

# What About The Children?

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*'Raising awareness of the never-changing emotional needs of the under-threes in our ever-changing society'*

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## RESEARCH SUMMARY

### **Association of Birth During the COVID-19 Pandemic With Neurodevelopmental Status at 6 Months in Infants With and Without In Utero Exposure to Maternal SARS-CoV-2 Infection.**

Shuffrey, L.C., Firestein, M.R., Kyle, M.H., et. al. Journal of American Medical Association. *Pediatrics online* (2022)

This study aimed to determine the effect of COVID 19 infection in pregnant women on the development of their infants. The hypothesis was that babies born to mothers infected with Covid during pregnancy might have developmental delays.

Globally, more than 200 million infants have been born since the onset of the COVID-19 pandemic. In New York City, in Spring of 2020, when PCR testing became routinely available in hospitals, 14% of women in labour in Columbia University Irving Medical Centre, New York (CUIMC) tested positive for SARS-CoV-2.

Previous viral infections in pregnant women have resulted in some developmental delays of their infants. For example, in the cohort born during the influenza (H1N1) pandemic of 1918 and also in a cohort of in-utero HIV-exposed infants (1999-2020). An increase in autism spectrum disorder or schizophrenia was found in offspring born during the rubella pandemic (1964).

In the case of the COVID-19 pandemic, Shuffrey et al's study was to determine whether there are any associations between exposure to maternal SARS-CoV-2, in utero, on babies' social or motor development measured at 6 months after birth.

### **Methods and Results**

The main study was carried out at Columbia University Irving Medical Centre, New York. Data was collected from March 2020 to October 2021, from the start of the pandemic in 2020. This was compared with an historic set of data concerning babies' development collected from November 2017 to January 2020, prior to the pandemic.

At the start of the COVID-19 pandemic, 1706 women who were expecting a baby at the Irving Medical Centre, were approached to enrol for the study. Of those who agreed to come to a 6-month assessment, post birth, 255 mothers with infants completed the questionnaires and were enrolled to the study. Each mother was classified into one of two groups: 114 mothers who had been exposed to SARS-CoV-2 during their pregnancy and 141 who had not been exposed. Exposure to SARS-CoV-2 was determined either by a positive PCR test during maternal COVID infection, or a positive anti-body test later. Comparable data was also available from

a historical cohort of 62 infants born *before* the pandemic.

At between 5 and 6 months (age adjusted for pre-term infants), babies' neurodevelopment was assessed by maternal reporting using a survey in English or Spanish (ASQ-3). For the pandemic cohort of infants, this was between October 2020 and June 2021. For the historical cohort it was between May 2018 and July 2020. The ASQ-3 tool reliably assesses 5 key developmental domains; communication, fine and gross motor, problem solving and personal-social skills.

The results showed that those mothers who were in the SARS-CoV-2 positive group were more likely to differ to the non-infected group by self-reported race, ethnicity, and educational level; they were more likely to be of other/mixed race, Hispanic/Latino ethnicity and a lower proportion reported a graduate degree.

Most of the mothers who took part in the study had experienced asymptomatic (34%) or mild (62%) disease and were infected in the second (47%) or third (31%) trimester, A small proportion of mothers had severe disease (4%) and 22% were infected in the first trimester.

The analysis of the scores from the ASQ-3 tests showed *no* significant group differences between exposed and unexposed infants on any of the 5 sub-scores measured at age 6 months.

The data revealed no associations of the scores from the ASQ-3 tests with timing or severity of SARS-CoV-2. Therefore, the exposed and unexposed healthy term infants of the pandemic cohort were pooled (n=227) and compared with the infants in the historical cohort. These results showed significant differences between three of the sub-scores from the ASQ-3 tests: gross motor (P<0.001), fine motor (P<0.001) and personal-social (P=0.01).

Infants born in the pandemic had a statistically significant delay in motor skills development. When trimester was examined, it was women who experienced the first peak of the SARS-CoV-2 pandemic (7 March – 6 April 2020) during their first trimester who had infants showing the greatest motor skill delay. The low numbers of severely affected mothers (4%), and the low number in their first semester during the peak of the pandemic (n=25 (22%)), does limit the reliability of the results, however.

## **Discussion and Conclusions**

To the knowledge of the paper's authors Shuffrey et al., this is the first investigation into possible developmental delays in infants aged 6 months due to in utero exposure to SARS-CoV-2. However, what is of particular interest, is that there was no evidence of difference between exposed and unexposed infants in the pandemic cohort, but there were significant differences (lower scores) and motor skill delay in all the pandemic-born infants compared to a group of 62 infants born before the pandemic. The lowest motor skill scores were in infants whose mothers were in their first trimester during the March – April 2020 peak of COVID in New York City.

Taken together, these findings suggest the potential for a significant public health crisis for the generation born during the COVID-19 pandemic, which will need further investigation.

This suggests that COVID-19 related stress should be considered as a potential underlying mechanism. Stressors for pregnant women previously reported as causing developmental delays in infants, have included job loss, food insecurity, and loss of housing. The pandemic has resulted in significant increase in symptoms of anxiety and depression in the population. Related studies looking at the effect of infants exposed in utero to their mothers' stress, associated this stress with increased risk of delayed neurodevelopment in their children.

This study found that birth during the pandemic, but not necessarily exposure to maternal SARS-CoV-2, was associated with differences in neurodevelopment at age 6 months. These early findings support the need for long-term monitoring of children born during the pandemic.

Dr Elizabeth Bland

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