

Impact of In-utero Exposure to Maternal SARS-CoV-2 Infection on Children's Hospital Admission Rates: National Birth Cohort Study In England

Mengyun Liu¹, Linda Wijlaars¹, Ali Judd², Charlotte Jackson², Claire Thorne¹, Jeannie Collins², Pia Hardelid¹
 1. Great Ormond Street Institute of Child Health, University College London, London, UK, 2. MRC Clinical Trials Unit, University College London, London, United Kingdom

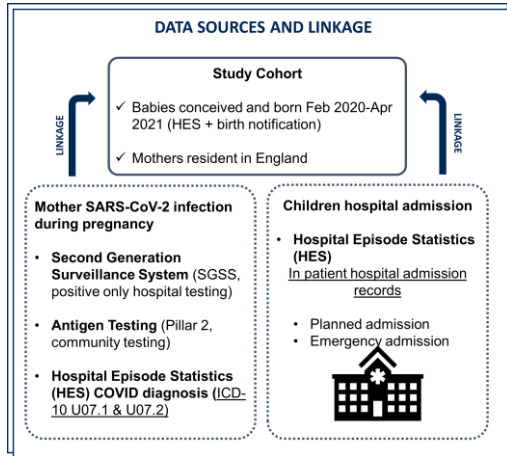
Contact: Mengyun.liu@ucl.ac.uk



Objective

To examine the impact of **in-utero exposure** to maternal **SARS-CoV-2 infection** on **planned and emergency hospital admission rates** in children <30 months old in England.

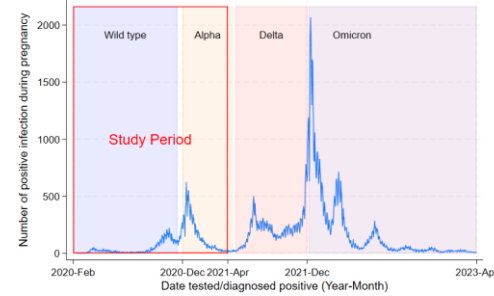
Method



- Children's in-utero exposure to SARS-CoV-2 infection was determined based on mother's testing and diagnosis
- Children were followed up to 2.5 years in longitudinal hospital data
- Planned and emergency admission rate were calculated by age groups
- Cox Proportional-Hazard models were used to examine association between in-utero infection and children hospital admissions

Study period & population

Figure 1. Number of positive in-utero SARS-COV-2 infection



- **296,305 children** conceived and born in England 1 Feb 2020 -30 Apr 2021 were included
- **5.7%** had mothers with confirmed SARS-CoV-2 infection during pregnancy ("test-positive") and **16.9%** had mothers tested negative during pregnancy, and **77.4%** had no recorded testing/diagnosis (untested).

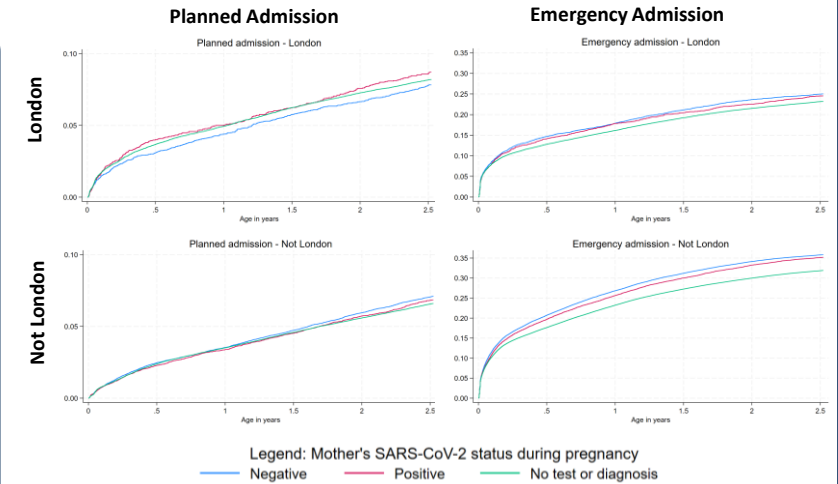
Hospital admission rate

Table 1. Hospital admission rate by in-utero infection status and by age groups (per 1000 person years)

Age group (year)	Test-Negative	Test-Positive	Untested
Planned admission			
(0, 1]	36.8	38.0	38.0
(1, 2]	25.0	25.3	22.2
(2, 2.5]	23.7	22.7	20.5
Emergency admission			
(0, 1]	307.8	283.5	254.0
(1, 2]	100.6	96.4	87.3
(2, 2.5]	48.9	55.9	51.5

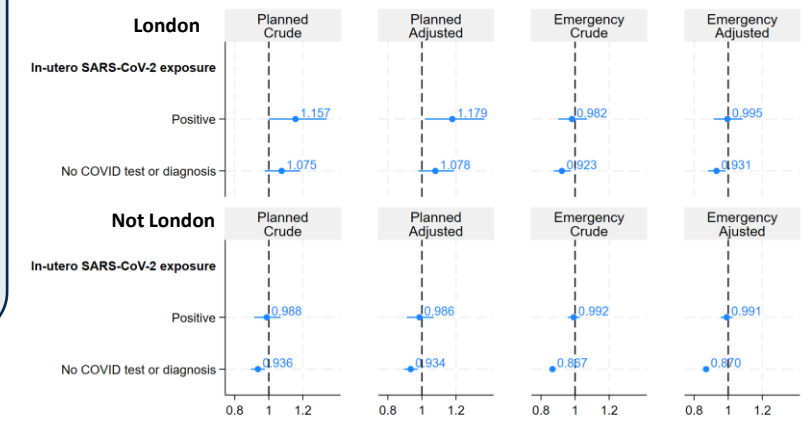
In-utero infection & hospital admission

Figure 2. Kaplan-Meier failure estimates for hospital admission according to in-utero infection



- London was examined separately due to different pattern of hospital admission rate
- London: "Tested-negative" group had **lowest planned admission rate** and **highest emergency admission rate**.
- Other regions: "tested-positive" children had a **similar rate**, and "untested" children had a **lower rate** for both planned and emergency compared with the "tested-negative"

Figure 3. Hazard ratio of planned and emergency admission, ref="test-negative" children



- Adjusting for the **sex of the baby, ethnicity, and deprivation hardly changes** the associations. Next step to further adjust for time of birth and/or time of admissions

Reference

Zylbersztejn (2020). *PLoS One*.
 COVID-19 Vaccine Surveillance Report, 20 Jan 2022

This work is part of the VERDI project (101045989), which is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

