

# Severe COVID-19 in pregnancy is almost exclusively limited to unvaccinated women – time for policies to change

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Pregnant women continue to be excluded from most clinical trials of COVID-19 vaccines and medication, despite very clear pre-pandemic guidance.<sup>1</sup> There appears little incentive amongst regulators or pharmaceutical companies to change this. Compounded by their exclusion, there is considerable vaccine hesitancy amongst pregnant women.<sup>2</sup> Such hesitancy persists, even though at present adverse outcomes of SARS-CoV-2 infection are increasing among pregnant and postpartum women in many countries,<sup>3</sup> while these are improving in most other groups. The impact of the omicron variant is, as yet, unknown.

Vaccine hesitancy in pregnancy is not a new phenomenon. Salmon and colleagues<sup>4</sup> identified three factors which influence parents' acceptance of vaccines for either them or their children: confidence in the efficacy of the vaccines, trust in their healthcare professionals, and, importantly, certainty of the systems to assess vaccine safety. They note that addressing vaccine hesitancy is a "complex problem [which] requires a multilevel approach, including interventions at the individual and health system levels."

Data suggest that vaccines are a highly effective protection against severe COVID-19 in the non-pregnant populations in which they were initially tested.<sup>5</sup> However, in many countries, pregnant and postpartum women and those planning a pregnancy continue to receive conflicting messages, mainly regarding the safety of the vaccines. Misleading information on social media continues to impede uptake of vaccination in

pregnant and postpartum women, even though observational data about vaccine safety, now including more than 250 000 women, are very reassuring.<sup>6</sup> Additionally, clear potential benefits have been documented, such as placental transmission of protective antibodies to the fetus.<sup>7</sup> By preventing maternal disease, vaccination may prevent stillbirths, preterm births and associated neonatal deaths.

Simultaneously, it has become clear that pregnant and postpartum women are at higher risk of serious illness compared to their non-pregnant contemporaries. This seems especially true for the Delta variant, which increased the risk of intensive care unit admission among pregnant women 2-3 times, with a 50% increase in iatrogenic preterm births.<sup>3,8,9</sup> Several European countries (Norway, UK) have recently recognised pregnant and postpartum women as an 'at risk' priority group for COVID-vaccination. This policy has been in place for even longer in other countries (Belgium, Denmark), yet it is still not universal (for example, in Italy, the Netherlands and Finland pregnant women are not prioritised).

Multiple initiatives to promote uptake of COVID-vaccination in pregnancy have been undertaken, with widely differing uptake rates and uptake estimates varying between 22% in England and 80% in Norway. Surprisingly, data are not available on Covid-19 vaccination rates amongst pregnant women in all European countries. Within the International Network of Obstetric Survey Systems (INOSS)<sup>10</sup> we have been able to combine surveillance data in six countries showing that amongst the most critically ill pregnant and postpartum women, almost none were vaccinated (Table 1). This is observed despite widely varying population vaccine uptake rates.

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Country	Period covered	Number of women admitted to hospital with covid	Number admitted to critical care (% of those admitted to hospital)	Number admitted to critical care who are unvaccinated (% of those admitted to critical care)	Estimated proportion of pregnant population who have received at least one vaccine dose
<b>UK</b>	16/05/21-31/10/21	1436 (symptomatic only)	230 (16)	225 (98)	22% (England, August 2021) 43% (Scotland, October 21)
<b>Netherlands</b>	01/05/21-06/12/21	220 (symptomatic only)	52 (24)	47 (90) Unknown: 5 (10) Vaccinated: 0 (0)	30-50%
<b>Norway</b>	15/07/21-15/12/21	28 <sup>a</sup> (symptomatic only)	8 (29)	8 (100)	80% <sup>b</sup>
<b>Finland (Helsinki Region)</b>	01/07/21-15/12/21	11 <sup>a</sup> (symptomatic only)	5 (45)	5 (100)	60% <sup>c</sup>
<b>Denmark</b>	01/06/21-30/11/21	N/A	8 (N/A)	8 (100)	56% (November 2021)
<b>Italy (Lombardy Region)</b>	01/05/21-15/12/21	506 <sup>d</sup>	15 (3)	12 (80) received one dose: 3 (20)	20% (May-October 2021)

**Table 1: Admissions of symptomatic pregnant women to hospital and critical care with estimated vaccine uptake rates, six European countries, May-December 2021.**

N/A – not available data

<sup>a</sup> Reporting of severe cases has been verified, there may be under-reporting of pregnant women with less severe disease in November and December 21.

<sup>b</sup> Estimated at the Norwegian Institute of Public Health, 15 December 21.

<sup>c</sup> Estimated by the Finnish Institute of Health and Welfare, 20 December 21.

<sup>d</sup> All pregnant women, symptomatic and asymptomatic.

Our findings emphasize the message to unvaccinated pregnant women, their partners, health professionals caring for pregnant women, decision makers and politicians that vaccination protects against severe disease. As the world is entering a new phase of the COVID-pandemic, with the Delta-variant rapidly being overtaken by the Omicron-variant, booster vaccinations are increasingly important to provide protection against severe COVID-19, especially in vulnerable groups such as pregnant and postpartum women or women who want to become pregnant. However, large numbers of pregnant and postpartum women in low, middle and high-income settings have yet to receive even a single vaccination dose. Health system as well as individual actions are now clearly needed. The World Health Organisation recommends COVID-19 vaccination in pregnant women when the benefits of vaccination to the pregnant woman outweigh the potential risks. These multi-country data clearly show those benefits in terms of prevention of severe disease. We believe that all governments should now prioritise pregnant and postpartum women as an at-risk group and encourage their vaccination.

### Declaration of Competing Interest

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### Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:[10.1016/j.lanepe.2022.100313](https://doi.org/10.1016/j.lanepe.2022.100313).

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