

# **Adverse Childhood Experiences**

## **Healthy Babies Healthy Children Analysis**

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**Ontario Ministry of Children and Youth Services**

# Disclosure

- There are no actual or potential conflicts of interest in relation to this presentation.

# Learning Objectives

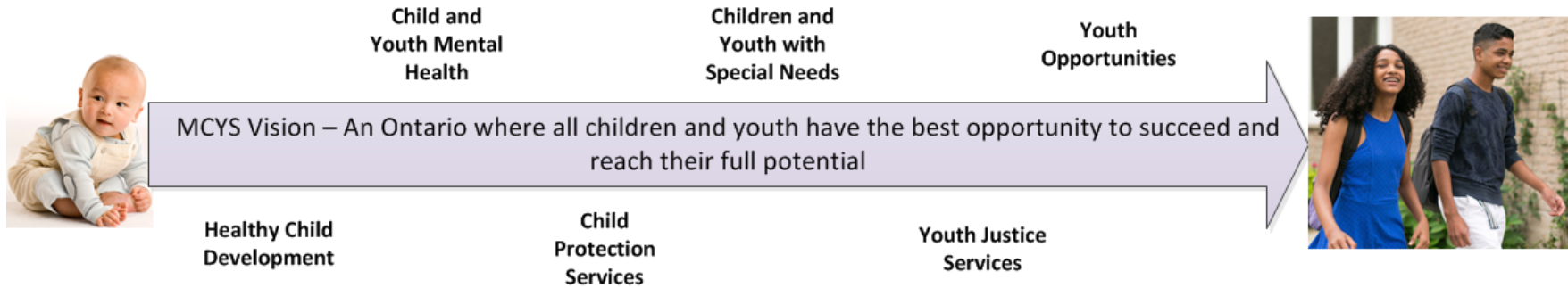
- 1) Demonstrate the potential of the HBHC Screen to identify, in the newborn population, risk factors that behave like the Adverse Childhood Experiences (ACE).
- 2) Illustrate the potential socio-demographic trends that can support surveillance and system improvements.
- 3) Describe the impact of ACE exposures to child development, and discuss the benefits of early intervention.

# Overview

- Healthy Babies Healthy Children (HBHC) background
- Why choose the ACE lens?
- Results of the HBHC ACE analysis
- Implications and opportunities

# Ontario Ministry of Children and Youth Services

- MCYS works with government and community partners to support children and youth and their families.

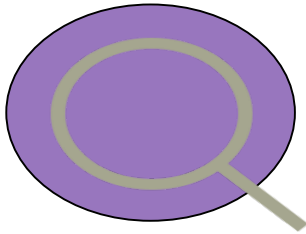


- The early years (birth to age 6)
  - Imperative to healthy development – brain and body are rapidly developing
  - MCYS supports healthy child development, with services targeting early identification and intervention, including services for newborn screening, speech and language, vision and hearing, autism and developmental disabilities.

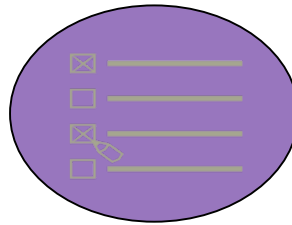
# Healthy Babies Healthy Children (HBHC)

- HBHC is an early identification, intervention and prevention program delivered through the 36 Public Health Units across Ontario.
  - Total annual allocation of \$81M.
- This program is part of the suite of Healthy Child Development programs within MCYS which support prevention services and play an important role in helping children achieve their developmental milestones in order to be ready to succeed at school and in life.

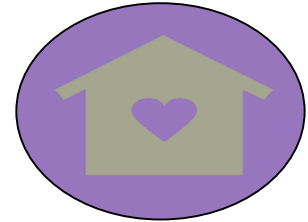
## Program components include



**screening**



**assessment**



**intervention**

# HBHC Delivery in Ontario

## MCYS

- Provides funding
- Responsible for policy, program design, monitoring and evaluation

## Boards of Health/Public Health Units

- Local delivery of services via 36 PHUs

## Hospital/Midwives

- Administer screen, as first postpartum contact with families
- ~ 140,000 birth in Ontario per year
- 110 birthing hospitals



# The HBHC Screen



- The HBHC Screen was developed in order to better screen families into HBHC Services
- Goals of the HBHC Screen are to:
  - Identify all risks to compromised child development, biological and psycho-social risks
  - Eliminate multiple steps for risk identification
  - Improve data quality related to risk identification
- The HBHC Screen was developed in consultation with a panel of experts and two phases of validation.



# The HBHC Screen

ISCIS Family ID Number:

## Healthy Babies Healthy Children Screen

Mother's Name:	Infant/Child's Name:
Mother's Maiden Name:	Infant/Child's DOB/EDD & Time (mm/dd/yyyy)
Mother's DOB: (mm/dd/yyyy)	Telephone: Telephone (Alt):
Father's/Partner Name:	Email Address:
Full Address:	Language Preferred:

### Section A: Pregnancy & Birth

	Yes/No	Reason for left blank
1) Multiple birth?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
*2) Premature? (born at less than 37 weeks gestation)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
*3) Was the birth weight less than 1500g?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
*4) Was the birth weight more than 4000g?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
*5) Apgar score of less than 5 at five minutes?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
6) Health conditions/medical complications during pregnancy that impact infant? e.g., diabetes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Please List:
*7) Complications during labour and delivery? e.g., emergency caesarean, infant trauma or illness such as respiratory distress syndrome, difficult vaginal birth including forceps or vacuum, scheduled caesarean due to complications	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Please List:
8) Maternal smoking of cigarettes during pregnancy?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
9) Maternal smoking of more than 100 cigarettes (5 packs) in her lifetime prior to pregnancy?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
10) Maternal alcohol use during pregnancy?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
11) Maternal drug use during pregnancy? Include information on illegal drug use and prescription drugs that impact on activities of daily living or are teratogenic	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Please List:
12) No prenatal care before sixth month?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

### Section B: Family

Mother		
13) Is less than 18 years old?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
14) Was less than 18 years old when first child was born?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
15) Experienced a previous loss? (pregnancy or baby)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
16) Is a single parent?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
17) Mother and/or child do NOT have a designated primary care provider?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
18) Does NOT have an OHIP number?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
19) Did NOT complete high school?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

### Infant/Child

20) Congenital or acquired health challenge?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Please List:		
*21) Maternal separation from infant greater than 5 days?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Please specify reason:		

### Partner/Father/Support Person

22) Father/partner/support person is NOT involved with care of baby/child?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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HBHC Screening Stage: Prenatal ☐ Postnatal ☐ Early Childhood (greater than 6 wks of age) ☐

Sex:	Parity:	Graida:	Apgar 1min:	Apgar 5min:
Birth Weight:	Birth Type:	Feeding:		
	<input type="checkbox"/> Vaginal <input type="checkbox"/> C-Section	<input type="checkbox"/> Breastfeeding <input type="checkbox"/> Formula <input type="checkbox"/> Both		
Discharge Weight:	Gestation:	Discharge Date Mother:	Discharge Date Baby:	
Referral (if applicable):				
<input type="checkbox"/> Child Protection Services <input type="checkbox"/> Lactation Consultant/Breastfeeding support <input type="checkbox"/> AHBHC				
<input type="checkbox"/> Other (Please Specify):				

Reason for left blank: A requires further assessment, B client declined to answer, C unable to assess

### Section C: Parenting

	Yes/No	Reason for left blank
23) Client cannot identify support person to assist with parenting of the baby/child?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
24) Client cannot identify support person to assist with care of the baby/child?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
25) Client or family in need of newcomer support?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
26) Client has concerns about money to pay for housing/rent and family's food, clothing, utilities and other basic necessities?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
27) Client or parenting partner has a history of depression, anxiety, or other mental illness?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
28) Client or parenting partner has a disability that may impact parenting?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
29) Client expresses concern about their ability to parent baby/child?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
30) Client expresses concern about their ability to care for baby/child?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
31) Client's relationship with parenting partner is strained? (evidence of relationship stress observed)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
32) Client or parenting partner has been involved with Child Protection Services as a parent?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
*33) Client expresses that baby/child is difficult to manage?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
*34) Client's response patterns are inconsistent or inappropriate to the baby's/child's cues? (evidence of inappropriate responses observed)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

### Section D: Infant/Child Development

*35) Parent(s) identified a risk factor? e.g., hearing, speech and language, communication skills, social development, emotional development behaviour, motor skills, vision, cognitive development, self help skills	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Please List:
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### Section E: Health Care Professional Observations

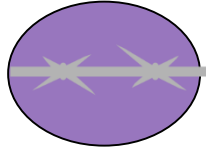
36) Health care professional has concerns about the wellbeing of client and/or baby/child?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Additional Comments:		
Client consent to share personal information and personal health information, and client consent to participate in the HBHC program have been obtained: <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/>		
Signature(s) of health care professional(s) completing Screen with client: _____ Date: _____		
Please print name: _____		
Professional Title: <input type="checkbox"/> RN <input type="checkbox"/> NP <input type="checkbox"/> Midwife <input type="checkbox"/> MD <input type="checkbox"/> Other (Specify) _____		

HBHC Screen: Version 9.0



# **ADVERSE CHILDHOOD EXPERIENCES**

# Adverse Childhood Experiences (ACEs)



## Neglect

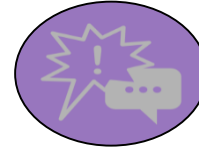
Physical  
Emotional

## Risk Factors



## Household Challenges

Mother treated violently  
Household substance abuse  
Mental illness in household  
Parental separation or divorce  
Incarcerated household member



## Abuse

Physical  
Emotional  
Sexual

- The ACE Study findings, which have been replicated several times, suggest that certain experiences are major risk factors for the leading causes of illness and death as well as poor quality of life in the United States.

# Impact of ACE on Society

(View of the Centre for Disease Control – USA)

## LIFE EXPECTANCY

People with six or more ACEs died nearly **20 years earlier on average** than those without ACEs.



## ECONOMIC TOLL

The Centers for Disease Control and Prevention (CDC) estimates that the lifetime costs associated with child maltreatment at **\$124 billion**.



# Resiliency and Protective Factors

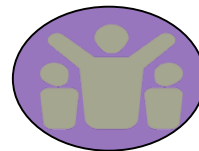
- Wave II of the ACE work has also identified protective factors that support the development of resiliency:



**Positive parenting &  
childhood experiences**



**Protective adult  
relationships**



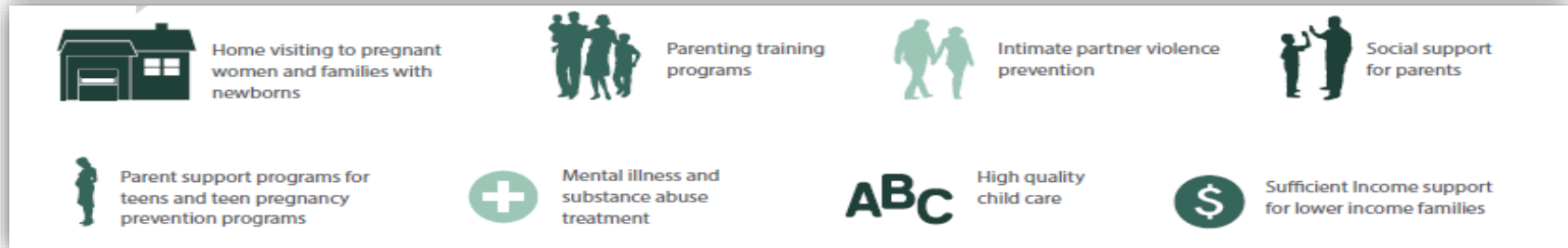
**Always available  
adult**

- These findings align with research from the Harvard Centre for the Developing Child which also concludes that a committed relationship with a supportive parent, caregiver or other adult is the single most common factor for children who develop resilience.

# Investments that can prevent ACEs

(from CDC)

- The CDC identifies 4 Essentials for Childhood:
  1. Raise awareness and commitment to promote safe, stable and nurturing relationships and prevent child maltreatment.
  2. Use Data to Inform Actions
  3. Create a context for healthy children and families through programs
  4. Create a context for healthy children and families through policies



- ACEs can be prevented by supporting safe, stable and nurturing relationships and environments.

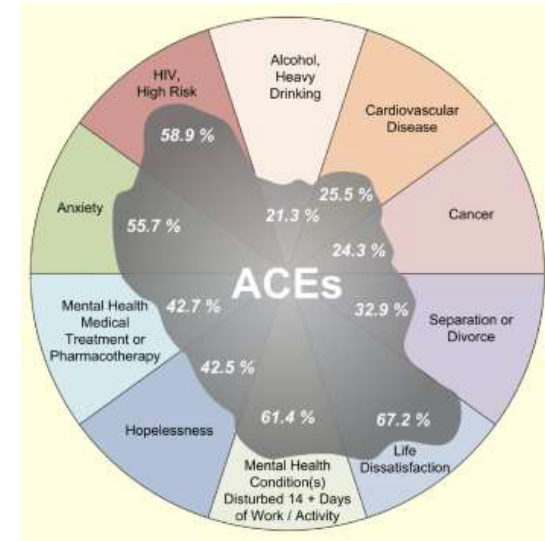
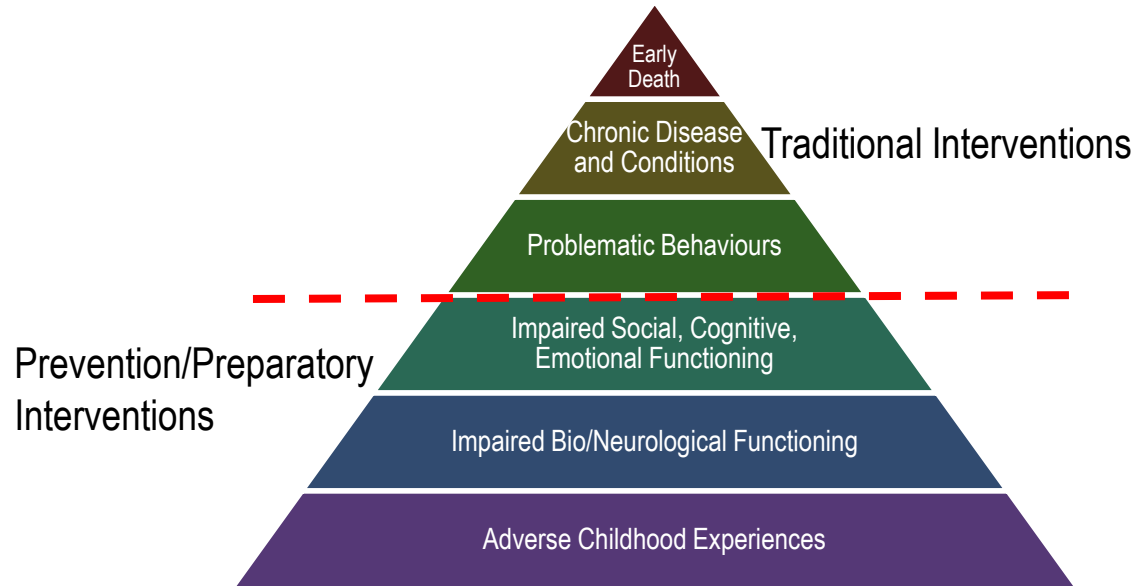
# Potential Impact of Utilizing an ACE Approach

- The cost of the ACE's **can be mitigated** by early identification and intervention
- **\$1 spent** on early interventions = **\$2-\$4 cost-benefit** (approximation)\*
- Highest savings come from programs that involve the greatest **follow-up** and are resource-intensive.



\* based on the RAND study, 2017 Outcome and Economic Analysis of Early Childhood Programs/Early Interventions examining the effectiveness of 115 programs and 19 formal economic evaluations.

# Maternal and Child Health as a Strategic Prevention Point





# Why Choose an ACE Lens for HBHC?

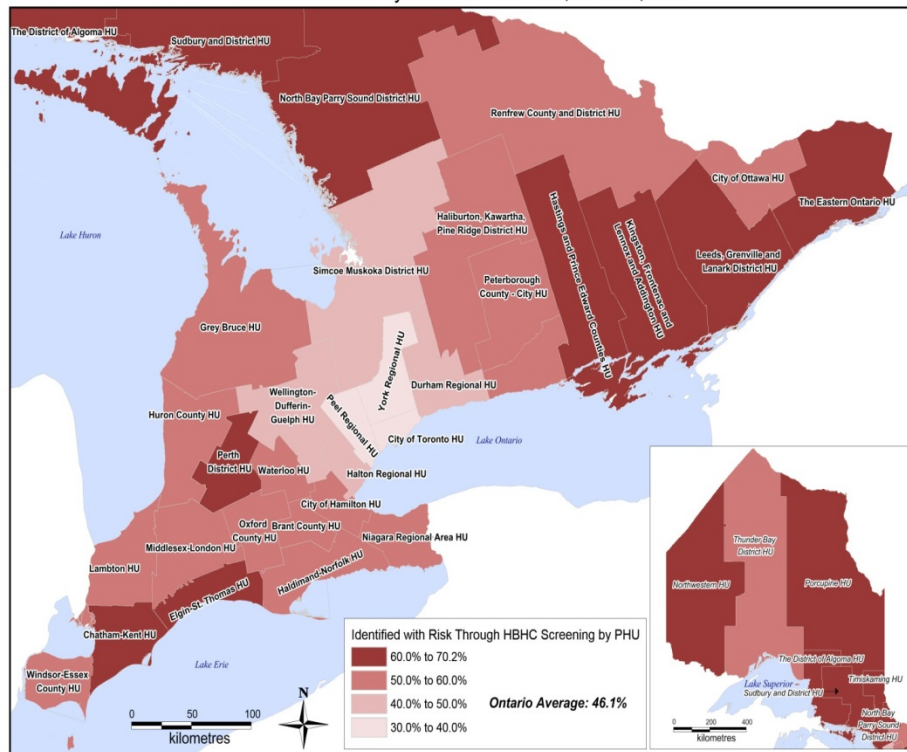
- Individual risk factor prevalence does not provide sufficient population level program planning information.
- Identifying ACE-like factors allows us to mobilize all the ACE science to:
  - Identify effective early interventions
  - Focus on proven investments
  - Consider strategic prevention-based opportunities



# **RESULTS OF THE HBHC ACE ANALYSIS**

# HBHC Screen Outcomes – % of Families With Risk (2+ risk factors identified)

HBHC Outcome by Public Health Unit, Ontario, 2014



Source: Integrated Services for Children Information System (ISCIS)  
Produced by: Labour Market and Data Analytics Unit, Strategic Information and Business Intelligence Branch, MCYS, April 2015.

## Analysis:

- Patterns emerge when comparing health units with higher prevalence of risk to those with lower prevalence when examined using socio-economic characteristics.
- Characteristics like employment rate, population density, and access to services (e.g., limited access for reserve communities) contributes to the level of risk.
- This aligns with what we know in public health related to the Social Determinants of Health.

## Interpretation:

- Examination of HBHC Screen outcomes from the perspective of clusters of risk factors occurring together provides greater insight into potential prevention and early intervention strategies.

# HBHC and Adverse Childhood Experiences

## The ACE Studies

- Assess associations between *childhood maltreatment* and later-life health and well-being.
- Findings suggest *10 identifiable experiences* are major risk factors for the leading causes of illness and death as well as poor quality of life (i.e. negative outcomes include chronic disease, high risk behaviours, and mental illness).

## HBHC Postpartum Screen

- Targets all live births in Ontario for *early detection of vulnerable families at risk for compromised child development and parenting*, to help children in these families achieve their full potential.
- Asks *36 questions, many of which are related to risk factors for child maltreatment* (i.e. the mother's physical and mental health, maternal substance use, parenting support systems, and financial status of the family).

Adverse Childhood Experience	"Best Fit" HBHC Screen Risk Factor
Current or Historical Abuse (Physical, Sexual, Emotional)	Involvement with CPS (Q32)
Current or Historical Neglect	Involvement with CPS (Q32)
Mother Treated Violently	Relationship with partner strained (Q31)
Household Substance Abuse	Smoking, drinking, drug use during pregnancy (Q8, 10, 11)
Household Mental Illness	History of mental illness (Q27)
Parental Separation/Divorce	No support person for parenting (Q23)
Incarcerated Household Member	No related HBHC question

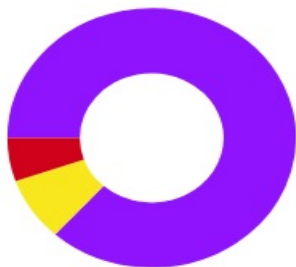
# HBHC Screen ACE Analysis - Methodology

- Utilized HBHC screening and assessment data for screens conducted between **May 2013 and April 2015** (2 years of data)
- Applying inclusion criteria that align with program components for HBHC **n=127,249**
- Minimized risk for selection bias by using a **larger sample size**
- Data Analysis
  - Used several statistical methods to compare HBHC Screen risk factors and assessment outcomes:
    - Cronbach's alpha,
    - factor analysis for the 7 identified factors as well as the 36 factors, and
    - cluster analysis.
  - **Confirmed that our mapping, based on face validity, is accurate** because the 7 ACE-like HBHC risk factors are related to each other, and they are predictive of the confirmation of risk.

# Prevalence and Patterns

## Prevalence of 1 or more ACE-like risk factors

n = 42, 919



■ 1-2 ACE (86.65%) ■ 3 ACE (7.97%) ■ 4+ ACE (5.38%)

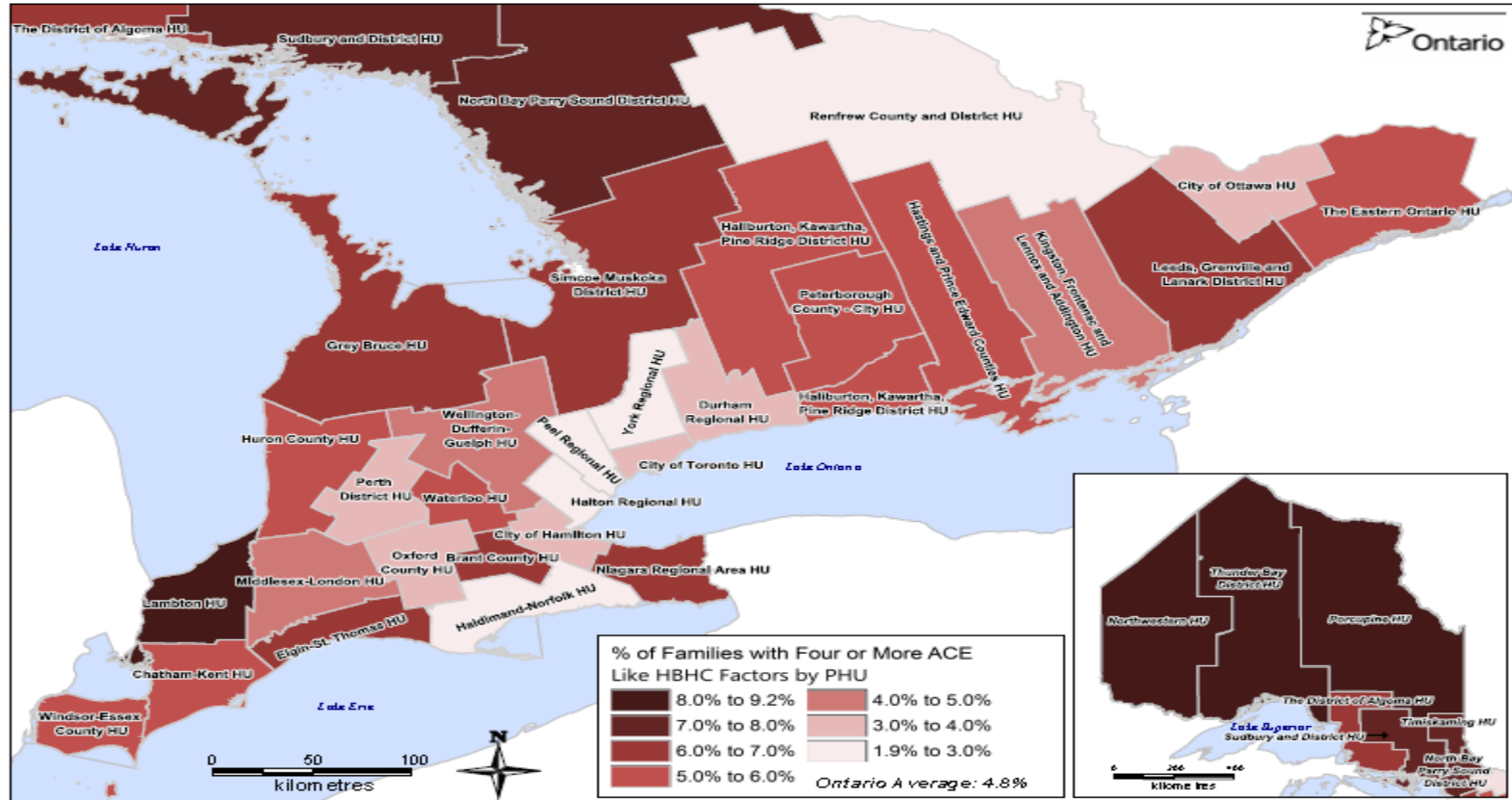
## Characteristics of families with 4+ACE-like Factors (n = 2,070)

- 89.9% Smoked During Pregnancy
- 85.7% History of Depression, Anxiety, Mental Illness
- 83.7% Involved with Child Protection Services
- 76.4% Drug Use During Pregnancy
- 46.2% Relationship with Partner Strained
- 36.6% Alcohol Use in Pregnancy
- 17.8% No Support Person for Parenting

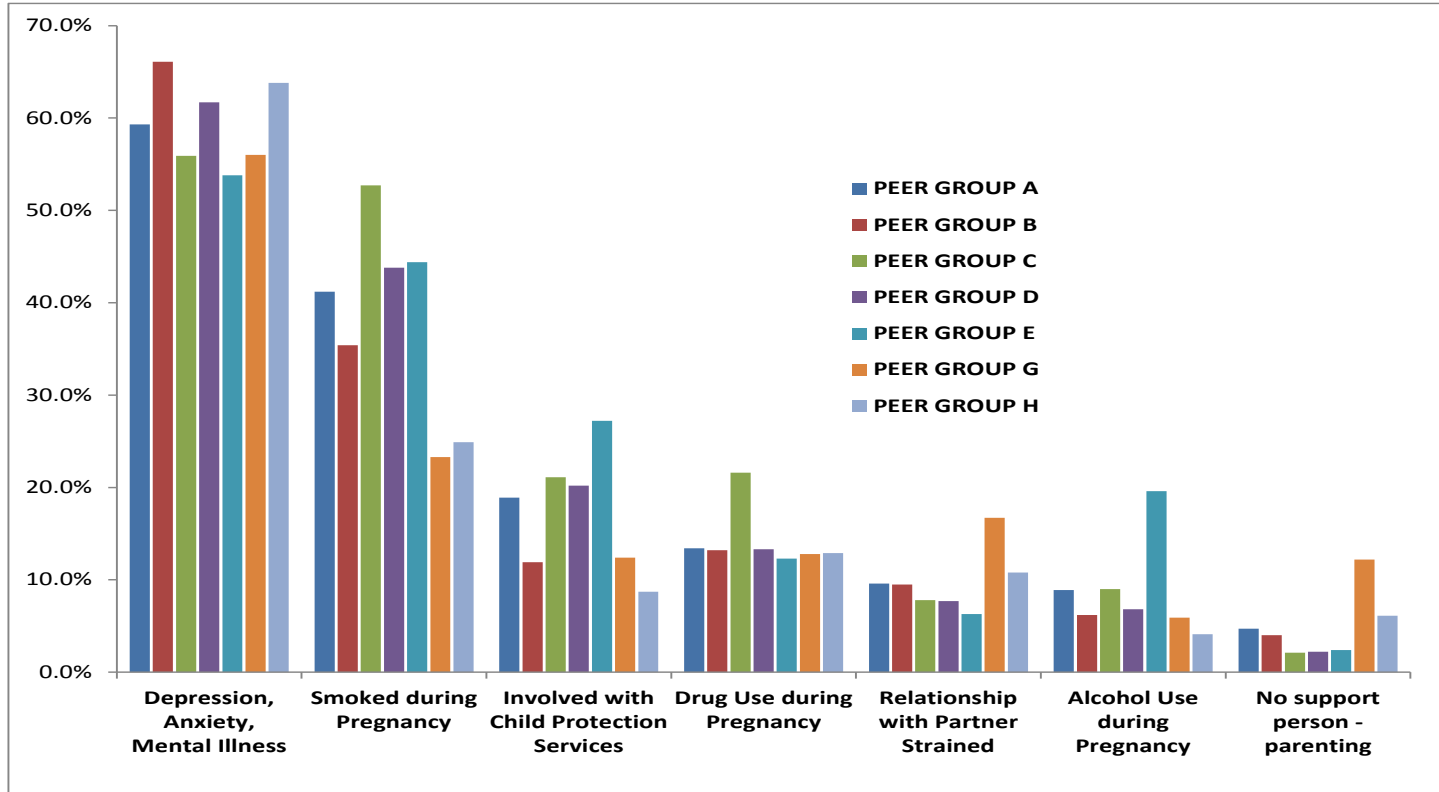


# Geographic Pattern to ACE Distribution

## Prevalence of 4+ ACE-like factors by Public Health Unit



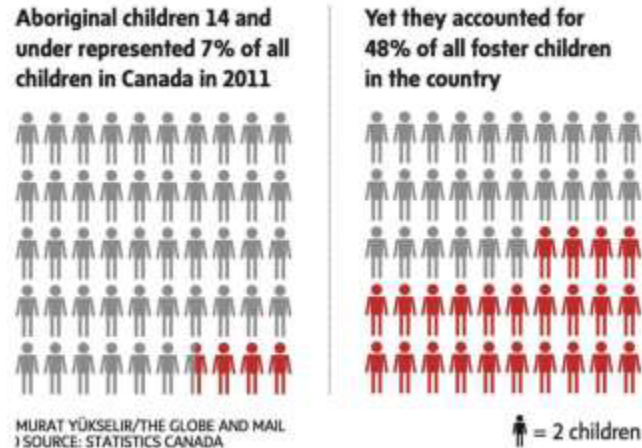
# Prevalence of ACE Factors (by Peer Group)





# Cautions in Interpretation

- Over representation of racialized populations in child welfare – may over identify with ACEs because of systemic issues



- Impact of social isolation

# Protective Factors Analysis

## Protective Factors Analysis

The following protective factors were identified through analysis of HBHC assessment findings:



Physical Health of Child



Behaviour Temperament of Child



Child's Positive Response to Caregiver



Parents acceptance of child



Stable living and housing conditions



Food security

# Implications and Opportunities

To HBHC:

- Improved screening to help ensure accurate early identification
- Identification of target populations that may benefit from early and intensive home visiting based interventions aligned to efficiency and effectiveness
- Potential for considering ACE in future resource allocations

To Early Identification and Early Intervention:

- Considering other data holdings, is further ACE analysis possible?
- Data linkages between similar data sets to support outcome and/or predictive analysis



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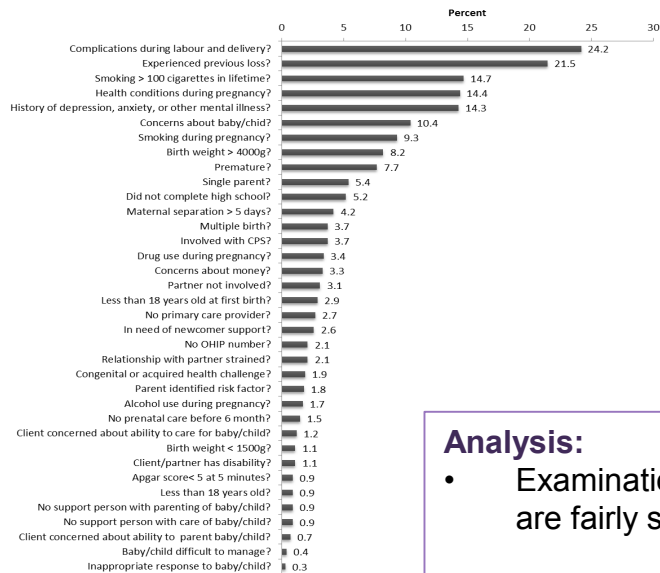
**[sara.cave@ontario.ca](mailto:sara.cave@ontario.ca)**

HBHC ACE Analysis

# APPENDICES

# HBHC Client Profile

- Client Profiles were developed for several MCYS programs as part of 2015 Data Month.
- A Client Profile for the HBHC Program was created using data from the cluster-supported Integrated Services for Children Information System (ISCIS).



## Top 5 reported risk factors, provincially:

1. Complications during labour and delivery (24.2%)
2. Experienced previous loss of pregnancy/baby (21.5%)
3. Smoking more than 100 cigarettes in lifetime (14.7%)
4. Health conditions during pregnancy that impact baby (14.4%)
5. History of depression, anxiety, or other mental illness (14.3%)

## Analysis:

- Examination of the risk factors by health unit revealed that the top five are fairly steady.

## Interpretation:

- Individual risk factor prevalence does not provide sufficient ministry level program planning information.

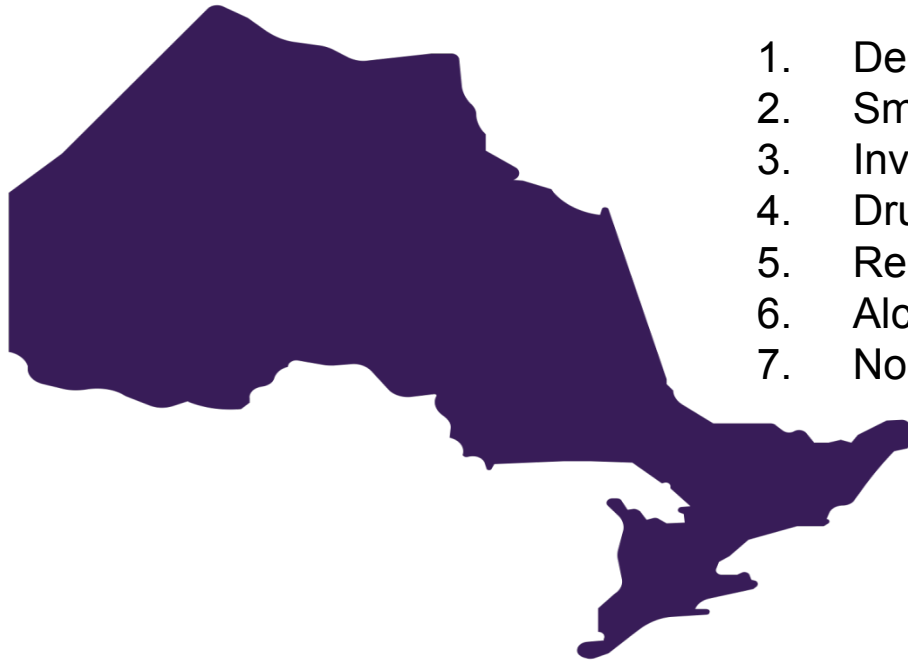
# ACE-Like Factor Prevalence

**Prevalance of ACE-Like Factors**  
**n=42,919**



- 87% of the newborns screened have a few ACE exposures which is not linked to long term outcomes.
- Approximately 13% of families have multiple ACE-like factors. The occurrence of multiple ACE exposures has been linked to poor long term outcomes.

# Prevalence of ACE Factors (provincial)

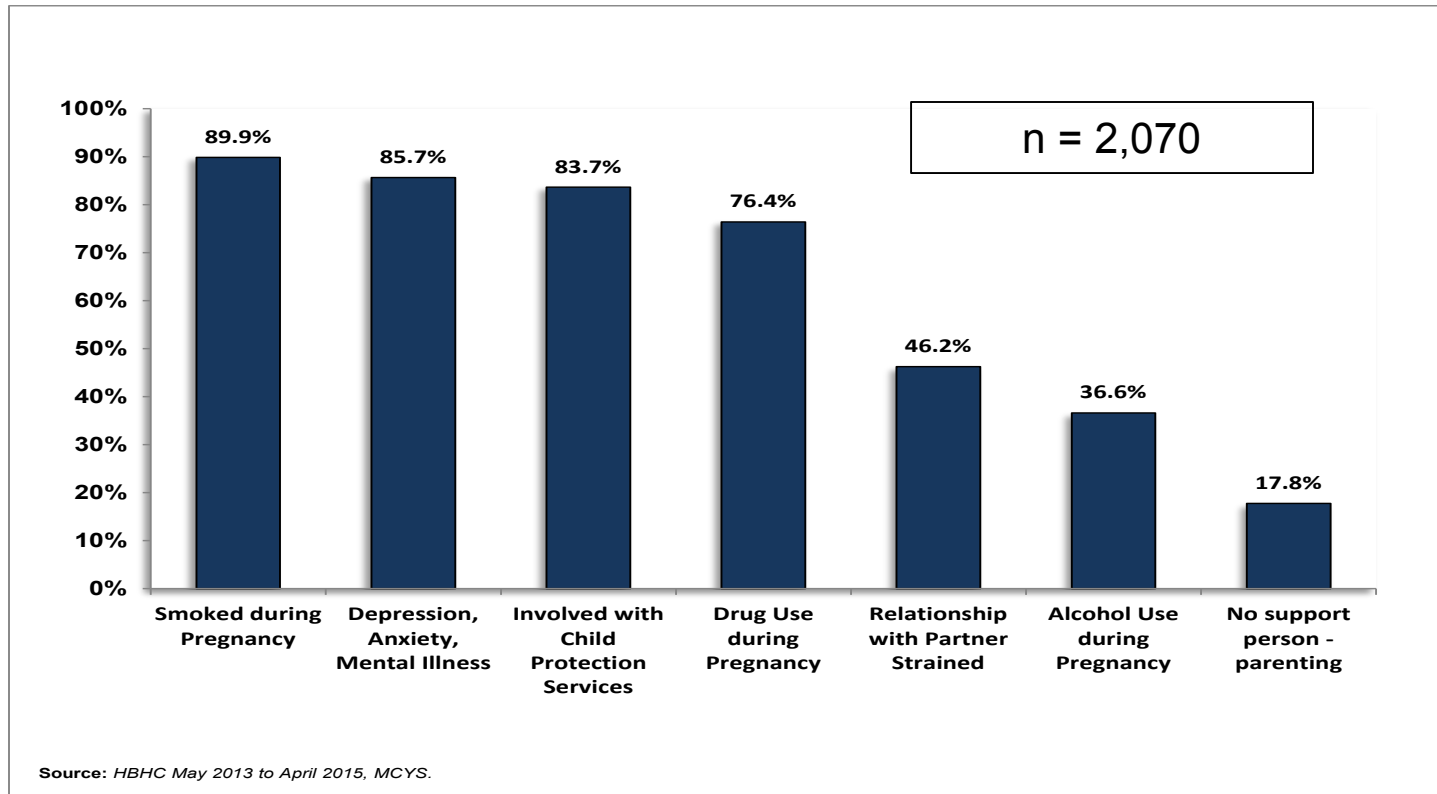


1. Depression, Anxiety, Mental Illness
2. Smoked During Pregnancy
3. Involved with Child Protection Services
4. Drug Use During Pregnancy
5. Relationship with Partner Strained
6. Alcohol Use During Pregnancy
7. No Support Person - Parenting



# A “Cross Government” Approach?

## Characteristics of families with 4+ ACE Factors

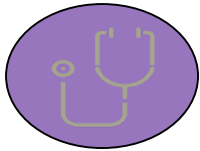


# Trend Analysis

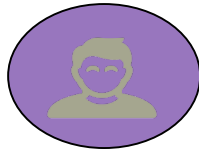
# of ACE factors	Percent in 2013-2015 (n=127,249)	Percent in 2015-2017 (n=162,969)
0	66.3%	62.5%
1	22.5%	23.4%
2	6.9%	7.8%
3	2.7%	3.8%
4	1.2%	1.8%
5	0.4%	0.6%
6	0.1%	0.1%
7	0.02%	0.0003%

# Protective Factors Analysis

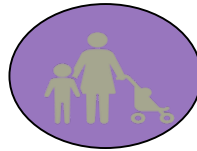
The following protective factors were identified through analysis of HBHC assessment findings:



**Physical  
Health**



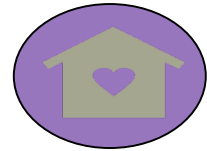
**Behaviour/  
Temperament**



**Response to  
Caregiver**



**Parent's  
Acceptance**



**Stable Living &  
Housing**

## Public Health Unit Peer Groups

Peer Group	Health Units	Principal Characteristics
A	-Brant County -City of Hamilton -Middlesex-London -Niagara Regional Area -Windsor-Essex County	<ul style="list-style-type: none"> <li>Population centres with high population density and rural mix from coast to coast</li> <li>High percentage of visible minority population</li> <li>Low percentage of Aboriginal population</li> <li>Average employment rate</li> </ul>
B	-Durham Region -Halton Region -City of Ottawa -Simcoe Muskoka District -Waterloo -Wellington-Dufferin-Guelph	<ul style="list-style-type: none"> <li>Mainly population centres with moderate population density</li> <li>Average percentage of visible minority population</li> <li>High employment rate</li> </ul>
C	-Elgin-St. Thomas -Hastings and Prince Edward Counties -Kingston, Frontenac, Lennox and Addington -County of Lambton -North Bay Parry Sound District -Northwestern -Peterborough County-City -Porcupine -Sudbury and District -Thunder Bay District -Timiskaming	<ul style="list-style-type: none"> <li>Population centres rural mix from coast to coast</li> <li>Average percentage of visible minority population</li> <li>High percentage of Aboriginal population</li> </ul>
D	-Grey Bruce -Haldimand-Norfolk -Haliburton, Kawartha, Pine Ridge District -Huron County -Leeds, Grenville and Lanark District -Oxford County -Perth District -Renfrew County and District -Eastern Ontario	<ul style="list-style-type: none"> <li>Mainly rural regions in Ontario and the Prairies</li> <li>Low percentage of visible minority population</li> <li>Average percentage of Aboriginal population</li> </ul>
E	-District of Algoma -Chatham-Kent	<ul style="list-style-type: none"> <li>Mainly rural Eastern regions</li> <li>Low percentage of visible minority population</li> <li>Low employment rate</li> </ul>
G	-City of Toronto	<ul style="list-style-type: none"> <li>Largest population centres with an average population density of 4211 people per square kilometre</li> <li>High percentage of visible minority population</li> <li>Very low Aboriginal population</li> </ul>
H	-Peel Region -York Region	<ul style="list-style-type: none"> <li>Mainly population centres with high population density</li> <li>Very high percentage of visible minority population</li> <li>Low Aboriginal population</li> </ul>