

COVID-19 and Pregnancy;

A Comparison of Bias Between Case Reports, Case Series and Registry Studies

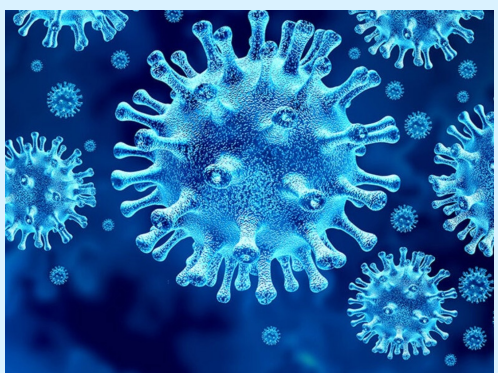
Eloise Young, Medical Student, University of Nottingham
Yasmin King, Medical Student, University of Nottingham
Joel Stewart, Medical Student, University of Nottingham
Oleia Green, Medical Student, university of Nottingham

Keelin O'Donoghue, Senior lecturer in Obstetrics, University College Cork
Kate F Walker, Clinical Associate Professor of Obstetrics, University of Nottingham
Jim G Thornton, Professor of Obstetrics and Gynaecology, University of Nottingham

Background:

Early case reports and case series of COVID-19 in pregnancy were potentially subject to selection or reporting bias. Registry studies would be expected to be less biased.

Objective: To compare the rates of adverse outcomes between case reports, case series and registries on the assumption that the latter provide the most accurate estimate.



Methods:

The MEDLINE, Embase and Maternity and Infant Care databases were searched from 22 March to 5 November 2020. This formed the basis of Professor J G Thornton’s curated list of primary sources – [Ripe Tomato](#). Case reports, case series or registry studies of pregnant women with confirmed COVID-19, where neonatal outcomes were reported, were selected from Ripe Tomato. Duplicate reports were excluded using the methods of Walker et al 2020. Data was extracted on neonatal infection status, neonatal death, neonatal intensive care unit admission, preterm birth, stillbirth, maternal CCU admission and maternal death.

Main Results:

149 studies, reporting 41,658 mothers and 8,854 neonates, were included. The observed rates of each outcome are shown in the table.

Comparison of Incidence of Severe Outcomes in Registries, Case Series and Case Reports:

Study Type Classification	No. of studies (N)	Neonates (N)	Infected Neonates N (%)	Stillbirth and Neonatal Death N (%)	Neonatal Intensive Care Unit Admission N (%)	Preterm Birth N (%)	Pregnant Women (ongoing pregnancy and delivered) (N)	Maternal Death N (%)	Maternal Critical Care Unit Admission N (%)
Registry	12	6396	85, (1.3)	57, (0.89)	506, (7.9)	823, (13)	33844	43, (0.13)	365, (1.1)
Case Series	76	2141	38, (1.8)	26, (1.2)	338, (16)	289, (13)	2840	6, (0.21)	168, (5.9)
Case Report	47	49*	6, (12)	2, (4.1)	25, (51)	24, (49)	47	1, (2.1)	19, (39)

*Included two reports of twin births

Conclusions:

Reported rates of adverse outcomes are higher in case series than registries and higher again in case reports. Since it is likely that registries provide the least biased estimates, the higher rates seen in the other two study designs are probably due to selection or publication bias.

However even some registry studies include self- or doctor-reported cases, so might be biased, and we could not completely exclude overlap of cases in some registries.

Accurate estimates of the true risks of Covid-19 in pregnancy require sophisticated epidemiological analysis such as has been done by the [WHO living systematic review group](#).

References:

- Walker KF, et al. Maternal transmission of SARS-COV-2 to the neonate, and possible routes for such transmission: a systematic review and critical analysis. October 2020. BJOG Volume 127: 1324-1336
- Thornton J G. Ripe Tomato [Internet] [Updated: 2021 July 10, Cited: 2021 July 12] Available From: <https://ripe-tomato.org/2020/05/15/covid-19-in-pregnancy-101-onwards/>
- WHO Living Systematic Review Group. PregCOV-19LSR [Internet] [Cited; 2021 July 12] Available from: <https://www.birmingham.ac.uk/research/who-collaborating-centre/pregcov/index.aspx>