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► **To cite this version:**

Odile Launay, Vassilis V. Tsatsaris. Comment Maternal influenza immunisation in resource-limited settings. *The Lancet Infectious Diseases*, 2016, 10.1016/S1473-3099(16)30121-9 . inserm-01327503

**HAL Id: inserm-01327503**

**<https://inserm.hal.science/inserm-01327503>**

Submitted on 6 Jun 2016

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## Maternal influenza immunisation in resource-limited settings



Pregnant women and young infants are at high risk of developing severe influenza.<sup>1,2</sup> Among infants, those younger than 6 months have the highest risk of developing complications associated with influenza;<sup>3</sup> however, antiviral treatments and influenza vaccines are not approved in this age group. Given that influenza vaccines administered to pregnant women have shown a good safety profile<sup>4</sup> and efficacy to prevent influenza in infants younger than 6 months,<sup>5,6</sup> maternal immunisation seems to be an important strategy to protect both pregnant women and their infants. WHO targets seasonal influenza vaccination of pregnant women as a high priority.<sup>7</sup> Most high-income countries recommend maternal influenza immunisation to reduce the burden of influenza in the pregnant woman and her infant.<sup>8</sup> However, additional data are needed to support decisions about introduction of influenza vaccine in pregnant women in resource-limited settings. The Bill & Melinda Gates Foundation funded three large trials in South Africa, Mali, and Nepal, with the objective of increasing the evidence base for the effect of maternal influenza immunisation.<sup>9</sup>

In *The Lancet Infectious Diseases*, Milagritos D Tapias and colleagues<sup>10</sup> report results of the trial done in Mali—a poorly-resourced country with high infant and maternal mortality. This is the largest randomised controlled trial evaluating the efficacy, safety, and immunogenicity of trivalent inactivated influenza vaccine administered to third-trimester pregnant women to prevent influenza in infants younger than 6 months. 4193 women were immunised: 2018 with trivalent inactivated influenza vaccine and 2085 with conjugate quadrivalent meningococcal vaccine. Vaccine efficacy against first-episode laboratory confirmed influenza in infants (the primary outcome) was 33·1% (95% CI 3·7–53·9) in infants born to women immunised at any time prepartum (intention-to-treat analysis), and 37·3% (7·6–57·8) in those born to women vaccinated at least 14 days prepartum (per-protocol analysis). Among participating women, vaccine efficacy was 70·3% (95% CI 42·2–85·8) overall, 76·6% (28·4–94·3) in pregnant women, and 70·1% (28·0–89·1) in the postpartum period. There was no beneficial effect of the trivalent inactivated influenza vaccine on birthweight. The technical and logistical feasibility of implementation

of a new maternal immunisation programme was also shown with a high rate of recruitment among eligible women.

Evidence of the efficacy of maternal influenza immunisation to prevent influenza in infants in low-income countries from this trial is convincing and in agreement with findings from the two previously reported randomised trials from Bangladesh (63% vaccine efficacy, 95% CI 5–85)<sup>5</sup> and South Africa (48·8%, 11·6–70·4).<sup>6</sup>

However, important questions follow. First, is the health impact of maternal influenza immunisation (on pregnant women, fetuses, and neonates) and countries' demands enough to justify support from international agencies (eg, GAVI, the Vaccine Alliance) and others? Maternal influenza immunisation could avert around 45 deaths per 100 000 people vaccinated in GAVI-eligible countries—ie, about 210 000 mother-infant deaths from 2015 to 2030 with broad adoption across GAVI countries.<sup>11</sup> However, these figures are estimates, and more specific data for influenza burden in poor-income countries are needed to better estimate health impact and convince decision makers. Second, is maternal influenza immunisation acceptable for pregnant women and health providers? In high-income countries, influenza vaccine coverage is less than 50%, even during the 2009 H1N1 pandemic.<sup>12,13</sup> However, in resource-limited countries, routine administration of tetanus toxoid vaccine as an important part of antenatal care should facilitate both implementation and acceptability of influenza vaccine from pregnant women and health workers. The third question is regarding the feasibility of seasonal vaccine supply, surveillance, and strain-matching? Logistical challenges with supplying, stocking, and administration of seasonal vaccines should be overcome to achieve high coverage of maternal immunisation. Development of maternal immunisation platforms in low-income countries seems to be an appealing approach.

The results of Tapias and colleagues' large randomised trial are important because they show not only the efficacy, but also the feasibility, of maternal seasonal influenza immunisation on infant protection during the first months of life in Mali. Moreover, the investigators put forward several propositions to overcome the



Martin Voigt/AP/Press Association Images

*Lancet Infect Dis* 2016

Published Online

May 31, 2016

[http://dx.doi.org/10.1016/S1473-3099\(16\)30121-9](http://dx.doi.org/10.1016/S1473-3099(16)30121-9)

See Online/Articles

[http://dx.doi.org/10.1016/S1473-3099\(16\)30054-8](http://dx.doi.org/10.1016/S1473-3099(16)30054-8)

difficulties of seasonal influenza vaccination in resource-limited countries. Nevertheless, supplementary data for influenza disease burden in low-income countries are urgently needed to support GAVI's decision.

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OL has been an investigator for Sanofi Pasteur MSD; reports personal fees from Sanofi Pasteur; and reports grants and non-financial support from GlaxoSmithKline Biologicals, Sanofi Pasteur, and Pfizer. VT declares no competing interests.

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