P3-MumBubVax: Development of a multi-component antenatal intervention to promote maternal and childhood vaccine uptake in Australia

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Burden of disease for pregnant women and their infants

Influenza in pregnancy

- Pregnant women and infants are a WHO high-risk priority group for influenza\(^1\)
- Pregnant women are **more than twice as likely to develop serious complications** and be admitted to hospital than non-pregnant women, particularly if they have underlying illnesses
- **Infants <6 months old are at highest risk of death** or developing serious complications
- The rates of hospitalisation in infants 0-5 months are **4 times higher** than adults >75 years

Pertussis in pregnancy

- Risk to the pregnant woman herself is less than for influenza, but can be severe or life-threatening for babies under 6 months
- **Infants <3 months have the highest risk of pertussis-related death**
Promotion of maternal and childhood vaccines in the antenatal period

- Need to increase and **sustain** acceptance and uptake of antenatal vaccination for influenza (40-60%)\(^6\) and pertussis (65-80%)\(^7,8\)
- Prepare for new maternal vaccines
- Expectant parents begin to decide about childhood vaccines, beginning with birth hep B\(^9\)
- Midwives in public antenatal clinics are most frequently accessed and highly trusted regarding vaccination\(^9\)
- A robust vaccine program needs high levels of vaccine acceptance, where people understand and have confidence in the purpose, value and effectiveness of vaccines.
We need effective, scalable interventions to embed vaccination discussion and delivery into routine antenatal care.
Interventions to improve antenatal influenza vaccine uptake - what works?

- Interventions that primarily aim to change vaccine attitudes
  - generally not effective in isolation
  - content that reinforces benefit to infant shown greatest impact

- Provider recommendation strongest predictor of vaccine receipt for pregnant women
  - few interventions evaluated focus on provider-patient interaction OR communication training for providers

- Nudge-based interventions have shown good success
  - include provider prompts to vaccinate and record vaccination, patient prompts ie text messages AND standing orders
  - build on positive intentions to vaccinate without trying to change attitudes

- Provision of vaccines on site
  - most common barrier is financial; need to fund/stock vaccines on site
The P3 Model - a promising intervention model

Theory-based model of preventive health behaviour that incorporates practice-, provider- and patient-level factors\textsuperscript{11}

Designed for the USA private obstetric antenatal setting targeting obstetricians to improve antenatal influenza and pertussis uptake

Trial underway; pilot study showed non-significant but promising results\textsuperscript{12}

\textsuperscript{11} Bednarczyk et al, 2018  \textsuperscript{12} Chamberlain et al, 2015
Aims and research plan

▪ **Design** multi-component intervention package with and for midwives to optimise vaccine discussions
  ▪ “MidVaxCom” qualitative study, Nov 2017-Sept 2018, Victoria and Western Australia

▪ **Pilot** the intervention to assess its acceptability and feasibility
  ▪ “MumBubVax” pilot study, Oct 2018-September 2019, Victoria

▪ **Evaluate** intervention efficacy in a national cluster randomised controlled trial
  ▪ “MumBubVax” RCT, from 2020, national
MidVaxCom - qualitative study to inform intervention design

- 12 semi-structured interviews with midwives
  - Royal Women’s Hospital, Melbourne (no maternal vaccines delivered)
  - King Edward Memorial Hospital, Perth (maternal vaccines delivered)
  - Discussed attitudes and values, perceptions about their role, communication techniques, resources and training, record-keeping

- 2 focus groups
  - Discussed preliminary intervention features, design, appropriateness, usefulness

Led by Dr Katie Attwell
Funded by WA Health

MidVaxCom - key findings

- Vaccination is part of a midwife’s role, but limited time and competing priorities
- Roles and vaccine discussions vary when vaccines are available on site
- Very little/no specific vaccination training
- Generally comfortable recommending vaccination (“It is recommended”) but not always confident answering questions
- Relationship with women is paramount, but most midwives respectfully ask parents’ reasons for hesitancy or refusal
- Trustworthy online info and fact sheets are useful and valued
- Rarely discuss infant and childhood vaccines
- Midwives particularly interested in knowing key vaccine facts and how to debunk myths / misinformation
- Findings support and echo those in other Australian studies\(^{14,15}\)
P3-MumBubVax intervention development

- **P3-MumBubVax intervention package** - design informed by MidVaxCom qualitative research and studies from the USA\(^{11,12,16,17}\)

### Practice-level components
- Vaccine champions
- Sticker/EMR reminders
- Vaccine promotional materials for clinic

### Provider-level components
- Online vaccine and communication tutorial for midwives (VaxChat Australia)
- Learning exercise to create personalised vaccine fact ‘cheat sheet’
- Provider portal of MumBubVax website with vaccine fact sheets and links to childhood vaccine info (SKAI)

### Parent-level components
- Text message reminders after booking visit
- Parent portal of MumBubVax website with maternal and early childhood vaccine information and fact sheets

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11. Bednarczyka et al, 2018  
16. Dempsey et al, 2018  
17. Stockwell et al, 2014
PRACTICE LEVEL: Stickers for paper records and vaccine champions

**PERTUSSIS VACCINE**
- **Discussed:** ☐
- **Date:**
- **Received:** ☐
- **Date:**
- **Declined:** ☐

**FLU VACCINE**
- **Discussed:** ☐
- **Date:**
- **Received:** ☐
- **Date:**
- **Declined:** ☐

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**VICTORIAN MATERNITY RECORD**

**THIS RECORD IS CONFIDENTIAL**

**Recommended care options:**
- [ ] Breastfeeding
- [ ] Formula feeding
- [ ] Other

**Recommended care provider details:**
- [ ] Shared care (Midwife
- [ ] Other

**WARNING:** If you have any of these symptoms please contact your midwife or doctor immediately:
- Stomach pain
- Vomiting
- Headache
- Fever
- Muscle pain

**ALERTS**

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**MANAGEMENT PLAN**

**PERMITI VACCINE**
- [ ] Discuss
- [ ] Date:
- [ ] Receive
- [ ] Date:
- [ ] Decline

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**YOUR PROGRESS THROUGH PREGNANCY**

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**SAMPLE ONLY**

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PROVIDER LEVEL: VaxChat online training video

1. Clear recommendation to vaccinate
2. Elicit concerns
3. Strategies to correct vaccine myths
4. Ask permission to share information and connect to worldview/core beliefs
5. Pivot to disease severity
6. Remember 1-2 key facts
7. Self-efficacy
PROVIDER LEVEL: Personalised vaccine fact ‘cheat sheet’

VaxChat Australia cheat sheet

In your conversations with expectant parents, it is helpful to have 1-2 key facts about maternal influenza and pertussis vaccines and the birth hepatitis B vaccine that can share quickly and confidently with expectant parents.

In short, we can tell you the facts you think are most memorable or useful in your discussions. At the end of the exercise, you will receive an email with your personalized fact sheet, which you can print and insert into your ID lanyard for easy access. We will not use or store your email address or responses to any of the questions.

All the facts listed in this exercise are supported by reliable, recent evidence and are included on the MumBubVax website and in the VaxChat educational tutorial.

Required

Email address *

Your email

First name

Your answer

GENERAL VACCINE SAFETY FACTS

In this question, you will select a key fact that you would like to remember about vaccine safety in general.

Choose 1 GENERAL vaccine safety fact:
- Maternal flu and pertussis vaccines are inactivated and can’t cause disease
- 11% of women have mild reactions (local reactions, headache, fever)
- Vaccines are tested in 3 phases of clinical trials before use and adverse events are monitored
- 1 in a million women have an anaphylactic reaction to vaccines

Flu facts:
- Flu complications include pneumonia, bronchitis, brain or heart inflammation & sepsis
- Maternal flu vaccination does not increase risk of stillbirth, premature delivery, or birth defects
- Flu vaccine effectiveness can vary each year, but vaccination is still the best way to protect mums & babies

Pertussis facts:
- Pertussis complications include pneumonia, organ failure, seizures & brain damage from lack of oxygen
- Previous anaphylactic reaction to vaccine is the only medical contraindication to maternal pertussis vaccination
- Protective antibodies transfer from mum to babies through the placenta after antenatal vaccination

Hepatitis B facts:
- Hepatitis B is very contagious & can be passed through birth, breastfeeding, biting & open sores
- No increased risk of Sudden Infant Death Syndrome (SIDS), autism, fever or infection from hepatitis B vaccination
- Premature babies are even more vulnerable to infection than full-term babies & should still be vaccinated on schedule

Jess test, this is your personalised vaccine information ‘cheat sheet’. Please print this document, cut along the outside lines and fold down the centre. This small card is designed to fit in a plastic ID lanyard for easy access.
PRACTICE LEVEL: Text message reminders for mothers

• Personalised
• Delivered from a recognised authority
• Starts with a message about disease severity and then a message of self-efficacy
PROVIDER & PARENT LEVEL: MumBubVax website

TALKING ABOUT IMMUNISATION FOR MOTHERS AND BABIES

Answering your questions and giving you evidence-based information to make decisions about vaccination in pregnancy and for your baby after delivery.

I AM VACCINATING

Vaccination during pregnancy is one of the best possible ways to protect your baby against disease during pregnancy and in the first few months after birth. Find out what vaccines are recommended during pregnancy and after delivery.

PERTUSSIS VACCINE

When you are pregnant, it is strongly recommended that you get vaccinated against pertussis (also known as whooping cough). Women should have a pertussis vaccination in each of their pregnancies, ideally between 28 and 32 weeks. The pertussis vaccine will protect both your baby and you from this serious infectious disease. The vaccine is free for all pregnant women in Australia.

INFOGRAPHIC: HOW DOES THE VACCINATION PROTECT MY BABY

1. Vaccine
   - Vaccines contain tiny fragments of the disease that are targeting. These are called ‘antigens’. In humans, these antigens are always inactivated which means they cannot reproduce or cause disease.

2. Antibodies
   - Antibodies are present in the blood. The are antibodies to protect against disease. When you get a vaccine, your immune system produces the antibodies to protect against the disease.

3. Vaccine during pregnancy
   - When you get a vaccine during pregnancy, the
PARENT LEVEL: Downloadable fact sheets

The pertussis vaccine for pregnant women

The flu vaccine for pregnant women

The hepatitis B vaccine for newborns

For more information, you can call the National Immunisation Hotline on 1800 006 655.
Links to existing Sharing Knowledge About Immunisation (SKAI) resources about childhood vaccination

P3-MumBubVax intervention designed to...

- Fit with midwife values
- Increase efficiency of vaccine conversations without adding to time or workload
- Schedule vaccine discussions at set times in pregnancy
- Create a platform for new vaccines ie RSV, GBS
- Operate in combination with structural levers
MumBubVax pilot for feasibility and acceptability

- **SETTING:**
  - Royal Women’s Hospital, Melbourne

- **TIMELINE:**
  - October 2018 - September 2019

- **OUTCOMES:**
  - Feasibility, acceptability, degree of intervention implementation
  - Uptake of maternal, infant and childhood vaccinations

- **MIDWIVES:**
  - n=25 midwives enrolled
  - n=18 completed VaxChat training (72%)
  - Median time to training completion = 13 days (range 5-53)

- **MOTHERS:**
  - n=62 expectant mothers enrolled (50% primipara)

- Data collection complete, analysis underway
Pilot data - quotes from midwives

- Stickers are my favourite strategies!
- It encouraged me to feel confident when discussing facts and figures with parents

Which skills from VaxChat did you use most?

- I took more time to get to the root of people’s concerns and use more open ended questions when discussing vaccinations.
- Sticking to one key point and making that relevant to the woman’s situation
- Really enjoyed the MumBubVax study. It increased my confidence in having these discussions and I have found the resources very helpful.
Next steps: national cluster RCT

PROPOSED TRIAL OUTCOMES:

1. Uptake of maternal influenza vaccine during pregnancy (*primary outcome*)
2. Uptake of maternal pertussis vaccine during pregnancy
3. Infant uptake of the birth dose of hepatitis B vaccine
4. Uptake and timeliness of primary series childhood vaccines to 12 months of age
5. Maternal knowledge and attitudes about maternal vaccines and hesitancy about childhood vaccines
6. Provider confidence in communicating about vaccination
References

7. Data sourced from Clinical Council Unit, Safer Care Victoria. Data compiled by Health Protection Branch
13. Kaufman J, Attwell K, Hauck Y, Omer SB, Danchin M. Vaccine discussions in pregnancy: interviews with midwives to inform design of an intervention to promote uptake of maternal and childhood vaccines. Human Vaccines and Immunotherapeutics 2019
Thank you!

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