



# ECHO

Environmental influences  
on Child Health Outcomes

A program supported by the NIH

# COVID-19 Science in the ECHO-wide Cohort

April 21, 2021

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COVID-19 Working Group Co-Chairs

# ECHO will generate solution-oriented, policy relevant COVID-19 research on child health

- Large, geographically, socioeconomically and racially diverse sample of children in the U.S.
  - Studies of both C-19 infection and ancillary impacts of pandemic
  - Geographic variation allows for the evaluation of C-19 policies (e.g., school closures)
  - Well-powered to understand racial and socioeconomic inequities
  - Longitudinal data provide perspective on how the impact of the pandemic is changing over time
- Cohorts are well-positioned to take advantage of both short- and long-term research opportunities related to COVID-19

# COVID-19 Science: Special Supplemental Funding

- ECHO awarded 6 supplements to support COVID-19 research
  - Impact of school closures and remote learning on child well-being with a focus on racial and social inequities
  - Impact of societal changes during the COVID-19 pandemic on obesity-related behaviors
  - Changes in environmental exposures resulting from the COVID-19 pandemic and impacts on child health outcomes
  - Microbial mediators of COVID-19 related stress during pregnancy and perinatal and neurodevelopmental outcomes
  - Impact of SARS-CoV-2 stress, infection and immunity on birth outcomes
  - Impact of COVID-19 and associated stressors on neurodevelopment in marginalized populations

# COVID-19 Science: ECHO-wide Cohort COVID-19 Questionnaire

- Content: COVID-19 infection; impacts of the pandemic (healthcare, behaviors, work, childcare, mood and stress, prenatal care)
- Data collected using several forms:
  - Parents report on their experiences
  - Parents report for younger kids
  - Older kids report for themselves
- 10,000+ questionnaires completed as of January 2021
  - 437 (0.4%) of children have had COVID-19

ECHO Environmental Influences on Child Health Outcomes <small>A program supported by the NIH</small>		COVID-19 Questionnaire – Adult Primary Version ECHO-wide Cohort Version 01.30 / April 9, 2020			Form C19-aPV Page 1 of 9
COHORT ID	SITE ID	PARTICIPANT ID	PIN	COHORT VISIT ID	FORM COMPLETED
-----	-----	_____	---	_____	--/--/----
ECHO LIFE STAGE			RESPONDENT		
<input type="checkbox"/> <sub>01</sub> Prenatal <input type="checkbox"/> <sub>03</sub> Infancy <input type="checkbox"/> <sub>05</sub> Middle Childhood		<input type="checkbox"/> <sub>02</sub> Perinatal <input type="checkbox"/> <sub>04</sub> Early Childhood <input type="checkbox"/> <sub>06</sub> Adolescence	<input type="checkbox"/> <sub>01</sub> Participant <input type="checkbox"/> <sub>03</sub> Biological Father		<input type="checkbox"/> <sub>02</sub> Biological Mother <input type="checkbox"/> <sub>04</sub> Other Respondent Code: ____

**STUDY STAFF INSTRUCTION:** This form should be completed by the pregnant woman enrolled in an ECHO cohort during the prenatal life stage and by the primary caregiver of a child enrolled in an ECHO cohort during the infancy, early childhood, middle childhood, and adolescence life stages. In the prenatal life stage, the pregnant woman's ID should be used in the header for the participant ID. In all other life stages, the child's ID should be used in the header for the participant ID.

**INSTRUCTIONS:**

This form has 4 sections:

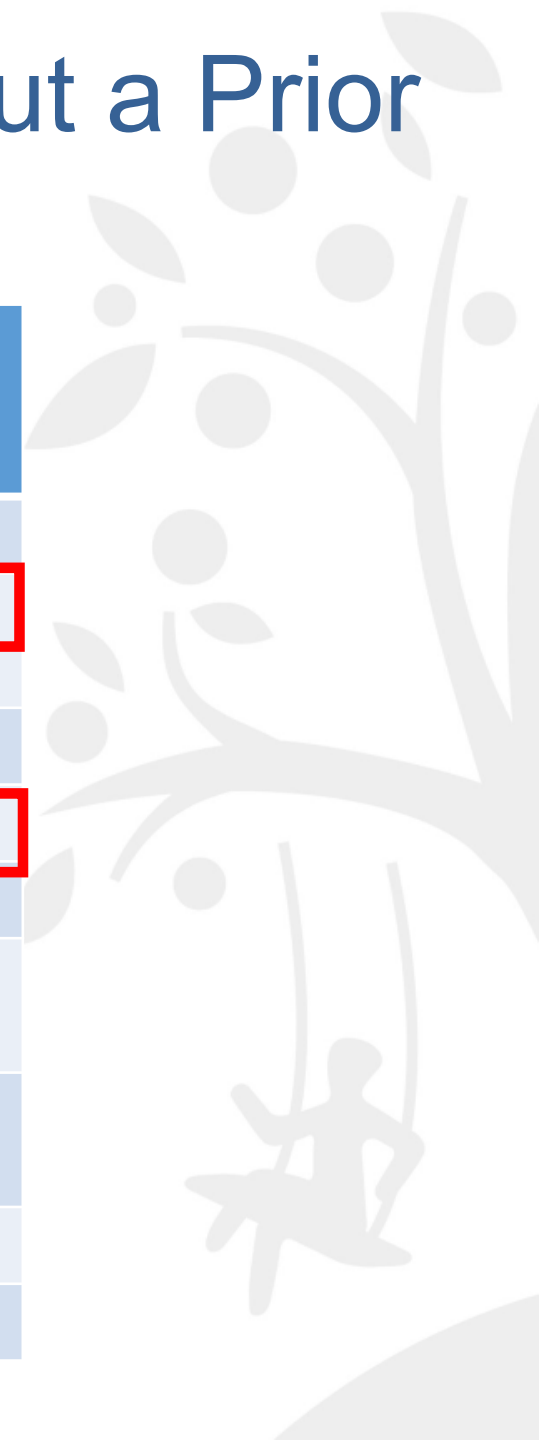
- Section A: COVID-19 Infection
- Section B: Impacts of the COVID-19 Outbreak on You
- Section C: Impacts of the COVID-19 Outbreak on Pregnancy – Current
- Section D: Impacts of the COVID-19 Outbreak on Pregnancy – Recall

Please complete Sections A and B. If you enrolled in ECHO during pregnancy and are currently pregnant, please also complete Section C. If you enrolled in ECHO during pregnancy and the pregnancy ended after February 28, 2020, please also complete Section D.

These questions are about your experience with COVID-19, or the coronavirus. For each question, do the best you can to remember the details requested.

# Characteristics of Children with or without a Prior COVID-19 Infection

Characteristic	Children with COVID Forms (N=10,490)	No COVID-19 (N=10,053)	COVID-19 (N=437)
Sex at birth - Male	50.7%	50.6%	51.7%
Ethnicity – Hispanic	22.3%	22.1%	28.3%
Non-Hispanic	76.2%	76.4%	69.3%
Race- White	63.5%	63.4%	65.9%
Black	13.7%	14.0%	10.0%
Asian	3.3%	3.3%	2.8%
Native Hawaiian/ Pac. Islander	0.4%	0.5%	0.3%
American Indian/ Alaskan Native	2.1%	2.1%	3.1%
Multiple	9.3%	9.3%	7.6%
Other/Unknown	7.7%	7.7%	10.3%



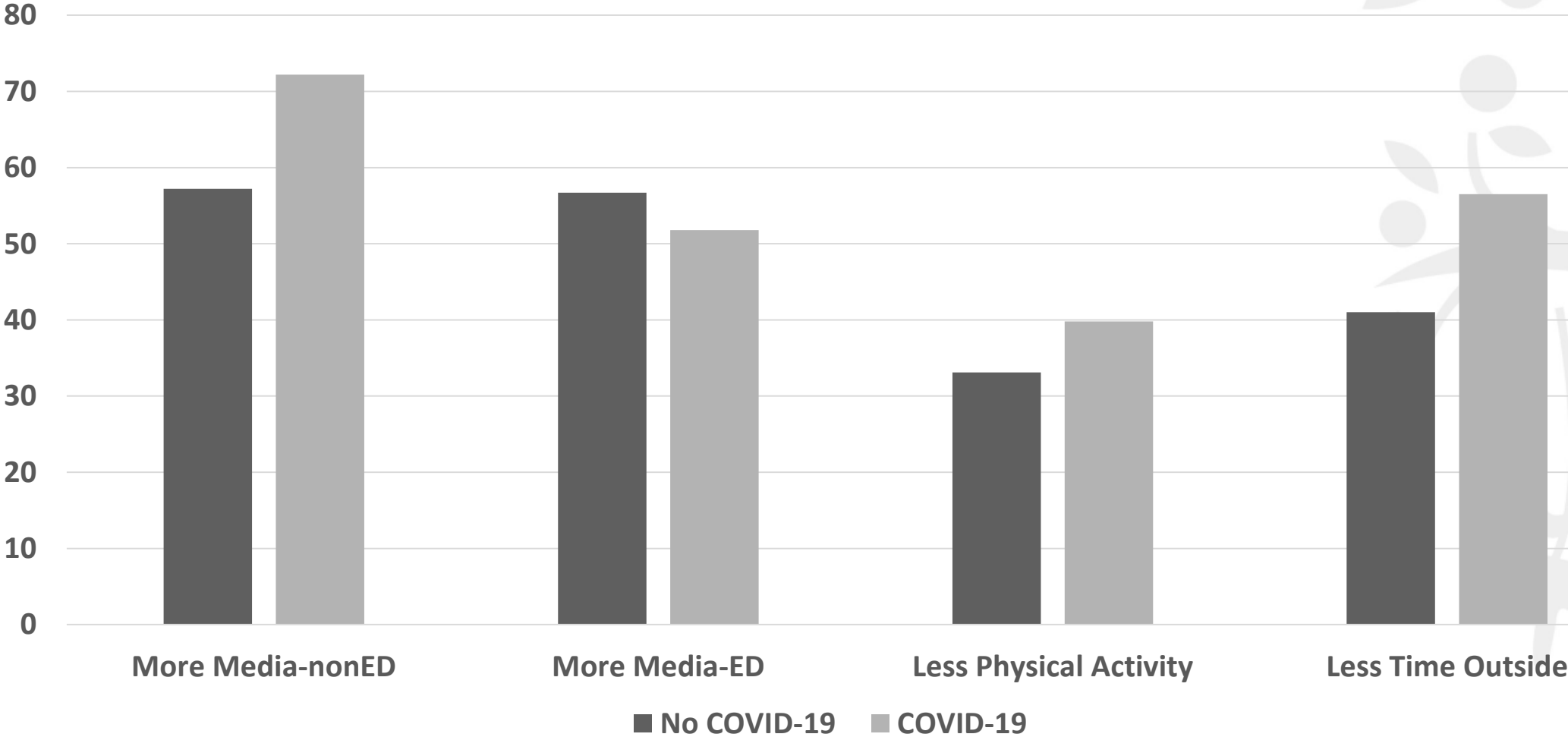
# How have children's activities changed since the pandemic began?

3. Compared to before the COVID-19 outbreak, how much is the child now doing the following:

	Less	Same amount	More
a. Eating	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
b. Sleeping	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
c. Physical activity	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
d. Spending time outside	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
e. Spending time with friends in-person	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
f. Spending time with friends remotely (e.g., online, social media, texting)	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
g. Spending time watching TV, playing video/computer games, or using social media for <b><u>educational</u></b> purposes, including school work	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>
h. Spending time watching TV, playing video/computer games, or using social media for <b><u>non-educational</u></b> purposes	<input type="checkbox"/> <sub>01</sub>	<input type="checkbox"/> <sub>02</sub>	<input type="checkbox"/> <sub>03</sub>

# Changes in activities early in the pandemic (March-August 2020)

Percent of Children



# School Closures and Access to Remote Learning Resources

Characteristic	Overall	Hispanic	Black	White
School or daycare closure	86.2%	87.6%	87.3%	85.7%
Online learning while closed	88.7%	86.7%	88.9%	89.6%
Free home internet	27.0%	28.3%	43.3%	22.5%
Free computer/tablet	67.3%	59.1%	77.6%	66.6%
Home internet				
Any WiFi	85.9%	82.9%	82.6%	88.2%
Smartphone	2.8%	4.9%	5.0%	1.7%
Dial-up only	0.3%	0.9%	0.3%	0.1%
None	11.0%	11.3%	12.1%	9.9%

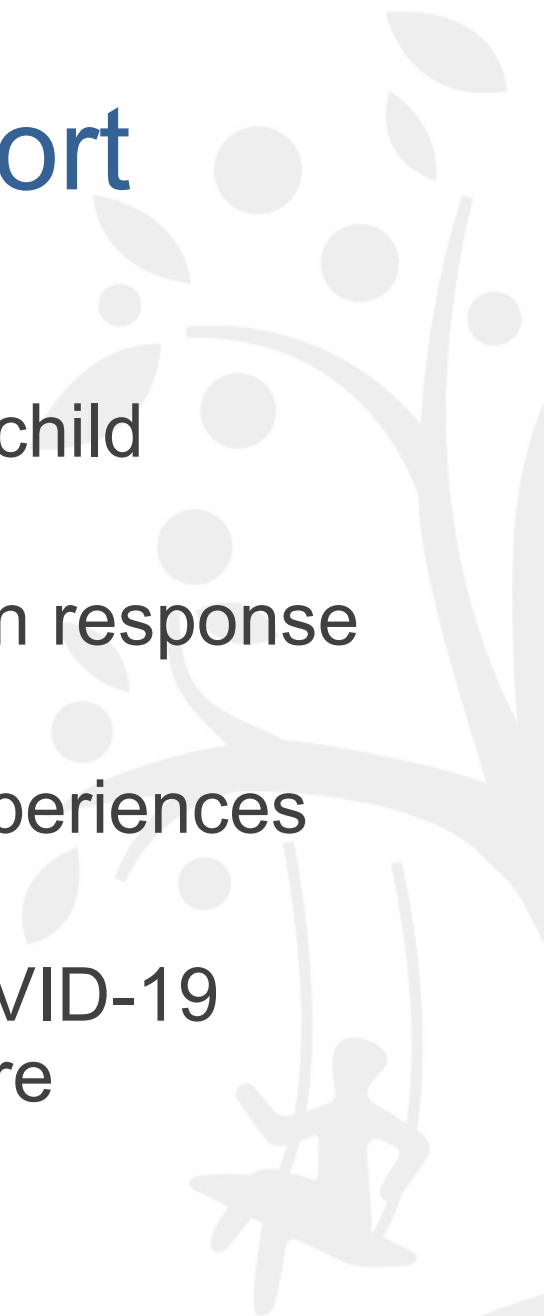


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# Impact of ongoing ECHO-wide Cohort COVID-19 Science

- Understand the impact of the pandemic on ECHO's 5 child health outcome areas
- Characterize changes in experiences and exposures in response to the pandemic and inequities in those exposures
- Identify upstream causes of inequities in pandemic experiences using rich extant data and geospatial linkages
- Generate policy-relevant findings on the impact of COVID-19 related policies on child well-being that will inform future responses

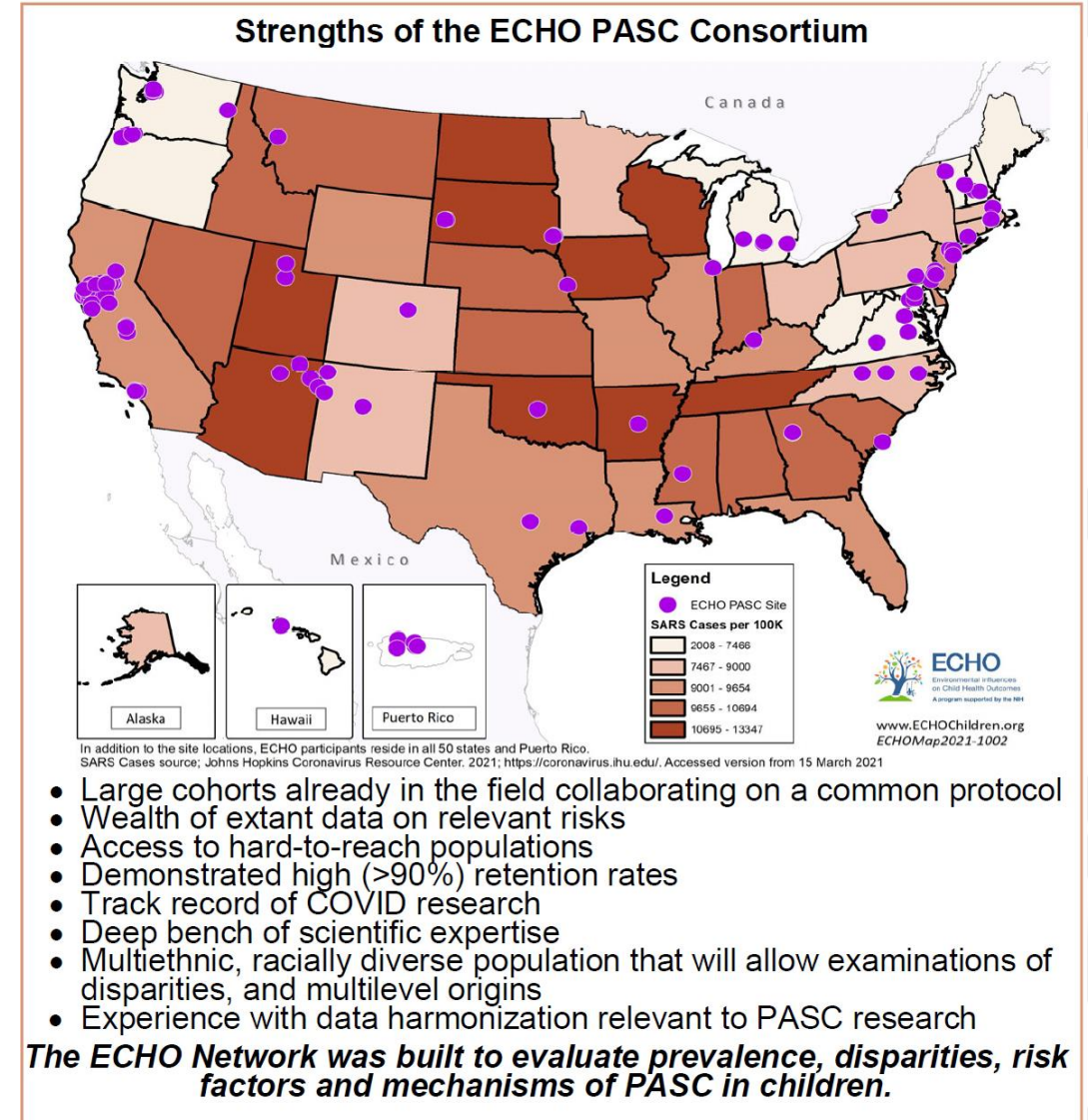


# ECHO is poised to advance understanding of the impact of the COVID-19 Pandemic on child health

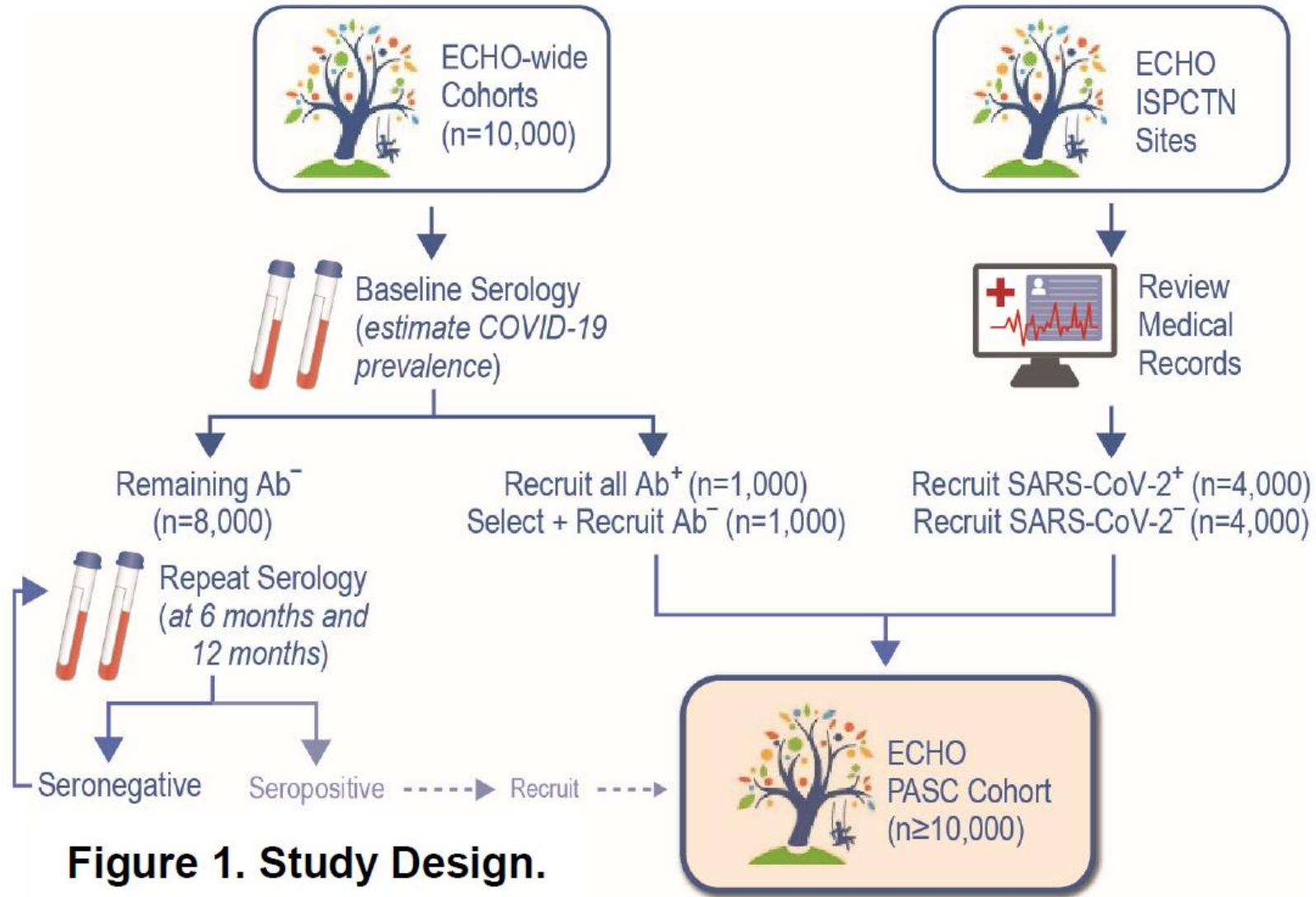
- Large, geographically and racially diverse sample of children in the U.S. actively engaged in ongoing data collection
  - → Studies of both C-19 infection and ancillary impacts of pandemic
  - → Geographic variation allows for the evaluation of C-19 policies (e.g., school closures)
  - → Well-powered to understand racial and socioeconomic inequities
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# Understanding “long COVID” in Children

- ECHO was “tailor made” to provide crucial insights into the origins of “long COVID”
  - How do uninfected and infected children differ on neurodevelopmental, cardiovascular, pulmonary and renal outcomes?
  - How do we define PASC and its natural history?
  - What risk factors and biological mechanisms underlie PASC and could be future targets for clinical intervention?
  - How do genetic susceptibility; co-morbidities and co-infections; SARS-CoV-2 vaccines, medications and immune modifying biologics; as well as social, physical and chemical exposures predict and modify PASC development and severity?



# Understanding “long COVID” in Children



**Figure 1. Study Design.**