Toxic stress and PTSD in children
TOXIC STRESS AND PTSD IN CHILDREN

1 Adversity in childhood is linked to mental and physical health throughout life
   Charles A Nelson, Zulfiqar A Bhutta, Nadine Burke Harris, Andrea Danese, Muthanna Samara

24 Psychopathology in children exposed to trauma: detection and intervention needed to reduce downstream burden
   Andrea Danese, Katie A McLaughlin, Muthanna Samara, Carla S Stover

28 Covid-19 could prompt an end to our continued betrayal of childhood
   Al Aynsley-Green
Adversity in childhood is linked to mental and physical health throughout life

The prevalence of “toxic stress” and huge downstream consequences in disease, suffering, and financial costs make prevention and early intervention crucial, say Charles A Nelson and colleagues

Today’s children face enormous challenges, some unforeseen in previous generations, and the biological and psychological toll is yet to be fully quantified. Climate change, terrorism, and war are associated with displacement and trauma. Economic disparities cleave a chasm between the haves and have nots, and, in the US at least, gun violence has reached epidemic proportions. Children may grow up with a parent with untreated mental illness. Not least, a family member could contract covid-19 or experience financial hardship—without adequate adult support. Toxic stress is the maladaptive and chronically dysregulated stress response that occurs in relation to prolonged or severe early life adversity. For children, the result is disruption of the development of brain architecture and other organ systems and an increase in lifelong risk for physical and mental disorders.

What is childhood adversity?
A large number of adverse experiences (ie, toxic stressors) in childhood can trigger a toxic stress response. These range from the commonplace (eg, parental divorce) to the horrific (eg, the 6 year old “soldier” ordered to shoot and kill his mother).

Adversity can affect development in myriad ways, at different points in time, although early exposures that persist over time likely lead to more lasting impacts. Moreover, adversity can become biologically embedded, increasing the likelihood of long term change. Contextual factors are important.

Type of adversity—Not all adversities exert the same impact or trigger the same response; for example, being physically or sexually abused may have more serious consequences for child development than does parental divorce.

Duration of adversity—How long the adversity lasts can have an impact on development. However, it is often difficult to disentangle duration of adversity from the type of adversity (eg, children are often born into poverty, whereas maltreatment might begin later in a child’s life).

Developmental status and critical period timing—The child’s developmental status at the time he or she is exposed to adversity will influence the child’s response, as will the timing of when these adversities occur.

KEY RECOMMENDATIONS
- Researchers should consider both objective and subjective measures of childhood adversity
- Researchers should broaden assessment of interventions beyond mental health measures to more regularly include health outcomes such as asthma, infection, inflammation, and insulin resistance
- Adversity and trauma should be considered in context, and investigators in different cultures may need to develop different assessments
- Researchers should consider how much better (eg, as predictors) objective biomarker panels are than behavior, how early in life they can be used, and whether they are scalable
- Researchers should move towards longitudinal studies and ideally studies that involve interventions
- Researchers should pay more attention to individual differences
- Governments should implement evidence-informed policies for optimizing health, nutrition, and early child development
- Health and education systems should link and optimize preventive child health and education initiatives early in life at the appropriate level
- Use community, school, and after-school based interventions
- Consider public health strategies for primary, secondary, and tertiary prevention of childhood maltreatment and adversity
Adolescence
Adulthood

**Number of adversities and the interaction among them**—The Adverse Childhood Experiences (ACE) study and subsequent body of ACE research provide compelling evidence that the risk of adverse health consequences increases as a function of the number of categories of adversities adults were exposed to in childhood. Although this seems intuitive, it belies the fact that, when it comes to severe adversity (eg, maltreatment), few children are exposed to only a single form of adversity at a single point in time. In addition, the effects of exposure to multiple adversities is likely more than additive. Thus, multiple forms of adversity may act in complex and synergistic ways over time to affect development.

**Exacerbating factors**—Children with recurrent morbidities, concurrent malnutrition, key micronutrient deficiencies, or exposure to environmental toxicants may be more sensitive to the adverse effects of other forms of toxic exposures.

**Supportive family environments**—Children develop in an environment of relationships, and supportive relationships can buffer the response to toxic stress. Safe, stable, and nurturing relationships and environments are associated with reduced neuroendocrine, immunologic, metabolic, and genetic regulatory markers of toxic stress, as well as improved clinical outcomes of physical and mental health.

**Pre-existing characteristics**—Many of the adversities being considered are not distributed at random in the population. They may occur more commonly in children and families with pre-existing vulnerabilities linked to genetic or fetal influences that lead to cognitive deficits.

Infants who are more vulnerable to adverse life events (eg, stigma) include those born very early (eg, at 25 weeks’ gestation) or very small (eg, <1500 g), those born with greater genetic liability to adverse health consequences, as inferred from electroencephalogram testing, and profound psychosocial deprivation has been associated with differences in overall brain volume and reduced brain electrical activity.

**Differences in brain development**—What mediates the effects of adversity? The link between exposure to adversity early in life and physical and psychological development are thought to be mediated through several direct and indirect pathways. We first talk about the effects on

---

Fig 1 | The interplay of adversities, context, and human development

---

(duration of adversity, number of adversities and interaction between them, type of adversity, developmental status and critical period timing)
physical development, then turn our attention to psychological development.

Effects mediated directly may include altering the regulation of stress-signalling pathways and immune system function\(^4\); changing brain structure and function\(^1\); and changing the expression of DNA and by accelerating cellular ageing.\(^5,6\) For example, abuse or neglect might directly lead to physical injury or undernutrition or malnutrition. Similarly, stress can directly lead to dysregulation of the hypothalamic-pituitary-adrenal axis and associated neuro-endocrine-immune\(^7\) as well as epigenetic effects.\(^8\)

Effects mediated indirectly might include changing the quality of the care giving environment (eg, less responsive care\(^3\)) or the surrounding distal environment (eg, neighbourhood violence, which in turn will affect child development across several levels\(^9\)); or building dysfunctional cognitions about the self and the world.\(^1\) The effects of food insecurity (leading to undernutrition or malnutrition) and unsafe or substandard housing (resulting in exposure to asthmagens or environmental toxicants such as lead) can lead to social disparities in health.\(^10\) Distal effects of adversity include the early adoption of health damaging behaviors (eg, smoking, poor food choices) that later in life lead to diabetes, heart disease, and metabolic syndrome.\(^11\)

---

**Table 1** | **Health conditions in children associated with adverse childhood experiences (ACE)**

<table>
<thead>
<tr>
<th>Symptom or health condition</th>
<th>For (\geq x) ACEs (compared with 0)</th>
<th>Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>4</td>
<td>1.7-2.8</td>
</tr>
<tr>
<td>Allergies</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Dermatitis and eczema</td>
<td>3*</td>
<td>2.0</td>
</tr>
<tr>
<td>Urticaria</td>
<td>3*</td>
<td>2.2</td>
</tr>
<tr>
<td>Increased incidence of chronic disease, impaired management</td>
<td>3</td>
<td>2.3</td>
</tr>
<tr>
<td>Any unexplained somatic symptoms (eg, nausea/vomiting, dizziness, constipation, headaches)</td>
<td>3</td>
<td>9.3</td>
</tr>
<tr>
<td>Headaches</td>
<td>4</td>
<td>3.0</td>
</tr>
<tr>
<td>Enuresis, encopresis</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overweight, obesity</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Failure to thrive, poor growth, psychosocial dwarfism</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Poor dental health</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>Increased infections (viral, upper and lower respiratory tract infections and pneumonia, acute otitis media, urinary tract infections, conjunctivitis, intestinal)</td>
<td>3*</td>
<td>1.4-2.4</td>
</tr>
<tr>
<td>Later menarche (≥ 14 years)</td>
<td>2*</td>
<td>2.3</td>
</tr>
<tr>
<td>Sleep disturbances</td>
<td>51</td>
<td>PR 3.1</td>
</tr>
<tr>
<td>Developmental delay</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Learning and/or behaviour problems</td>
<td>4</td>
<td>32.6</td>
</tr>
<tr>
<td>Repeating a year at school</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>Not completing homework</td>
<td>4</td>
<td>4.0</td>
</tr>
<tr>
<td>High school absenteeism</td>
<td>4</td>
<td>7.2</td>
</tr>
<tr>
<td>Graduating from high school</td>
<td>4</td>
<td>0.4</td>
</tr>
<tr>
<td>Aggression, physical fighting</td>
<td>For each additional ACE</td>
<td>1.9</td>
</tr>
<tr>
<td>Depression</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Attention deficit/hyperactivity disorder (ADHD)</td>
<td>4</td>
<td>5.0</td>
</tr>
<tr>
<td>Any of: ADHD, depression, anxiety, conduct/behaviour disorder</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>Suicidal ideation</td>
<td>For each additional ACE</td>
<td>1.9</td>
</tr>
<tr>
<td>Suicide attempts</td>
<td>For each additional ACE</td>
<td>1.9-2.1</td>
</tr>
<tr>
<td>Self-harm</td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>First use of alcohol at ≤ 14 years</td>
<td>5</td>
<td>6.2</td>
</tr>
<tr>
<td>First use of illicit drugs at ≤ 14 years</td>
<td>5</td>
<td>9.1</td>
</tr>
<tr>
<td>Early sexual debut (15-17 years)</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Teenage pregnancy</td>
<td>4</td>
<td>4.2</td>
</tr>
</tbody>
</table>

*Odds ratio represents at least one ACE, but also includes other adversities
†Prevalence ratio represents at least one ACE, but also includes other adversities
Toxic stress and PTSD in children

On the psychological side, early adversity can lead to the development of psychopathology early in life (eg, disruptive behavior) that later in life manifests in more severe forms (eg, antisocial personality). Furthermore, it can lead to the development of dysfunctional cognition about self and others. The interplay of these different mediation mechanisms remains largely unclear.

Modelling the effects of adversity must take into consideration the type of adversity, the duration and timing of the adversity, the synergistic effects of multiple forms of adversity with the child’s genetic endowment (fig 2), and the social supports and interventions on which the child can depend (such as caregivers to whom the child is attached).

What can we do now?

If we wish for today’s youth to inherit a world that is safe and conducive to healthy development, we must do all we can to create such a world, by preventing disorders from developing and intervening once they are apparent.

Even for children living in adverse circumstances, much can be done now to make a difference by preventing such disorders from developing and intervening once they have surfaced. For example, we can screen children experiencing adverse life events, and once screened refer such children to early intervention services, as California is doing (see elsewhere in this collection).

Intervention strategies have been developed to help children manage their toxic stress response and to help families cope with adversity. Many children are resilient, and physician-community partnerships can help foster resilience.

Recommendations for research

Much of the evidence has depended on the use of self- or parent-report measures, which are relatively easy to score, can be scaled at population level, and can be used (with modification) across cultures. However, such measures are inherently subjective and prone to biases (eg, recall bias). Other measures, such as official court or child protection records, provide a more objective assessment but often underestimate the prevalence of adversity.

Objective and subjective measures of childhood adversity identify largely non-overlapping groups of individuals and, thus, may be associated with health outcomes through different pathways. Subjective experience is particularly important for psychopathology, over and above objective experience.

A challenge in examining the effects of adversity on development is how to compare children growing up in different cultures. For example, one study reported that a questionnaire on bullying used in different cultures and countries did not generalize well (eg, how one culture interpreted bullying differed from another).

Adversity and trauma should be considered in context, and investigators in different cultures may need to develop different assessments.

To move away from subjective evaluations of toxic stress (eg, self- or other-report), and to gain insight into the neural and biological mechanisms that mediate the toxic stress response, several investigators have started to develop more objective biomarker panels for screening for toxic stress that use markers of neurological, immunological, metabolic, and genetic regulatory derangements.

As this work continues, issues to consider include how much better (eg, as predictors) such measures are than behavior, how early in life they can be used, and whether they are scalable.

The study of toxic stress and the toxic stress response needs to move away from correlational and cross-sectional studies and deploy designs that are amenable to drawing causal inference. This would include longitudinal studies and ideally studies that involve interventions. An advantage of the latter includes the ability to shed light on mechanism.

More attention also needs to be paid to individual differences. Different people respond differently to the same stressors. For example, only a minority of children who experience trauma or maltreatment go on to develop enduring psychiatric disorders; and some children develop physical health disorders such as asthma whereas others will not. In addition, individual differences exist in biological

Table 2 | ACE-associated health conditions in adults associated with adverse childhood experiences (ACE)

<table>
<thead>
<tr>
<th>Symptom or health condition</th>
<th>Odds ratio (excluding outliers)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease (coronary artery disease, myocardial infarction, ischemic heart disease)</td>
<td>2.1</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>≥1 ACE: 1.4</td>
</tr>
<tr>
<td>Stroke</td>
<td>2.0</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease (emphysema, bronchitis)</td>
<td>3.1</td>
</tr>
<tr>
<td>Asthma</td>
<td>2.2</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.4</td>
</tr>
<tr>
<td>Obesity</td>
<td>2.1</td>
</tr>
<tr>
<td>Hepatitis or jaundice</td>
<td>2.4</td>
</tr>
<tr>
<td>Cancer, any</td>
<td>3.7</td>
</tr>
<tr>
<td>Arthritis, self-reported</td>
<td>3 ACEs, hazard ratio=1.5</td>
</tr>
<tr>
<td>Memory impairment (all causes, including dementias)</td>
<td>4.9</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>1.7</td>
</tr>
<tr>
<td>Headaches</td>
<td>≥5 ACEs: 2.1</td>
</tr>
<tr>
<td>Chronic pain, any (using trauma z-score)</td>
<td>1.2</td>
</tr>
<tr>
<td>Chronic back pain (using trauma z-score)</td>
<td>3.3</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>≥1 ACE: 1.8</td>
</tr>
<tr>
<td>Unexplained somatic symptoms, including somatic pain, headaches</td>
<td>2.0-2.7</td>
</tr>
<tr>
<td>Skeletal fracture</td>
<td>1.6-2.6</td>
</tr>
<tr>
<td>Physical disability requiring assistive equipment</td>
<td>1.8</td>
</tr>
<tr>
<td>Depression</td>
<td>4.7</td>
</tr>
<tr>
<td>Suicide attempts</td>
<td>37.5</td>
</tr>
<tr>
<td>Suicidal ideation</td>
<td>10.5</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>3.6</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.7</td>
</tr>
<tr>
<td>Panic and anxiety</td>
<td>–</td>
</tr>
<tr>
<td>Post-traumatic stress disorder</td>
<td>4.5</td>
</tr>
<tr>
<td>Illicit drug use (any)</td>
<td>5.2</td>
</tr>
<tr>
<td>Injected drug, crack cocaine, or heroin use</td>
<td>10.2</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>6.9</td>
</tr>
<tr>
<td>Cigarette or e-cigarette use</td>
<td>6.1</td>
</tr>
<tr>
<td>Cannabis use</td>
<td>11.0</td>
</tr>
<tr>
<td>Teen pregnancy</td>
<td>4.2</td>
</tr>
<tr>
<td>Sexually transmitted infections, lifetime</td>
<td>5.9</td>
</tr>
<tr>
<td>Violence, victimization (intimate partner violence, sexual assault)</td>
<td>7.5</td>
</tr>
<tr>
<td>Violence perpetration</td>
<td>8.1</td>
</tr>
</tbody>
</table>

*Odds ratios compare outcomes in individuals with >4 ACEs with those with 0 ACEs, except where specified. doi: 10.1136/bmj.m3048 | BMJ 2020;371:m3048 | the bmj
sensitivity to stressors: for example, children identified as shy or inhibited early in life may be more vulnerable to stressors than children with more robust temperaments and who are less fearful of novelty and are more predisposed to anxiety as adults.

**Recommendations for policy**

Policy is only as good as the underpinning evidence, and these recommendations have sufficient evidence to support them. Careful consideration should be given to implementing evidence-informed policies for optimizing health, nutrition, and early child development, which in turn can be expanded to include older children and adolescents. Although the first three years of life are generally emphasized, older children exhibit remarkable plasticity in molding their personalities and behaviors. Effective interventions exist to treat and possibly prevent psychopathology emerging after childhood trauma, but implementation needs to be scaled up.

Linking and optimizing preventive child health and education initiatives early in life are key to successful intervention and need to be done at the appropriate level in the health and education systems. The development of the nurturing care framework has been a welcome step in this direction, engaging platforms such as community health workers and pre-schools.

Community, school, and after-school based interventions can reduce the effects of traumatic events among children and adolescents living in adversity circumstances.

Public health strategies for primary, secondary, and tertiary prevention of childhood maltreatment and adversity include both universal and targeted interventions, ranging from home visiting programs to parent training programs, routine screening for adversity, and cognitive behavioral therapy.

We thank Lee Anglin and Lily Breen for proofreading the manuscript.

**Competing interests:** We have read and understood BMJ policy on declaration of interests and have no relevant interests to declare.

**Provenance and peer review:** Commissioned; externally peer reviewed.

This article is part of a series commissioned by the BMJ for the World Innovation Summit for Health (WISH) 2020. The BMJ peer reviewed, edited, and made the decisions to publish. The series, including open access fees, is funded by WISH.

Charles A Nelson, Richard David Scott chair in pediatric developmental medicine

---

**TOXIC STRESS AND PTSD IN CHILDREN**

Zulfiquar A Bhutta, co-director, director of research

Nadine Burke Harris, surgeon general

Andrea Danese, professor of child and adolescent psychiatry

Muthanna Samara, professor of psychology

Department of Pediatrics, Boston Children's Hospital and Harvard Medical School, Harvard Graduate School of Education, Boston, MA, USA

Centre for Global Child Health, Hospital for Sick Children, Toronto, Canada

Institute for Global Health and Development, Aga Khan University, South Central Asia, East Africa and UK

State of California, USA

Institute of Psychiatry, Psychology and Neuroscience, King's College London and the National and Specialist CAMHS Clinic for Trauma, Anxiety, and Depression, South London and Maudsley NHS Foundation Trust, London, UK

Department of Psychology, Kingston University, London, UK

Correspondence to: C Nelson charles_nelson@harvard.edu
TOXIC STRESS AND PTSD IN CHILDREN


From bitter experience
Lifelong implications of adverse childhood experiences

Today's youth face challenges unforeseen in previous generations. Adversity in the first years of life may deleteriously affect the course of human development. This graphic presents some of these challenges and introduces the biological and psychological mechanisms by which they can affect health throughout a child's development and journey into adulthood.

Context
Each child's situation is unique, and their particular circumstances can have an important impact on how they are affected by their experiences.

- Type of adversity
- Duration of adversity
- Number of adversities
- Interactions between adversities
- Timing and developmental status
- Child's temperament and reaction to adversity
- Pre-existing characteristics
- Family environment
- Health status and comorbidities

Health problems that have been observed more commonly in people that have experienced adversity in childhood

**Examples of physical impacts**
- Somatic symptoms
  - Headaches
  - Poor dental health
  - Asthma
  - Allergies
  - Increased infections
- Chronic obstructive pulmonary disease
- Somatic symptoms
- Skeletal fracture
- Hepatitis or jaundice
- Cancer
- Cardiovascular disease

**Examples of behavioral impacts**
- Learning and/or behavioral problems
  - Early use of illicit drugs
  - High school absenteeism
  - Early use of alcohol
  - Attention deficit hyperactivity disorder
- Suicide attempts
- Cannabis use
- Suicidal ideation
- Injected drug, crack cocaine, or heroin use
- Violence perpetration
- Violence victimization

Disruption of the development of brain architecture and other organ systems can increase lifelong risk for physical and mental disorders. Such impacts can be observed across multiple systems, affecting cardiovascular, immune, metabolic and brain health, and may extend far beyond childhood, affecting life course health.

The way forward
In their BMJ analysis article, Nelson and co-authors explain their recommendations for policy and research in this area, including:

- Development of new metrics
- Implementation of evidence-informed policies
- More individualized research
- A range of interventions at all stages of childhood

© 2020 BMJ Publishing Group Ltd.

Disclaimer: This infographic is not a validated clinical decision aid. This information is provided without any representations, conditions, or warranties that it is accurate or up to date. BMJ and its licensors assume no responsibility for any aspect of treatment administered with the aid of this information. Any reliance placed on this information is strictly at the user's own risk. For the full disclaimer wording see BMJ's terms and conditions: https://www.bmj.com/company/legal-information/
Children’s prolonged exposure to the toxic stress of war trauma in the Middle East

Conflict leads to toxic stress and health problems in childhood and beyond. Long term investment in evidence informed mitigation strategies is needed to end the devastating cycles of violence, write Muthanna Samara and colleagues

Violent political conflict has had a devastating effect on the physical and mental health of children in the Middle East (box 1). Many have been killed or injured. Many have been displaced, including 2.5 million Syrian child refugees. Conversely, Palestinian children under blockade in the Gaza Strip cannot escape even to relative safety. Yemen’s dire situation has triggered the world’s biggest food security emergency and the largest recorded cholera epidemic. Children in conflict settings may lack access to water and experience bombing, loss of their home, and the injury or death of loved ones. Sexual exploitation and abduction can proliferate when rule of law collapses. The effects of poverty and destroyed healthcare and schools can persist long after violence has ceased.:

The threat of harm intensifies exposure to psychological trauma. Continuous exposure to trauma is associated with mental health problems including post-traumatic stress disorder (PTSD), emotional dysregulation, depression, and suicidal thoughts or behaviors.

Toxic stress, when children experience strong, frequent, or prolonged adversity without adequate adult support, can disrupt development of the brain and other organs and increase psychopathology as well as cognitive and emotional impairment. Effects are likely to persist into adulthood even after violence stops. Prompt identification and evidence based treatment of serious psychopathology can help.

Children must be supported in healing from the effect of toxic stress to break the cycle of violence in which the next generation struggles to rebuild society after the trauma of war. But a focus on the short term effect of war means scant attention has been paid to longer term mental health support. A cohesive effort is needed among policy makers, humanitarian agencies, and health services in the region to increase resilience and prevent escalation in mental and physical health problems, and to advocate for security and health.

**KEY RECOMMENDATIONS**

- Continuous and prolonged war trauma exposure in conflict areas in the Middle East affects children’s development and mental health. Psychosocial interventions need to focus on building children’s resilience and coping strategies and progress to more focused service provision for those who remain symptomatic
- The development of mental health problems can be mediated by multiple stressors, including parenting, parental wellbeing, and economic hardship. These need to be taken into account when designing multimodal interventions
- Instruments and interventions need to take into account the social, cultural, and religious contexts in the Middle East
- Research and practice barriers in the Middle East such as stigma, limited transporta- tion, costs, and mental health services should be taken into consideration
- Middle Eastern countries that are affected by war and recurrent conflicts largely lack skilled mental health resources. Alternative plans could include training of paraprofessionals and frontline professionals on trauma focused, resilience, and coping strategies and interventions
- Use of mobile mental health resources and digital technologies could be maximized
- The Middle East lacks planned, sufficient, and integrated mental health services. Policy makers should integrate mental health services building and development in the health care system plans and policies.

**Toxic stress and mental health**

Children in armed conflict areas in the Middle East experience high rates of mental disorders, including PTSD, depression, anxiety, behavioral problems, and attention deficit hyperactivity disorder, as well as functional impairment. Worldwide, as many as one in five children and adults affected by conflict may experience mental ill health, compared with a mean global prevalence of one in 14.

Children in conflict areas are also at increased risk of suicide ideation, enuresis, nightmares, hypervigilance, grief, separation anxiety disorder, phobia, stuttering, stereotypic movements, refusal to attend school, learning disabilities, conduct disorders, aggression, and feeding disorders in infancy or early childhood.

These conditions impair children’s ability to engage in daily life, to focus and perform in school, to form relationships and attachments, and to feel safe. Multiple exposures to violence cumulatively increases the risks.

Without early intervention, these mental health problems are likely to continue into adulthood and to predict adverse outcomes. Untreated adults who experienced adverse childhood experiences may carry 12 times the risk for alcoholism, drug misuse, depression, and suicide attempts. They are also more likely to have physical health conditions, including heart disease, cancer, chronic lung or liver disease, and skeletal fractures.

Young Kuwaitis adults’ educational and occupational outcomes, for example, were adversely affected by exposure to war trauma a decade before. Boys with greater exposure were less likely to pursue further education and more likely to have post-traumatic stress, poor sleep quality, high body mass index, and poor self-reported health in adulthood.

**Mediating factors in toxic environments**

Children’s risk of poor mental health is mediated by genetic, familial, societal,
and environmental factors, which influence their development in a toxic environment. Effects are subsequently transmitted through biological, psychological, familial, economic, and societal pathways. In war environments, good parenting, relationships with teachers, social networks, and healthcare services are also affected by trauma and toxic stress and may be less protective or even harmful.

Children with traumatized parents may be at increased risk of poor mental health outcomes, particularly without social support. Postwar trauma among Palestinian fathers, and arrest of Kuwaiti fathers during the war, for example, were related to increased mental health problems, avoidance behaviors, and attachment insecurity among their offspring. Children born after conflict stops can also be affected. Intergenerational transmission has been observed in increased rates of mental illness in the children of Holocaust survivors, for example.

Poverty that persists after violence stops affects children directly and indirectly through the parent-child relationship, aggravating toxic stress responses. In addition, parents worrying about daily survival can become less nurturing and more aggressive towards their children.

**Mental health services in the Middle East**

Health services in Middle Eastern countries are provided by governmental, commercial, and non-governmental organizations. Disruption to health services often continues even after violence stops, while demand for healthcare remains high. The Libyan system operates far below the needs of the population, for example, including mental health services. Retention and recruitment of staff in war contexts is especially difficult, for reasons including disruption to education systems (boxes 2 and 3).

Although some national healthcare plans have started to recognize mental healthcare as essential (such as those in Iraq and Palestine), many Middle Eastern countries tend to lack mental health funding, resources, and workforce. Psychosocial service providers face a lack of qualified, specialist staff, financial constraints, political conflict, and poor community awareness, a study of practitioners at refugee camps in the West Bank, Palestine, found.

Additionally, stigma means people are less likely to access help that even when services are offered. Further obstacles may include inadequate transport and complex referral processes. Patients may seek alternatives, such as faith healers, as seen in Iraq.

**Psychosocial interventions and service transformation**

Limited service provision and reluctance to access services must be at the forefront when designing mental health interventions for children in areas affected by conflict. A growing body of research from the Middle East elsewhere shows the complexity of such children’s needs, influenced by the interplay of multiple risk and protective factors. Overwhelming needs and paucity of specialist resources indicate the importance of multimodal interventions that maximize current resources and community strengths.

Evidence also shows the importance of tackling concurrent challenges that mental health services face in Middle Eastern cultures, such as stigma; collective exposure to toxic stress of children, parents, communities, and professionals; limited contextualization and cultural adaptation of interventions; and constraints in infrastructure and staff competencies.

First level response interventions should aim to strengthen children’s coping strategies and resilience, life skills, and symptom management. Several psychoeducation and “trauma informed” (meaning that activities link to children’s trauma exposure without intending for them to re-experience and re-process their experiences) programmes have shown promising results. These can include, body-mind interventions such as mindfulness that deal with physical and psychological presentations of distress (such as meditation, breathing techniques, guided imagery, and self-expression through words, drawings, and movement). Creative interventions emphasize interactive activities such as drama and music to help children build better relationships and improve resilience and wellbeing.

Crucially, such programmes bypass many challenges faced by mental health services in the Middle East because they are low cost and can be delivered by paraprofessionals (or community volunteers), peer educators, teachers, social care or non-governmental organizations, who nevertheless require training, supervision, and links with mental health services.

First level interventions are non-stigmatizing, as these can be provided to groups in schools, community, and religious centres. These contexts also solve access difficulties during conflicts and capitalize on feelings of belonging and comfort associated with their functions (especially religious forums). In Palestine, for example, school based intervention programmes including mind-body skills group programmes and teaching recovery techniques showed success in decreasing various mental health problems among children and adolescents exposed to war trauma (box 4).

The second level of interventions can draw on contextualized frameworks such as trauma focused cognitive behavioral therapy (CBT), narrative exposure, and child centred therapy, and requires skilled mental health professionals lacking in Middle Eastern contexts. These should be offered to children whose symptoms continue after a resilience building...
TOXIC STRESS AND PTSD IN CHILDREN

Box 3: Mental health services in Yemen

Rates of mental health problems are much higher in Yemen than other countries in conflict.23 War, floods, epidemics, poverty, and water shortages have damaged healthcare and education systems,24-26 and they lack practitioners.27 An intervention among general practitioners was found to improve their performance in the emergency management of acute medical problems.28 WHO’s Mental Health Gap Action Programme subsequently trained health and community workers to increase access to mental health services,4 although these services have not been evaluated for use and effectiveness.

Approach. Long term investment in mental health will mean that more children can be targeted for intervention at this level. Ideally parents are involved, otherwise their own unresolved distress can adversely affect their children. Psychoeducation and parent-child dyadic psychotherapy or trauma focused CBT have been applied in war contexts (in Palestine, for example), but these should be adapted to the Middle Eastern culture and combined with social support.72 Coordination of services can offer adult mental health input.

Children, young people, and parents should actively be involved in the co-design and adaptation of interventions to ensure they are engaging and culturally acceptable. Interventions and capacity building should be framed in a stepped care service model (box 5).23,74 Digital interventions and staff training can be delivered in conflict affected areas using smartphones.75-77 These have been shown to be efficient in assessing, screening, evaluating, and intervening among children, adults, and practitioners in Middle Eastern countries, where smartphone use is common.36 Digital tools are relatively low cost and can be easily integrated to both response levels (box 6).

Recommendations for practice in the Middle East

Firstly, in the immediate term, short courses should be provided for primary care professionals so they can detect and treat mental illness and refer to specialist services. Longer term, undergraduate medical curriculums need increased emphasis on mental health and formal training for practising medical practitioners.80

Secondly, mental health professionals should train paraprofessionals, teachers, social workers, and other community workers in first level responses to strengthen children’s coping strategies and resilience and to recognize those who need specialist interventions. Ideally, these professionals would themselves receive mental health support.

Thirdly, mental health professionals should be trained and supervised to implement level two interventions. Capacity building should be tailored to community and specialist levels, and an interdisciplinary context is needed to promote joint working, networks, and efficient use of resources.81 The particular social, cultural, and religious contexts in the Middle East should be taken into account.

Finally, a long term goal should be to upgrade and integrate mental health services across the health sector.

Recommendations for research in the Middle East

Research on child mental health, especially on interventions, has been underprioritized in Middle Eastern countries. Research examining specialist second tier interventions targeting children most at need specific to Middle Eastern contexts is currently lacking.

Policy makers and researchers should prioritize assessing prevalence, needs, and mechanisms to establish the amount of psychosocial support needed and shape planning. Accurate data on mental health resources, use, and expenditure in conflict affected Middle East settings are lacking. War torn populations are usually hard to access and screen for mental health disorders. More data are needed to evaluate national mental health intervention programmes such as those established with WHO’s support.

Traditional paper based data collection is often difficult. Mobile phone based data collection, access to services, and interventions have had positive effects, such as in screening Palestinian children to enable timely intervention for children with psychopathology.82

Mental health literacy campaigns could assuage the concerns about stigma that deter participation in studies.83 Extending assessment to positive psychosocial functioning, coping strategies, and other indicators of resilience could also encourage participation.

Screening should use mixed methods to capture comprehensive psychosocial outcomes. Research tools and interventions may need culturally adaptation to Middle Eastern contexts, including language translation, piloting, culturally appropriate analogies, and focus group discussions with children, parents, teachers, and other stakeholders to co-design programmes and tools that match communities’ needs.6-86 Tools and interventions should be contextualized to marginalized groups, including women and girls, disabled people, and developmentally delayed children.

Finally, research findings in the Middle East are mostly based on cross sectional studies, assessing mental health problems at one point in time. More longitudinal studies are needed, as they can assess the effects of prolonged trauma and toxic stress over time and generations.

Fig 1 | Mental health workforce (rate per 100 000 population) in Middle Eastern countries with continuous conflict, compared with high income countries and global rate (where value is zero this is equal to zero or not reported).54

doi: 10.1136/bmj.m3155 | BMJ 2020;371:m3155 | the bmj
The occurrence and treatment of psychiatric disorders in the Gaza strip and the West Bank in Palestine were studied from 2005 to 2008 among patients older than 1 year. They were clinically assessed by a psychologist or a psychiatrist (supervised by a senior psychologist or psychiatrist) through a local mental health and counselling health network. Psychological care, consisting of individual, family, group, or dyad psychotherapy, at home or in a consultation centre, was provided to the patients with diagnoses with PTSD, depression, or anxiety. The majority (79%) had better symptoms through psychotherapy and around 30% required additional psychotropic medication.87

Box 4: A psychosocial school based support program in the Gaza Strip, Palestine

Wars in Palestine exposed children to trauma and mental health problems. After the 2014 war, teachers, social workers, and counsellors implemented a psychosocial support programme in all schools in the Gaza Strip. Parents were actively involved. Cognitive behavioral techniques included group psychoeducation, discussion of past traumatic experiences, physical exercises, cooperative games and drama. PTSD, other emotional, and somatic symptoms, as well as cognitive functional impairment, significantly decreased after the intervention.64

Box 5: A psychotherapy treatment in the Gaza Strip and the West Bank, Palestine

The occurrence and treatment of psychiatric disorders in the Gaza strip and the West Bank in Palestine were studied from 2005 to 2008 among patients older than 1 year. They were clinically assessed by a psychologist or a psychiatrist (supervised by a senior psychologist or psychiatrist) through a local mental health and counselling health network. Psychological care, consisting of individual, family, group, or dyad psychotherapy, at home or in a consultation centre, was provided to the patients with diagnoses with PTSD, depression, or anxiety. The majority (79%) had better symptoms through psychotherapy and around 30% required additional psychotropic medication.87

Box 6: An online CBT intervention in Iraq

Technology can help treat mental health problems in unstable areas that lack healthcare practitioners. An online CBT approach was developed to treat PTSD and other emotional problems in adults in Iraq.75 Patients and trained therapists in Iraq, the Middle East, and Europe communicated through structured writing assignments submitted online. This form of intervention can improve symptoms of PTSD, anxiety, depressed mood, and grief across different cultures.76,77

Contributors and sources: MS has expertise on developmental psychopathology investigating mental health in children of war, refugees, premature children, and bullying. SH is interested in the interplay between genetics and environment and its effects on the development of children. PV has developed and evaluated interventions and services for vulnerable children, especially in low income countries. BE-K is interested in developmental psychopathology specially anxiety, PTSD, and depression in children of war. NA-D’s expertise is on molecular and human genetics. MS initiated this article. All authors contributed to the conceptualization of the article. MS and SH wrote the first draft of the manuscript. All authors critically reviewed and approved the final manuscript. MS is the guarantor of this article.

Competing interests: We have read and understood BMJ policy on declaration of interests and have no interests to declare.

Provenance and peer review: Commissioned; externally peer reviewed.

This article is part of a series commissioned by The BMJ for the World Innovation Summit for Health (WISH) 2020. The BMJ peer reviewed, edited, and made the decisions to publish. The series, including open access fees, is funded by WISH.

Muthanna Samara, professor of psychology
Sara Hammuda, research fellow in psychology
Panos Vostanis, professor of child mental health

Toxic stress and PTSD in children

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

OPEN ACCESS

12 Nelson CA, Scott RD, Bhutta ZA, Harris NB, Danese A, Samara M. Adversity in childhood is linked to mental and physical health throughout life. BMJ 2020;371:m3048

TOXIC STRESS AND PTSD IN CHILDREN

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

Check for updates

TOXIC STRESS AND PTSD IN CHILDREN


Cite this as: *BMJ* 2020;371:m3155

http://dx.doi.org/10.1136/bmj.m3155
The Muppets bringing child resilience into Middle Eastern humanitarian work

The makers of Sesame Street are working with a global humanitarian agency to try to help children affected by conflict and displacement. Ingrid Torjesen reports

Six year olds Basma and Jad are best friends. Basma is a purple furred Muppet who loves to sing and dance. Jad has yellow fur and likes art. Followed around by a pet goat called Ma’zooza, who eats anything shaped like a circle and causes chaos, they have fun and adventures together.

This may seem similar to any other TV show for 3-8 year olds, but specialists in child development and trauma help created the characters and content in Ahlan Simsim (Welcome Sesame) to support the social and emotional development of displaced children in Syria, Iraq, Jordan, and Lebanon.

For displaced families

The program is part of an initiative offering mass media and direct services for displaced families by Sesame Workshop, the US non-profit organization that produces Sesame Street, in collaboration with the International Rescue Committee (IRC), a global humanitarian organization. The John D and Catherine T MacArthur Foundation awarded the initiative £100m (£110m; $130m) to transform the way humanitarian systems serve children affected by crisis. Before developing the content, Sesame consulted child development and educational experts, humanitarian organizations working in the refugee camps, and parents and children living there.

The new Muppets have special powers: Basma can create sounds with her hands and Jad, who is new to the area, can paint in midair. “They use these as non-verbal sensory ways to describe how they’re feeling,” says Shanna Kohn, senior manager of education for Sesame’s humanitarian program.

Development of children’s social and emotional skills is as important as development of their academic skills. The first season of the program focused on managing emotions such as anger, sadness, jealousy, and fear through coping strategies—for example, breathing techniques and expressing emotions through art. Kohn describes these as “the ABCs of social and emotional learning” that will continue through the remaining three seasons.

The second season, airing now, deals with challenges presented by covid-19, such as isolation. Season three will deal with social skills and conflict resolution, and season four will focus on perseverance, optimism, and hope.

Community focused

One of the experts Sesame consulted was Reem Khamis-Dakwar, professor of communication sciences and disorders at Adelphi University, Garden City, New York.

“Every decision made in the design of the program and its production was based on the evidence and review of culturally and linguistically relevant studies and knowledge,” she says.

Khamis-Dakwar, a Palestinian who studied in Israel, was impressed by the depth of Sesame’s consultation to reach expert consensus. “It was all in Arabic,” she says. “That tells me they’re looking at the community.”

“It’s really important that the kids really connect.” Children can relate to the program, she says, because the characters look like them, dress like them, talk like them, and even eat the same food as them.

During production, Sesame tests all its programs with small groups of children and parents for appeal, for developmental and cultural relevance, and to make sure that educational messages are understood.

The program is broadcast on the pan-Arab MBC3 satellite channel and local stations across the region. Episodes and bonus content are also available on YouTube. Many families in refugee camps have bought a television and a satellite dish, says Kim Foulds, senior director of international research and evaluation at Sesame Workshop, as there are few other distractions for families. Parents often watch the program with their children, she says.

Multifaceted initiative

The program is part of a multifaceted initiative to support the emotional development of children who have experienced extreme trauma, with services delivered by the IRC.

The IRC runs year long preschool “healing classrooms” that aim to promote a sense of security, safety, and belonging and offer play based, developmentally appropriate learning activities to help children prepare for primary school. Videoclips from Ahlan Simsim are shown, and activities are linked to characters and storylines.

Such formal programs cannot run in less stable areas, such as north east Syria, but the IRC establishes informal play and learning sessions in community centres and health clinics, and home visits support parents, explains Katie Murphy, the IRC’s senior technical adviser for early childhood development.

“The covid-19 pandemic has forced us to rely much more heavily on digital and phone based engagement,” she adds, so phone calls and tailored text messages from teachers and facilitators have replaced home visits. Messages focus on play and learning activities and promoting children’s wellbeing as well as information about covid-19 and hygiene.

The IRC says attending Ahlan Simsim activities at its centres helps reduce the impact of psychological stress among children who have experienced conflict, displacement, and familial loss.

Muthanna Samara, professor of psychology at Kingston University, London, thinks Ahlan Simsim is “a very good initiative.”

It explains the emotions that young displaced children may be experiencing in a way they can understand, he says, such as fear of the dark on movie night and frustration when friends don’t want to play or don’t play by the rules. It incorporates tried and tested techniques for helping traumatized children to express themselves, such as art and play therapy, and teaches them simple coping strategies such as “belly breathing,” he says.

“When you have hundreds, thousands, millions of refugees, you cannot do this individually with each child,” he says.

Samara’s research has shown cumulative exposure to violence may increase children’s likelihood of developing mental health, emotional, and behavioral problems, and that positive parenting and strengthening children’s emotional intelligence and
friendships can help reduce mental health problems.\textsuperscript{2,3}

Independent evaluation

Hirokazu Yoshikawa, professor of globalization and education, co-director of the Global TIES for Children Center at New York University, and co-chair of the network on early childhood development for the UN’s sustainable development goal 4, is leading an independent evaluation of the initiative’s effect. “The humanitarian sector has traditionally not had an emphasis on early childhood development and learning that goes beyond survival,” he explains. “Most of the early work has been around basic health, nutrition, and shelter.”

“The point of this initiative was to think about early childhood development more broadly, to think beyond survival on to helping children thrive. So, to think about health and nutrition, but also learning and social and emotional development.”

The evaluation will use vignettes to assess children’s ability to identify emotions in different situations and come up with coping strategies, he explains. Children will be asked how characters might feel and what they might do, and how they themselves might feel and what they might do in a similar scenario. In Jordan, this is being conducted in the context of a randomized controlled trial, with preschools randomly assigned to using Ahlan Simsim materials or to the government curriculum.

The IRC’s Murphy says: “One of our overall ambitions is not just that this improves the lives of individuals within the four countries but that we are able to demonstrate that early childhood interventions can be effective, cost effective, and used at scale. “We can shift the humanitarian response so that these types of approaches become core to any emergency response.”

Competing interests: I have read and understood BMJ policy on declaration of interests and have no relevant interests to declare.

Provenance and peer review: Commissioned; not externally peer reviewed.

This article is part of a series commissioned by The BMJ for the World Innovation Summit for Health (WISH) 2020. The BMJ peer reviewed, edited, and made the decisions to publish. The series, including open access fees, is funded by WISH.

Ingrid Torjesen, freelance journalist
London, UK

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.


Cite this as: BMJ 2020;371:m4270
http://dx.doi.org/10.1136/bmj.m4270
Mitigating toxic stress in children affected by conflict and displacement

Anushka Ataullahjan and colleagues describe the myriad stressors related to conflict and displacement experienced by children and how best to reduce their negative effect.

A rmed conflict and displacement pose a threat to the health and wellbeing of children. As the global community begins to recognize the cumulative effects of conflict and displacement related stressors, our attention has shifted to toxic stress and its short and long term health effects.1 Toxic stress, regarded as the result of prolonged activation of the stress response, can occur before birth and during childhood is known to contribute to epigenetic changes, with health and neurodevelopmental consequences.2 However, various social factors and early and appropriate intervention can help mitigate the negative effects.3

How conflict and displacement affect children

Over 415 million children were living in conflict affected countries in 2018,4 including 33 million displaced children (16 million refugees and asylum seekers, and 17 million internally displaced children).5 Although all children are vulnerable to toxic stress, certain subgroups are particularly vulnerable because of their marginalization—for example, orphaned or unaccompanied children, girls, children with HIV infection, and children with developmental disorders or a disability.6 These groups may face additional stressors and have reduced access to services. The emergence of covid-19 has also raised concerns about spread in conflict affected populations adding to the risk of toxic stress (box 1).

Conflict and displacement increase toxic stress in children through sudden and extreme trauma exposures such as violence and forced displacement (fig 1). Moreover, the frequency and severity of existing daily stressors such as family violence can increase in response to armed conflict.7 Data on the number of children affected by conflict who are experiencing toxic stress globally are lacking, but regional studies indicate that it is pervasive. To illustrate, a study from Syria found that 71% of children experienced frequent bedwetting and involuntary urination, which are common features of toxic stress.8 Further research to accurately quantify the extent of toxic exposures faced by conflict affected children is needed.9

Active conflict disrupts economic activity and food systems, pushing many families into poverty.10 Overhead bombing and artillery fire can damage health, water, and electricity infrastructure, thereby decreasing access to health services, increasing displacement, and physical injury.11 The interruption of immunization schedules may cause outbreaks of previously uncommon infectious diseases, as was seen with polio in Syria in 2013.12

Early and repeated exposure to violence can have lifelong effects, including propagating social norms tolerant of violence.13 The United Nations Security Council’s monitoring and reporting mechanism tracks data on six grave violations against children during armed conflict: killing and maiming, sexual violence, attacks against schools or hospitals, abduction, denial of humanitarian access, and recruitment by armed forces and groups.14 All of these grave violations contribute to toxic stress.

Most people affected by conflict are not externally displaced and continue to live in active conflict zones, while some are internally displaced.15 For those who are forcibly displaced, the process of displacement can introduce a range of adversities. Raids on homes, schools, and villages as well as political oppression characterize preflight insecurity. Many families remain internally displaced for extended periods, unable to access adequate health, educational, and social services.16 During displacement, children may be exposed to increased environmental, social, and physical hazards, including crowded and makeshift living conditions with poor access to water and sanitation. Diseases such as malaria, tuberculosis, and cholera are easily transmitted in these contexts.17

Forcibly displaced children and families are often exposed to extreme temperatures and novel disease vectors.18 The lost boys of Sudan provide a good example of the physical hardships encountered by unaccompanied minors during displacement. While traveling thousands of miles, many lost their lives to armed militia, wild animals, malnutrition, and exposure to the elements.19 Young children, and girls in particular, may be targets of sexual violence as part of systematic militarized action such as the genocidal rape seen in countries from the Balkans to the Great Lakes region in sub-Saharan Africa20 or exploitative exchanges by UN peacekeepers, as noted in several countries, including the Central African Republic, and Democratic Republic of Congo.21,22

When resettling as refugees in host countries, children may experience stress related to social dislocation, isolation, and adjusting to an unfamiliar language and culture.23 Separation from family networks can disrupt children’s access to traditional knowledge and protection systems.24 Moreover, resettlement policies may further disadvantage asylum seekers by accommodating them in impoverished

KEY RECOMMENDATIONS

- Research is needed to determine optimal strategies for sustained implementation of proved interventions to reduce toxic stress.
- Clinicians and pediatricians must work closely with other sectors to integrate trauma informed treatment across systems of care.
- Response agencies and professionals working with conflict affected and displaced children can mitigate the effects of daily stressors by ensuring access to food, housing, education, employment, financial assistance, and healthcare.
- Task shifting and training of lay workers to deliver community based programs can increase access to psychosocial support in marginalized and difficult to reach populations.
Box 1: Covid-19 in humanitarian settings

Conflict affected populations are particularly vulnerable to covid-19. Overcrowding and inadequate water and sanitation systems in refugee camps and informal settlements, coupled with previously existing illnesses, may increase the spread and severity of covid-19.6 7 Moreover, resource and health system constraints may restrict access to adequate and appropriate care.6 7 Control measures such as physical distancing may be difficult and may also increase economic precarity, intimate partner violence, and food insecurity in populations already vulnerable because of conflict or displacement.

There are concerns that the health needs of conflict affected populations may be deprioritized by host governments. In refugee camps in Lesbos, Greece, for example, a lack of government support required grassroots mobilization by refugees to increase awareness, create masks, and improve sanitation in their camps.2 9 In addition, social isolation and distancing during quarantine are associated with different stressors such as fears, insomnia, anxiety, unfulfilled basic needs, interrupted medical care, and family problems, all of which are common triggers of mental illnesses and suicidal tendencies.10 11 We must also assume that refugees in host countries will be at greater risk of these problems since they are further socially isolated.

Although swift action is needed to control the transmission of covid-19, it is important to ensure that these control measures are context sensitive.7 Community based participatory methods can be used to establish youth and community advisory boards to help guide covid-19 mitigation strategies to ensure they are culturally appropriate and thus more effective.7 Ensuring that the most vulnerable people are protected may require contextually appropriate measures such as isolation at a household level with designated rooms for vulnerable family members; at street or extended family level, where community members swap houses and designate one home for high risk members; or at neighborhood or sector level, where areas of settlements are designated for only vulnerable individuals.6 The Interagency Standing Committee has created guidelines for managing covid-19 that recommend increasing awareness, strengthening health facilities, and strategic planning.12

Disrupted educational systems and lack of economic opportunities may shift marriage practices, with families choosing to marry their daughters young, as has been seen among Syrian refugees in Lebanon.28 After resettlement, children may exhibit disruptive behavior, disorientation, and cultural bereavement.25 Refugee children report more functional impairment, physical health, psychosomatic, and peer problems.25 Parenting can also be challenging as many care givers struggle with their own trauma and emotion dysregulation while learning the norms and practices of a new country.30 Adjusting to an unfamiliar and at times unfriendly educational system is an additional challenge for children. Furthermore, the educational progress of some children may be affected by difficulties with concentration and learning.

Health effects

Despite a broad understanding of the myriad conflict and displacement related stressors experienced by children, the literature capturing the health effects of these stressors on children is limited. A recent Save the Children report on Syria found that 78% of children reported feeling extreme grief and sadness at some time.13 The report contends that toxic stress coupled with prolonged exposure to war during children’s key developmental stages has the potential to become irreversible if appropriate action is not taken quickly.13 Evidence from Sierra

**Fig 1 | Conflict related stressors and trauma exposures and their effect through the life course**

the bmj | BMJ 2020;371:m2876 | doi: 10.1136/bmj.m2876
Leone has shown that lower levels of social stigma and higher community and familial acceptance of former child soldiers was associated with a more positive mental health trajectory and adult life outcomes. 31

Global evidence suggests that toxic stress continues to affect the health of future generations through epigenetic changes long after conflict has subsided. 17 32 A small but growing body of literature has described the intergenerational effects of war, including low birth weight, developmental delays, chronic illness, mental health problems, and intergenerational violence. 33 Children of parents with post-traumatic stress disorder (PTSD) after the 1994 Tutsi genocide in Rwanda showed higher secondary traumatization symptoms and lower resilience than children whose parents did not have PTSD. 34 Additionally, new evidence suggests that our knowledge of the interplay between genetics and psychosocial symptoms is still limited. A recent study on male Syrian refugees who participated in a stress attunement framework, which ensures that children’s rights are protected and focuses on their rights of families experiencing conflict and displacement through financial assistance, food, housing, education, employment, and healthcare can also benefit children. 38 As conflict affected settings begin to develop and strengthen health systems, mental health and social services will be critical. 39 Increasing access to services requires improving refugees’ mental health literacy and knowledge of services. 40

Improving parenting quality and care giver support can encourage children to build resilience and strengthen protective factors that allow children to better manage stressors. 34 Positive interactions with primary care givers have an important protective role in reducing synaptic pruning (the process by which extra neurons and synaptic connections are eliminated to increase the efficiency of neuronal transmissions) during childhood. 37 Furthermore, friendship quality and increased number of friends can protect refugee children from some behavioral and psychological problems. 35 In contexts of conflict, particularly protracted conflict, we must expect to see intergenerational violence and trauma. By improving care givers’ capacity to provide a stable, nurturing relationship and highlighting the role of fathers, the intergenerational effects of war can be mitigated.

Group and community programs
Since few mental health professionals are available in many war affected settings, various studies have explored the use of group mental health treatments to expand access to care. These models often leverage the strengths inherent in collectivist cultures in war affected regions. 42 As epidemics or pandemics such as covid-19 further constrain resources and health worker capacity, task shifting to community health workers can allow access to hard-to-reach populations in countries such as Somalia and Yemen. 35

Community based interventions are important in the short and long term rehabilitation of children experiencing toxic stress. 36 School based programs can help overcome some of the barriers to access to care and improve educational outcomes. 43 Awareness of trauma also allows teachers to create a safe and stable environment for students to buffer their stress response. The trauma informed approach focuses on nurturing relations and attachments, increasing ability to self-regulate, and cultivating students’ developmental competencies. 44 Lay counsellors delivering mental health interventions within schools can also improve psychosocial problems. 45 Furthermore, mentoring schemes and after school clubs have helped refugee children overcome some of their behavioral and psychological difficulties. 46 Additionally, evidence suggests that social protection services such as cash transfers can benefit child development by reducing the financial stress experienced by families. 47

Family based therapies
A range of therapies targeting care givers such as carer-child interaction therapy, child and care giver psychotherapy, and stress reduction can help improve stress responses. 48 Research in Kosovo has highlighted the role of the family in improving children’s response to adversity. 49 One study found that mobilizing families to access community based social support services for people with severe mental health illnesses led to increased family coping and quality of life. 50 Similarly, a study in Rwanda with vulnerable families found that home visits to promote early childhood development improved interactions, reduced violence, and created a more enriched home environment. 51 The intervention also increased equitable decision making and child dietary diversity. 50

The success of such interventions shows the interconnectedness of stressors and supports the nurturing care framework approach, which focuses on the links between health, nutrition, safety, care giving, and early education for childhood brain development. 31 This multisectoral approach integrates health and nutrition interventions for children as a way to buffer stress response and decrease the impact of toxic stress. 32

Personal therapies
Several approaches aim to build resilience and mitigate the impact of the stress response. Mindfulness based therapies have been shown to decrease psychological distress and anxiety and increase well-being. 46 Biofeedback therapies focusing on
been used successfully among children and adolescents in Gaza, Sri Lanka, and Kosovo.

More traditional approaches such as trauma focused psychotherapy and cognitive behavioral therapy can also ameliorate toxic stress and reduce PTSD symptoms. Integrating trauma informed treatment across systems of care is essential to ensure that conflict affected and displaced children receive the care they need. This will require strong collaboration between healthcare providers, development workers, the international community, and governmental and non-governmental organizations. Implementation science can help to develop and test innovative strategies to expand reach and ensure the quality and sustained use of evidence based interventions as conflict affected regions move towards peace and development.

**Next steps**

Despite the growing evidence on toxic stress in children affected by conflict and displacement, gaps in our knowledge persist. A recent systematic review on the mental health of women, children, and adolescents affected by conflict highlighted the need for interventions to be described in more detail in research papers. Moreover, rigorous evaluation of success, failure, and effectiveness of interventions and strategies for widespread implementation in conflict affected regions should be prioritised. Most research has not included children affected by conflict and displacement, and knowledge of best practices for these contexts is limited (box 2). Existing interventions to reduce toxic stress in regions affected by conflict need to be adapted to take account of cultural context and values, vulnerable subgroups, and resource constraints in their design and delivery.

Appropriate action to reduce toxic stress requires a better understanding of the scope of the problem among children and families affected by conflict. Objective measures of toxic stress are essential, and biomarkers offer one such possibility. A recent study of adolescents affected by conflict showed that hair cortisol concentration can be used to assess response to interventions. Further research on the use of biomarkers to track and measure stress responses is key to ameliorating toxic stress.

A broader understanding of toxic stress in children is particularly important during the current covid-19 pandemic, when measures to limit the spread of this disease may unintentionally increase exposure to multiple adversities through school closures, movement restrictions, and economic disruption. In India, for instance, national lockdowns resulted in mass cross-country migrations, children risked separation from family members, economic insecurity, and violence. The compounding effect of daily stressors and conflict and displacement related stressors encountered by children increases their vulnerability to toxic stress. As social and economic stressors take hold and families are forced into isolation, there has been a rise in family conflict and violence as well as increasing rates of mental health problems among children and their caregivers.

Research has indicated that low socioeconomic status, multiple types of violence, and low parental support aggravate the consequences of traumatic events on the development of mental health problems. Multisectoral approaches must engage the child, family, community, and, at times, humanitarian groups to prevent and ameliorate the impact of toxic stress among conflict affected and displaced children and strengthen sustainable systems of prevention and care.

**Box 2: Examples of the rehabilitation of children of conflict**

**Bosnia and Herzegovina**

The 1992-95 war had severe long term effects on the health and wellbeing of children and adolescents, with high rates of PTSD, anxiety, and depression. A Unicef funded psychosocial program, delivered in over 32 secondary schools across the region, shows how appropriate and comprehensive intervention can reduce the rates of reduced post-traumatic stress, depression, and grief symptoms among children through normalizing, validating, and processing traumatic experiences. The program also enhanced coping, tolerance, social skills, and problem solving abilities.

**Syria**

Syrian refugee children have developed increased mental health problems, including PTSD and emotional dysregulation. An eight week humanitarian intervention program of structured activities for 12-18 year olds was designed based on the profound stress attunement framework. The intervention reduced symptoms of insecurity, distress and perceived stress, depression, and anxiety and improved behavioral outcomes but had no effect on prosocial behavior or symptoms of PTSD.

**Sierra Leone**

Community consultations have been used to adapt common elements of cognitive behavioral therapy and interpersonal therapy to create the youth readiness intervention. The intervention, which focused on increasing emotion regulation, interpersonal skills, and problem solving, was delivered to youth aged 15-24 years old by trained lay workers. A randomized control trial found that the intervention significantly improved emotion regulation skills, prosocial attitudes and behaviors, and social support, and reduced functional impairment. An eight month follow-up found that participants were more likely to persist in school and had better attendance and academic performance than those who did not receive the intervention.

As the number of people affected by conflict and displacement continues to grow, action to decrease the long term negative effects of toxic stress must be targeted and swift.
Theresa S Betancourt, director
Zulfiqar A Bhutta, inaugural Robert Harding chair
Centre for Global Child Health, Hospital for Sick Children, Toronto, Ontario, Canada
Department of Psychology, King’s College London, London, UK
Research Program on Children and Adversity, Boston College School of Social Work, Boston, USA
Centre of Excellence in Women and Child Health, Aga Khan University, Karachi, Pakistan
Correspondence to: Z Bhutta
zulfiqar.bhutta@sickkids.ca

OPEN ACCESS

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

Check for updates

35 Kamali M, Munyuzangabo M, Siddiqui FJ, et al. Delivering mental health and psychosocial...


Cite this as: BMJ 2020;371:m2876
http://dx.doi.org/10.1136/bmj.m2876
Our children face “pretraumatic stress” from worries about climate change

Children are particularly vulnerable to the psychological trauma from extreme weather events and can also be harmed by the fear of future harms, writes Lise Van Susteren

Lise Van Susteren, psychiatrist in private practice
Washington, USA

The scientific consensus is overwhelming: serious harms related to anthropogenic climate change will increase in intensity and frequency for years to come.1 This century, resulting resource scarcity, geopolitical upheaval, and humanitarian crises will render parts of the world uninhabitable. Without meaningful action our children face an increasing toll of physical and psychological injury.

Today’s floods, storms, droughts, heat waves, wildfires, and pandemics related to climate change traumatize us. But trauma can also arise from fears of future threats, giving rise to pretraumatic stress.2

Angry, terrified, and in despair
As expert witness on the psychological damages to 21 young people suing the US government for climate inaction,3 I reported on their stressful and dominating feelings of powerlessness, uncertainty, and abandonment.

Children are protesting in the streets to demand climate action. Many report feeling angry, terrified, and in despair. Some see no purpose in life, believing the world will soon be unrecognizably damaged, or that they may soon be dead.

Experiencing or witnessing life threatening events can cause deep and persistent psychological trauma. If severe this can lead to post traumatic stress disorder (PTSD). Children have been diagnosed as having PTSD after experiencing extreme weather events.4 5 Symptoms may appear months later, sometimes triggered by a new trauma. PTSD may also be diagnosed after indirect exposure to trauma, from reflecting on traumatic experiences that relatives or friends have endured or even, simply, from repeatedly hearing details of traumatic events.

The capacity to heal from the psychological effects of traumatic events depends on many factors. When disasters are experienced as entirely “natural” healing may be less arduous: perhaps we more readily accept that we are powerless over fate. But when the injury or loss reflects human error, carelessness, or negligence, healing may be complicated by thoughts that the event could have been avoided.6 We know that natural disasters are not entirely natural anymore: their frequency and intensity reflect the ongoing choices humans are making.

Having some control over how we respond to current climate disasters can bolster our resilience, facilitating recovery. We may have time to choose to flee or hunker down. Effects may be experienced in phases, helping us muster the psychological defenses needed at each moment. Shared experiences mean victims can lean on each other, providing community solidarity.

Psychological harms from worries of future disasters are different. There is no reminding ourselves that the stress is a remnant of the past. Our options to control the situations envisioned are few, engendering helplessness.

Damaging lifelong consequences
Chronic stress can permanently affect brain development as well as brain functioning. Exposure to climate related stress during early development may have damaging lifelong consequences, including maladaptive behaviors, memory problems, problems with attention, diminished inhibition, difficulty regulating emotions, impaired decision making, impaired problem solving, behavioral problems, and priming for future stressful events.7

Psychological and behavioral problems can interrupt schooling and social life. High levels of stress over time can also cause physical harm: cardiovascular damage, hormonal changes and infertility, and compromised immune function.

Exposure to trauma can also alter the expression of genes.8 9 Even in the absence of the trauma, this activated state can be passed down to future generations epigenetically. Thus the trauma that children are experience due to acute and chronic climate stress could have transgenerational impact.

Climate disruption requires immediate action to reduce multigenerational psychological harm. Calls for a UN led strategy to protect the mental health of young people should be loud and unrelenting. Funding for regional resilience councils is needed to assess and prepare for local risks. Academic institutions must deploy their vast resources to work with communities to find solutions. Educating medical professionals to become experts and advocates for healthy climate policy must become a requirement. Mental health professionals are at the core of the call for behavioral change, justifying a new subspecialty in climate and mental health.

Our children cannot be relieved of their fears with words. Real menace is thrusting them into existential uncertainty. We must acknowledge that children’s psychological wellbeing is on the line. Holding ourselves accountable now for our outrage and despair is crucial, not only for taking meaningful action but also to show them that we care. Unless we act, the injustice they and future generations face will have them regard adults today as depraved and demented to have stood by knowing what would happen.

Intergenerational injustice such as this meets a definition that has a name: child abuse.8 Children do not want to hear from adults about what a good job they are doing to save the world. As the teenage climate activist Greta Thunberg has said, “I don’t want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. And then I want you to act.”

Competing interests: I have read and understood BMJ policy on declaration of interests and have no relevant interests to declare.

Provenance and peer review: Commissioned; not externally peer reviewed.

This article is part of a series commissioned by The BMJ for the World Innovation Summit for Health (WISH) 2020. The BMJ peer reviewed, edited, and made the decisions to publish. The series, including open access fees, is funded by WISH.
TOXIC STRESS AND PTSD IN CHILDREN

cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

1 Global Climate Change. The effects of climate change. https://climate.nasa.gov/effects/

Cite this as: BMJ 2020;371:m4588
http://dx.doi.org/10.1136/bmj.m4588
Psychopathology in children exposed to trauma: detection and intervention needed to reduce downstream burden

The clinical implementation of assessment and evidence based interventions is lagging behind research, with huge cost to individuals and society, write Andrea Danese and colleagues. To provide the best possible care to some of the most vulnerable children, specialist training, clinical capacity, and access to care must be increased.

Childhood traumas—defined as events that involve “actual or threatened death, serious injury or accident, or sexual violence”—are key modifiable risk factors for psychopathology in children, adolescents, and adults. As such, child trauma is a major focus for research and clinical practice in mental health. Although much is known about the association of child trauma with psychopathology and about evidence based interventions for trauma related psychopathology, the clinical implementation of adequate assessment and treatment in this area has been hampered by substantial obstacles in service delivery. For example, although some children are resilient in the face of trauma, many trauma-exposed children develop complex psychopathology that challenges diagnostic boundaries and simple case formulation. To identify and address the needs of this vulnerable group, we need to boost specialist training and clinical capacity in child trauma and its consequences.

Furthermore, although effective treatments exist, most children with trauma-related psychopathology probably go undetected and do not access treatment promptly. To tackle these unmet needs, it is important to identify barriers to healthcare use, implement screening procedures, develop accurate prediction models to detect children at most risk, and improve primary care practitioners’ knowledge of child and adolescent mental health problems. Upfront investment to tackle these barriers to service delivery can reduce the large downstream costs to individual children and society.

Mental ill health in children after trauma

After traumatic events, most children show transient psychological symptoms. They may become tearful, anxious, clingy, or withdrawn; struggle to pay attention or to sleep; re-enact the event through play and drawings; avoid talking about it; complain about headaches or stomach aches; or become irritable and oppositional as they struggle to cope with their emotions. These are normal psychological responses to trauma that subside within a few weeks in most children. When psychological symptoms persist for more than a month and impair the child’s functioning (such as school achievement or socialisation with peers), children may meet criteria for a psychiatric diagnosis.

A common clinical concern is post-traumatic stress disorder (PTSD). In PTSD, abnormal processing of traumatic memories leads to persistent re-experiencing of the event through unwanted and distressing memories or nightmares, particularly in the presence of triggers resembling the context in which the traumatic event occurred. The memories typically are experienced as if they were happening now, although frank dissociative symptoms where awareness of time is lost (flashbacks) are less common in children. Because the re-experiencing symptoms are so distressing, children with PTSD develop overt or covert avoidance strategies, such as keeping themselves busy or distracted or staying away from people or places that remind them of the traumatic event. Alternatively, they may become upset if they find themselves in contexts resembling the traumatic event. Although avoidance might offer short term relief from distress, it does not reduce the occurrence of re-experiencing symptoms in the long term and may reduce engagement in enjoyable activities. Because of the often chronic, unpredictable nature of the distressing re-experiencing symptoms, children may feel under continued threat and therefore display physiological hyperarousal as they remain alert and vigilant for danger. Because of the hyperarousal, children with PTSD are often irritable, struggle to concentrate on daily tasks, and have problems sleeping.

On average, one in four trauma-exposed children develop PTSD by age 18 years, with a lifetime prevalence of 4.7–7.4% in the general population. The prevalence of PTSD can be much higher in displaced children and those exposed to armed conflict. The risk of PTSD in individual children exposed to trauma depends on many characteristics including, importantly, the nature of the trauma. Traumas involving direct experiences of interpersonal violence, such as physical or sexual abuse, are most strongly associated with psychopathology. Children with PTSD are at high risk of harming themselves and of harming others because of aggression and risk taking. The odds of self harm are eight times higher in children with PTSD compared with children without PTSD, and the odds of suicide attempt are 10 times higher. In absolute terms, about half...
of children with PTSD report self-harming and one in five report attempting suicide. The odds of violent offence records are also three times higher in children with PTSD compared with children without PTSD, corresponding to one in 10 children with PTSD. Finally, children with PTSD have significant functional impairment. They are three times more likely to be not in education, employment, or training (NEET) compared with children without PTSD, corresponding to one in four children with PTSD.

Although PTSD is a common clinical concern, the most prevalent disorders in children exposed to trauma are those also most prevalent in the general population. For example, while the 12 month prevalence of PTSD in trauma-exposed children is 14%, the prevalence of depression is nearly 30%, conduct disorder 23%, and alcohol dependence 16%. Of note, a PTSD diagnosis further increases the risk of comorbid psychiatric diagnoses, and more than three out of four children with PTSD have additional diagnoses ranging from internalising (such as depression or generalised anxiety) to externalising problems (such as conduct problems, substance misuse, or attention deficit and hyperactivity disorder) and psychotic symptoms. Beyond psychopathology, trauma-exposed children, on average, show small but pervasive cognitive deficits that may impair daily functioning and treatment response.

Although the association between child trauma and psychopathology is well established and likely causal, the mechanisms explaining this association are the focus of much current research. The traditional view has been that exposure to child trauma triggers a biological “toxic stress response” that alters brain function and ultimately contributes to psychopathology. Recent findings suggest that psychopathology is more strongly associated with the retrospective recall of childhood trauma (that is, subjective experience) than the actual exposure, pointing to psychological mechanisms involving biases in memory, core beliefs, and decision making. In contrast, the association between child trauma and cognitive deficits likely emerges from non-causal mechanisms and particularly pre-existing and stable differences in cognitive abilities that are risk factors for exposure to some trauma types. Finally, the complex clinical picture likely varies based on particular profiles of risk exposure in individual children, which can include both threats and deprivation (such as neglect or poverty), highlighting the importance of dimensional models of risk measurement.

Because of the high prevalence and complexity of psychopathology related to child trauma, it is important to boost specialist training and clinical capacity in this area, which are often lacking in the community. Inadequate investment in this area has important negative consequences. One consequence is that, because of the complexity of clinical presentations, misdiagnosis or underdiagnosis is likely, leading to ineffective treatment and overload of other public services, such as the criminal justice system. Another consequence is that, although natural recovery occurs in some cases, many children do not improve without treatment. Therefore, without timely evidence based treatment, children may go on to develop chronic or recurrent psychiatric disorders that become increasingly difficult to treat—with substantial individual and societal costs across the person’s life course.

### Four ways to improve detection

It is impossible to implement interventions if child trauma and trauma related psychopathology go undetected. In a recent population based British study, only 20% of trauma-exposed children sought help from general practitioners or mental health practitioners, and only 10% accessed mental health services in the past year. Rates of healthcare use are similarly low for children with trauma-related psychopathology. In the same cohort, only 40% of children with PTSD sought help from GPs or mental health practitioners and only 20% accessed mental health services in the past year and might still be misdiagnosed or inadequately treated because of the lack of training in trauma-related disorders. Rates of health care use are almost certainly even lower in countries without universal healthcare or affected by conflict, emergencies, and disasters. There are at least four important steps to improving under-detection.

First, improve understanding of barriers to healthcare use. Some relate to the children, such as trauma-related psychological symptoms (for example, avoidance, low motivation, hopelessness, distrust); trauma-related cognitions (such as shame or guilt); or fear of reprisal by perpetrators or disbelief by family and adults. Other barriers relate to parents or carers, such as deliberate concealment of trauma by perpetrators; fears of being blamed, having their child taken by child protective services, reprisal towards them or their child by perpetrators; poor mental health literacy; stigma around mental illness; and structural barriers (such as lack of insurance, access, or transportation).

Second, reduce these barriers by screening for trauma exposure. Screening is the first and necessary step to identify children who may develop trauma-related psychopathology. It can be undertaken in primary care or non-specialist health settings without significant distress for the children interviewed with short questionnaires (such as the Child Trauma Screen). However, like all screening programmes, it can only be ethically justified when it is implemented along with procedures to review the results of the screening and to provide further assessment and treatment to children who screen positive.

Third, develop accurate prediction models to identify which trauma-exposed children are at greatest risk of developing psychopathology. Pragmatically, risk prediction is generally based on identification of early emotional and behavioural symptoms through screening instruments (such as the Child Revised Impact of Events Scale (CRIES), the Revised Children’s Anxiety and Depression Scale (RCADS), and the Strengths and Difficulties Questionnaire (SDQ)). However, to enable interventions from the earliest stages in non-symptomatic trauma-exposed children and at scale, there is growing interest in developing individualised risk prediction models using modern statistical and machine learning methods.

Fourth, and more broadly, improve general practitioners’ and primary care practitioners’ training in child and adolescent mental health. Improved knowledge in this area can promote detection of psychological problems in children and referral to specialist mental health services.

### Evidence based treatment

Evidence based psychological treatments for PTSD in children endorsed by guidelines from the National Institute for Health and Care Excellence (NICE) and the American Academy of Child and Adolescent Psychiatry include trauma-focused psychotherapies (such as trauma-focused cognitive behavioural therapy, cognitive therapy for PTSD, prolonged exposure, and narrative exposure therapy). Trauma-focused psychotherapies target cognitive and behavioural factors that contribute

---

**BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

1. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

2. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

3. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

4. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

5. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

6. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

7. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

8. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

9. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

10. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

11. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

12. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

13. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

14. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

15. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

16. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

17. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

18. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

19. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

20. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

21. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

22. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

23. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

24. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**

25. **BMJ 2020;371:m3073 | doi: 10.1136/bmj.m3073**
to the maintenance of PTSD and generally include psycho-education to provide information to children and families about PTSD symptoms and the treatment rationale; coping skills training to better manage intense negative emotions; gradual exposure to trauma memories and reminders to address avoidance and build a coherent trauma narrative; and cognitive restructur- ing to address biased appraisals related to the trauma memory. All individual forms of trauma-focused psychotherapies have large effects in reducing PTSD symptoms compared with waiting list\textsuperscript{26} and are cost effective in the treatment of PTSD in children.\textsuperscript{24}

Limited but growing evidence indicates that eye movement desensitisation and reprocessing (EMDR),\textsuperscript{12,24} which involves recalling traumatic events while performing tasks that generate bilateral sensory stimulation, may be beneficial for young people with PTSD. Pharmacological interventions are not effective for treating PTSD in young people\textsuperscript{12,14} but can be effective for treatment of comorbid disorders (such as depression and anxiety).

Because PTSD is not the only or the most common diagnosis in trauma-exposed children,\textsuperscript{15} treatment recommendations for each trauma-exposed child should be guided by the diagnoses made by experienced clinicians. It is important to consider how trauma may organise and provide distinctive features to the clinical presentation. Because psychiatric comorbidity\textsuperscript{7} is common, trans-diagnostic approaches that target common mechanisms underlying the co-occurrence of different disorders are gaining popularity.\textsuperscript{26}

There is also much interest in early interventions to reduce psychopathology in trauma-exposed children, because of the identifiable external cause. As in adults, universal single-session debriefing is not beneficial for trauma-exposed children.\textsuperscript{13,14} More targeted interventions have yielded better results, however. For example, children who reported at least one new PTSD symptom after trauma exposure and received a family intervention targeting psycho-education about trauma symptoms, improved family communication, and teaching of coping skills to manage symptoms were significantly less likely to have a PTSD diagnosis three months after the intervention.\textsuperscript{27,28} Furthermore, focused psychosocial interventions can be effective for children in low-resource humanitarian settings\textsuperscript{29,30} or among refugees, asylum seekers, or internally displaced people.\textsuperscript{31}


20 Bhushan D, Argueta BR, Machtinger E, Harris NB. Screening and intervening on adverse childhood experiences (ACEs) and toxic stress. BMJ [forthcoming].


Cite this as: BMJ 2020;371:m3073
http://dx.doi.org/10.1136/bmj.m3073
Covid-19 could prompt an end to our continued betrayal of childhood

Many children in wealthy countries such as the UK face huge yet avoidable adversities, risk factors for toxic stress and lifelong physical and mental health problems. Al Aynsley-Green notes how the covid-19 pandemic has compounded this scandal, but presents a chance to reset the baseline and end the betrayal.

Our children overall have some of the worst outcomes in the developed world for health, education, social care, justice, and poverty, as my 2018 book The British Betrayal of Childhood documented. High levels of childhood adversity can give rise to a toxic stress response, with lifelong implications for physical as well as mental health.

My findings were not new. In 2013 the BMA argued that children had been “betrayed on a grand scale” by a lack of political support with little changing by 2016.

In 2017, the Royal College of Paediatrics and Child Health documented shocking key indicators, including for child mortality, preventable injuries, mental ill health, adverse health behaviours, long term conditions, and family and social environments. Three years later progress has stalled or is even reversing.

The covid-19 response

Children seem more resistant to covid-19 infection, but have suffered disproportionately from 2020’s lockdowns: school closures, isolation, loss of education continuity, denial of play and sport, with soaring domestic violence, child abuse, and obesity.

“Children simply haven’t been at the forefront of decisions,” concludes the current Children’s Commissioner for England. Especially searing are her comments on the plight of children in care.

The pandemic has also had deleterious impacts on children’s health services. Particularly vulnerable children, including those with special educational needs, disabilities, and in the criminal justice system may be faring worst.

The 1001 Critical Days Manifesto emphasises the powerful economic return from investing in babies, infants, and their families. But the early years sector is at risk of collapse.

Far from being a leveller, the pandemic is exacerbating the widening social inequality exposed by Sir Michael Marmot.

Prioritise children’s needs

The Children’s Society charity wants the government to put children’s interests at the heart of recovery from coronavirus despite children’s needs seemingly forgotten as a government priority, eclipsed by economic concerns of getting parents back to work.

Why does British society have such long standing indifference to children? And why are children being let down so savagely now? We have four fundamental problems.

First, unhelpful attitudes towards children and the importance of their start in life are rife in public and political discourse. It’s engrained that families care for their own children, but society does not care enough for other people’s children, especially if they are different or troublesome. Political polarisation of the roles of the state and parents in feeding children was recently laid bare by the footballer Marcus Rashford’s campaign to provide free meals to poor children in school holidays.

Second, untrustworthy politicians and short-term decision making systematically decimated the internationally applauded Every Child Matters policy. Every department of state had been obliged to promote five key outcomes. Local directors of children’s services provided local coordination, focused on Sure Start Centres, most of which have closed.

Who in government now is responsible for children’s needs overall? Who has responsibility for developing joined-up policies to support children?

Third, the sector lacks coordinated advocacy. Fourth, silos within and between professions, organisations, and government departments are ubiquitous. Individuals and organisations with passion, skills, innovation, and knowledge are waiting to build on what has gone before. But the gap between what is needed and what seems possible is often too daunting.

Building local communities with resilient children should be embedded in all policy and practice. Needs should be identified early and interventions made available.

This takes inspirational local leadership, as is being developed in Newark and the north east and Cumbria.

Reasons for optimism

The pandemic gives some reasons for optimism. Greater family cohesion, home learning, and imaginative online study can mitigate adversity. The Co-space Study has shown remarkable resilience in some young people, and we must acknowledge articulate and motivated young people themselves.

Not all rich countries had similarly dismal outcomes pre-covid-19, and the Netherlands, Norway, and Denmark may have done best for children during covid-19. Canada shows how local organisations can map the needs of children and families across health, education, social justice, and poverty.

Article 12 of the UN Convention on the Rights of the Child insists we listen to children. We must put their needs at the centre of healthcare services, schools, outdoor space, the built environment, care systems, and courts.

Children are the future of the very society that keeps letting them down so badly. As we emerge into a post-covid-19 world, we must rethink the society in which we hope to live. We must reset a better baseline for adversity in childhood to reduce the impact of toxic stress. We cannot allow children to be betrayed again.

Practical steps to improve outcomes

- Appoint local directors of children’s services to integrate all aspects of their lives
- Commission “mapping” of local children’s lives from routinely collected data across sectors
- Collaborate with education, social care, justice, and child poverty–child health and wellbeing are not just the preserve of health professionals
- Confront barriers between primary care, hospital, community, and mental health services
• Establish a cabinet level secretary of state for babies, children, young people, and families responsible for integrating all aspects of policy for children
• Empower doctors and nurses through effective leadership to speak out for the best interests of expecting mothers, babies, infants, children, and young people

Competing interests: We have read and understood BMJ policy on declaration of interests and have no relevant interests to declare.

Provenance and peer review: Commissioned; externally peer reviewed.
This article is part of a series commissioned by The BMJ for the World Innovation Summit for Health (WISH) 2020. The BMJ peer reviewed, edited, and made the decisions to publish. The series, including open access fees, is funded by WISH.

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

Cite this as: BMJ 2020;371:m4834
http://dx.doi.org/10.1136/bmj.m4834