# NASEM Pediatric Disaster Science Symposium: Leveraging Networks to Deploy Disaster Science Studies

# Experience from the Pediatric Emergency Research Network (PERN) COVID-19 Study

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- No financial conflicts of interest to report

# Pediatric Emergency Research Network (PERN) A global pediatric emergency care network of networks



### What is PERN?

- Global "network of pediatric emergency care networks"
- Established 2009 in Amsterdam during H1N1 pandemic
- Enabling dialogue between member networks and large collaborations across the world
- Capture opportunities to answer globally relevant PEC research questions

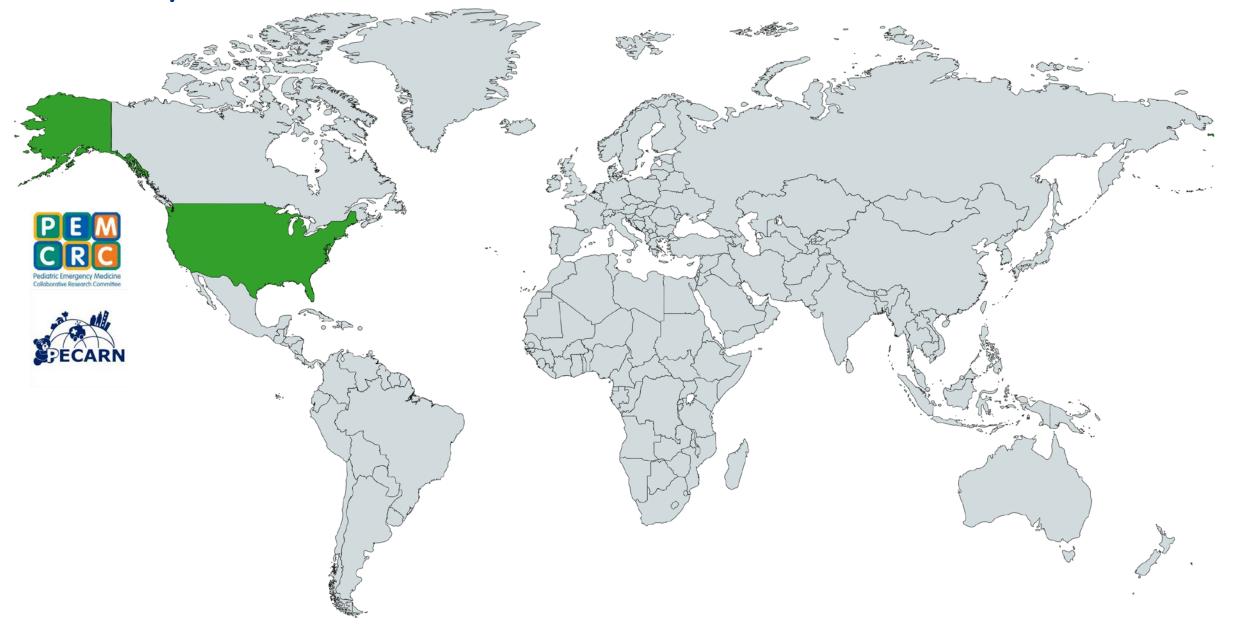


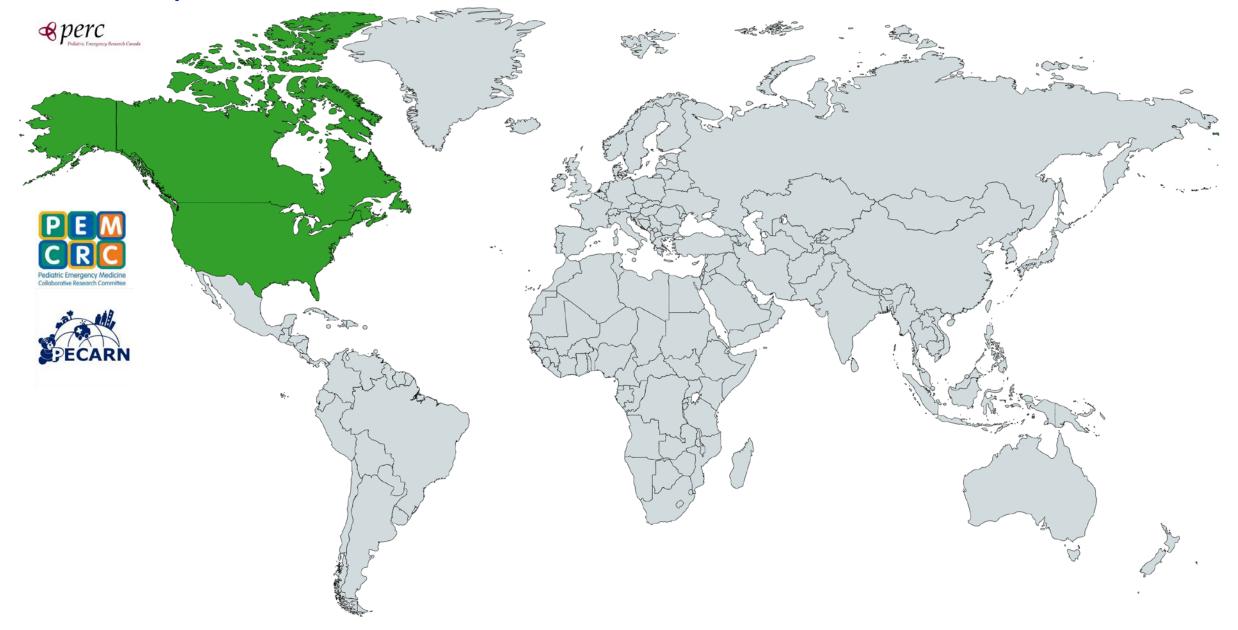


### **PERN Mission**

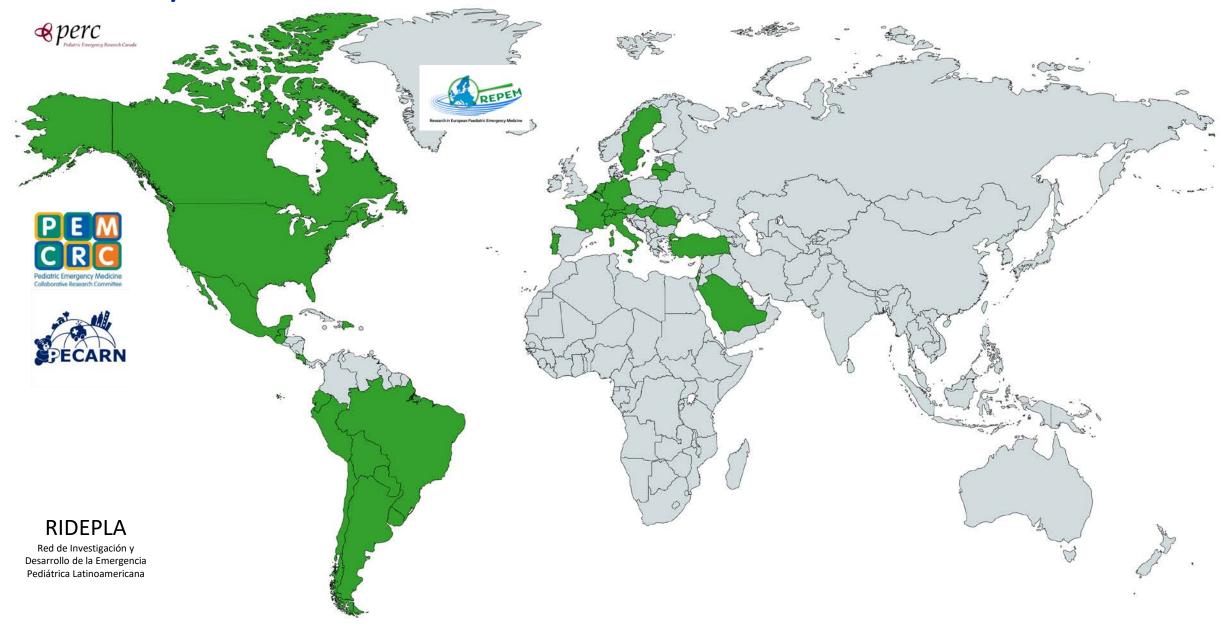
- To perform meaningful and scientifically rigorous global collaborative research in pediatric emergency care
  - 1. For global health problems, and/or
  - 2. To address hypotheses that would benefit acutely ill and injured children globally.

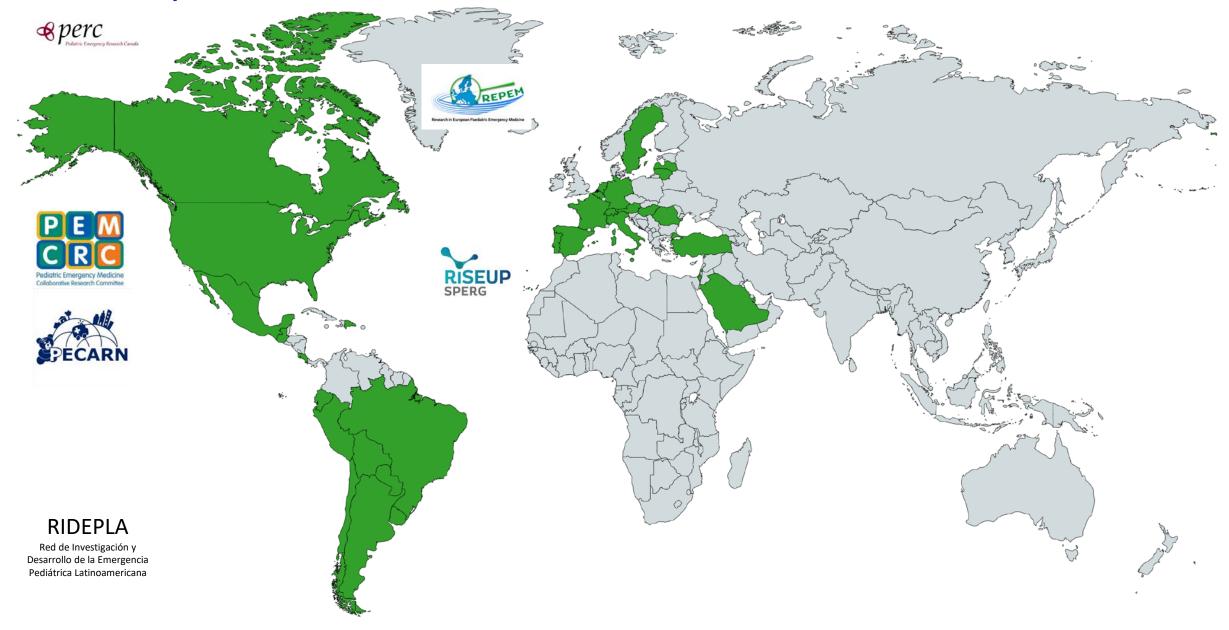








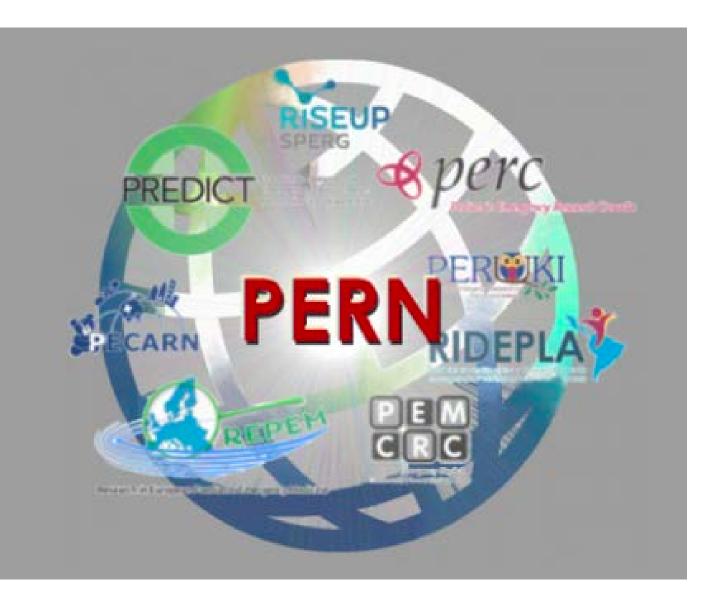












- 8 member networks
- 35 countries
- 4 of 6 WHO regions
- >200 hospitals
- >5 million annual visits



BMJ



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### RESEARCH

# Predictors of severe H1N1 infection in children presenting within Pediatric Emergency Research Networks (PERN): retrospective case-control study

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### PERN a Decade Later

### **REVIEW ARTICLE**

**OPEN** 

# The Pediatric Emergency Research Network A Decade of Global Research Cooperation in Pediatric Emergency Care

**Objectives:** The Pediatric Emergency Research Network (PERN) was launched in 2009 with the intent for existing national and regional research networks in pediatric emergency care to organize globally for the conduct of collaborative research across networks.

**Methods:** The Pediatric Emergency Research Network has grown from 5- to 8-member networks over the past decade. With an executive committee comprising representatives from all member networks, PERN plays a supportive and collaborative rather than governing role. The full impact of PERN's facilitation of international collaborative research, although somewhat difficult to quantify empirically, can be measured indirectly by the observed growth of the field, the nature of the increasingly challenging research questions now being addressed.

and the collective capacity to generate and implement new knowledge in treating acutely ill and injured children.

Results: Beginning as a pandemic response with a high-quality retrospective case-controlled study of H1N1 influenza risk factors, PERN research has progressed to multiple observational studies and ongoing global randomized controlled trials. As a recent example, PERN has developed sufficient network infrastructure to enable the rapid initiation of a prospective observational study in response to the current coronavirus disease 2019 pandemic. In light of the ongoing need for translation of research knowledge into equitable clinical practice and to promote health equity, PERN is committed to a coordinated international effort to increase the uptake of evidence-based management of common and treatable acute conditions in all emergency department settings.

# Predicting Severe Pneumonia in Children: A Global Study of the Pediatric Emergency Research Networks (PERN)

Principal Investigators:
Todd Florin & Nathan Kuppermann (PECARN, PEMCRC)

Working Group/Co-Investigators:

Mark Neuman (PEMCRC)

Amy Plint (PERC)

Santiago Mintegi (REPEM)

Stuart Dalziel (PREDICT)

Franz Babl (PREDICT)

Daniel Tancredi (Statistician)

Lilliam Ambroggio (Epidemiologist)









# PERN Pneumonia Specific Aims

### **PRIMARY AIMS**

- 1. To <u>identify predictors of CAP severity</u>, including need for hospitalization, empyema, respiratory failure, sepsis and death, in a large, global cohort
- 2. To develop a clinical prediction rule that would accurately identify children with CAP who are at risk for mild, moderate and severe disease

### **SECONDARY AIMS**

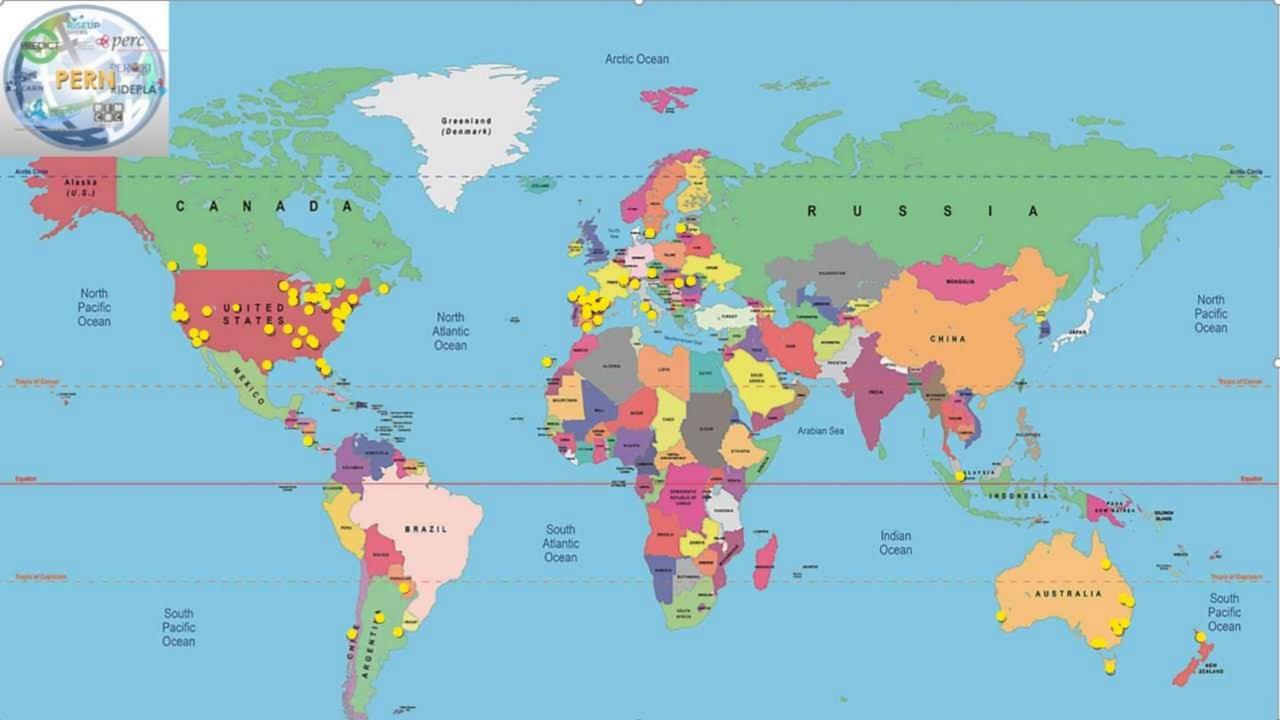
- 1. To describe <u>variation in the ED management</u> of children with CAP, including diagnostic testing and treatment, in a large, global cohort
- 2. To compare the effectiveness of different antibiotic strategies











# PERN Pneumonia By the Numbers

- •69 sites
- 2,156 children prospectively enrolled
- Excellent follow-up
- Database locked and cleaned
- Presentations and publications started









# BMJ Open Predicting severe pneumonia in the emergency department: a global study of the Pediatric Emergency Research Networks (PERN)—study protocol

Todd Adam Florin , <sup>1</sup> Daniel Joseph Tancredi , <sup>2</sup> Lilliam Ambroggio, <sup>3</sup> Franz E Babl , <sup>4,5,6</sup> Stuart R Dalziel, <sup>7,8</sup> Michelle Eckerle, <sup>9,10</sup> Santiago Mintegi, <sup>11,12</sup> Mark Neuman, <sup>13</sup> Amy C Plint, <sup>14</sup> Nathan Kuppermann, <sup>15</sup> Pediatric Emergency Research Networks (PERN) Pneumonia Investigators

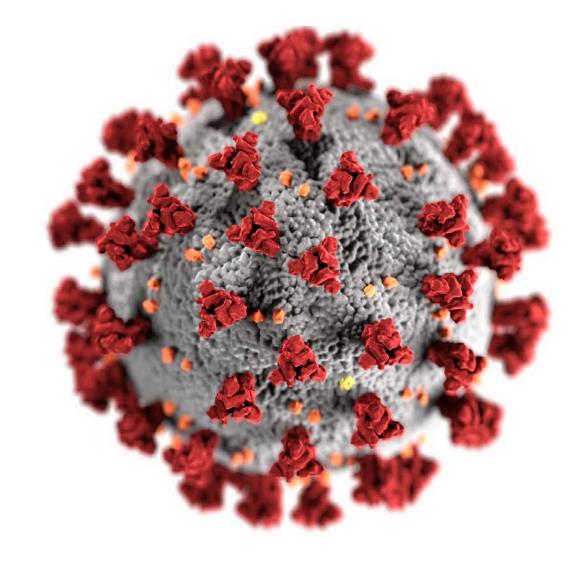
BMJ Open 2020



















# **PERN-COVID-19 Prospective Cohort**

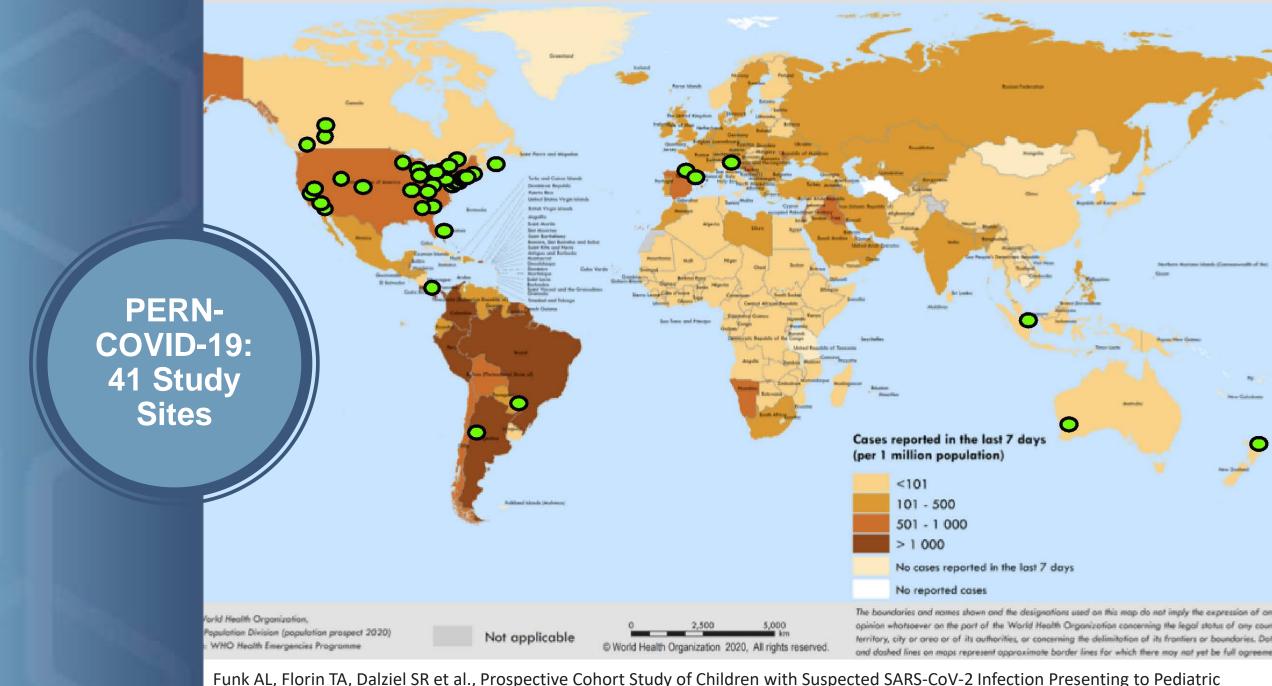
- Severe and long-term outcomes of infection are uncommon
- Risk factors of severe and long-term outcomes unknown
  - Mostly registries, hospital-based, medical record follow-up

### **So...**

- PERN-COVID-19 Prospective Cohort Study
  - March 2020 January 2021
  - 39 emergency departments (ED); 8 countries
  - Longitudinal follow-up of children tested for SARS-CoV-2 infection
    - Both positive and negative children

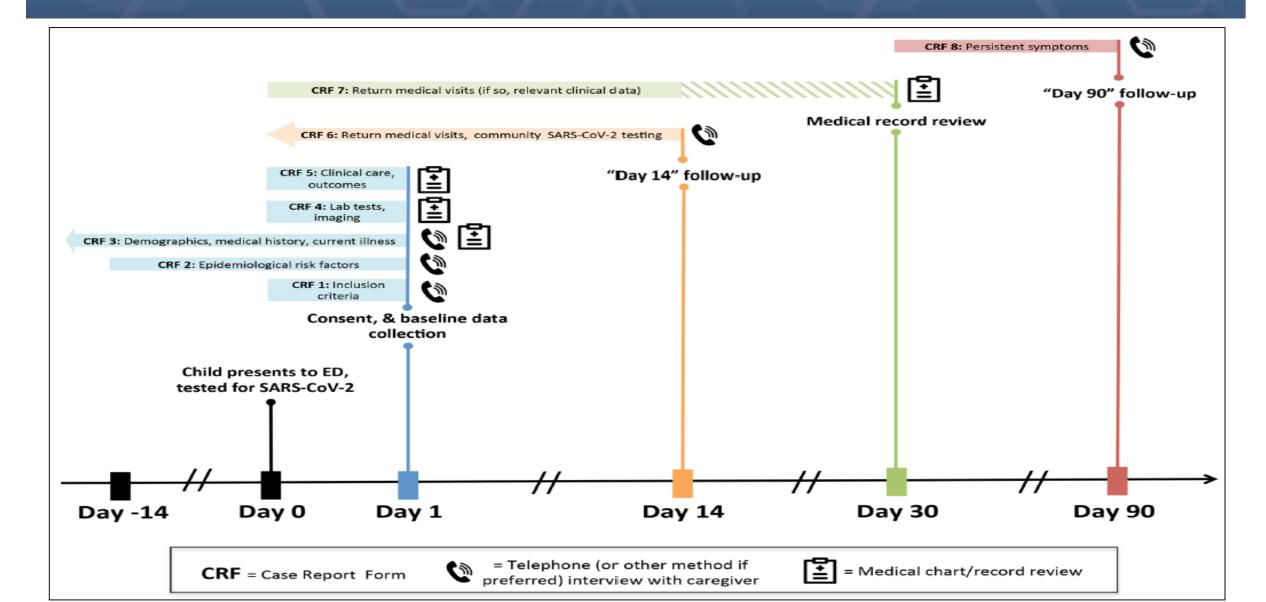
Pediatric Emergency Research Network





Funk AL, Florin TA, Dalziel SR et al., Prospective Cohort Study of Children with Suspected SARS-CoV-2 Infection Presenting to Pediatric Emergency Departments: A Pediatric Emergency Research Networks (PERN) Study Protocol. *BMJ Open* 2021. 2021 Jan 1;11(1):e042121

# **Data Collection**



### Severe outcomes definition

### Intervention or care received

- Inotropic support
- Positive pressure ventilation, ECMO, chest drainage
- Renal replacement therapy

### **Diagnosis**

- Respiratory (e.g. respiratory failure, acute respiratory distress syndrome)
- Cardiovascular (e.g. heart failure, stroke)
- Infectious (e.g. encephalitis)
- Other

### **Death**

# Post-COVID-19 Condition (PCC)

### Definition

- Persistent, new or returning symptoms or health problems 3 months from onset of COVID-19 with symptoms lasting ≥ 2 months
- Not explained by an alternative diagnosis

### Frequency in children is variable and unclear

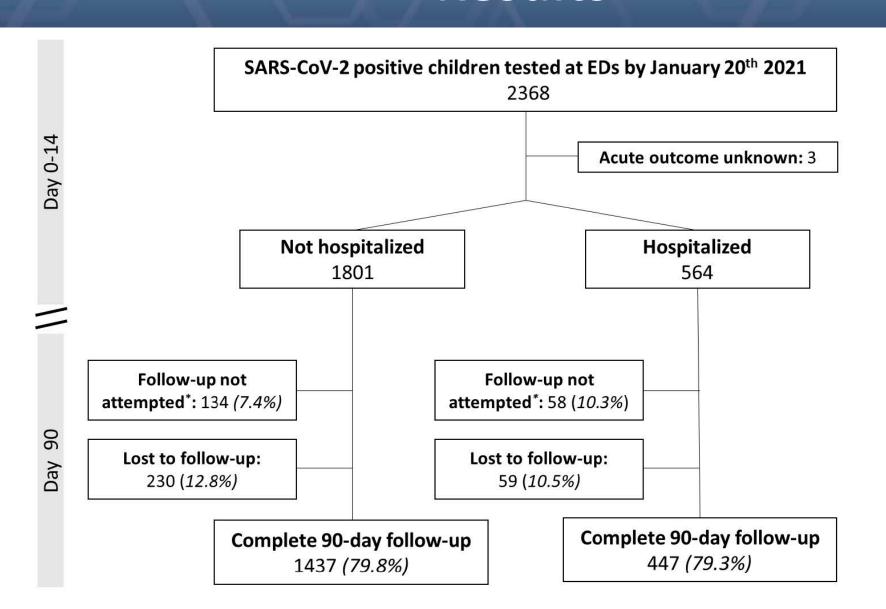
Studies to date have limitation precluding accurate estimate

### Accurate estimate needed to inform:

- Public health policies
- Individual decisions (e.g. vaccination, masking)
- Care of high-risk children



# Results







Original Investigation | Pediatrics

### Outcomes of SARS-CoV-2-Positive Youths Tested in Emergency Departments The Global PERN-COVID-19 Study

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### Abstract

**IMPORTANCE** Severe outcomes among youths with SARS-CoV-2 infections are poorly characterized.

**OBJECTIVE** To estimate the proportion of children with severe outcomes within 14 days of testing positive for SARS-CoV-2 in an emergency department (ED).

**DESIGN, SETTING, AND PARTICIPANTS** This prospective cohort study with 14-day follow-up enrolled participants between March 2020 and June 2021. Participants were youths aged younger than 18 years who were tested for SARS-CoV-2 infection at one of 41 EDs across 10 countries including Argentina. Australia, Canada Costa Pica, Italy, New Zealand, Paraguay, Singapore, Spain.

### **Key Points**

Question What proportic CoV-2-positive youths te emergency departments experience severe outco intensive interventions, simpairment, or death) wi

positive youths enrolled prospective cohort study





### Original Investigation | Pediatrics

### Post-COVID-19 Conditions Among Children 90 Days After SARS-CoV-2 Infection

Anna L. Funk, PhD, MSc; Nathan Kuppermann, MD, MPH; Todd A. Florin, MD, MSCE; Daniel J. Tancredi, PhD; Jianling Xie, MD, MPH; Kelly Kim, BSc; Yaron Finkelstein, MD; Mark I. Neuman, MD, MPH; Marina I. Salvadori, MD; Adriana Yock-Corrales, MD; Kristen A. Breslin, MD; Lilliam Ambroggio, PhD, MPH; Pradip P. Chaudhari, MD; Kelly R. Bergmann, DO, MS; Michael A. Gardiner, MD; Jasmine R. Nebhrajani, MD; Carmen Campos, MD; Fahd A. Ahmad, MD, MSCI; Laura F. Sartori, MD, MPH; Nidhya Navananadan, MD; Nirupama Kannikeswaran, MD; Kerry Caperell, MD, MS, MBA; Claudia R. Morris, MD; Santiago Mintegi, MD, PhD; Iker Gangoiti, MD; Vikram J. Sabhaney, MD; Amy C. Plint, MD; Terry P. Klassen, MD, MSc; Usha R. Avva, MD; Nipam P. Shah, MD, MBBS, MPH; Andrew C. Dixon, MD; Maren M. Lunoe, MD; Sarah M. Becker, MD; Alexander J. Rogers, MD; Viviana Pavlicich, MD; Stuart R. Dalziel, MBChB, PhD; Daniel C. Payne, PhD; Richard Malley, MD; Meredith L. Borland, MD; Andrea K. Morrison, MD, MS; Maala Bhatt, MD; Pedro B. Rino, MD; Isabel Beneyto Ferre, MD; Michelle Eckerle, MD; April J. Kam, MD; Shu-Ling Chong, MPH; Laura Palumbo, MD; Maria Y. Kwok, MD, MPH; Jonathan C. Cherry, MD; Naveen Poonai, MD; Muhammad Wassem, MD; Norma-Jean Simon, MPH; Stephen B. Freedman, MDCM, MSc; for the Pediatric Emergency Research Network-COVID-19 Study Team

#### Abstract

**IMPORTANCE** Little is known about the risk factors for, and the risk of, developing post-COVID-19 conditions (PCCs) among children.

**OBJECTIVES** To estimate the proportion of SARS-CoV-2-positive children with PCCs 90 days after a positive test result, to compare this proportion with SARS-CoV-2-negative children, and to assess factors associated with PCCs.

**DESIGN, SETTING, AND PARTICIPANTS** This prospective cohort study, conducted in 36 emergency departments (EDs) in 8 countries between March 7, 2020, and January 20, 2021, included 1884 SARS-CoV-2-positive children who completed 90-day follow-up; 1686 of these

### **Key Points**

Question What proportion of children infected with SARS-CoV-2 who were tested in emergency departments (EDs) reported post-COVID-19 conditions (PCCs) 90 days after their ED visits?

Findings In this cohort study of 1884 SARS-CoV-2-positive children with 90-day follow-up, 5.8% of patients, including 9.8% of hospitalized children and 4.6% of discharged children,

# **Questions?**

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