Global Mental Health Research: Time for the Kids

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BACKGROUND:

Although 9 of 10 of the world's children live in low- and middle-income countries (LMICs), and children constitute nearly half of their populations, far too little research has focused on child mental health in LMICs.[1] The expansion of research in global health and global mental health over the past several decades has not yet been matched by new research in child mental health in LMICs.[2] It's time for that to change.

Research from high-income countries (HICs) tells us why the time has come. 75% of adult mental health problems begin during childhood, with nearly half developing by age 14.[3] Undoubtedly, adverse childhood experiences, including abuse, neglect, maltreatment, and deprivation, are plentiful in LMICs, and are potent risk factors for developing mental health as well as physical health problems.

Most LMICs have few mental health professionals, including especially child experts, and insufficient community mental health care for children and adolescents. The World Health Organization found that LMICs have only 0.1 child psychiatrists per 100,000, compared to 1.19 in high-income countries.[4] Child mental health in LMICs receives little assistance from international donors.[5] Moreover, the strong association between compound, chronic adversity and mental illness, coupled with the demographic youth "bulge" in many LMICs,[6] suggests that individually-based clinical treatments alone won't be enough to reduce the burden of mental illness in LMICs.[7]

While LMICs work to expand healthcare infrastructure and access to clinical services, progress can be accelerated by additionally building interventions which mitigate the impacts of the social drivers of mental illness. Relevant social drivers in LMICs could include poverty, armed conflict, discrimination, family violence, and community violence. Although we know

something about these drivers, we know little about which drivers, if targeted, will most effectively reduce risk, alleviate symptoms, and enhance mental health.[7,8] Moreover, some social drivers appear to differentially affect mental health depending on local context, gender, developmental stage, and other factors.[9] There is much to be learned.

To advance child mental health research in global health, we convened the first ever satellite meeting on global child mental health research at the 2019 Consortium of Universities for Global Health (CUGH) annual meeting. The CUGH meeting brings together over 170 academic institutions and other organizations from around the world that engage in addressing global health challenges. The presenters at the satellite meeting on global child mental health research were leading researchers in the areas of neuroscience, implementation science, and clinical science with children. They addressed key topics and engaged participants in lively discussions so as to arrive at consensus opinions and recommendations regarding child global mental health research.

The participants included: Dr. Josh Gordon (Director, National Institute of Mental Health); Dr. Theresa Betancourt (Boston College, U.S.); Dr. Mark Van Ommeren, (World Health Organization, Switzerland); Dr. James Leckman, (Yale University, U.S.), Dr. Mary M. McKay (Washington University in St. Louis); Dr. Reshma Shah, (University of Illinois at Chicago, U.S.), and; Dr. Sylvia Kaaya (The Muhimbili University of Health and Allied Sciences, Tanzania).

In this paper, we summarize the presentations and deliberations at the satellite meeting on global child mental health, and highlighting key takeaways.

PRESENTATIONS AND DELIBERATIONS:

Dr. Josh Gordon, Director, National Institute of Mental Health, U.S.:

The Center for Global Mental Health Research at NIMH coordinates research efforts aimed at improving the lives of people with mental illness worldwide. In all of these efforts, NIMH emphasizes the importance of a collaborative approach that centers on local needs and capabilities. All our projects engage local practitioners, scientists, and health policy experts, to ensure that our research takes maximal advantage of local infrastructure and is responsive to local needs. A particular focus is on expanding evidence-based practices through ethno-centric approaches, such involving individuals within local communities to share their lived experience, using visual aids to improve communication, and involving local leaders in designing and implementing research programs. Furthermore, it is important for global mental health work to reach populations with true need, rather than 'easy to reach' populations where research work tends to be concentrated.

An example of these collaborative approaches is our Scale-Up Hubs Network. Working in partnership with the Global Alliance for Chronic Diseases, the Center supports 15 research projects in low and middle-income countries, each of which are collaborations across disciplines and national boundaries.[10] These projects are designed to solve challenges facing these countries in delivering evidence based mental health care by studying how to implement sustainable, science-informed mental health policies and programs. The knowledge produced by this network and its precursor, the Collaborative Hubs for International Research in Mental Health, is making its way into practice in South Africa and Brazil, and into public policy in Uganda and Argentina. This work is also finding its way back to the United States, where the knowledge gained is being used to expand healthcare access in underserved communities.

Dr. Theresa Betancourt, Salem Professor in Global Practice, Director of Research Program on Children and Adversity, Boston College, U.S.:

Modern war and terrorism have devastating consequences on children and youth in particular. Globally, at the end of 2017, there were 69 million forcibly displaced people, 40 million internally displaced people, and 25 million refugees; over half of these people were under 18 years old. The number of children living in conflict zones rose by 74% over the last decade. Children exposed to war suffer from high rates of traumatic stress reactions, depression, anxiety, and high-risk behaviors. Many meet diagnostic thresholds of PTSD. Even in more developed areas, young people are increasingly exposed to violent actions, images, and settings, which impact their mental health.

There are 2 common perspectives on the potential impact of exposure to violence on children: 1) violence begets violence, so the exposed children will grow to become violent adults, or 2) coping and resilience is possible with the right support, thus mitigating its effect on quality-of-life outcomes. A deeper understanding of these perspectives on the intergenerational effect of war is central to the work of global mental health professionals around the world. Dr. Betancourt's current research focuses on 3 key areas:

1. Children affected by communal violence/armed conflict in Sierra Leone: A randomized control trial measured the impact of a Cognitive Behavioral Therapy-based intervention-- the Youth Readiness Intervention (YRI) -- on emotional regulation, prosocial behavior, functional impairment, psychological distress, and social support in Sierra Leone. YRI recipients in Sierra Leone were 6 times more likely to persist in school as compared to students who did not receive YRI. Among youth in school, blinded assessments indicated that YRI youth demonstrated significantly better classroom performance as well as

attendance. The "Youth FORWARD" scale-up study, to integrate the YRI into a locally funded youth employment/entrepreneurship program is underway and a Type II Implementation-Effectiveness Study with N=1200 youth is testing effectiveness in this new delivery platform while also investigating Collaborative Teams as a strategy for quality improvement and sustainment. [11]

2. Family Strengthening Intervention for Early Childhood Development and Violence Prevention (Rwanda): 'Sugira Muyango' targets families in extreme poverty with young children birth-36 months. The intervention supports responsive parenting to promote ECD and prevent violence through active in-home coaching and father engagement. Standard content on early childhood stimulation, nutrition, and hygiene are presented, along with content on problem solving, conflict resolution, and stress management. This intervention was piloted and tested using a cluster randomized trial. Families receiving intervention demonstrated important improvements in child development as well as reductions in violence including reduced intimate partner violence and harsh punishment of children. Secondary outcomes also indicated a decrease in maternal and paternal depression and anxiety. Now, the program is being transitioned to a larger scale-up, reaching all Ubudehe 1 (those in the most extreme poverty) in three districts in Rwanda using Collaborative Teams as an implementation strategy to reach over 10,000 children and more than 14,300 caregivers. [12,13]

3. Promoting resilience and healthy parent-child relationships in refugee families in the US (Somali Bantu refugees and Bhutanese refugees). The Family Strengthening Intervention for Refugees (FSI-R) was developed using a community-based participatory research approach as a home visiting intervention 'for refugees, by refugees.' Using a strengths-

based approach, the FSI-R aims to improve parenting strategies and communication, while also helping families navigate resettlement stressors and acculturative challenges. An 80-family feasibility and acceptability pilot with Somali Bantu and Bhutanese refugee communities in New England has been completed, demonstrating significant decreases in child mental health problems for both Somali Bantu and Bhutanese refugees and reductions in family conflict among Bhutanese families. A 300-family effectiveness trial is currently ongoing with the same communities. [14]

Dr. Mark Van Ommeren, Coordinator of the MER team (Evidence, Research and Action on Mental Health and Brain Disorders and Substance Abuse), Department of Mental Health and Substance Abuse, World Health Organization, Switzerland:

Communities that are affected by adversity (violence, insecurity, and poverty) are commonly impacted by prolonged disabling emotional distress. Community members experience the stress in the form of mental disorders such as Major Depressive Disorder and PTSD. However, many nations lack resources for mental health and psychosocial care for all people in need; therefore, there is a great need for innovative, low-cost solutions. Innovative psychological interventions are a promising new direction due to their good efficacy and high rank in research priority setting (supported by 50+ trials from LAMIC). WHO is developing, testing, and publishing such interventions. Additionally, WHO will mentor stakeholders in use of such interventions and develop guidance to set up psychological services in communities that are affected by adversity.

In order to make psychological interventions scalable, WHO recommends reducing the reliance on specialists by instead training lay people or nurses/community members, publishing

self-help guides for community members, using one treatment for multiple problems where possible, possibly foregoing the diagnostic assessment, and focusing on developing skills in community members for self-management. If the low resource intensity psychological intervention is not successful, WHO recommends a 'step up' to more intensive care with a specialist, if available. In this way, less severe cases do not utilize unnecessary resources. WHO is currently working to publish a range of scalable evidence-based psychological interventions that can be adopted and implemented in communities affected by adversity. So far, these include: 1) Thinking Healthy for Antenatal Depression, [15] 2) 8-Session Group IPT for Depression. [16]

Communities may also develop and test their own new interventions. WHO will mentor stakeholders in the use of such interventions to break down the process into 5 phases: Phase 1) Adaptation of intervention for local sociocultural context (qualitative research), and if possible, an uncontrolled pilot run, Phase 2) Small, feasibility randomized controlled trial to explore (a) feasibility, safety, and delivery of the intervention in an RCT and (b) feasibility of high quality evaluation (n = 40 -120), Phase 3) Process evaluation (qualitative research) of administering and trailing the intervention to finalize intervention and prepare for Phase 4, Phase 4) Large definitive, state-of-art RCT (n = 350 – 550), Phase 5) Process evaluation (qualitative research) of administering the intervention to prepare for scaling up (n = 25).

A number of interventions have been successfully implemented: 'Effect of a Multicomponent Behavioral Intervention in Adults Impaired by Psychological Distress in a Conflict-Affected Area of Pakistan: A Randomized Clinical Trial' [17], 'Self Help Plus: study protocol for a cluster-randomised controlled trial of guided self-help with South Sudanese refugee women in Uganda' [18], 'Early Adolescent Skills for Emotions' [19], 'Step-by-Step (Khoutweh-Khoutweh)'. [20]

Dr. Reshma Shah, Assistant Professor of Pediatrics, University of Illinois at Chicago, U.S.:

The first 3 years of a child's life can offer an incredible window of opportunity for future well-being. However, for the millions of children living in poverty worldwide it can be period of extreme vulnerability resulting in a cascade of physiologic and epigenetic disruptions that ultimately hinder healthy brain development which, in turn, result in early delays in language, social-emotional, and cognitive outcomes. Because developmental skills are predictive of later educational, emotional, and behavioral well-being, these early disparities have significant implications for a child's well-being. For example, in the United social, emotional and behavioral health disorders are among the top five chronic conditions in the pediatric population and are two times more likely to occur in children living in poverty as compared to children living above the poverty line.

Importantly, a growing body of multidisciplinary research (economics, developmental psychology, epigenetics, and pediatrics) has repeatedly demonstrated that the quality of caregiving a child receives during these early, important years of brain development can exacerbate or mitigate the effects of poverty. Specifically, this research demonstrates that a cognitively enriched home with nurturing caregiving can promote healthy development even in settings of adversity. However, it is not hard to imagine why it would be extraordinarily difficult for families to provide quality caregiving when faced with adversity which is why having policy level factors in place such as improving maternal education and ensuring safe and secure environments are needed. [21] Additionally, and the focus of Dr. Shah's work, is the is the use of the healthcare setting and routine health care visits, such as the well-child or immunization visits, to help promote these key parenting behaviors. The primary care setting offers a significant

opportunity to promote positive parenting behaviors. Advantages include: 1) a pre-established location and infrastructure 2) accessibility to a large population of families, and 3) a non-stigmatizing setting.

Dr. Shah's team is currently working to build on existing innovative primary care-based programs and further leverage the primary care setting, with a specific focus on clinics serving low-income communities. Their goal is to implement brief, accessible and sustainable programs in healthcare settings to encourage early childhood development and expand reach to the many families who may benefit from a less intense, population-level approach. Towards this goal, they are developing a health care-based model, Sit Down and Play (SDP), that capitalizes on the advantages of routine well-child visits from 2 months to 24 months age to supports evidence-based parenting behaviors that promote early child development. SDP relies on existing clinical staff, nonprofessionals, or volunteers for delivery and embeds services within well-child appointments while families wait to be seen by their primary care provider without disrupting existing clinical flow processes. In addition to being implemented in the United States, and in collaboration with physicians and researchers from Jawaharlal Nehru Medical College, this model has also been culturally adapted for implementation within healthcare settings serving a predominantly rural population in Karnataka, India. [22, 23, 24]

Dr. James Leckman, Professor of Child Psychiatry, Psychology, and Pediatrics, Yale University, U.S.:

The global community must address the root causes of violence and conflict. Children and families can be agents of change for peace. Young children's healthy development depends on their receiving nurturing care that ensures the child's health, nutrition, safety and security, as

well as opportunities for early learning. [25] Early Childhood Development (ECD) programs aimed at enhancing responsive parenting can also reduce the impact of adverse childhood experiences (poor nutrition, neglect, abuse, and other forms of dysfunction in the home). They can also impact brain structure and function, our physical health, and even how our DNA is read and transcribed. [26] As a consequence, there is an urgent need to provide high quality ECD services in low-middle income countries and to build multi-sectorial partnerships with government officials at the local and societal levels to sustain ECD services and bring them to scale.

To address this need, the Early Childhood Peace Consortium [27] was founded in 2013 at the Headquarters of the United Nations with the support of more than 140 global partners from multiple sectors including civil society, the social and mass media, government officials, as well as practitioners and academic scholars. A 'Theory of Change', was then developed by members of the ECPC, which was designed to inform government officials concerning the societal risks that result when quality ECD services are lacking. This 'Theory of Change' illustrates how ECD services can contribute to reducing violent conflict and sustaining peace through increasing social cohesion horizontally (within the family) and vertically (within the community and the region) and how this has the potential to have a major impact on global peace. [28]

As a result, at present, Dr. Leckman and his team are working in close collaboration with UNICEF and other global partners to rigorously evaluate promising ECD programs in Lebanon, Brazil and Saudi Arabia. [29] In addition, as part of the LINKS Initiative, based in Belfast, Northern Ireland and funded by the National Institute Health Research in the United Kingdom, ECD programs are now being piloted in conflict affected regions of the world (Colombia, Egypt, Kyrgyzstan, Mali, Palestine, Tajikistan, Timor-Leste, and Vietnam).

We need to take action to make our world a better place for our children and for future generations. Next steps include a commitment to refine, adapt, and implement in a sustainable fashion ECD programs of proven value across the globe.

Dr. Sylvia Kaaya, MD, PhD, Muhimbili University of Health and Allied Sciences, Dar Es Salaam, Tanzania:

Exposure to stressful events such as violence, neglect, and maltreatment are correlated with higher prevalence of psychopathology in children and adolescents, including depression, anxiety, PTSD, conduct disorder, and disruptive and reactive behavior disorder. Additionally, the effects of harsh discipline of children include both internalizing and externalizing problems, as well as poor working memory and school achievement. These identified risk factors for child and adolescent mental health disorders are mirrored in studies across the globe. Interestingly, associations between postnatal depression and infant and child growth stunting have been found in some SSA countries, but not in others. This suggests that variations in kinship and cultural supports for new mothers, and socio-economic and cultural factors need to be explored to understand this further.

In particular, there is a high magnitude of mental health problems in children in sub-Saharan Africa (SSA), yet only a few national-level studies on the prevalence of child/adolescent mental disorders. Dr. Kaaya's work is focused on this area to address this need.

Dr. Kaaya and her team tested a preventive mental health intervention, "Healthy Options", which is designed to enhance the quality of life and mental well-being among women living with HIV and depression in Tanzania. The intervention is designed to occur while these mothers receive prevention of mother-to-child transmission of HIV services (PMTCT

services). Maternal and infant outcomes were evaluated at six weeks and nine months post-delivery. Results of this intervention showed promising results, demonstrating that depression can be addressed effectively within the context of PMTCT services. [30]

Dr. Mary M. McKay, Dean of the Brown School, Washington University in St. Louis, U.S.:

The population of sub-saharan Africa (SSA) is currently undergoing rapid growth with the majority of the population being under 25 years of age. Thus, the physical and emotional wellness of young people in SSA is a high priority as economic, social and health outcomes will be influenced by the trajectories of youth. Currently, there are emerging concerns that rates of childhood disruptive behavior disorders in low and middle-income countries is elevated (12-33%). These youth mental health challenges existing within low income countries (including those in SSA) which dedicate approximately 5 times less of their annual health budget to alleviating mental health burdens than high income countries. Therefore, it is especially critical to develop scalable and cost-efficient interventions to reduce the mental health burden in low and middle income countries.

New youth mental health supports can be guided by frameworks, such as PRISM (Practical, Robust Implementation and Sustainability Model). This is a comprehensive model which can be used to guide the translation of research into practice by specifying multi-level aspects of service implementation aimed to influence its adoption, integration, and sustainment. More specifically, PRISM emphasizes organizational perspective on a new practice (i.e., readiness, barriers of staff, burden), patient perspective (i.e., relevance, barriers, burden), external environment (i.e., reimbursement, resources), infrastructure (i.e., training/support, plan

for sustainability), organizational characteristics (i.e., agency culture, management support, leadership), and patient-level influences (i.e., competing demands, beliefs).

Dr. McKay and colleagues (Ssewamala and Sensoy Bahar) are leading the SMART (Strengthening Mental health And Research Training in sub-Saharan Africa) Center, a NIMH-funded trans-disciplinary collaborative guided by the aim to reduce gaps in child and adolescent mental health services through science-based methods and research in 3 sub-Saharan African countries: Ghana, Kenya, and Uganda. Key activities of the center include: 1) networking and information sharing on scale-up implementation methodology and translation of findings in timely ways within the center and with other consortiums; 2) technical support for new implementation and research project development; and 3) support for stakeholders to carry out independent research projects, including testing implementation strategies to scale up child and adolescent mental health preventative interventions in diverse community settings. In addition, there is a high priority on engaging in capacity building that targets policymakers and NGO stakeholders who are interested in applying evidence-based policies and programs. Finally, the SMART Africa team are producing academic products, including 'The prevalence of disruptive behavioral disorders and ADHD among school-going children in Southwestern Uganda', [31] 'Adapting a U.S. based evidence-based practice to the Uganda context' [32] and 'Implementation science in the global health setting: Working with governmental structures & communities in Uganda'. [33]

CONCLUSIONS:

What evidence-based preventive and treatment interventions exist and can be implemented in LMICs?

The presenters discussed multiple child-focused interventions that they or others have implemented and evaluated in LMICs.   The discussions made reference to a 2013 review by Barry et al.,[34] which identified 22 school based interventions or community-based youth mental health interventions that had been evaluated in LMICS with either RCTs or quasi-experimental designs since 2000.

Several existing child-focused interventions address adverse environmental conditions in LMICs, including those social drivers mentioned earlier: poverty, discrimination, family violence, community violence, and armed conflict. To encourage and guide further research focused on mitigating the impact of social drivers, we prepared Table 1. This identifies six social drivers of mental illnesses and selected potential mitigation strategies that have been implemented in LMICs or other low resource settings. Some of these interventions (e.g., cash transfer, improved housing/neighborhood, parenting training, social support) have shown promise in LMICs,[9,35,36] but we don't yet have a good understanding of the mechanisms and pathways by which they work, and others still need to be implemented and evaluated in different LMIC contexts.

Given the large number of children with unaddressed mental health needs in LMICs, scaling-up interventions to meet population needs is a global mental health priority. To make psychological interventions scalable, the presenters recommended reducing the reliance on specialists by instead training nurses or community health workers, using one treatment for multiple problems, forgoing diagnostic assessment, integrating mental health care into pediatric primary care and other sectors (e.g. education, family welfare, justice), and focusing on developing skills for self-management. Lastly, it was noted that of course not all LMIC settings

are equivalent, so contextual and sociocultural adaptation is required before moving interventions from one context to another.

What policy interventions can most effectively improve child and adolescent mental health?

Multi-sectoral partnerships with government officials at the local, regional, and national levels and with non-governmental stakeholders are needed to stimulate research and promote the delivery of evidence-based child mental health and early child development packages. Researchers may help to facilitate these partnerships by engaging policymakers across government sectors (e.g., health, education, family welfare) and stakeholders groups (e.g., educators, families, advocates) and by conveying the experiences and outcomes of children who received such services to demonstrate the value to society of investing in programs targeting children.[14] Conducting such research in LMICs, however, faces many challenges, including lack of funding, training opportunities, mentors, and institutional support. [37]

One successful example of research partnerships is a series of NIMH initiatives based on the Hubs model (e.g. <u>Research Partnerships for Scaling Up Mental Health Interventions in LMICs</u>). [10] The Hubs model aims to develop new scientific knowledge by supporting public health-relevant mental health implementation research and building in-country research capacity through stakeholder partnerships and international networking. It builds partnership with both local non-governmental stakeholders and a LMIC government agency to promote faster translation of research findings to practice and to foster science-informed mental health policies and programs within the country. This in turn requires investments to help build the institutional

and administrative capacity of academic, governmental, and NGO partners in LMICs necessary for conducting research and promoting these partnerships.

Finally, the presenters endorsed using clear and strategic communication approaches to share key research findings with policy makers at critical points in the legislative and policy development processes. Researchers can draft policy briefs using language that can easily be adapted for use in mental health laws and policies. Researchers can highlight the shared benefits of child mental health research for children living in low-resource settings in different countries globally, including in the U.S.

What knowledge gaps, if filled through research, would substantially advance the field?

The presenters called for new research to accelerate the uptake of existing evidence-based interventions and to test new interventions designed to modify selected social conditions that drive up risk for mental illness among youth living in LMICs. Existing, evidence-based mental health services for children and adolescents are not widely used. At the same time, research on quality improvement is needed to determine how to sustain effective services when expanding their reach to large populations.

To promote expanded services, policymakers need much more information that is currently available. For example, new research should examine the mechanisms and pathways by which interventions - at the individual, family, community, environmental, or policy levels - exert their effects on mental health outcomes. Moreover, we need to shed light on how the various elements of multi-component or multi-level interventions may work synergistically to amplify beneficial effects. Policymakers also need research data on costs, budget impact, and return on investment for youth mental health services. Cost-effectiveness research can help them

to select from among different service options. Essential for all of this new research is keeping an eye on issues of equity and disparity, to understand which interventions and combinations of interventions are optimal for different population groups and settings, and to ensure that access to high-quality mental health services extends to all LMIC youth.

In conclusion, now is the time for building child mental health research in LMICs, especially for children exposed to chronic, compound adversity. Some evidence-based interventions from other settings can be adapted for the local contexts and then scaled up in LMICs. At the same time, de novo interventions are needed to target unique social and environmental characteristics of LMICs and thereby modify upstream social drivers of mental illnesses so that risk is lowered, and fewer children require individual clinical services. The results of such a research agenda would go a long way in guiding new policies and practices for sustainable child mental health care in LMICs.

Table 1. Social Drivers of Mental Illness and Selected Mitigation Strategies

Social Drivers	Selected Mitigation Strategies
Adverse social dynamics (e.g., stigma, discrimination, lack of access to mental health resources)	• Policies or programs to reduce gender/sex discrimination (e.g., Gibbs et. al, 2020 [38]; Fazwi et. al, 2019 [39]) • Policies or programs to reduce stigma (Kakuma et al, 2010 [40]) • Interventions to enhance access to care (Dawson et al, 2019 [41]; Carswell et al, 2018 [42])
Family poverty and associated factors (e.g., food insecurity, un/under-employment, inadequate housing)	• Employment (Desrosiers et al, 2020 [43]; Baksheev et al, 2012 [44]) • Economic empowerment (Ssewamala et al [45], 2012; Kim et al, 2009 [46]; Kivumbi et al, 2019 [47]) • Food assistance (Rodgers et al, 2007 [48]) • Early childhood stimulation (Gertler et al, 2014 [49])
Harmful family-based interactions (e.g., harsh disciplinary practices, poor emotion regulation, child neglect/abuse, impoverished communication)	• Positive parenting and family techniques (Bell et al, 2008 [50]; Annan et al, 2017 [51], Betancourt et al, 2017 [52]; Shah et al, 2017 [53]; Tolan et al., 1996 [54]) • Antenatal depression management (World Health Organization, 2015 [55]; Sikander et al, 2015 [56]) • Child protection policies with enforcement (Bick et al, 2015 [57]) • Community-based interdisciplinary approach (Marques et al, 2015 [58])
Unfavorable community/neighborhood characteristics (e.g., impoverished infrastructure, violence, crime, poor social cohesion)	• Violence reduction (Pronyk et al, 2006 [59]) • Social/Peer support (Kumakech et al, 2009 [60]) • Neighborhood/housing improvement (Leventhal et al, 2003 [9])
Environmental trauma (e.g., armed conflict, natural disasters)	• Interventions for children exposed to armed conflict (Qouta et al, 2012 [61]; McMullen et al, 2013 [62]; Karam et al, 2008 [63])

	• Interventions for children exposed to natural disasters (Shooshtary et al., 2008 [64]) • Interventions for child refugees (Sijbrandij et al, 2017 [65])
Inadequate school support (e.g., harsh disciplinary practices, lack of access to prevention)	• Improved classroom management and disciplinary practices (Khamis et al, 2004 [66]) • Life skills education (Ager et al, 2011 [67]; Srikala et al, 2010 [68]) • School program to prevent depression (Rivet-Duval et al, 2011 [69]) • Teacher and parent education (Huang, et al, 2014 [70])

REFERENCES:

1. Uppendahl JR, Alozkan-Sever C, Cuijpers P, de Vries R, Sijbrandij M. Psychological and Psychosocial Interventions for PTSD, Depression and Anxiety Among Children and Adolescents in Low-and Middle-Income Countries: A Meta-Analysis. Frontiers in Psychiatry; 2019.

2. Kieling C, Rohde LA. Child and adolescent mental health research across the globe. Journal of the American Academy of Child and Adolescent Psychiatry; 2012.

3. World Health Organization. Child and Adolescent Mental Health. https://www.who.int/mental_health/maternal-child/child_adolescent/en/. Accessed December 12, 2019.

4. WHO Mental health atlas 2017. Geneva: World Health Organization; 2018.

5. Lu C, Li Z, Patel V. Global child and adolescent mental health: the orphan of development assistance for health. PLoS medicine; 2018.

6. Riaz S, & Asrar S. Population and income groups. Al Jazeera; 2017. https://www.aljazeera.com/indepth/interactive/2017/07/international-migration-mapped-170712143840109.html. Accessed December 12, 2019.

7. Eisenberg L, Belfer M. Prerequisites for global child and adolescent mental health. Journal of Child Psychology and Psychiatry; 2009.

8. Lund C, Brooke-Sumner C, Baingana F, Baron EC, Breuer E, Chandra P, Haushofer J, Herrman H, Jordans M, Kieling C, Medina-Mora ME. Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. The Lancet Psychiatry; 2018.

9. Leventhal T, Brooks-Gunn J. Moving to opportunity: an experimental study of neighborhood effects on mental health. American journal of public health; 2003.

10. Pringle B, Williams M, Collins PY. Evidence for action: Stimulating research to address the global mental health treatment gap. In: Okpaku S. (Ed.), Innovations in Global Mental Health. New York, NY: Springer, Cham; 2019.

11. Betancourt, TS, Thomson DL, Brennan RT, Antonaccio CM, Gilman SE, VanderWeele TJ. Stigma and Acceptance of Sierra Leone's Child Soldiers: A Prospective Longitudinal Study of Adult Mental Health and Social Functioning. Journal of the American Academy of Child & Adolescent Psychiatry; 2019.

12. Barnhart DA, Farrar J, Murray SM, Brennan RT, Antonaccio C, Sezibera V, Ingabire C, Godfroid K, Bazubagira S, Uwimana O, Kamurase A, Yousafzai A, Betancourt T. Randomized pilot of a home-based intervention delivered by community-based lay workers in Rwanda to promote early childhood development and reduce violence. Journal of Child and Family Studies; (Accepted).

13. Betancourt TS, Jensen SKG, Barnhart D, Brennan RT, Murray SM, Yousafzai AK, Farrar J, Godfroid K, Bazubagira SM, Rawlings LB, Wilson B, Sezibera V, Kamurase A. Promoting parent child relationships and preventing violence via home visiting: A pre-post cluster randomized trial among Rwandan families linked to social protection programs. BMC Public Health; (Revise and Resubmit).

14. Betancourt TS, Berent JM, Frounfelker RL, Brennan, RT, Abdi S, Maalim A, Abdi A, Mishra T, Gautam B, Creswell JW, Beardslee WR. Family-Based Mental Health Promotion for Somali Bantu and Bhutanese Refugees: Feasibility and Acceptability Trial. Journal of Adolescent Health; 2019.

15. Sikander S, Lazarus A, Bangash O, Fuhr DC, Weobong B, Krishna RN, Ahmad I, Weiss HA, Price L, Rahman A, Patel V. The effectiveness and cost-effectiveness of the peer-delivered Thinking Healthy Programme for perinatal depression in Pakistan and India: the SHARE study protocol for randomised controlled trials. Trials; 2015.

16. Bolton P, Bass J, Neugebauer R, Verdeli H, Clougherty KF, Wickramaratne P, Speelman L, Ndogoni L, Weissman M. Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. Jama; 2003.

17. Rahman A, Hamdani SU, Awan NR, Bryant RA, Dawson KS, Khan MF, Azeemi MM, Akhtar P, Nazir H, Chiumento A, Sijbrandij M. Effect of a multicomponent behavioral intervention in adults impaired by psychological distress in a conflict-affected area of Pakistan: a randomized clinical trial. Jama; 2016.

18. Brown FL, Carswell K, Augustinavicius J, Adaku A, Leku MR, White RG, Ventevogel P, Kogan CS, García-Moreno C, Bryant RA, Musci RJ. Self Help Plus: study protocol for a cluster-randomised controlled trial of guided self-help with South Sudanese refugee women in Uganda. Global Mental Health; 2018.

19. Dawson KS, Watts S, Carswell K, Shehadeh MH, Jordans MJ, Bryant RA, Miller KE, Malik A, Brown FL, Servili C, van Ommeren M. Improving access to evidence-based interventions for young adolescents: Early Adolescent Skills for Emotions (EASE). World Psychiatry; 2019.

20. Carswell K, Harper-Shehadeh M, Watts S, van't Hof E, Ramia JA, Heim E, Wenger A, van Ommeren M. Step-by-Step: a new WHO digital mental health intervention for depression. Mhealth; 2018.

21. Shah R, Kennedy S, Clark MD, Bauer SC, Schwartz A. Primary care–based interventions to promote positive parenting behaviors: a meta-analysis. Pediatrics; 2016.

22. Shah R, Isaia A, Schwartz A, Atkins M. Encouraging Parenting Behaviors That Promote Early Childhood Development Among Caregivers From Low-Income Urban Communities: A Randomized Static Group Comparison Trial of a Primary Care-Based Parenting Program. Maternal and Child Health Journal; 2019.

23. Shah R, Gustafson E, Dhaded S, Herekar V, Metgud D, Mastiholi S, Kim H, Goudar S, Atkins M. Integrating an Adapted, Low-Intensity Program to Promote Early Childhood Development in Routine Health Visits in Rural India: A Feasibility Study. Journal of Developmental & Behavioral Pediatrics; 2020.

24. Shah R, DeFrino D, Kim Y, Atkins M. Sit Down and Play: A Preventive Primary Care-Based Program to Enhance Parenting Practices. Journal of Child and Family Studies; 2017.

25. Britto PR, Lye SJ, Proulx K, Yousafzai AK, Matthews SG, Vaivada T, Perez-Escamilla R, Rao N, Ip P, Fernald LCH, MacMillan H, Hanson M, Wachs TD, Yao H, Yoshikawa H, Cerezo A, Leckman JF, Bhutta ZA. Nurturing care: promoting early childhood development. Lancet; 2017.

26. Campbell F, Conti G, Heckman JJ, Moon SH, Pinto R, Pungello E, Pan Y. Early childhood investments substantially boost adult health. Science; 2014.

27. Donaldson CK, Affolter FW, Ponguta LA, Salah R, Britto PR, Leckman JF, Connolly P, Fitzpatrick S, Walmsley P. Contributions of Early Childhood Development Programming to Sustainable Peace and Development. New York: Early Childhood Peace Consortium. 2019. Available from https://ecdpeace.org/ecpc-background-paper.

28. Leckman JF, Britto PR. Steps towards Peace and Violence Prevention across Generations: The Potential of Early Child Development in the Context of the 2030 Sustainable Development Goals. New Directions Child Adolesc Development; 2018.

29. Ponguta LA, Issa G, Aoude L, Maalouf C, Hein S, Bick J, Zonderman AL, Katsovich L, Khoshnood K, Awar A, Nourallah S, Householder S, Moore CC, Salah R, Leckman JF. Effects of the Mother-Child Education Program on parenting stress and disciplinary practices among refugee and other marginalized communities in Lebanon: A randomized controlled trial. J Am Acad Child Psychiatry; 2020 (Online ahead of print)

30. Fawzi MC, Siril H, Larson E, Aloyce Z, Araya R, Kaale A, Kamala J, Kasmani MN, Komba A, Minja A, Mwimba A. Healthy Options: study protocol and baseline characteristics for a cluster randomized controlled trial of group psychotherapy for perinatal women living with HIV and depression in Tanzania. BMC Public Health; 2020.

31. Kivumbi, A., Byansi, W., Damulira, C., Mugisha, J., Namatovu, P., Sensoy Bahar, O., McKay, M.M., Hoagwood, K., Ssewamala, F.M. Prevalence of behavioral disorders and ADHD among school going children in Southwestern Uganda. BMC Psychiatry; 2019.

32. Sensoy Bahar, O., Byansi, W., Kivumbi, A., Ssewamala, F., McKay, M., & Nyoni, T. From "4Rs and 2Ss" to "Amaka Amasanyufu" (Happy Families): Adapting a U.S. based evidence-based practice to the Uganda context. Family Process; 2020 (online before print).

33. McKay, M., Sensoy Bahar, O., & Ssewamala, F. Implementation science in the global health setting: Working with governmental structures & communities in Uganda. Psychiatry Research; 2020.

34. Barry MM, Clarke AM, Jenkins R, Patel V. A systematic review of the effectiveness of mental health promotion interventions for young people in low and middle income countries. BMC public health; 2013.

35. Karimli L, Ssewamala FM. Do savings mediate changes in adolescents' future orientation and health-related outcomes? Findings from randomized experiment in Uganda. Journal of Adolescent Health; 2015.

36. Cluver LD, Orkin FM, Meinck F, Boyes ME, Yakubovich AR, Sherr L. Can social protection improve sustainable development goals for adolescent health?. PLoS one; 2016.

37. Heckman J, Pinto R, Savelyev P. Understanding the mechanisms through which an influential early childhood program boosted adult outcomes. American Economic Review; 2013.

38. Gibbs A, Washington L, Abdelatif N, Chirwa E, Willan S, Shai N, Sikweyiya Y, Mkhwanazi S, Ntini N, Jewkes R. Stepping Stones and Creating Futures intervention to prevent intimate partner violence among young people: cluster randomized controlled trial. Journal of Adolescent Health. 2020 Mar 1;66(3):323-35.

39. Fawzi MC, Siril H, Liu Y, McAdam K, Ainebyona D, McAdam E, Somba M, Oljemark K, Mleli N, Lienert J, Andrew I. Agents of change among people living with HIV and their social networks: stepped-wedge randomised controlled trial of the NAMWEZA intervention in Dar es Salaam, Tanzania. BMJ global health. 2019 May 1;4(3).

40. Kakuma R, Kleintjes S, Lund C, Drew N, Green A, Flisher AJ. Mental Health Stigma: What is being done to raise awareness and reduce stigma in South Africa?. African Journal of Psychiatry. 2010;13(2).

41. Dawson KS, Watts S, Carswell K, Shehadeh MH, Jordans MJ, Bryant RA, Miller KE, Malik A, Brown FL, Servili C, van Ommeren M. Improving access to evidence-based interventions for young adolescents: Early Adolescent Skills for Emotions (EASE). World Psychiatry. 2019 Feb;18(1):105.

42. Carswell K, Harper-Shehadeh M, Watts S, van't Hof E, Ramia JA, Heim E, Wenger A, van Ommeren M. Step-by-Step: a new WHO digital mental health intervention for depression. Mhealth. 2018;4.

43. Desrosiers A, Kumar P, Dayal A, Alex L, Akram A, Betancourt T. Diffusion and spillover effects of an evidence-based mental health intervention among peers and caregivers of high risk youth in Sierra Leone: study protocol. BMC psychiatry. 2020 Dec;20(1):1-1.

44. Baksheev GN, Allott K, Jackson HJ, McGorry PD, Killackey E. Predictors of vocational recovery among young people with first-episode psychosis: findings from a randomized controlled trial. Psychiatric rehabilitation journal. 2012 Dec;35(6):421.

45. Ssewamala FM, Neilands TB, Waldfogel J, Ismayilova L. The impact of a comprehensive microfinance intervention on depression levels of AIDS-orphaned children in Uganda. Journal of Adolescent Health. 2012 Apr 1;50(4):346-52.

46. Kim J, Ferrari G, Abramsky T, Watts C, Hargreaves J, Morison L, Phetla G, Porter J, Pronyk P. Assessing the incremental effects of combining economic and health interventions: the IMAGE study in South Africa. Bulletin of the World Health Organization. 2009;87:824-32.

47. Kivumbi A, Byansi W, Ssewamala FM, Proscovia N, Damulira C, Namatovu P. Utilizing a family-based economic strengthening intervention to improve mental health wellbeing among female adolescent orphans in Uganda. Child and adolescent psychiatry and mental health. 2019 Dec;13(1):14.

48. Rodgers YV, Milewska M. Food assistance through the school system: Evaluation of the Food for Kids program. Journal of Children and Poverty. 2007 Mar 1;13(1):75-95.

49. Gertler P, Heckman J, Pinto R, Zanolini A, Vermeersch C, Walker S, Chang SM, Grantham-McGregor S. Labor market returns to an early childhood stimulation intervention in Jamaica. Science. 2014 May 30;344(6187):998-1001.

50. Bell CC, t Gibbons R, McKay MM. Building protective factors to offset sexually risky behaviors among black youths: a randomized control trial. Journal of the National Medical Association. 2008 Aug 1;100(8):936-44.

51. Annan J, Sim A, Puffer ES, Salhi C, Betancourt TS. Improving mental health outcomes of Burmese migrant and displaced children in Thailand: A community-based randomized controlled trial of a parenting and family skills intervention. Prevention Science. 2017 Oct 1;18(7):793-803.

52. Betancourt TS, Ng LC, Kirk CM, Brennan RT, Beardslee WR, Stulac S, Mushashi C, Nduwimana E, Mukunzi S, Nyirandagijimana B, Kalisa G. Family-based promotion of mental health in children affected by HIV: a pilot randomized controlled trial. Journal of Child Psychology and Psychiatry. 2017 Aug;58(8):922-30.

53. Shah R, DeFrino D, Kim Y, Atkins M. Sit down and play: a preventive primary care-based program to enhance parenting practices. Journal of child and family studies. 2017 Feb 1;26(2):540-7.

54. Tolan PH, McKay MM. Preventing serious antisocial behavior in inner-city children: An empirically based family intervention program. Family Relations. 1996 Apr 1:148-55.

55. World Health Organization. *Thinking Healthy: A Manual for Psychosocial Management of Perinatal Depression* (WHO generic field-trial version 1.0). Geneva, WHO, 2015.

56. Sikander S, Lazarus A, Bangash O, Fuhr DC, Weobong B, Krishna RN, Ahmad I, Weiss HA, Price L, Rahman A, Patel V. The effectiveness and cost-effectiveness of the peer-delivered Thinking Healthy Programme for perinatal depression in Pakistan and India: the SHARE study protocol for randomised controlled trials. Trials. 2015 Dec 1;16(1):534.

57. Bick J, Zhu T, Stamoulis C, Fox NA, Zeanah C, Nelson CA. Effect of early institutionalization and foster care on long-term white matter development: a randomized clinical trial. JAMA pediatrics. 2015 Mar 1;169(3):211-9.

58. Marques AH, Oliveira PA, Scomparini LB, Silva UM, Silva AC, Doretto V, de Medeiros Filho MV, Scivoletto S. Front Psychiatry. 2015 Jul 30;6:102.

59. Pronyk PM, Hargreaves JR, Kim JC, Morison LA, Phetla G, Watts C, Busza J, Porter JD. Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial. The lancet. 2006 Dec 2;368(9551):1973-83.

60. Kumakech E, Cantor-Graae E, Maling S, Bajunirwe F. Peer-group support intervention improves the psychosocial well-being of AIDS orphans: Cluster randomized trial. Social Science & Medicine. 2009 Mar 1;68(6):1038-43.

61. Qouta SR, Palosaari E, Diab M, Punamaki RL: Intervention effectiveness among war-affected children: a cluster randomized controlled trial on improving mental health. J Trauma Stress 2012 2012, 25(3):288–298.

62. McMullen J, O'callaghan P, Shannon C, Black A, Eakin J. Group trauma-focused cognitive-behavioural therapy with former child soldiers and other war-affected boys in the DR Congo: A randomised controlled trial. Journal of Child Psychology and Psychiatry. 2013 Nov;54(11):1231-41.

63. Karam EG, Fayyad J, Karam AN, Tabet CC, Melhem N, Mneimneh Z, Dimassi H. Effectiveness and specificity of a classroom-based group intervention in children and adolescents exposed to war in Lebanon. World Psychiatry. 2008 Jun;7(2):103.

64. Shooshtary MH, Panaghi L, Moghadam JA. Outcome of cognitive behavioral therapy in adolescents after natural disaster. Journal of Adolescent Health. 2008 May 1;42(5):466-72.

65. Sijbrandij M, Acarturk C, Bird M, Bryant RA, Burchert S, Carswell K, de Jong J, Dinesen C, Dawson KS, El Chammay R, van Ittersum L. Strengthening mental health care systems for Syrian refugees in Europe and the Middle East: integrating scalable psychological interventions in eight countries. European Journal of Psychotraumatology. 2017 Nov 24;8(sup2):1388102.

66. Khamis V, Macy R, Coignez V. The impact of the classroom/community/camp-based intervention (CBI) program on Palestinian children. USA: Save the Children. 2004 Jun.

67. Ager A, Akesson B, Stark L, Flouri E, Okot B, McCollister F, Boothby N. The impact of the school-based Psychosocial Structured Activities (PSSA) program on conflict-affected children in northern Uganda. Journal of child psychology and psychiatry. 2011 Nov;52(11):1124-33.

68. Srikala B, Kishore KK. Empowering adolescents with life skills education in schools–School mental health program: Does it work?. Indian Journal of psychiatry. 2010 Oct;52(4):344.

69. Rivet-Duval E, Heriot S, Hunt C. Preventing adolescent depression in Mauritius: A universal school-based program. Child and Adolescent Mental Health. 2011 May;16(2):86-91.

70. Huang KY, Nakigudde J, Calzada E, Boivin MJ, Ogedegbe G, Brotman LM. Implementing an early childhood school-based mental health promotion intervention in low-resource

Ugandan schools: study protocol for a cluster randomized controlled trial. Trials. 2014 Dec;15(1):471.