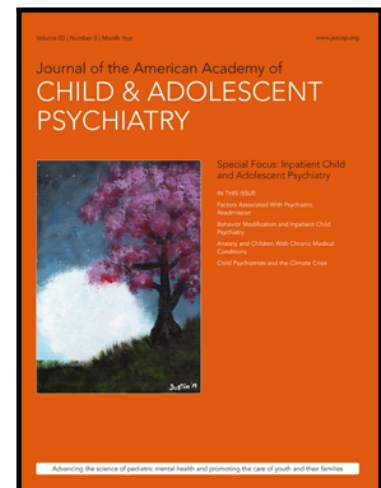


Journal Pre-proof

Editors' Note and Special Communication: Research Priorities in Child and Adolescent Mental Health Emerging From the COVID-19 Pandemic



Douglas K. Novins MD , Joel Stoddard MD, MAS ,
Robert R. Althoff MD, PhD , Alice Charach MD, MSc, FRCPC ,
Samuele Cortese MD, PhD , Kathryn Regan Cullen MD ,
Jean A. Frazier MD , Stephen J. Glatt PhD ,
Schuyler W. Henderson MD, MPH , Ryan J. Herringa MD, PhD ,
Leslie Hulvershorn MD, MSc , Christian Kieling MD, PhD ,
Anne B. McBride MD , Elizabeth McCauley PhD, ABPP ,
Christel M. Middeldorp MD, PhD , Angela M. Reiersen MD, MPE ,
Carol M. Rockhill MD, PhD, MPH , Adam J. Sagot DO, FAPA ,
Lawrence Scahill PhD , Emily Simonoff MD, FRCPsych ,
S. Evelyn Stewart MD , Eva Szigethy MD, PhD ,
Jerome H. Taylor MD , Tonya White MD, PhD ,
Bonnie T. Zima MD, PhD

PII: S0890-8567(21)00153-2
DOI: <https://doi.org/10.1016/j.jaac.2021.03.005>
Reference: JAAC 3387

To appear in: *Journal of the American Academy of Child & Adolescent Psychiatry*

Accepted date: 9 March 2021

Please cite this article as: Douglas K. Novins MD , Joel Stoddard MD, MAS ,
Robert R. Althoff MD, PhD , Alice Charach MD, MSc, FRCPC , Samuele Cortese MD, PhD ,
Kathryn Regan Cullen MD , Jean A. Frazier MD , Stephen J. Glatt PhD , Schuyler W. Henderson MD, MPH ,
Ryan J. Herringa MD, PhD , Leslie Hulvershorn MD, MSc , Christian Kieling MD, PhD ,
Anne B. McBride MD , Elizabeth McCauley PhD, ABPP , Christel M. Middeldorp MD, PhD ,
Angela M. Reiersen MD, MPE , Carol M. Rockhill MD, PhD, MPH , Adam J. Sagot DO, FAPA ,
Lawrence Scahill PhD , Emily Simonoff MD, FRCPsych , S. Evelyn Stewart MD ,
Eva Szigethy MD, PhD , Jerome H. Taylor MD , Tonya White MD, PhD , Bonnie T. Zima MD, PhD ,
Editors' Note and Special Communication: Research Priorities in Child and Adolescent Mental Health
Emerging From the COVID-19 Pandemic, *Journal of the American Academy of Child & Adolescent
Psychiatry* (2021), doi: <https://doi.org/10.1016/j.jaac.2021.03.005>

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Editors' Note and Special Communication: Research Priorities in Child and Adolescent Mental Health
Emerging From the COVID-19 Pandemic

RH = Editors' Note

Accepted March 11, 2021

Douglas K. Novins, MD, Joel Stoddard, MD, MAS, Robert R. Althoff, MD, PhD, Alice Charach, MD, MSc, FRCPC, Samuele Cortese, MD, PhD, Kathryn Regan Cullen, MD, Jean A. Frazier, MD, Stephen J. Glatt, PhD, Schuyler W. Henderson, MD, MPH, Ryan J. Herringa, MD, PhD, Leslie Hulvershorn, MD, MSc, Christian Kieling, MD, PhD, Anne B. McBride, MD, Elizabeth McCauley, PhD, ABPP, Christel M. Middeldorp, MD, PhD, Angela M. Reiersen, MD, MPE, Carol M. Rockhill, MD, PhD, MPH, Adam J. Sagot, DO, FAPA, Lawrence Scahill, PhD, Emily Simonoff, MD, FRCPsych, S. Evelyn Stewart, MD, Eva Szigethy, MD, PhD, Jerome H. Taylor, MD, Tonya White, MD, PhD, Bonnie T. Zima, MD, PhD

Dr. Novins, Editor-in-Chief, and Dr. Stoddard, Editorial Board member, are with the University of Colorado Anschutz Medical Campus, Aurora. Dr. Althoff, Associate Editor, is with the University of Vermont, Burlington. Dr. Charach is with The Hospital for Sick Children, Toronto, Ontario, Canada. Dr. Cortese, Deputy Editor, the Center for Innovation in Mental Health, Academic Unit of Psychology, Faculty of Environmental and Life Sciences; Clinical and Experimental Sciences (CNS and Psychiatry), Faculty of Medicine, University of Southampton, United Kingdom; Solent NHS Trust, Southampton, United Kingdom; New York University Child Study Center, New York; and the Division of Psychiatry and Applied Psychology, School of Medicine, University of Nottingham, United Kingdom. Dr. Cullen, Editorial Board member, is with the University of Minnesota, Minneapolis. Dr. Frazier, Deputy Editor, is with University of Massachusetts Medical School, Worcester. Dr. Glatt, Editor-At-Large for Methodology and Statistics, is with SUNY Upstate Medical University, Syracuse, New York. Dr. Henderson, Deputy Editor, is with New York University Langone School of Medicine, New York, and Bellevue Hospital, New York. Dr. Herringa, Editorial Board member, is with the University of Wisconsin Madison School of Medicine and Public Health, Madison. Dr. Kieling, International Editor-at-Large, is with Federal University of Rio Grande do Sul, Porto Alegre, Brazil. Dr. Hulvershorn, Editorial Board member, is with Indiana University School of Medicine, Indianapolis. Dr. McBride, John F. McDermott, MD, Assistant Editor-In-Residence, is with University of California, Davis. Dr. McCauley, Deputy Editor, is with Seattle Children's Hospital, Washington. Dr. Middeldorp, International Editor-at-Large, is with the University of Queensland, Brisbane, Australia. Dr. Reiersen, Editor-At-Large for Methodology and Statistics, is with Washington University School of Medicine, St. Louis, Missouri. Dr. Rockhill, Editorial Board member, is with Seattle Children's Hospital, Washington. Dr. Sagot, *JAACAP Connect* Editorial Board member, is with the University of Pennsylvania Perelman School of Medicine, Philadelphia. Dr. Scahill, Consulting Editor, is with Emory University, Atlanta, Georgia. Dr. Simonoff, Editorial Board member, is with King's College London, United Kingdom. Dr. Stewart, Editorial Board member, is with the University of British Columbia, Vancouver. Dr. Szigethy, Editorial Board member, is with the University of Pittsburgh Medical Center, Pennsylvania. Dr. Taylor, Former Contributing Editor, is with Children's Hospital of Philadelphia, Pennsylvania. Dr. White, Deputy Editor, is with Erasmus University Medical Centre – Sophia Children's Hospital, Rotterdam, The Netherlands. Dr. Zima, Consulting Editor, is with University of California, Los Angeles.

The authors have reported no funding for this work.

This study was determined to be exempt from human subjects regulations by the Colorado Multiple Institutional Review Board.

Author Contributions

Conceptualization: Novins, Stoddard, Althoff, Charach, Cortese, Cullen, Frazier, Glatt, Henderson, Herringa, Hulvershorn, Kieling, McBride, McCauley, Middeldorp, Reiersen, Rockhill, Sagot, Scahill, Simonoff, Stewart, Szigethy, Taylor, White, Zima

Data curation: Novins

Formal analysis: Novins, Stoddard, Althoff, Charach, Cortese, Cullen, Frazier, Glatt, Henderson, Hulvershorn, Kieling, McBride, McCauley, Middeldorp, Reiersen, Rockhill, Sagot, Scahill, Simonoff, Szigethy, Taylor

Investigation: Novins, Stoddard, Althoff, Charach, Cortese, Cullen, Frazier, Glatt, Henderson, Herringa, Hulvershorn, Kieling, McBride, McCauley, Middeldorp, Reiersen, Rockhill, Sagot, Scahill, Simonoff, Stewart, Szigethy, Taylor, White, Zima

Methodology: Novins, Stoddard, Althoff, Charach, Cortese, Cullen, Frazier, Glatt, Henderson, Herringa, Hulvershorn, Kieling, McBride, McCauley, Middeldorp, Reiersen, Rockhill, Sagot, Scahill, Simonoff, Stewart, Szigethy, Taylor, White, Zima

Project administration: Novins

Resources: Novins, Stoddard

Software: Novins, Stoddard

Supervision: Novins

Validation: Novins, Stoddard, Althoff, Charach, Cortese, Cullen, Frazier, Glatt, Henderson, Hulvershorn, Kieling, McBride, McCauley, Middeldorp, Reiersen, Rockhill, Sagot, Scahill, Simonoff, Szigethy, Taylor

Visualization: Novins

Writing – original draft: Novins, Stoddard

Writing – review and editing: Novins, Stoddard, Althoff, Charach, Cortese, Cullen, Frazier, Glatt, Henderson, Herringa, Hulvershorn, Kieling, McBride, McCauley, Middeldorp, Reiersen, Rockhill, Sagot, Scahill, Simonoff, Stewart, Szigethy, Taylor, White, Zima

ORCID

Douglas K. Novins, MD: <https://orcid.org/0000-0003-4475-8596>

Joel Stoddard, MD, MAS: <https://orcid.org/0000-0003-4070-4566>

Robert R. Althoff, MD, PhD: <https://orcid.org/0000-0002-5673-7613>

Alice Charach, MD, MSc, FRCPC: <https://orcid.org/0000-0001-9756-4328>

Samuele Cortese, MD, PhD: <https://orcid.org/0000-0001-5877-8075>

Kathryn Regan Cullen, MD: <https://orcid.org/0000-0001-9631-3770>

Jean A. Frazier, MD: <https://orcid.org/0000-0001-7055-3530>

Stephen J. Glatt, PhD: <https://orcid.org/0000-0002-0360-7567>

Schuyler W. Henderson, MD, MPH: <https://orcid.org/0000-0001-9271-2846>

Ryan J. Herringa, MD, PhD: <https://orcid.org/0000-0002-1936-7959>

Leslie Hulvershorn, MD, MSc: <https://orcid.org/0000-0001-5827-4889>

Christian Kieling, MD, PhD: <https://orcid.org/0000-0001-7691-4149>

Anne B. McBride, MD: <https://orcid.org/0000-0002-6320-4831>

Elizabeth McCauley, PhD, ABPP: <https://orcid.org/0000-0001-9763-9262>

Christel Middeldorp, MD, PhD: <https://orcid.org/0000-0002-6218-0428>

Angela M. Reiersen, MD, MPE: <https://orcid.org/0000-0003-3203-4590>

Carol M. Rockhill, MD, PhD, MPH: <https://orcid.org/0000-0001-5799-9706>

Adam J. Sagot, DO, FAPA: <https://orcid.org/0000-0002-4393-5346>

Lawrence Scahill, PhD: <https://orcid.org/0000-0001-5073-1707>

Emily Simonoff, MD, FRCPsych: <https://orcid.org/0000-0002-5450-0823>

S. Evelyn Stewart, MD: <https://orcid.org/0000-0002-0994-6383>

Eva Szigethy, MD, PhD: <https://orcid.org/0000-0001-6783-581X>

Jerome H. Taylor, MD: <https://orcid.org/0000-0003-2787-6232>

Tonya White, MD, PhD: <https://orcid.org/0000-0003-0271-1896>

Bonnie T. Zima, MD, PhD: <https://orcid.org/0000-0002-5542-1879>

The authors consist of members of the Masthead of the *Journal of the American Academy of Child and Adolescent Psychiatry* and its companion journal, *JAACAP Connect*. The authors acknowledge the contributions of Nicole King Cotton, MD, of Morehouse School of Medicine, Stacy S. Drury, MD, PhD, of Tulane University, Lasha D. Shah, MD, of Icahn School of Medicine at Mount Sinai, Chad M. Sylvester, MD, PhD, of Washington University School of Medicine, and Peter Szatmari, MD, of University of Toronto, in the design of the survey methods. The authors also acknowledge the contributions of Mary Billingsley, ELS, *JAACAP* Managing Editor, in editing this manuscript and preparing it for publication.

Disclosure: Dr. Novins has received grant or research support from the National Institutes of Health and the Administration for Children and Families. Dr. Stoddard has received grant or research support from the National Institute of Mental Health. He has served as a DSMB committee member: Threat Interpretation Bias as Cognitive Marker and Treatment Target in Pediatric Anxiety (R61 Phase). Dr. Althoff has received grant or research support from the National Institute of Mental Health, the National Institute on Drug Abuse, and the Klingenstein Third Generation Foundation. He has served on the editorial board of *Child Psychiatry and Human Development* and as consulting editor of the *Journal of Clinical Child and Adolescent Psychology*. He has received honoraria from Massachusetts General Hospital Psychiatry Academy and Frontline Medical Communications, Inc. He is a partner of WISER Systems, LLC. Dr. Charach has received grants or research funding from the Canadian Institutes of Health Research, the Ontario Ministry of Health, the University of Toronto Department of Psychiatry, the University of Toronto Edwin S.H. Leong Centre for Healthy Children, and SickKids Centre for Brain and Mental Health. Dr. Cortese has served as deputy editor of *Evidence-Based Mental Health*, associate editor of *Child and Adolescent Mental Health*, and on the editorial boards of the *Journal of Child Psychology and Psychiatry*, the *Journal of Child and Adolescent Psychopharmacology*, and *CNS Drugs*. He has received honoraria from the Association for Child and Adolescent Mental Health, the British Association for Psychopharmacology, Healthcare Convention, and the Canadian ADHD Resource Alliance. Dr. Frazier has received grant or research support from the the National Institute of Mental Health, the Eunice Kennedy Shriver National Institute of Child Health and Human Development, Fulcrum Therapeutics, and Roche. She has served on the editorial board of the *Harvard Review of Psychiatry* and as associate editor of the *Journal of Child and Adolescent Psychopharmacology*. Dr. Glatt has received grant or research support from the National Institutes of Health and the National Science Foundation. He has served as a consultant to Cohen Veterans Bioscience. He has received book royalties from Oxford University Press. Dr. Herringa has received grant or research support from the National Institute of Mental Health. Dr. Hulvershorn has received grant or research support from the National Institutes of Health, the Substance Abuse and Mental Health Services Administration, the Indiana Family and Social Services Agency, Merck, and Greenwich Biosciences. Dr. Kieling has received research support from Brazilian governmental research funding agencies: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), and Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul (Fapergs); from the UK funding agencies MQ: Transforming Mental Health, the Academy of Medical Sciences, and the Royal Academy of Engineering; and from the US National Institutes of Health. He has served on the editorial boards of *Archives of Clinical Psychiatry*, *Global Mental Health*, *Jornal Brasileiro de Psiquiatria*, and *Social Science and Medicine - Mental Health*. He has received authorship royalties from Brazilian publishers Artmed and Editora Manole. Dr. McBride has received royalties from American Psychiatric Publishing, Inc. Dr.

McCauley has received grant or research support from the National Institute of Mental Health, the Institute of Education Sciences - US Department of Education, the American Foundation for Suicide Prevention, and the Scooty Fund. She has served as a consultant to King County Public Health—School-Based Mental Health Programs and School Mental Health, Ontario. She has received honoraria for trainings for school-based mental health providers on a Brief Intervention for School Clinicians (BRISC). She has received book royalties from Guilford Press for *Behavioral Activation with Adolescents: A Clinician's Guide* and Academic Media Solutions for a psychology textbook. Dr. Middeldorp has received grant or research support from the National Health and Medical Research Council, the European Union, the National Mental Health Research Committee, and the Australian ADHD Professional Association. She has served as associate editor of the *American Journal of Medical Genetics Part B*. Dr. Reiersen has received grant or research support from the National Institutes of Health, the McDonnell Center for Systems Neuroscience, and the McDonnell Center for Cellular and Molecular Neurobiology. She has received travel support from the Child and Adolescent Psychiatric Department, Region Zealand (Denmark hospital) and Wolfram Syndrome UK. Dr. Scahill has received grant or research support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the US Department of Defense, and the Marcus Foundation. He is a co-author of the Children's Yale–Brown Obsessive Compulsive Scale (CYBOCS), the Children's Yale–Brown Obsessive Compulsive Scale modified for Autism Spectrum Disorder (CYBOCS-ASD), and the Parent-Rated Anxiety Scale for youth with autism spectrum disorders (PRAS-ASD). He has served as a consultant to Roche, Impel NeuroPharma, Inc., Yamo Pharmaceuticals, and Teva Pharmaceutical Industries. He has served as associate editor of the *Journal of Child and Adolescent Psychopharmacology* and on the editorial board of the *International Journal of Developmental Disabilities*. He has received royalties from Guilford Press, Oxford University Press, and American Psychiatric Association Publishing. Dr. Simonoff has received grant or research support from the UK National Institute of Health Research, the European Commission, the UK Economic and Social Research Council, the UK Medical Research Council, the National Institute of Health Research Biomedical Research Centre at South London and Maudsley Foundation, the Psychiatry Research Trust, the Guy's and St. Thomas' Charitable Foundation Trust, and the Maudsley Charity. She has served on the advisory boards of the European ADHD Guidelines Group, Eunethydis, the Autistica Mental Health Steering Group, the National Autism Project Board, the Medical Research Council Neuroscience and Mental Health Board, the Central Institute for Mental Health, Mannheim, Germany, and the Oak Foundation. She is author of the assessment tools *Assessment of Consuming Behaviour* (copyright, Santosh and Simonoff, manuscript in preparation) and *Observation Schedule for Children with Autism* (in preparation). She has served on the editorial board of the *British Journal of Psychiatry*. She has received honoraria from the Royal College of Physicians as Senior Clinical Advisor for the National Institute of Health and Care Excellence. Dr. Stewart has received grant or research support from the Michael Smith Foundation for Health Research and the International OCD Foundation. She has served on the Scientific Advisory Board of the International OCD Foundation and on the Scientific Advisory Committee of Anxiety Canada. She is an author of the OCD Family Functioning (OFF) Scale and the Personal Impact of Coronavirus Survey (PICS). She has served on the editorial boards of the *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, *Annals of Clinical Psychiatry*, and the *Canadian Journal of Psychiatry*. She has received honoraria from the University of Colorado for 2019-20 Brewster Visiting Professorship and the Canadian Academy of Child and Adolescent Psychiatry for keynote speaker talk. She has received travel expenses from the University of Colorado and the Canadian Academy of Child and Adolescent Psychiatry. She has received anonymous donor funding support. Dr. Szigethy has received grant or research support from the National Institutes of Health and the Patient-Centered Outcomes Research Institute. She has received book royalties from APPI for co-editing *Cognitive-Behavior Therapy for Children and Adolescents*. She has served on the speakers' bureau of Janssen. Dr. White has received grant or research support from the Sophia Children's Hospital Foundation, the Dutch Research Council

(Nationale wetenschappelijke organisatie; NWO), and the US National Institutes of Health. She has served on the scientific advisory board/DSMB of the University of Bergen Center for Brain Plasticity. She is the Editor-in-Chief of *Aperture Neuro* and has served on the editorial board of *Neuroinformatics*. Dr. Zima has received grant or research support from the Substance Abuse and Mental Health Services Administration, the California Mental Health Services Act (SB82-833), and the California Bureau for Cannabis Control. She has served as deputy editor to the *Journal of Child and Adolescent Psychopharmacology* and as consulting editor to the *Journal of Clinical Child and Adolescent Psychology* and the *Journal of Emotional and Behavioral Disorders*. Drs. Cullen, Henderson, Rockhill, Sagot, and Taylor have reported no biomedical financial interests or potential conflicts of interest.

Correspondence to Douglas K. Novins, MD, University of Colorado Anschutz Medical Campus, Departments of Psychiatry and Community and Behavioral Health, Children's Hospital Colorado 13123 East 16th Avenue, B13013055 East 17th Avenue, Aurora, CO 80045; e-mail: dnovins@jaacap.org

Over the last year, the coronavirus disease 2019 (COVID-19) pandemic has resulted in profound disruptions across the globe, with school closures, social isolation, job loss, illness, and death affecting the lives of children and families in myriad ways. In an Editor's Note in our June 2020 issue,¹ our senior editorial team described this *Journal's* role in advancing knowledge in child and adolescent mental health during the pandemic and outlined areas we identified as important for science and practice in our field. Since then, the *Journal* has published articles on the impacts of the pandemic on child and adolescent mental health and service systems,²⁻⁵ which are available in a special collection accessible through the *Journal's* website.⁶ Alongside many opinion papers, the pace of publication of empirical research in this area is rapidly expanding, covering important issues such as increased frequency of mental health symptoms among children and adolescents^{3,5,7-10} and changes in patterns of clinical service utilization such as emergency department visits.¹¹⁻¹⁴

As the Senior Editors prepared that *Editors' Note*, they were acutely aware that the priorities they identified were broad and generated by only a small group of scientists and clinicians. Although this had the advantage of enabling us to get this information out to readers quickly, we decided that a more systematic approach to developing recommendations for research priorities would be of greater long-term value. We were particularly influenced by the efforts of the partnership between the UK Academy of Medical Scientists and a UK mental health research charity (MQ: Transforming Mental Health) to detail COVID-19-related research priorities for "Mental Health Science" that was published online by Holmes *et al.* in *The Lancet Psychiatry* in April 2020.¹⁵ Consistent with its focus on mental health research across the lifespan, several recommendations highlighted child development and children's mental health. However, a more detailed assessment of research priorities related to child and adolescent mental health was beyond the scope of that paper. Furthermore, the publication of that position paper preceded the death of George Floyd at the hands of Minneapolis police on May 25, 2020, which re-energized efforts to acknowledge and address racism and healthcare disparities in the United States and many other countries.

To build upon the JAACAP Editors' Note¹ and the work of Holmes *et al.*,¹⁵ we conducted an international survey of professionals - practitioners and researchers - working on child and adolescent development and pediatric mental health to identify concerns about the impact of the pandemic on

children, adolescents, and their families, what is helping families navigate these impacts, and the specific research topics that are of greatest importance.

METHOD

Between June 30 and July 26, 2020, participants were recruited through outreach to professional societies, including the American Academy of Child and Adolescent Psychiatry, Royal Australian and New Zealand College of Psychiatry, and social media groups of child development and mental health professionals (eg, The International Association for Child and Adolescent Psychiatry and Allied Professions) across the world to complete a brief online survey. Three open-ended questions covered domains comparable to the community survey included in Holmes *et al.*'s position paper:¹⁵ 1) *what are you most concerned about in terms of the impacts of the COVID-19 pandemic on health, child development, families, and child and adolescent mental health?*; 2) *what do you think has been most helpful to children, adolescents, and families during the course of the pandemic?*; and 3) *what are the top 3 research questions you believe we need to address regarding the pandemic and the mental health of children, adolescents, and their families?* The survey also included demographic questions such as age group, gender identity, race, ethnicity, and area of residence. The full survey is included in Supplement 1, available online.. This study was determined to be exempt from human subjects regulations by the Colorado Multiple Institutional Review Board.

Responses to the open-ended questions were analyzed using two methods. First, we used a commonly-utilized natural language analysis technique, latent Dirichlet allocation based topic modeling¹⁶ to identify the most common themes for each of the 3 open-ended questions. For the question focused on research priorities, this unsupervised machine learning approach complemented the labor-intensive approach of verifying the most common concerns of our respondents, described below. For each open-ended question, *perplexity*, a traditional statistic for evaluating topic models, informed the choice of a number of topics, k . Lower values of perplexity represent a better fit when comparing two values of k . The *topics* are latent themes that the model estimates best explain all responses to a question. Only topics with a large representation across all responses are reported. For each question, topics are assigned a probability value. This is the likelihood that the topic is represented in responses relative to other topics over the entire response set to a question. All probability values for topics sum to 1, so a probability value for a topic is only meaningful in comparison to all the other topics in the set. For reference, many topics have a probability value near zero (eg, median values $\sim .01$). Topic modeling was done in MATLAB¹⁷ version R2020b using standard procedures in the Text Analytics Toolbox. Code is posted at [joelStod/COVIDlda \(github.com\)](https://github.com/joelStod/COVIDlda).

Second, for the open-ended question on research priorities, we identified 7 *a priori* domains of research (measurement; genetics and epigenetics; biomarkers; neuroscience; prevention, treatment, and service delivery; social determinants of health; epidemiology). For each of these 7 domains, two or more authors conducted a thematic analysis of the open-ended responses to identify specific topics within each domain of research.¹⁸⁻²⁰ Authors independently coded 50 responses at a time which they then compared and discussed, building a codebook for each research domain and addressing coding discrepancies. During this coding process, social determinants of health were combined with epidemiology research domain because of the substantial overlap of identified themes. Biomarkers,

genetics, epigenetics, and neuroscience areas were similarly combined. Once agreement was established between coders, the remaining responses were divided across authors, again working in groups of two or more to assure continued discussion and agreement on codes, and coding was completed. There were no responses directly related to measurement.

For both the natural language and thematic analyses, individual participant responses could contribute to more than one topic and/or theme. Findings from both analytic approaches are summarized below and include illustrative quotes from survey participants.

RESULTS

Six hundred and eighty-one participants provided answers to at least one of the 3 open-ended questions. Their characteristics are summarized in Table 1. The majority of participants were between 25-50 years old (54%), female (59%), resided in the United States (69%) and in urban areas (54%), and reported they were completing the survey from the perspective of a mental health care provider (68%). Participant race and ethnicity were queried as open-ended questions given the international scope of the survey. The majority of participants chose not to respond to the question (65%). Among those who responded, the majority were White (59%).

[Table 1 About Here]

Table 2 summarizes the results of the natural language analyses for the open-ended questions regarding greatest concerns for children, adolescents, and families, and what has been most helpful for them, respectively. Word clouds for each of these topic areas are reported in Figures S1 and S2, available online. As reflected in the high χ^2 's, we expected and discovered high diversity of themes. For the question regarding greatest concerns, $\chi^2=100$, with the 5 most probable topics representing 23% of the topic probability and the remaining 77% of topic probability distributed over 95 topics. For the question two regarding what has been most helpful, $\chi^2=50$, with the 5 most probable topics also accounting for 23% of the topic probability and the remaining 77% of topic probability distributed over 45 topics.

[Table 2 About Here]

What are you most concerned about in terms of the impacts of the COVID-19 pandemic on health, child development, families, and child and adolescent mental health? - Natural Language Analysis

The leading topic was concerns about **increased stress in families** with a topic probability of 5.8% (Quote [Q] 1A: *The effect on the economy, leading to stress in families, leading to worsening child mental health; Q1B: For families, the lack of childcare is disproportionately impacting women, who are unable to work, and leading to increased financial and emotional stress within the home; Q1C: The impact of parents' increased stress - this pandemic has stretched everyone's reserve of resilience, energy and motivation. As parent stress increases, children and youth are increasingly stressed*). This was followed by concerns about the **effects of the pandemic on children** (topic probability of 5.2%; Q1D: *My*

major concern is the further deterioration of children and families in rural areas which are pathetically under-served by C&A Psychiatrists. Included in this group is foster children and adolescents. Many of these children do not have enough nutritious food, basic medical care, or resources for in-home schooling. The devastation to them and their families is very clear; I have significant concerns about children and adolescents with special needs being unable to succeed academically using online schooling; Q1E: Impact of quarantine and ACES [adverse childhood experiences] for children and developmental outcomes), concerns about **increased rates of abuse and domestic violence** (topic probability of 5.1%; Q1F: More reports of child abuse/domestic violence; Increased exposure to domestic violence due to lockdown) concerns about the **impact of the pandemic on child development, especially social development**, (topic probability of 4.5%; Q1G: The long-term psychological, social, and academic impacts remote and reduced in-person learning will have on child development; Q1H: The impact of social isolation on peer relationships/social development), and **impacts on child and adolescent mental health** (topic probability of 2.8%; Q1I: The increase in anxiety that the COVID-19 pandemic has caused which has exacerbated the mental health issues of those already suffering and created new symptoms in those that have not had mental illness).

What do you think has been most helpful to children, adolescents, and families during the course of the pandemic? - Natural Language Analysis

The most commonly endorsed topic was **material support for families** with a topic probability of 5.7% (Q2A: Direct financial support to parents. Direct food aid to families who need assistance; Q2B: Government unemployment assistance, school food programs; emotional and financial support for families). This was followed by **parents and children learning more about each other** (topic probability of 5.4%; Q2C: more personal time with parents, parents learning more about what their children are learning; more time at home with parents and siblings. Parents are getting to see their children in new light - their strengths and weaknesses in the context of completing school work. Similarly children are getting to see their parents work, which was the case for human history during agricultural period, and this can increase bidirectional understanding), **access to health care** (topic probability of 4.6%; Q2D: Reliable access to appropriate services in education, health - including mental health, and social care; Q2E: ability to access MH [mental health] care through telemedicine), **flexibility to spend time with family** (topic probability of 4.1%; Q2F: Increased time at home for families {eg, caretakers working from home}; When parental employment has been flexible enough to allow parents to be away from work and either facilitate remote learning or just be with their kids, without panic over making ends meet. Too rare, though!), and **more quality time for children and their families** (topic probability of 3.6%; Q2G: Families who are solid have spent more time together. But families who were struggling do not always benefit from more together time).

Research Priorities - What are the top 3 research questions you believe we need to address regarding the pandemic and the mental health of children, adolescents, and their families?

Thematic Analyses

Results of the thematic analyses are summarized here, with illustrative quotes, and are reported in Table 3. The most common research priorities were related to epidemiology and social determinants of health, with 80% of participants describing at least one such theme followed by research related to prevention, treatment, and service system response (59%) and research related to biomarkers and neuroscience (30%).

[Table 3 About Here]

Epidemiology and Social Determinants of Health. Priorities in this area of research grouped into the following major areas: 1) exposures during the pandemic that might affect children, 2) effects of the pandemic on children and their outcomes, and 3) risk modifiers (both social determinants of health and resilience).

The most common exposure-related themes included the **closure of schools and virtual/online schooling** (17% of participants; Q3A: 1) *Impact of isolation on social/emotional development?* 2) *Impact of virtual schooling in cognitive development in younger children?*, 3) *Effect of schools being closed on depression and anxiety?*), **social isolation** (16% of participants; Q3B: *How has social isolation impacted children and do the effects differ based on socioeconomic factors?*, *The impact of social isolation on normal developmental milestones ie, toddlers, school age, middle school/high school age and college age young adults*), and the **effects of the pandemic on relationships within families** (12% of participants; Q3C: *What symptoms are most likely occur in children and youth in relation to the level of caretaker and family stress during this epidemic?*, *Have family attachments improved due to being shut down together?*).

Priorities related to the **effects of the COVID-19 pandemic on child and adolescent mental health** were the most common outcome-related themes (53% of participants; Q3D: *Determining rates of depression, anxiety and PTSD across different SE and ethnic groups. Clarifying steps that best correlate with resilience and (+) outcomes—ie, returning to school, government \$ support?*). Other outcome-related themes included **effects on child development, including social emotional development** (13% of participants; Q3E: *impact on normal development, especially socialization?*, *How does isolation impact their social development?*), **learning and academic achievement** (13% of participants; Q3F: *how much educational ground do kids lose from online schooling?*, *Is the education loss recovered in the following school year or will we face lower scores and abilities?*), and **effects on social skills and damage to peer relationships** (9% of participants; Q3G: *To what extent has isolation related to the pandemic negatively impacted social and academic skills?*).

The most priorities related to risk modification highlighted **social determinants of health for children and adolescents who had mental health problems prior to the pandemic** (19% of participants; Q3H: *impact of COVID on symptom levels among youth with pre-existing mental health conditions?*, *Impact of loss of schedule/routine on children with ASD/IDD - rates of hospitalization, respite care use, medication changes?*). Statements related to **other social determinants of health such as discrimination and minoritized groups** were less common (5% and 3%, Q3I: *experience of Black children and adolescents with the double stressor of the pandemic and George Floyd's murder*). Thirteen percent of

participants included a focus on **resilience, both of the child and the family** (13% of participants; Q3J: *What makes some at-risk children resilient to the impacts of the pandemic, but not others?*).

Prevention, Treatment, and Service Systems. Priorities in this area grouped into two major areas: service system surveillance and interventions to improve services during the pandemic.

In terms of service system surveillance, the most common themes related to **access to clinical services in an equitable manner** (24% of participants; Q4A: *Effectiveness of virtual assessment and intervention with emphasis on those who do not benefit, considering equity, diversity and inclusion factors*) and **outcomes of clinical care during the pandemic** (14% of participants; Q4B: *Looking at providing telehealth on a broad scale to compare to care as usual prior to the pandemic. With less regulation and oversight, how did our profession do at taking good care of children/adolescents?*).

The most common priorities regarding interventions focused on prevention and community interventions (31% of participants), including **strategies to increase coping, wellness, and resilience** (11%; Q4C: *What are concrete ways to increase resiliency in children and adolescents?*), **strategies to mitigate the effects of the pandemic and societal responses on children** (7%; Q4D: *What strategies can be effectively used to mitigate some of the traumatizing nature of learning about the pandemic in the home?*), and **efforts to prioritize service for vulnerable populations** (6%; Q4E: *What to prioritize - how to comprehensively organize care for vulnerable families incl aspects that affect overall ability to deal w adverse events - how to adapt to virtual care / make accessible for all?*). Responses of 10% of participants focused on interventions to and for schools (15% of responses), including **interventions to support the education of children with mental health problems** (5%; Q4F: *How to get remote learning right for kids with ADHD and/or ASD?*). Clinical and service system research priorities (20% of participants) most commonly focused on **providing effective assessment and treatment services via telemental health** (13%; Q4G: *To test new ways of delivering care, digital care*). Other themes included **interventions for specific clinical issues such as obsessive-compulsive disorder** (5%) and **interventions to the service system to improve the equity of access to and quality of mental health care** (6%; Q4H: *Ways child psychiatrists can reach underserved minority families during a pandemic. How can we improve access to mental health support to all--these are more accessible to affluent people at this time?*).

Biomarkers and Neuroscience. Thirty percent of participants identified priorities related to biomarkers and neuroscience in their responses. The most common theme was related to concerns regarding the **effect of the pandemic on child and adolescent cognition and cognitive development** (21% of participants; Q5A: *What impact does a global pandemic or other global event/crisis have [on] a child's neurological development?*; Q5B: *The effect of the solitary use of computer-based learning on achievement and brain development, including the development of oral language skills/social communication {pragmatics, etc.}, auditory skills {field/ground, etc.}*) and the **direct impact of the SARS-Cov-2 virus on the brain** (7% of participants; Q5C: *What are the long term inflammatory, neurological, and psychological effects on children who have been infected with the virus, if any?*).

Natural Language Analysis

Table 2 and Figure S3, available online, summarizes the results of the natural language analyses for the open-ended question regarding COVID-19 pandemic-related research priorities. As with questions 1 and 2, we expected and discovered high diversity of themes ($n=150$). Despite the diversity of

respondents and our prompt to offer 3 recommendations, there was a remarkable convergence of topics. For example, the top 10 most probable topics represented 25% of topic probability (with the remaining 75% probability distributed over 140 topics). The findings supported the thematic analyses, as indicated by the most probable 10 topics displayed in Table 2. Finally, we used each illustrative quote provided above to query the model for topics that were most represented by that quote. The findings of this crosswalk are summarized in Table S1, available online. Quotes matched well with topics identified in this analysis.

DISCUSSION

The responses of participants of this survey, conducted in June and July of 2020 and to our knowledge the first large-scale survey of this type, appear prescient as the pandemic has continued to affect children, adolescents, and their families. Although the scholarly literature is still developing, media across the globe continue to document the ways societies have responded to the pandemic to reduce the spread of COVID-19 and how the related morbidity and mortality have affected children and their families.^{4,5,9,10,21-24} Participants in the present survey emphasized the importance of documenting these effects through research as well as developing and testing interventions to reduce them. Many of the research questions raised by participants, such as the longitudinal effects of the pandemic on vulnerable populations, as well as adjustments to preventive and clinical services, will require ongoing surveillance. The full scope of the developmental and mental health effects of the COVID-19 pandemic will be an important area of research for many years.

The most frequently described research priorities are consistent with participants' concerns regarding the impact of the pandemic as well as what they identified as most helpful to families and is summarized in Figure 1. Given the rationale for the survey and the background of the participants, it is not surprising that the effects of the COVID-19 pandemic on the mental health of children and adolescents was a research priority described by a majority of participants (53%) and was one of the 5 most common topics from participant responses regarding the impacts of the pandemic. Similarly, preventive and community interventions, service access, and equity were the most commonly endorsed services and treatment priorities (31% and 24%, respectively) and material support for families and access to health care were among the 5 most common topics regarding what was proving helpful for children and families. Finally, the impacts of the pandemic on cognitive development was the most common biomarker and neuroscience research priority (21%), which was captured by 2 of the 5 most commonly endorsed topics regarding the impacts of the pandemic, specifically impacts on children and impacts on social development.

[Figure 1 About Here]

For thematic analysis, the topics that included biomarkers, genetics, epigenetics, and neuroscience domains were combined for the purpose of analysis, and responses related to these topics were relatively rare. In particular, there were no responses that directly mentioned genetics or epigenetics, though genetics and epigenetics could potentially be included in research studies of biomarkers and neuroscience, and topics outside of the biomarkers and neuroscience category (social

determinants of health, risk and resilience factors, various aspects of mental health) could potentially be influenced by genetics, epigenetics and gene-environment interplay.

While respondents did not directly raise questions regarding research methods and measures, their responses do have implications for the conduct of research regarding the mental health effects of the COVID-19 pandemic on children and adolescents. First, we need reliable and valid measures that are able to capture the unique challenges that the COVID-19 pandemic has created, such as stress, social isolation, and trauma, as well as the mental health effects of the virus itself on infected children.

The research questions raised by survey participants span a wide variety of important topics, including adherence to public health recommendations, reactions to public health measures, rationale for individual/family behavior, effects of uncertainty around the pandemic itself (eg, when it will end, what behaviors and situations raise the risk of infection, whether the gains of in-person education outweigh the risks of exposure to others infected with COVID-19), the effects of the political environment during the pandemic, and the effects of the pandemic on child/adolescent worldview. Developing new research in these areas will necessitate the development of measures that capture these novel aspects of the pandemic and its effects. In areas where baseline and ongoing measures have already been and continue to be collected, it will be important to scrutinize the ability to capture the experiences of children and families during the pandemic, including social isolation, child development, family cohesion, unemployment, financial stressors, and resilience. Identification and analysis of the effects of the COVID-19 pandemic on vulnerable populations, including children from minoritized groups, who live in poverty, have existing mental health problems, or experienced loss of special education services, will also need careful scrutiny.

In addition, because the pandemic reduces contact between children and mandated reporters of child abuse, new methods are needed to detect incidents of abuse and neglect. Finally, although research examining the delivery of child and adolescent telemental health includes well-established procedures,²⁵⁻²⁷ some aspects of service delivery, such as telemental health directly into homes, are not well studied and likely require the development of new methods and measures. In sum, studies that assess the psychometric properties of these much-needed measures are foundational for ongoing and future COVID-19-focused research.

This survey and these analyses have a number of limitations. The participants predominantly resided in the United States in urban and suburban areas, even though 31% resided in other countries and 9% in rural areas. This survey focused on recruiting participants in the mental health professions. A survey that captures the perspectives of children and families is also warranted. Although almost two-thirds of participants did not report their race/ethnicity, among those that did the majority (59%) were White. Only 43 participants identified as Asian, 23 participants identified as Hispanic, 10 as Black, 7 as Multiracial, 3 as Indigenous, 1 as Arab, making it highly likely that we did not capture the perspectives of our Black, Indigenous, and People of Color (BIPOC) colleagues during a time of increased awareness of COVID-19 specific racial disparities, increased racial tensions, civil unrest, and enhanced global awareness of systemic racism. The heterogeneity of the open-ended responses created challenges for both the natural language analysis and the thematic analyses. For the topic modeling, the dataset of 681 participants was relatively small, specifically fitting to brief responses representing a diverse set of topics. This is particularly the case for the item querying research preferences, which prompted 3 ideas per response. In contrast, for the thematic analyses, the dataset was relatively large, making the

development of a codebook representative of the diverse themes raised by participants particularly challenging. Furthermore, JAACAP's June-July 2020 survey preceded the COVID-19 vaccine development and approval of multiple vaccines beginning in December 2020. As the pandemic unfolds and hopefully subsides, vaccine distribution and equity issues and the uncertainty of when and how to return to more in-person activities will affect the mental health of youth and their families. Finally, the survey did not address the effect of the pandemic on research itself, and the challenges in conducting research that is rigorous, reliable, and valid while trying to capture new phenomena and limiting the risk to participants and research staff.

As we write this almost a year after the WHO declared the COVID-19 outbreak a global pandemic, we, as members of the Editorial Board of JAACAP, renew our commitment to maintain our high editorial standards, such that the articles we publish regarding this pandemic *are well designed, carefully conducted, and properly interpreted and... [are] situated within and expand the existing knowledge base.*²⁸ We hope this survey helps guide the ongoing investigation and analyses of the events that have - and will - change the developmental trajectory and mental health of many children and adolescents, and support our work to provide the extraordinary prevention and treatment they need and deserve.

REFERENCES

1. Novins DK, Althoff RR, Billingsley MK, et al. JAACAP's Role in Advancing the Science of Pediatric Mental Health and Promoting the Care of Youth and Families During the COVID-19 Pandemic. *J Am Acad Child Adolesc Psychiatry.* 2020;59(6):686-688.
2. Zeytinoglu S, Morales S, Lorenzo NE, et al. A Developmental Pathway From Early Behavioral Inhibition to Young Adults' Anxiety During the COVID-19 Pandemic. *J Am Acad Child Adolesc Psychiatry.*
3. Penner F, Ortiz JH, Sharp C. Change in Youth Mental Health During the COVID-19 Pandemic in a Majority Hispanic/Latinx US Sample. *J Am Acad Child Adolesc Psychiatry.*
4. Copeland WE, McGinnis E, Bai Y, et al. Impact of COVID-19 Pandemic on College Student Mental Health and Wellness. *J Am Acad Child Adolesc Psychiatry.* 2021;60(1):134-141.e132.
5. Chen IH, Chen C-Y, Pakpour AH, Griffiths MD, Lin C-Y. Internet-Related Behaviors and Psychological Distress Among Schoolchildren During COVID-19 School Suspension. *J Am Acad Child Adolesc Psychiatry.* 2020;59(10):1099-1102.e1091.
6. Journal of the American Academy of Child and Adolescent Psychiatry. COVID-19 Paper Collection. <https://www.jaacap.org/covid-19>. Published 2021. Accessed February 23, 2021.
7. Isumi A, Doi S, Yamaoka Y, Takahashi K, Fujiwara T. Do suicide rates in children and adolescents change during school closure in Japan? The acute effect of the first wave of COVID-19 pandemic on child and adolescent mental health. *Child Abuse Negl.* 2020;110:104680.
8. Patrick SW, Henkhaus LE, Zickafoose JS, et al. Well-being of Parents and Children During the COVID-19 Pandemic: A National Survey. *Pediatrics.* 2020;146(4):e2020016824.

9. Nearchou F, Flinn C, Niland R, Subramaniam SS, Hennessy E. Exploring the Impact of COVID-19 on Mental Health Outcomes in Children and Adolescents: A Systematic Review. *Int J Environ Res Public Health*. 2020;17(22).
10. Czeisler M, Lane RI, Petrosky E, et al. Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic - United States, June 24-30, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(32):1049-1057.
11. Cheek JA, Craig SS, West A, Lewena S, Hiscock H. Emergency department utilisation by vulnerable paediatric populations during the COVID-19 pandemic. *Emerg Med Australas*. 2020;32(5):870-871.
12. Goldman RD, Grafstein E, Barclay N, Irvine MA, Portales-Casamar E. Paediatric patients seen in 18 emergency departments during the COVID-19 pandemic. *Emerg Med J*. 2020;37(12):773-777.
13. Leeb RT, Bitsko RH, Radhakrishnan L, Martinez P, Njai R, Holland KM. Mental Health-Related Emergency Department Visits Among Children Aged <18 Years During the COVID-19 Pandemic - United States, January 1-October 17, 2020. *MMWR Morbidity and mortality weekly report*. 2020;69(45):1675-1680.
14. Holland KM, Jones C, Vivolo-Kantor AM, et al. Trends in US Emergency Department Visits for Mental Health, Overdose, and Violence Outcomes Before and During the COVID-19 Pandemic. *JAMA Psychiatry*. 2021.
15. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*. 2020;7(6):547-560.
16. Blei DM, Ng AY, Jordan MI. Latent dirichlet allocation. *the Journal of machine Learning research*. 2003;3:993-1022.
17. MATLAB. <https://www.mathworks.com/products/matlab.html>. Published 2021. Accessed March 7, 2021.
18. Chapman AL, Hadfield M, Chapman CJ. Qualitative research in healthcare: an introduction to grounded theory using thematic analysis. *J R Coll Physicians Edinb*. 2015;45(3):201-205.
19. Strauss A, Corbin JM. *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks, CA, US: Sage Publications, Inc; 1990.
20. Flick U. *An Introduction to Qualitative Research*. SAGE Publications; 2009.
21. Lawson M, Piel MH, Simon M. Child Maltreatment during the COVID-19 Pandemic: Consequences of Parental Job Loss on Psychological and Physical Abuse Towards Children. *Child Abuse Negl*. 2020;110(Pt 2):104709.
22. Grose J. The Pandemic Is a 'Mental Health Crisis' for Parents. *New York Times*. 09/09/2020, 2020.
23. Goldberg E. Teens in Covid Isolation: 'I Felt Like I Was Suffocating'. *New York Times*. 11/12/2020, 2020.
24. Levin D. How the Pandemic Has Been Devastating for Children From Low-Income Families. In communities struggling with poverty and gun violence, the coronavirus has only inflamed the difficulties that many families already were enduring. *New York Times*. 12/29/2020, 2020.
25. Myers K, Cain S. Practice parameter for telepsychiatry with children and adolescents. *J Am Acad Child Adolesc Psychiatry*. 2008;47(12):1468-1483.
26. Clinical Update: Telepsychiatry With Children and Adolescents. *J Am Acad Child Adolesc Psychiatry*. 2017;56(10):875-893.
27. Myers K, Vander Stoep A, Zhou C, McCarty CA, Katon W. Effectiveness of a telehealth service delivery model for treating attention-deficit/hyperactivity disorder: a community-based randomized controlled trial. *J Am Acad Child Adolesc Psychiatry*. 2015;54(4):263-274.

28. Novins DK, Althoff RR, Billingsley MK, et al. Bias, the Scientific Method, and the Journal. *J Am Acad Child Adolesc Psychiatry*. 2018;57(2):71.

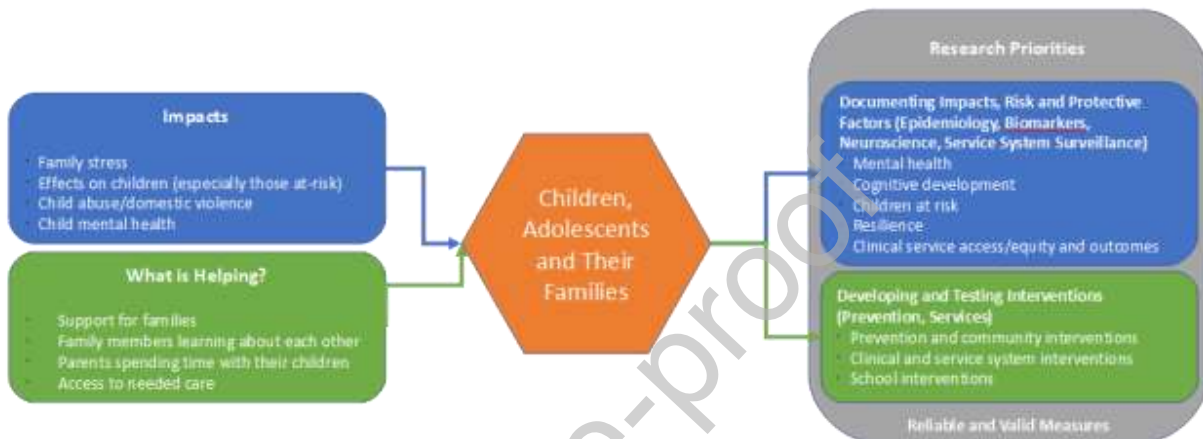


Figure 1. Overview of Key Study Findings

Table 1. Participant Characteristics (n=681)

Characteristic	%
Age	
18-24 years old	0.6%
25-50 years old	53.5%
50 years old or older	46.0%
Gender Identity	
Female	59.2%
Male	37.0%
Non binary	0.3%
Prefer not to state	1.9%
Race/Ethnicity	
Black	1.5%
Asian	6.3%
Indigenous	0.4%
White	18.4%

	Hispanic		3.4%
	Multiracial		1.0%
	Arab		0.1%
	Not provided		64.9%
Region of Residence			
	North America		73.9%
		United States	69.0%
		Midwest	12.9%
		South	9.7%
		South West	4.1%
		Intermountain West	2.2%
		West Coast	12.2%
		East Coast	27.5%
		Alaska, Puerto Rico, Hawaii	0.4%
		Canada	3.4%
		Mexico	1.3%
		Central America	0.1%
	Europe		10.3%
		Eastern	0.3%
		Northern	1.0%
		Southern	2.5%
		Western (including UK)	5.7%
	Australasia, New Zealand, Indonesia		8.1%
	Asia		3.8%
	South America		2.9%
	Africa		1.0%
	Middle East		0.7%
Urban-Rural			
	Urban		53.6%
	Suburban		36.0%
	Rural		8.7%
Primary Perspective When Completing Survey			
	Mental health care provider		67.7%
	A researcher focused on child mental illness		10.3%
	Health care provider		9.0%
	A leader in an organization/foundation focused on child mental illness		2.6%
	A member of the public with in interest		1.8%

in child mental health	
A person with a family member with a mental illness	0.9%
A person involved in child education	0.9%
A parent of a child with a mental illness	0.9%
A decision maker for an organization/foundation involved in funding for research focused on child mental health	0.4%
A person involved in political decision making	0.4%
A person with lived experience of mental illness	0.3%
A member of a support group or network or organization focused on child mental illness	0.3%
A person involved in child protection/child welfare/child maltreatment services	0.1%
Other	2.1%

**COVID-19 Pandemic
Status in Community of
Residence**

Almost none or no cases daily	9.5%
Increasing rates of new cases daily	48.5%
About the same number of new cases daily	19.1%
Decreasing rates of new cases daily	19.4%
Don't know	1.0%

Note:

Includes participants who answered at least one of the key survey questions
Not all categories total 100% due to missing values
Race/Ethnicity question was open ended given that the survey was international

Table 2. Results of Natural Language Analysis (n=681)

Question/Topic	Probability*
Concerns About the Impacts of the Pandemic on Children	
Increased stress in families	.058
Effects of the pandemic on children	.052
Increased rates of abuse/domestic violence	.051
Impact of the pandemic on child development, especially social development	.045
Impacts on child and adolescent mental health	.028
What is helping children during the pandemic	
Material support for families	.057
Parents and children learning more about each other	.054
Access to health care	.046
Flexibility to spend time with family	.041
More quality time for children and their families	.036
Top 3 research questions we need to address	
Mental health (vulnerability)	.042
Families and childhood	.032
Service delivery/support	.028
Social isolation	.028
Children & adolescents	.026
Impact on education	.020
Developmental effects	.020
Depression & anxiety	.018
School policy	.017
Pandemic effects	.017

Note. *Probability is really the concentration of the topic's representation relative to all the other topics in the whole body of responses for that specific question (also called the "corpus"). In other words, it is the normalized probability that you'll see the topic in reading anything from all of the responses together. For each question, all topic probabilities sum to one.

Table 3. Endorsement of Research Priority Themes (n=643)

Area/Theme	%
EPIDEMIOLOGY/SOCI AL DETERMINANTS OF HEALTH	
Exposures During the Pandemic (Factors Affecting Child)	54.4 %
Fear of pandemic/contagio n	1.4%
Public health measures	25.2 %
<i>school closure/virtual schooling</i>	16.6 %
<i>closure of public spaces</i>	0.8%
<i>social distancing</i>	3.6%
Screen time	5.4%
<i>social media</i>	2.3%
<i>video games</i>	0.8%
Social isolation	15.6 %
Parents and families	28.9 %
<i>parental mental health</i>	8.1%
<i>death of family member/loved one</i>	2.6%
<i>family relations (including stress and conflict)</i>	12.0 %
<i>family financial stresses</i>	4.2%
<i>parental unemployment</i>	1.6%
<i>child abuse/neglect family/domestic violence</i>	7.8% 3.6%
Other traumatic experience	4.7%
Impacts on Child (Child Outcomes)	64.9 %

	Mental health effects on child	52.7%
	<i>suicidality</i>	4.7%
	<i>substance use</i>	1.2%
		12.8%
	<i>anxiety</i>	%
		13.4%
	Child development	%
	<i>social emotional development</i>	8.2%
	Adaptive functioning	1.2%
	Learning/academic achievement	13.1%
		%
	Diminished view of the future	1.2%
	Loss of social skills/damage to peer relationships	8.9%
Risk Modifiers - Social Determinants of Health		29.1%
	Prior mental health problems	19.1%
		%
	Vulnerable populations	4.0%
	Minoritized groups	3.3%
	<i>Black people/people of color</i>	1.1%
	Discrimination	5.0%
	Poverty	2.0%
	<i>homelessness</i>	0.8%
Risk Modifiers - Resilience		12.9%
	Resilience of Child/Youth	11.5%
		%
	Resilience of Family	3.6%
ANY EPIDEMIOLOGIC THEME ENDORSED		79.8%
PREVENTION, TREATMENT, AND SERVICE SYSTEMS		
Service System Surveillance		32.5%
	Clinical Service Access/Equity	24.0%
		%
	<i>access to mental health services</i>	9.0%

	<i>during the pandemic impact of programmatic changes in inpatient, partial hospitalization, and residential care on quality of services</i>	1.6%
	<i>changes in mental health services to address increased need</i>	15.1%
Clinical Service Quality and Outcomes		13.7%
	<i>effectiveness of telemental health</i>	2.2%
Interventions to Improve Services During the Pandemic		44.8%
	<i>Prevention & Community Interventions</i>	30.9%
	Direct support to families (e.g., financial, rent support, food)	4.8%
	Strategies to mitigate impacts of pandemic and societal responses on children	7.2%
	<i>use of electronic means (social media, gaming, videoconferencing) to maintain social connections and reduce impacts of pandemic on mood</i>	1.1%
	Strategies to mitigate the impacts of COVID-19 directly upon neurodevelopment	3.1%
	Strategies to	11.2%

	increase coping, wellness, and resiliency	%
	Prioritizing services for vulnerable populations	6.4%
	Services to support parents such as social work and parenting skill development	3.1%
	Interventions to assure the ability of health, education, and human service professionals to identify children at risk for/experiencing child abuse/neglect	3.1%
	<i>Interventions in/for Schools</i>	9.6%
	Interventions to improve online educational engagement and effectiveness	2.3%
	Interventions to support the education of children with mental health problems	4.7%
	Interventions to bring children back to in-person school safely	2.5%
	<i>Clinical and Service System Interventions</i>	19.9%
	Telemental Health Services	10.6%
	<i>interventions to assure quality and accessibility of telemental health services</i>	4.8%

	<i>use of health information technology for engagement in mental health treatment</i>	0.9%
	<i>interventions to support valid assessments and evaluations (TMH)</i>	2.0%
	<i>adapting interventions for delivery by telemental health</i>	3.9%
Interventions for specific clinical issues		6.8%
	<i>prevention and treatment of OCD</i>	5.3%
	<i>interventions to address impacts of trauma on child mental health</i>	1.4%
	<i>proper use of medication during the pandemic</i>	0.9%
Developing changes to the service system to improve the equity of access to and quality of mental health services		5.8%
	<i>policy changes that support the delivery of quality services in an equitable manner (TMH)</i>	1.9%
ANY PREVENTION, TREATMENT, OR SERVICE SYSTEM THEME ENDORSED		59.4%
BIOMARKERS AND NEUROSCIENCE		
	Cognition & cognitive development	20.7%
	SARS-CoV-2 infection	7.0%

Circadian rhythm [sleep physiology]	1.7%
Brain function	1.6%
Immune system function	1.6%
Allostatic load/cortisol	0.8%
Nutritional markers	0.8%
<hr/>	
ANY BIOMARKER/NEUROSCIEN CE THEME ENDORSED	29.7 %

Note: Themes listed here were endorsed by 5 or more participants

Journal Pre-proof