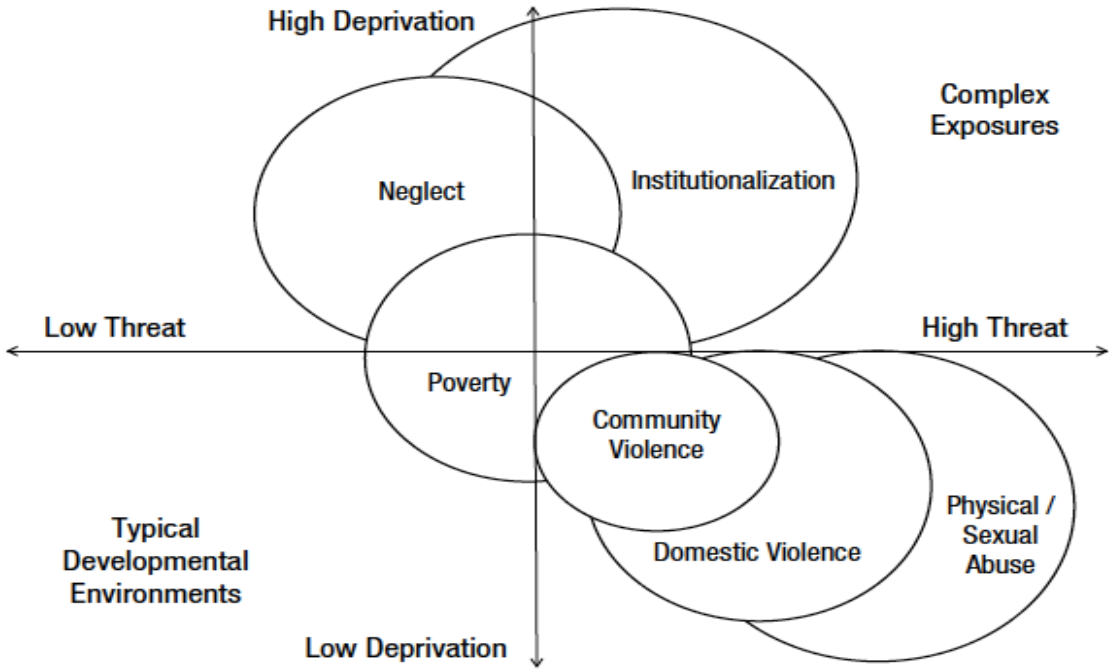
Biological Consequences

- Stress-response system dysregulation
  - HPA axis
- Changes in the brain
  - Limbic (amygdala, hippocampus) system
  - Cortical areas
- Neurotransmitter systems
  - e.g., corticotrophin releasing factor [CRF]
- Cellular Aging
  - Short telomere length
- Epigenetics
  - Modifications of HPA and neuroplasticity-related methylation patterns
    - e.g. , greater methylation of glucocorticoid receptor and Demethylation of FKBP5
- Inflammation
  - Dysregulation of the immune system: peripheral C-reactive protein, IL-6 and TNF-α
  - Physical and sexual abuse: IL-6 and TNF-α; Parental absence: CRP

IL-6 = interleukin-6; TNF-α = tumor necrosis factor-α; CRP = C-reactive protein; HPA = hypothalamic-pituitary adrenal-axis.

A Dimensional Model of Childhood Adversity

Deprivation and threat as distinct dimensions of early experience



McLaughlin KA, et al. *Curr Dir in Psychol Sci*. 2016;25(4):239-245.

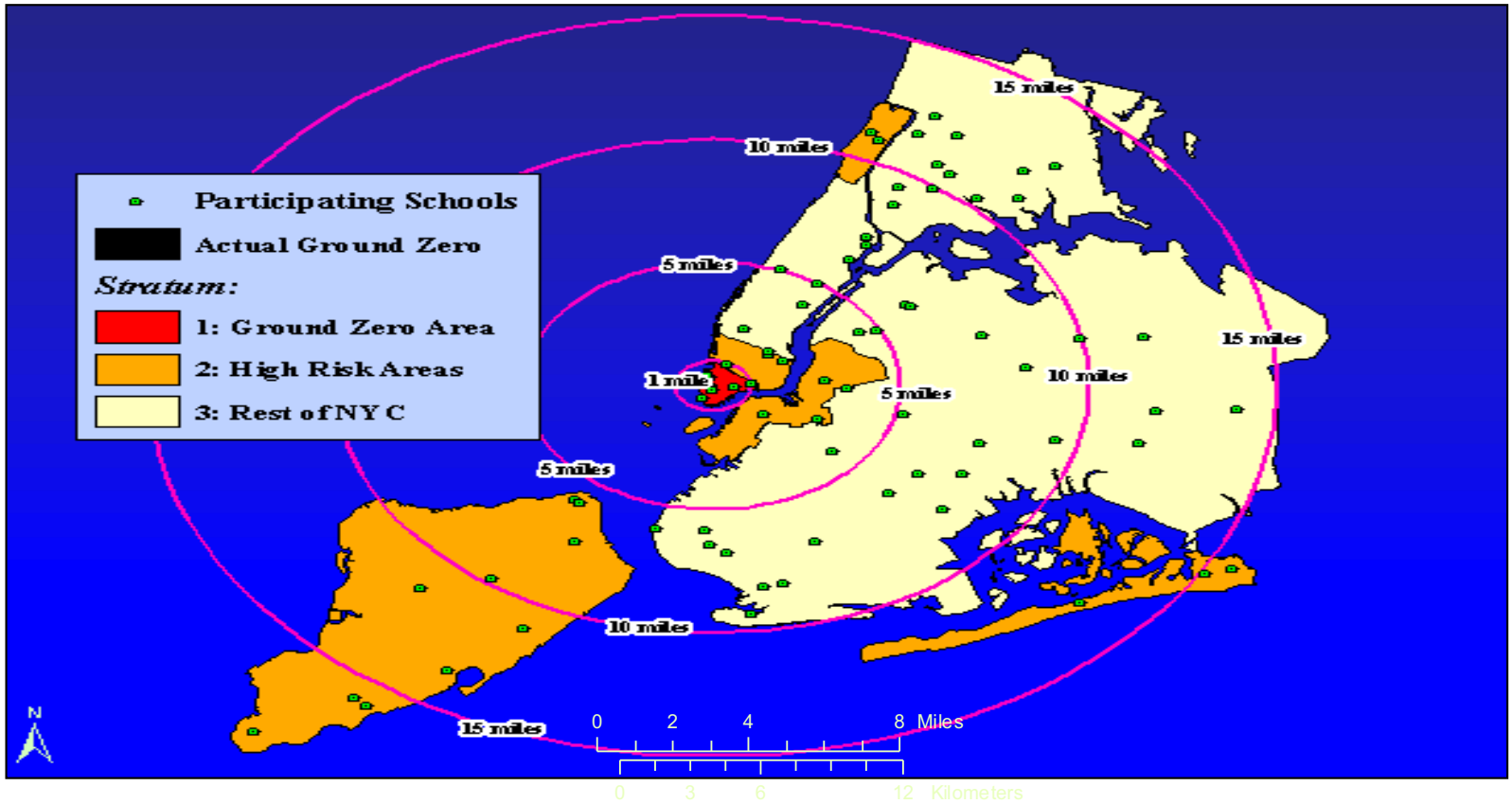
NYC-WTC: Department of Education Study

- February-March 2002
- Representative sample of NYC public school students (Grades 4-12)
- 94 schools, N = 8,236

NYC-WTC = New York City-World Trade Center.

Hoven CW, Duarte, CS et al. *Arch Gen Psychiatry*. 2005;62(5):545-552.

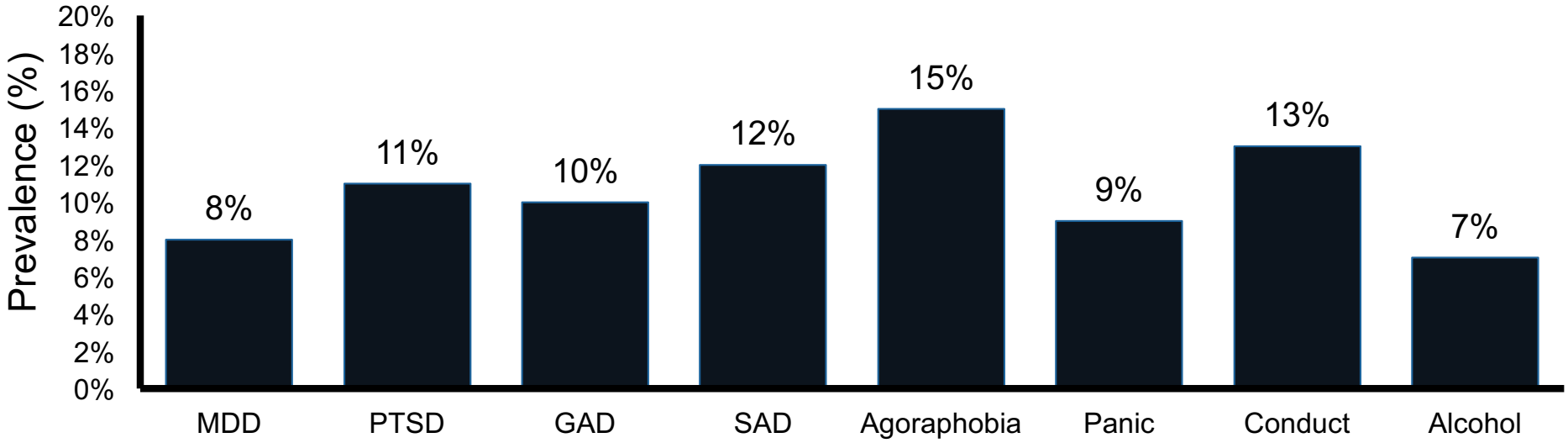
Fifteen Mile Radius From Ground Zero



Hoven CW, et al. *Arch Gen Psychiatry*. 2005;62(5):545-552.

Impact of WTC Attack on NYC Public School Students

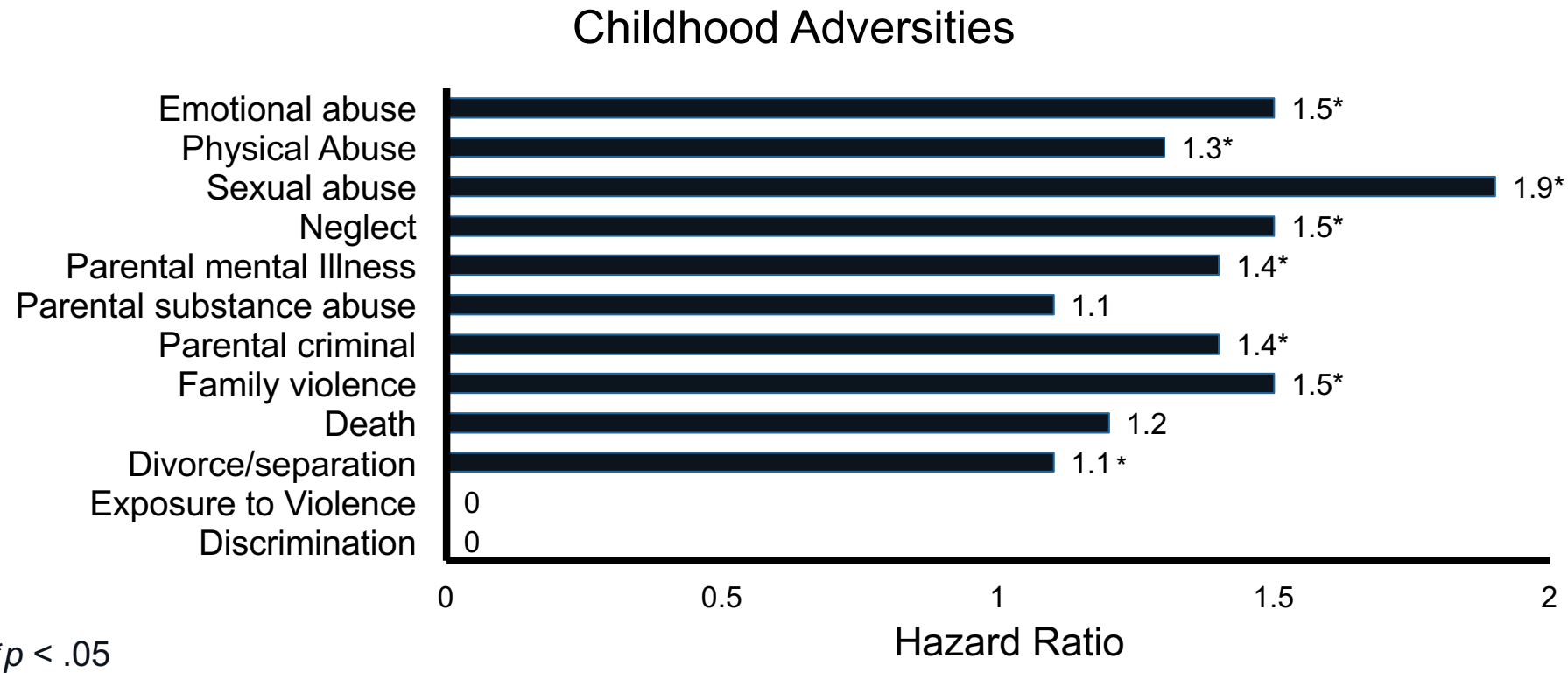
Prevalence of Psychiatric Disorders Post WTC Among NYC Public School Students (N = 8,236)



MDD = major depressive disorder; PTSD = post traumatic stress disorder;
GAD = generalized anxiety disorder, SAD = seasonal affective disorder.

Hoven CW, Duarte CS, et al. *Arch Gen Psychiatry*. 2005;62(5):545-552.

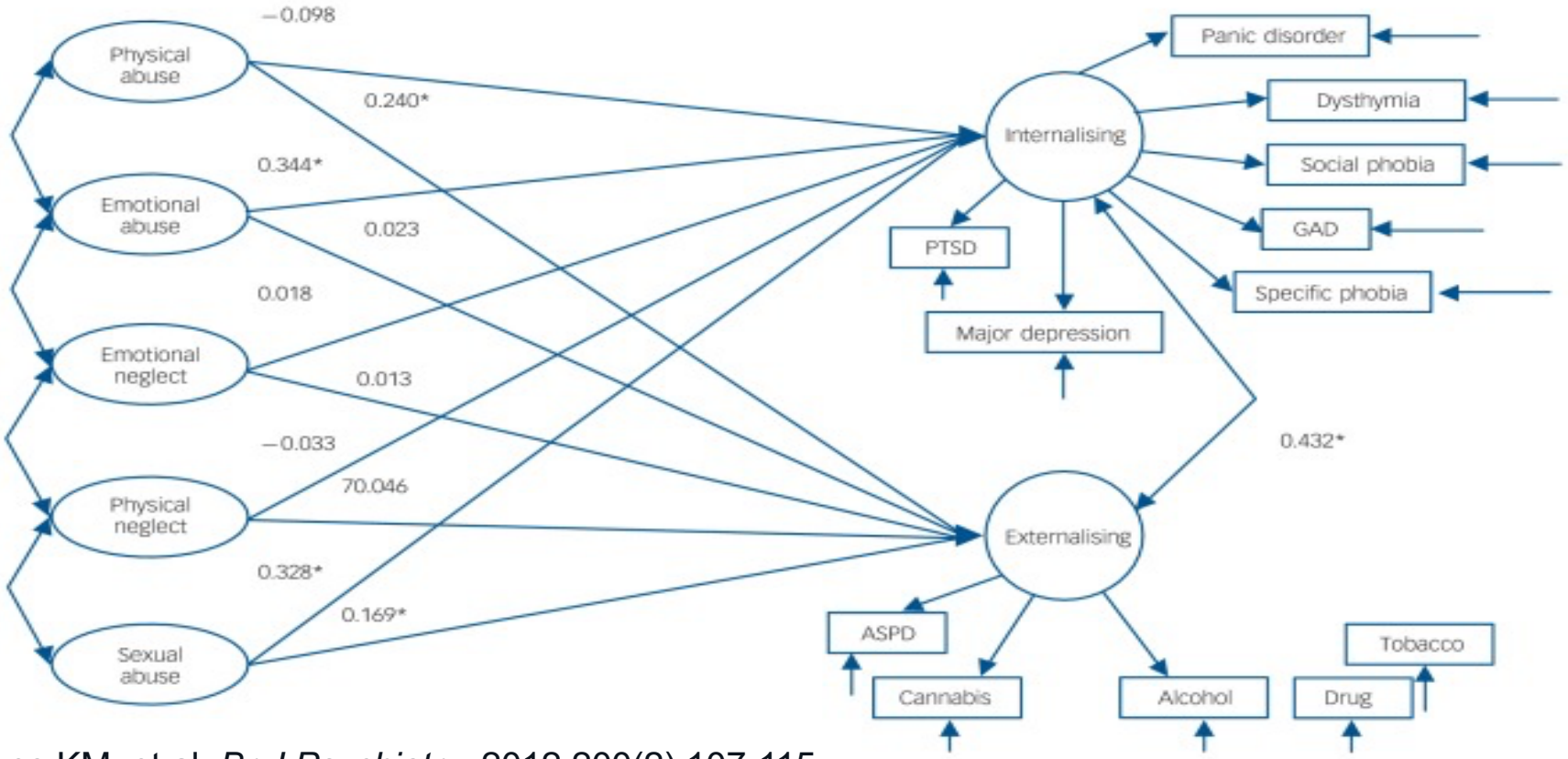
Childhood Adversities and Psychiatric Disorders Among Adolescents (NCS-A)



*$p < .05$

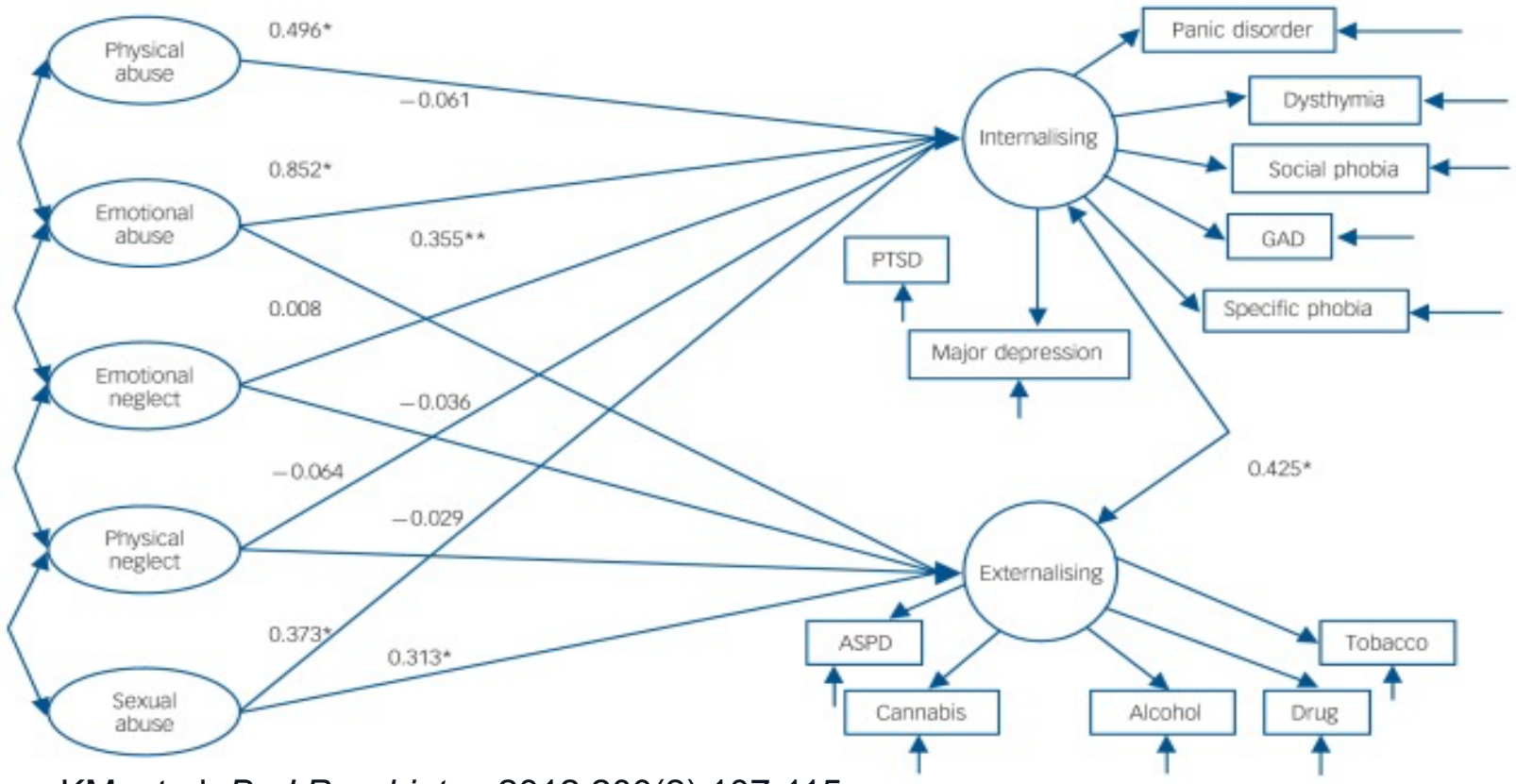
McLaughlin KA, et al. *Arch Gen Psychiatry*. 2012;69(11):1151-1160.

Childhood Adversities and Psychiatric Disorders



Keyes KM, et al. *Br J Psychiatry*. 2012;200(2):107-115.

Childhood Adversities and Psychiatric Disorders



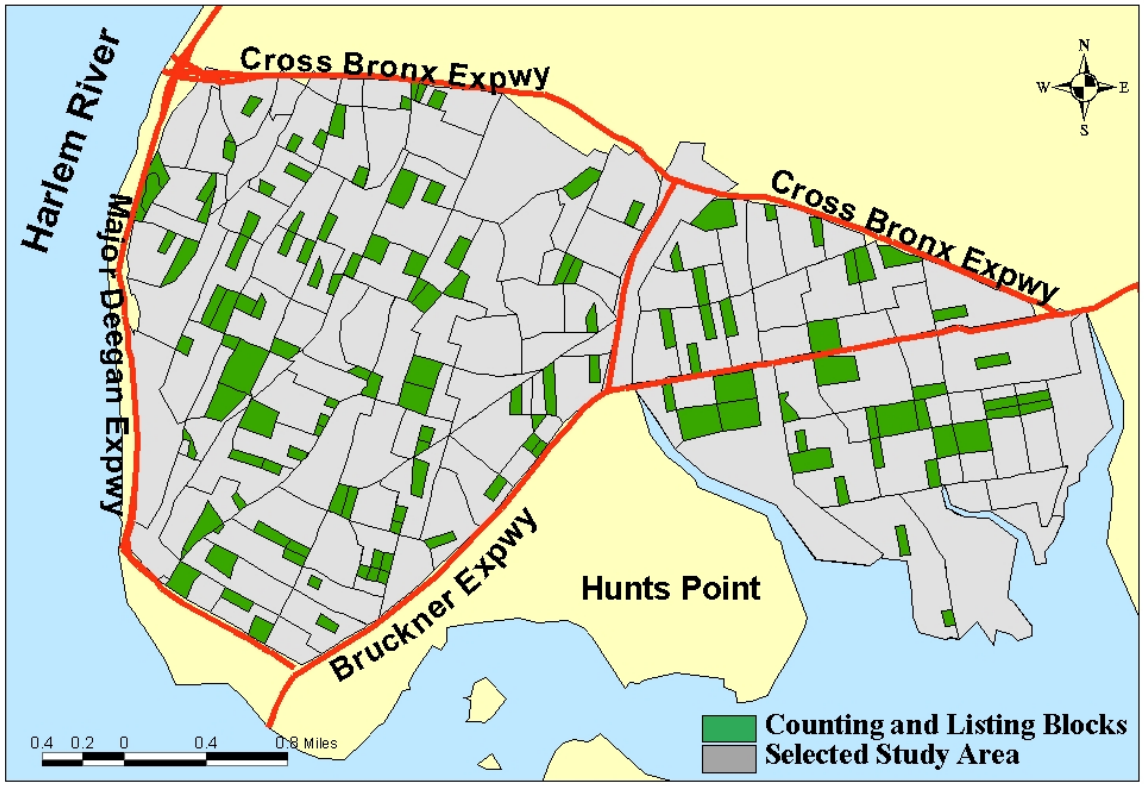
Keyes KM, et al. *Br J Psychiatry*. 2012;200(2):107-115.

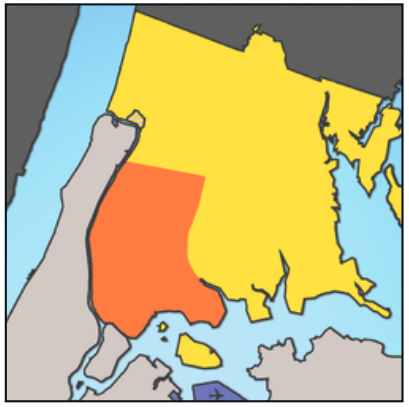
Boricua Youth Study

- Probability samples of households in Metropolitan San Juan in Puerto Rico and the South Bronx in New York City (N = 2,491).
  Initiated by Hector Bird and Glorisa Canino
- Inclusion criteria (at enumeration)
  - Children 5 – 13 years
  - A caretaker of Puerto Rican background
- Participation rates
  - South Bronx: 80.5%
  - San Juan, PR: 88.7%
- 3 waves (yearly) of data between 2001-2004 and 4th wave about 10 years later
  - >85% of Wave 1 participated in Wave 3
  - ~79% of Wave 1 participated so far in Wave 4 *(ongoing)*

Bird HR, et al. *J Am Acad Child Adolesc Psych.* 2006*;45:*1032-1041.

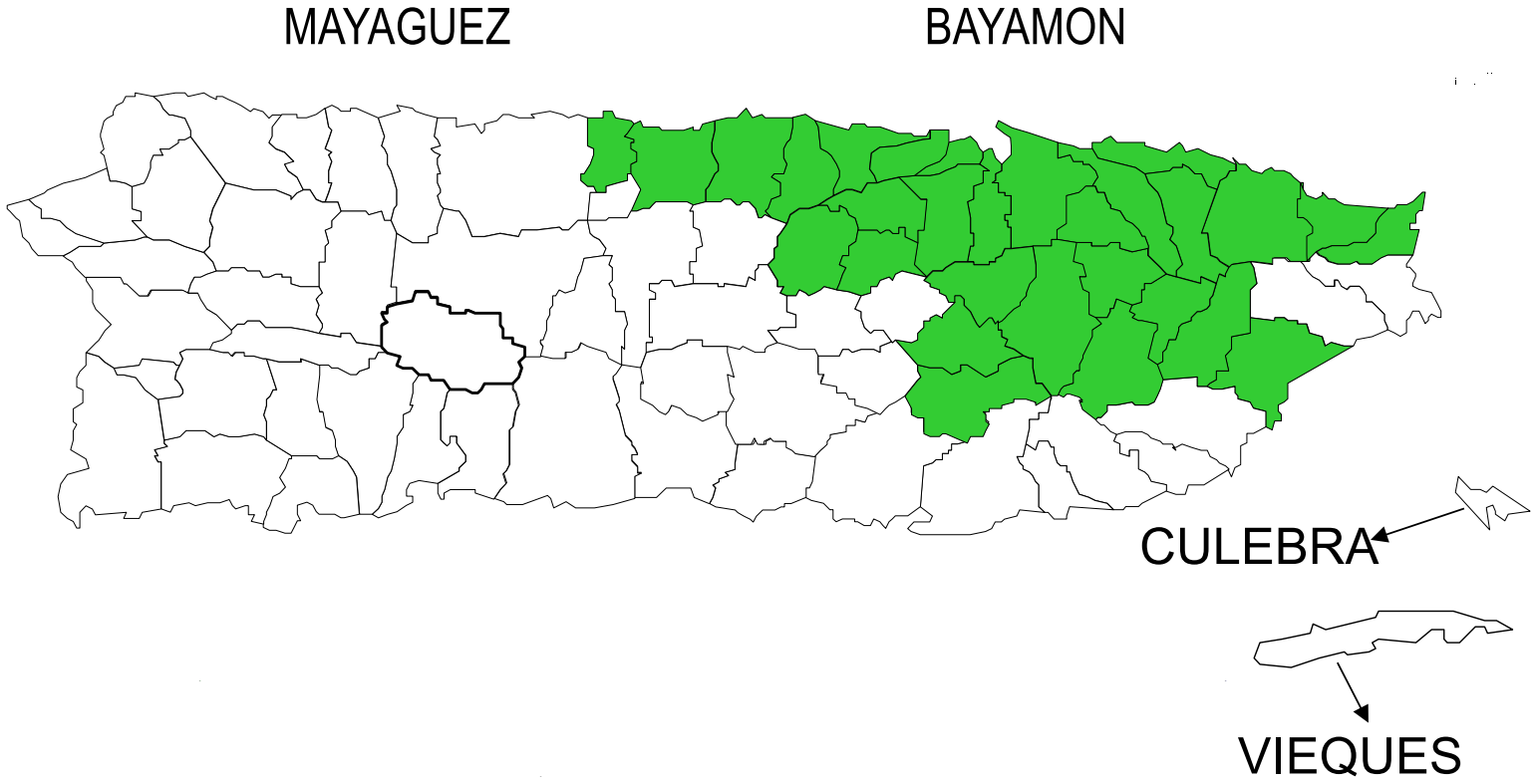
Sample Selection: South Bronx, NYC





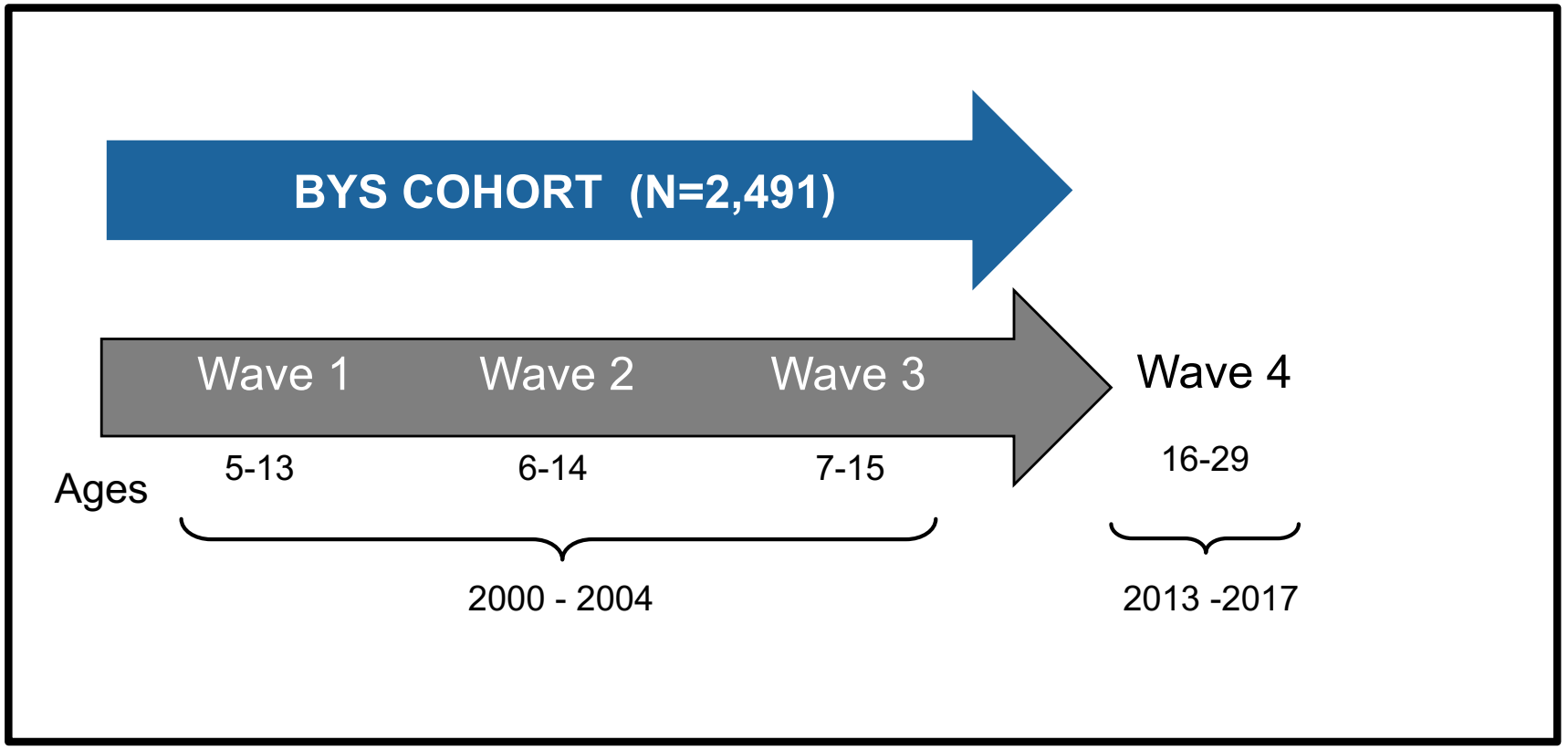
Bird HR, et al. *J Am Acad Child Adolesc Psych*. 2006;45:1032-1041.

Sample Selection: Puerto Rico, San Juan Standard Metropolitan Area

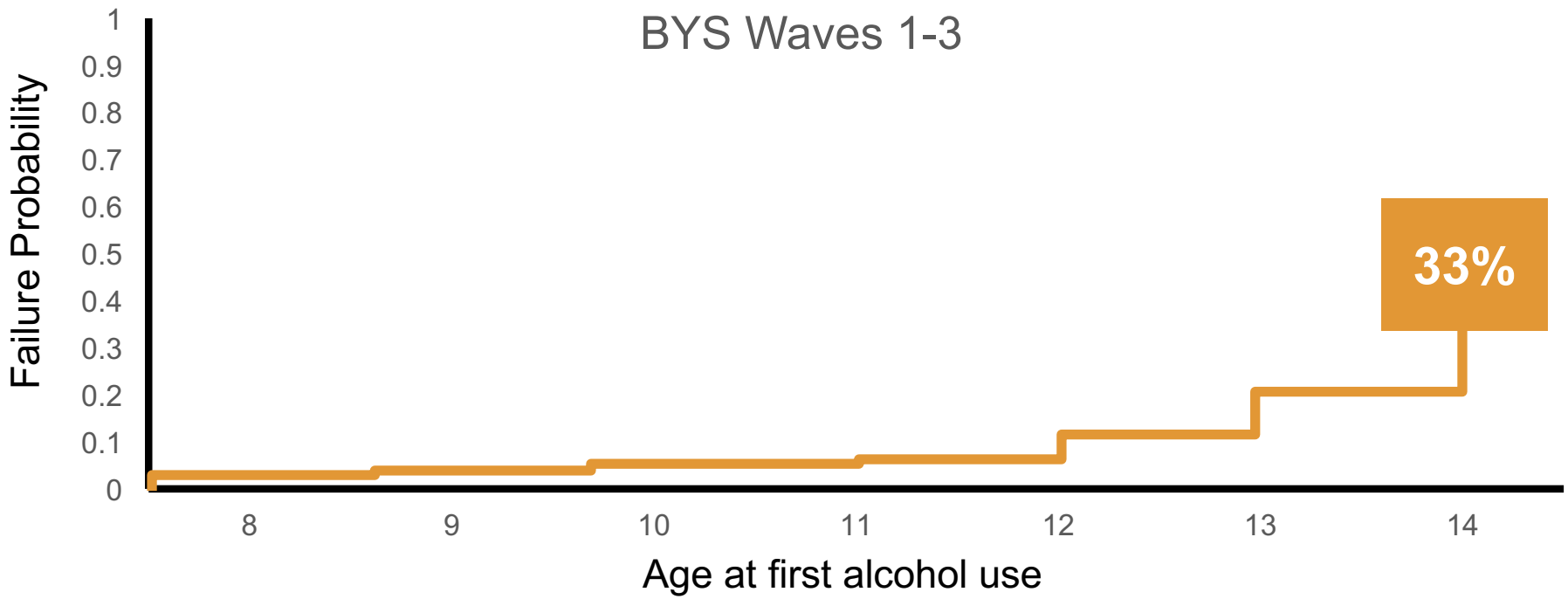


Bird HR, et al. *J Am Acad Child Adolesc Psych*. 2006;45:1032-1041.

The Boricua Youth Study (BYS)



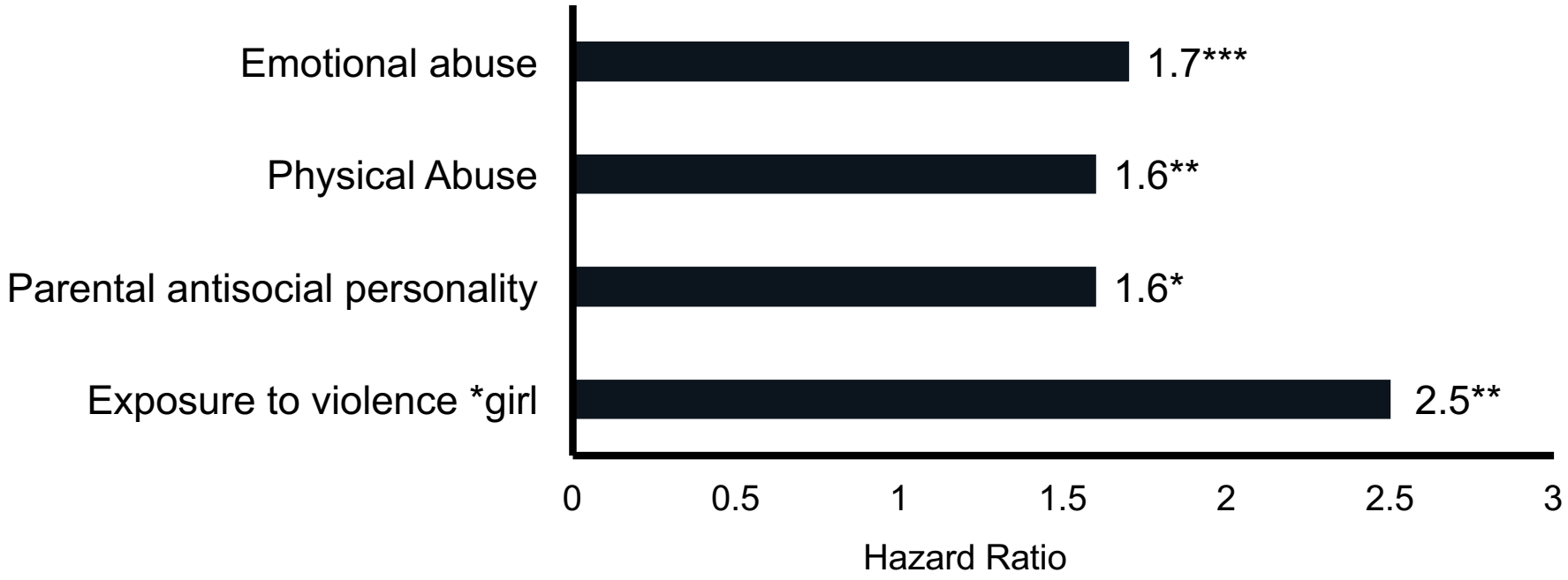
Early Initiation of Alcohol Use



Note. There were no significant differences by gender (Hazard Ratio = 0.98[0.71;1.36]) or social context in the hazard for early alcohol use (Hazard Ratio = 0.94[0.73;1.21]).

Ramos-Olazagasti, et al. *J Youth Adolesc.* 2017;46(1):28-44.

Adversities and Early Alcohol Use

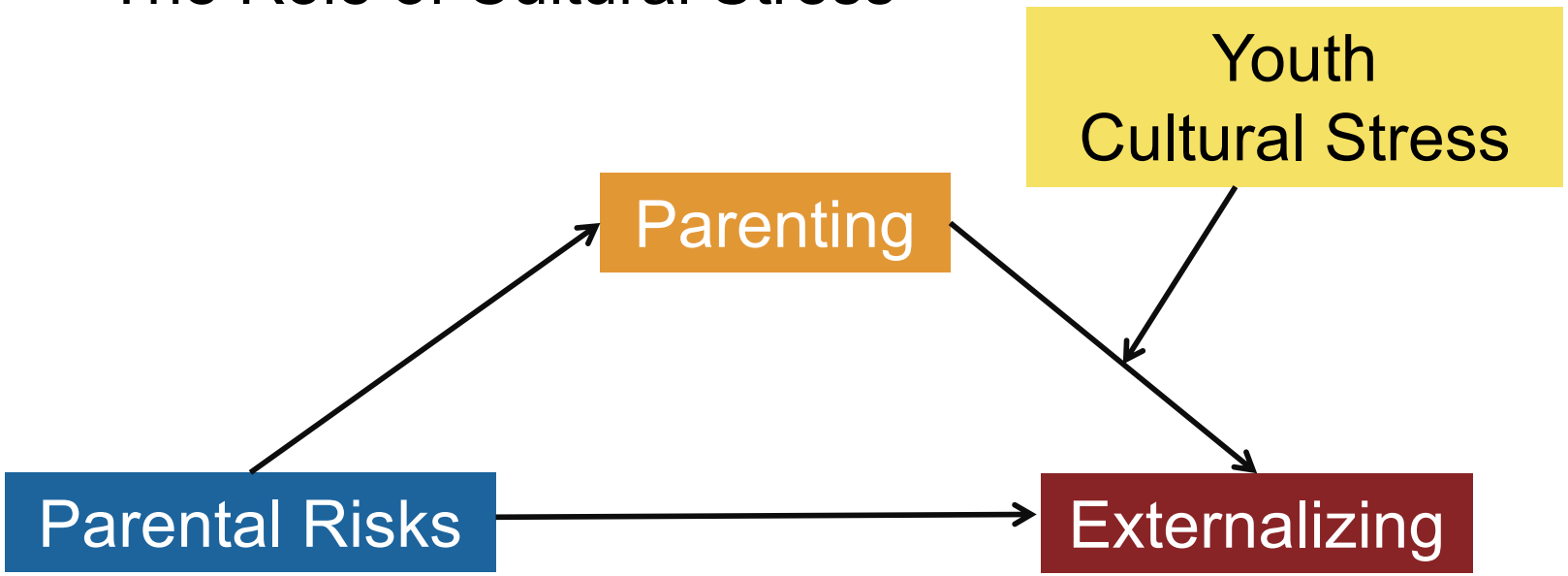


Analyses adjust for gender, age, site, and poverty, *$P < .05$, ** $P < .01$, *** $P < .001$.

Ramos-Olazagasti, et al. *J Youth Adolesc.* 2017;46(1):28-44.

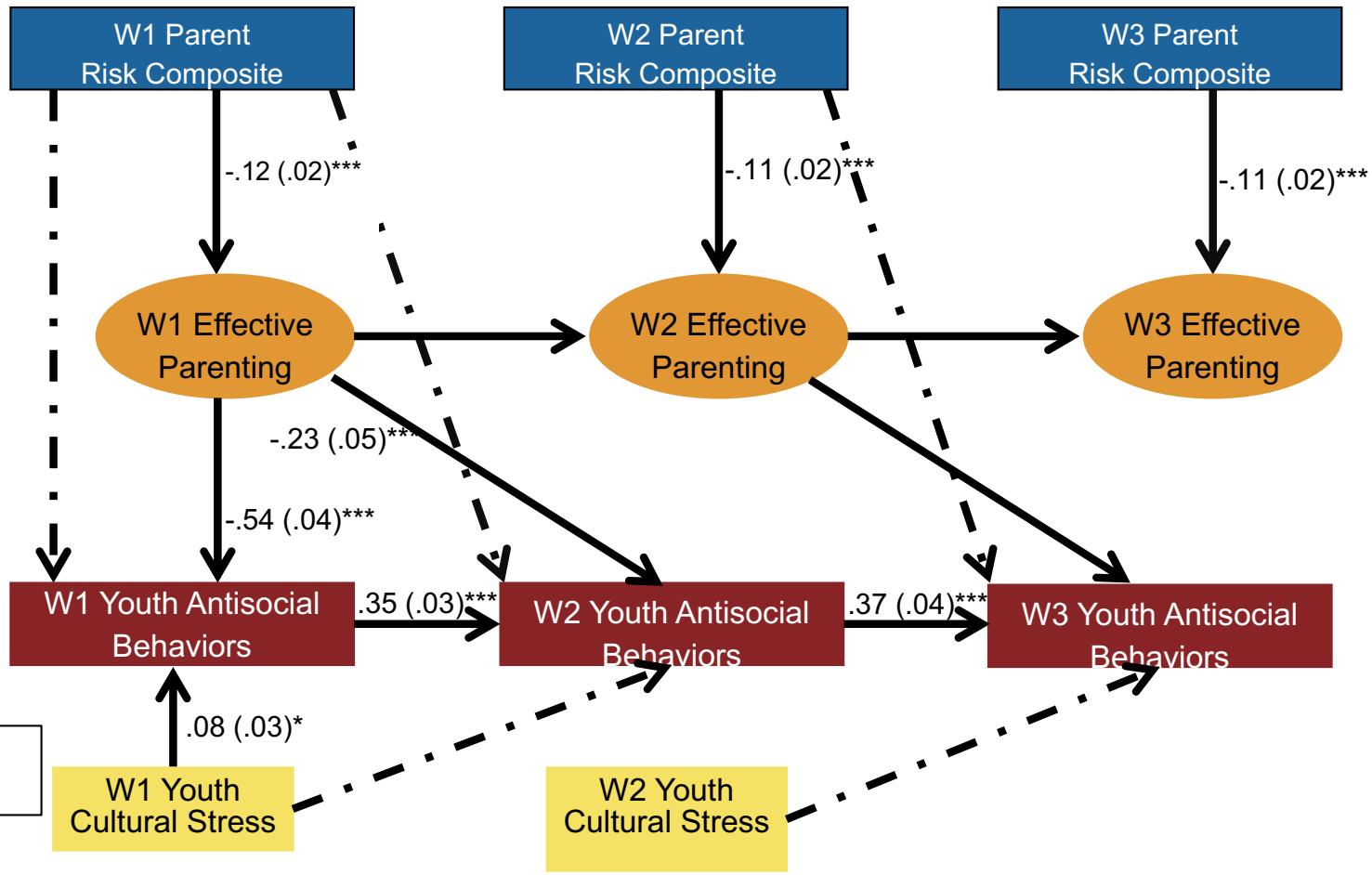
Parenting

The Role of Cultural Stress



Wei, CM, et al. Development of youth antisocial behaviors: Longitudinal, integrative model of parental factors and youth cultural stress. *(In preparation)*.

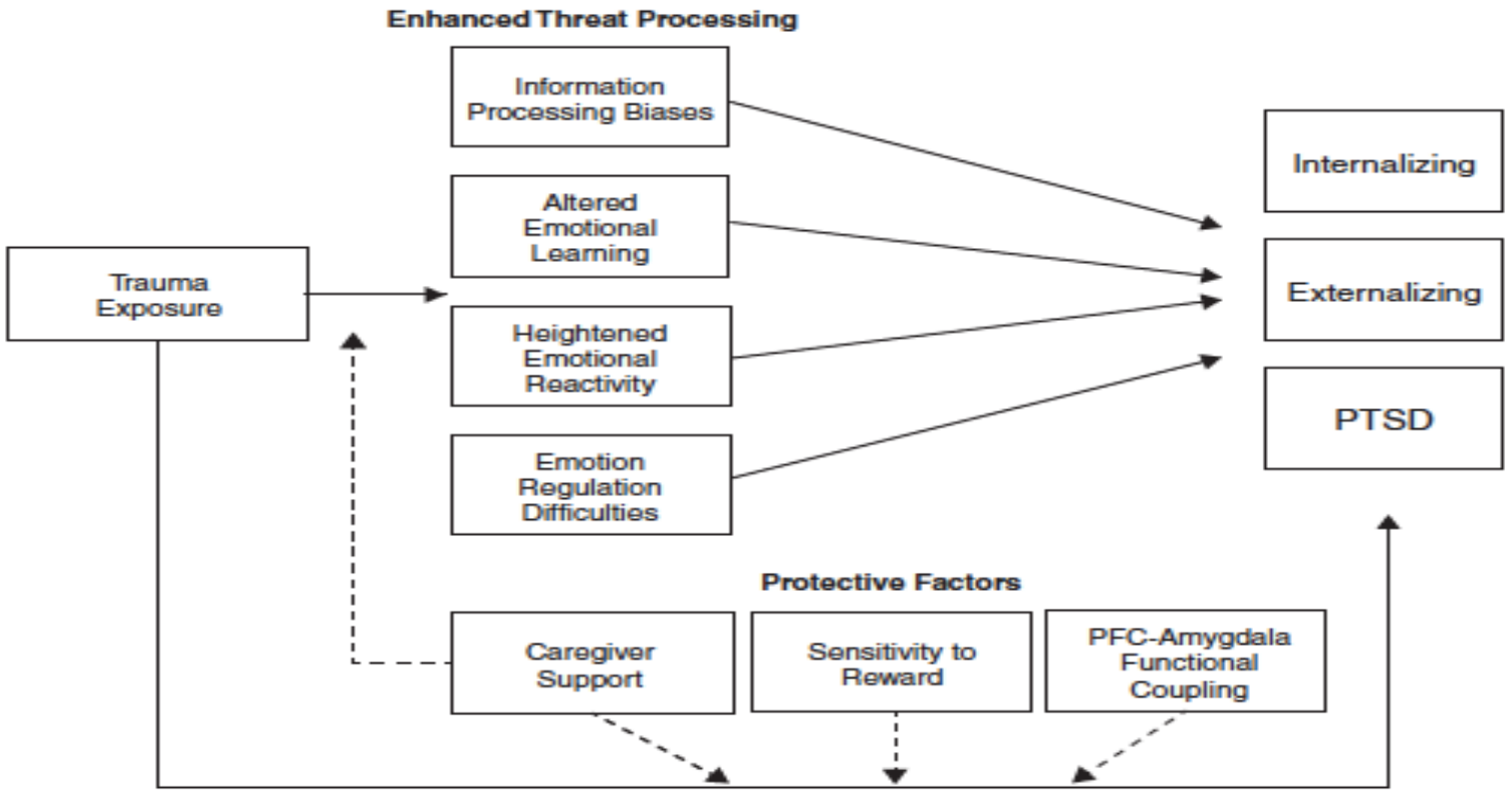
Effects of Parental Factors and Youth Cultural Stress on Youth Antisocial Behaviors



Cultural stress: interaction term estimate=0.432, SE=0.199, p=0.030

Wei, CM, et al. Development of youth antisocial behaviors: Longitudinal, integrative model of parental factors and youth cultural stress. *(In preparation).*

Prevention and Treatment



McLaughlin KA, et al. *Curr Opin Psychol*. 2017;1429-1434.

What *Can* Be Done About ACES?

These wide-ranging health and social consequences underscore the importance of preventing ACEs before they happen. Safe, stable and nurturing relationships **and environments** (SSNRs) can have a positive impact on a broad range of health problems and on the development of skills that will help children reach their full potential. Strategies that address the needs of children and their families include:

Voluntary home visiting programs can help families by strengthening maternal parenting practices, the quality of the child s home environment, and children s development. Example: Nurse-Family Partnership

Home visiting to pregnant women and families with newborns

Parenting training programs

Intimate partner violence prevention

Social support for parents

Parent support programs for teens and teen pregnancy prevention programs

Mental illness and substance abuse treatment

High quality child care

Sufficient Income support for lower income families

VetoViolence. https://vetoviolence.cdc.gov/apps/phl/resource_center_infographic.html. Accessed May 30, 2017.

Psychosocial Treatments

- Well-established
  - Individual CBT with parent involvement
  - Individual CBT and
  - Group CBT
- Probably efficacious
  - Group CBT with parent involvement
  - Eye movement desensitization and reprocessing (EMDR)

CBT = cognitive behavioral therapy.

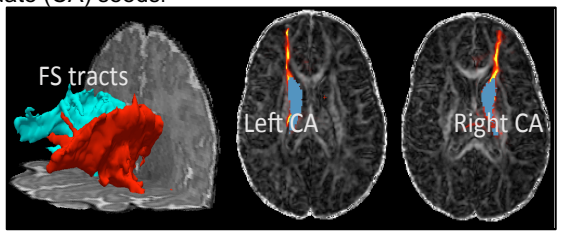
Dorsey S, et al. *J Clin Child Adolesc Psychol*. 2017;46(3):303-330.

The Next Generation: Boricua Youth Study - ECHO

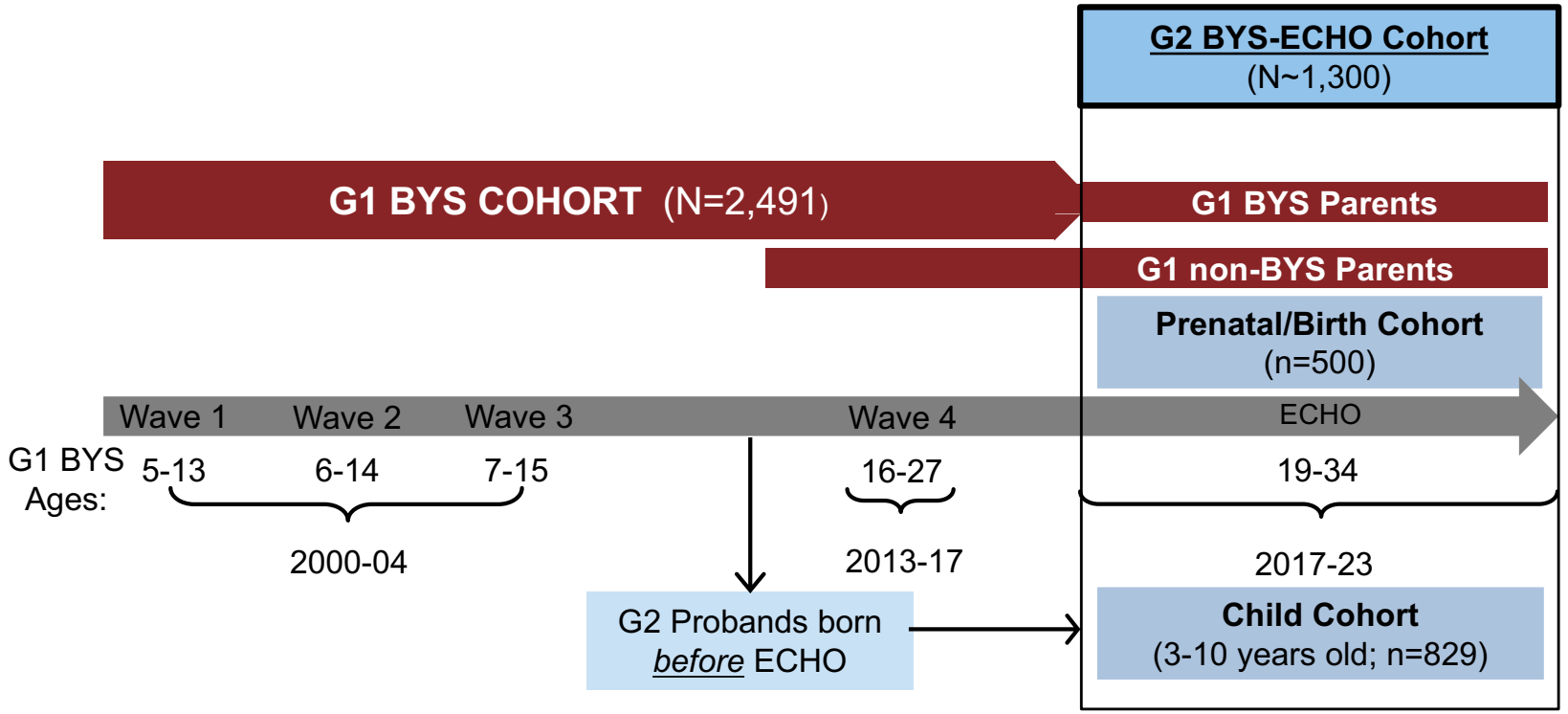
Environmental influences on Child Health Outcomes (ECHO) Program: New NIH program ($157 million awarded in 2016)

ECHO – Boricua Youth Study: Newborns and children of BYS participants up to 10 years old in two sites (N~1,300) will be assessed

Infant Diffusion MRI. Data from 3 infants scanned at UPR. Tractography shows left (blue) and right (red) frontostriatal white matter tracts derived from left and right caudate (CA) seeds.



Boricua Youth Study-ECHO



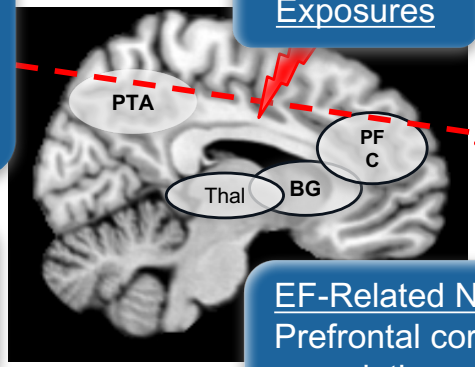
Main Hypothesis and Potential Mechanisms

- Parents' adverse childhood experiences (ACEs) may affect offspring development *independent* of:
  - exposure to maternal distress during pregnancy and
  - adverse experiences that may be part of the postnatal rearing environment.
- Potential Mechanisms
  - Alterations in parental caregiving arising from their own early adverse experiences
  - Women's childhood experiences influence the gestational environment through adaptations in immune, metabolic, endocrine and oxidative stress processes
  - Father to child transmission: 'parent of origin' effects involving imprinted genes, and germline epigenetic mutations originating from stressed males

Focus on the Building Blocks of Executive Functioning and Early Neurodevelopment

Executive Functions (EF)
Inhibitory control, attention, working memory, problem solving, planning

Adverse Exposures



Impaired EF
Poor academic, social, & emotional functioning, neuropsychiatric disorders

Intact EF
Promotes social & academic functions, and mental health

EF-Related Neural Circuits
Prefrontal cortex (PFC), Parietotemporal association cortex (PTA), Basal ganglia (BG), Thalamus (Thal)

Why study early EF dysfunctions in disadvantaged children?

- Protracted development
- Vulnerable to childhood adversities
  (poverty, neglect, abuse, poor nutrition, and restricted cognitive stimulation)
- Predictive of future academic, social, and emotional success
- Associated with neuropsychiatric disorders
- Amenable to early interventions

Intergenerational Transmission of Disadvantage

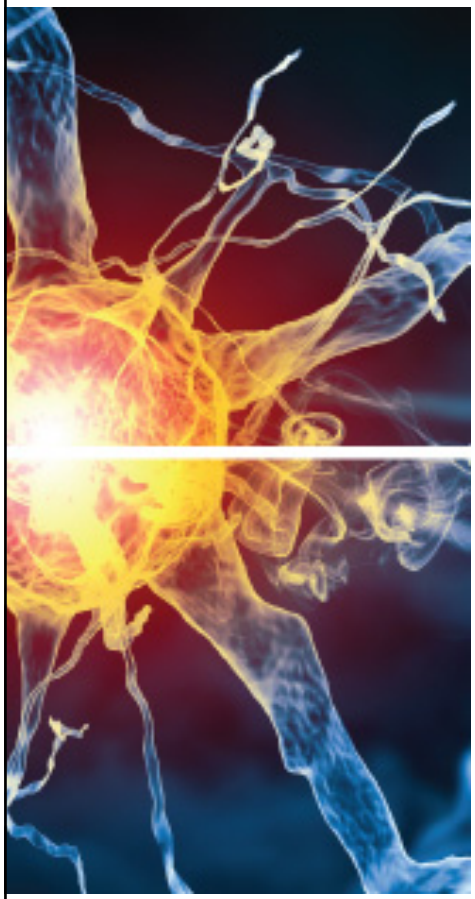
- **Beyond Prenatal and Childhood exposure to stress**
  - To date, most studies and developmental theories have assumed that a *child's own experiences of adversity* are primarily influencing future negative outcomes.
  - This lens may be too narrow: the intergenerational, cyclic nature of disadvantage suggests the possibility that the effects of adversities may *extend beyond the exposed child, influencing the offspring*, through a number of potential sources.
- **A new perspective on exposure to childhood adversity and disadvantage across generations**

SMART Goals

- Acknowledge frequency and types of ACEs in specific groups
- Be aware of the relationship between ACEs and psychiatric disorders
- Initiate psychosocial treatments in children and adolescents exposed to ACES
- Prevent ACEs before they happen

Boricua Youth Study – Current Assessment

Wave 4		Ancillary Studies		BYS-ECHO
Substance Abuse & Sexual Risk (2012-2018)	**Depression/ Anxiety (2012-2017)**	**Gambling & Impulsive Behaviors (2014-2019)**	**Early CVD Risk (2014- 2019)**	**Intergenerational Transmission (2016-2023)**
Substance Use/Abuse & HIV/STI Risk Behaviors in Puerto Rican Youth [R01 DA033172] **PI: Cristiane Duarte** NYSPI - Columbia University University of Puerto Rico	**Effects of Social Context, Culture and Minority Status on Depression and Anxiety** [1R01MH098374] **MPI: Maggie Alegria Glorisa Canino Cristiane Duarte** Mass General Hospital University of Puerto Rico NYSPI-Columbia University	**Predictors of Impulsive Behaviors among Youth** [R01 HD060072] **MPI: Silvia Martins Carlos Blanco Glorisa Canino Cristiane Duarte** MSPH Columbia University NYSPI University of Puerto Rico	**Childhood Adversity and Cardiovascular Health among Puerto Rican Youth** [R01HL125761] **PI: Shakira Suglia Col: Glorisa Canino Cristiane Duarte** MSPH Columbia University NYSPI University of Puerto Rico	**Breaking The Cycle of Intergenerational Disadvantage: Neurodevelopment Among Puerto Rican Children** [UG3OD023328] **MPI: Cristiane Duarte Glorisa Canino Catherine Monk Jonathan Posner** NYSPI - Columbia University University of Puerto Rio



Questions & Answers