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COVID-19 Public Health and Social Measures (PHSM) and early childhood developmental concerns in Scotland: an interrupted time series analysis

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Background

COVID-19 public health and social measures (PHSM) may have affected children's development, for example by reducing their interaction with others. We examined associations between PHSM and developmental concerns among young children in Scotland.

Methods

We utilised data from routine 13–15 month and 27–30 month child health reviews, covering 257,532 children in Scotland who took part in reviews between January 2019 and August 2023. Interrupted time-series analysis assessed slope changes in the weekly proportion of children with health visitor-identified developmental concerns following the March 2020 introduction of, and August 2021 removal of, PHSM. Outcomes were any 13–15 month and 27–30 month developmental concerns, and domain-specific concerns regarding speech-language-communication, problem-solving, gross-motor, personal-social, emotional-behavioural and fine-motor development.

Findings

The March 2020 PHSM introduction was associated with a slope change increase in the proportion of children with any developmental concerns (+0.091 percentage points per week [95% CI: 0.065, 0.116] at 13–15 months and +0.076 percentage points per week [95% CI: 0.048, 0.104] at 27–30 months. The August 2021 PHSM removal was associated with a slope change decrease in the proportion of children with any developmental concerns at 27–30 months (−0.067 percentage points per week [95% CI: −0.088, −0.046]), but not 13–15

months, in the main analysis. Results were broadly consistent across developmental domains.

Interpretation

COVID-19 PHSM were associated with increased developmental concerns among young children in Scotland. While leveraging interrupted time-series analysis yields findings consistent with a causal impact of PHSM, the influence of potential time-varying confounders cannot be ruled out.

