Vaccines, Pregnancy, and the R&D Agenda: Challenges and Opportunities

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Vaccines in pregnancy

- Immunization in pregnancy can offer significant benefits
  - To the pregnant woman (e.g., Flu, Yellow Fever)
  - To the developing fetus (e.g., Zika, CMV)
  - To the infant via conferred immunity (e.g., Pertussis)

- We now routinely recommend certain vaccines in pregnancy

- However, pregnant women have been largely excluded from research trials

- Not a single vaccine has been licensed with a specific indication for use in pregnancy
Vaccines for use in pregnancy are critically important

- Pregnant women (and their fetuses) often face higher susceptibility to and severity of illness
- Many women who have limited interaction with the health system will not have pre-existing immunity
- Pregnancy as a critical window of contact with the health system
- Past efforts to vaccinate ahead of and around pregnancy have not been sufficient
- Pregnant women and their offspring should not be unjustly denied the benefits of advancements in vaccine science
Needed: an evidence base for vaccines in pregnancy

• Immunological differences in pregnancy
• Need maternal and fetal safety data
• Critical for public health officials, clinicians, and pregnant women to ensure:
  • informed, responsible, and timely adoption of beneficial vaccines in pregnancy
  • responsible management of inadvertent exposure to vaccines during pregnancy
    • Reduce unnecessary anxiety and/or terminations of wanted pregnancies

“Pregnant women deserve an evidence base for the prevention and treatment of their illnesses equal to others as a matter of justice.

-The Ethics Working Group on ZIKV Research & Pregnancy
Perceived challenges & sources of reluctance

Legal, financial and reputational risk

Fetal risk inflation/distortion

Over-reliance on alternative strategies

Tendency to push data collection post-market

Lack of market incentives – with potentially large disincentives
Additional Challenges

• Lack of data on background rates of adverse maternal, fetal, infant outcomes
  ▪ Potential for misattribution of harms to vaccine

• Novel vaccine platforms, adjuvants, and delivery mechanisms
  ▪ Keeping pace with innovations – not leaving pregnant women behind

• Emerging and re-emerging pathogens
  ▪ When R&D is accelerated and pathogens intermittent, sequential approaches to evidence generation may not be possible
Potential Solutions

• Explicit calls for vaccines acceptable in pregnancy w/ funding & incentives

• Policies that shift to presumption of inclusion

• Insurance and injury compensation programs

• Engaging maternal-fetal experts in research design, ethics review, implementation, and ultimate communication of findings

• Data collection on background rates

• Earlier inclusion of pregnant women in efficacy trials when acceptable risk-benefit profile

• Prospective and systematic data collection from inadvertent exposures
Progress

• Pipeline for vaccines specifically targeted for maternal immunization (GBS, RSV, CMV)

• GAIA work on guidelines for standardized and harmonized data collection in vaccine trials of outcomes relevant to pregnancy

• 21st Century Cures Act expanding coverage under the VICP of vaccines given in pregnancy

• PLLR → more nuanced information about products in pregnancy
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