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# Preliminary findings from the emotion, mental imagery, & vaccine acceptance (EMIVA) project

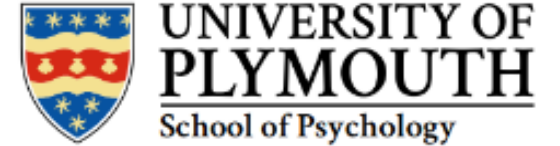
Dr Julie Ji

Lecturer, School of Psychology, University of Plymouth

Adjunct, School of Psychological Science, UWA

Email: [julie.ji@plymouth.ac.uk](mailto:julie.ji@plymouth.ac.uk)

 <https://www.linkedin.com/in/drjulieji/>  [@julieji.bsky.social](https://bsky.app/profile/julieji.bsky.social)



Government of Western Australia  
Department of Health



# PROJECT TEAM

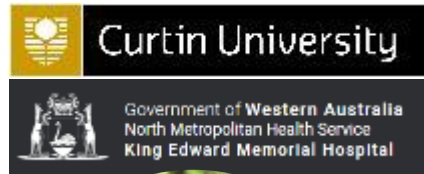
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**A/Prof Katie Attwell**



**Dr Zoe Bradfield**



**Prof Chris Blyth**



**Prof Margie Danchin**



**Catherine Hughes AM**



**A/Prof Jane Warland**



**Prof Colin Macleod**



**A/Prof Lies Notebaert**



**Dr Ben Grafton**



**Dr Julian Basanovic**



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Special thanks to midwife research assistants: Monique Rose, Eva Hansord

# Doctors call for whooping cough vaccination uptake amid worst year on record for cases

By Georgie Hewson

Vaccines and Immunity

Fri 8 Nov



ABC NEWS

## Whooping Cough Surge

▶ Watch

Australia experiencing worst whooping cough epidemic on record

### Whooping cough cases in Australia by year

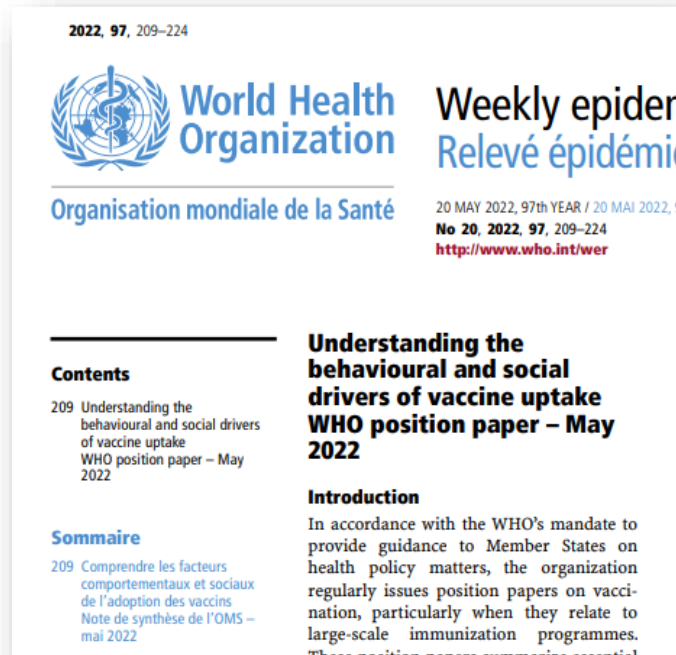
Highest number of cases on record as of November, 2024.



ABC News / Source: Australian Government Department of Health and Aged Care. NINDSS Portal. / [Get the data](#)

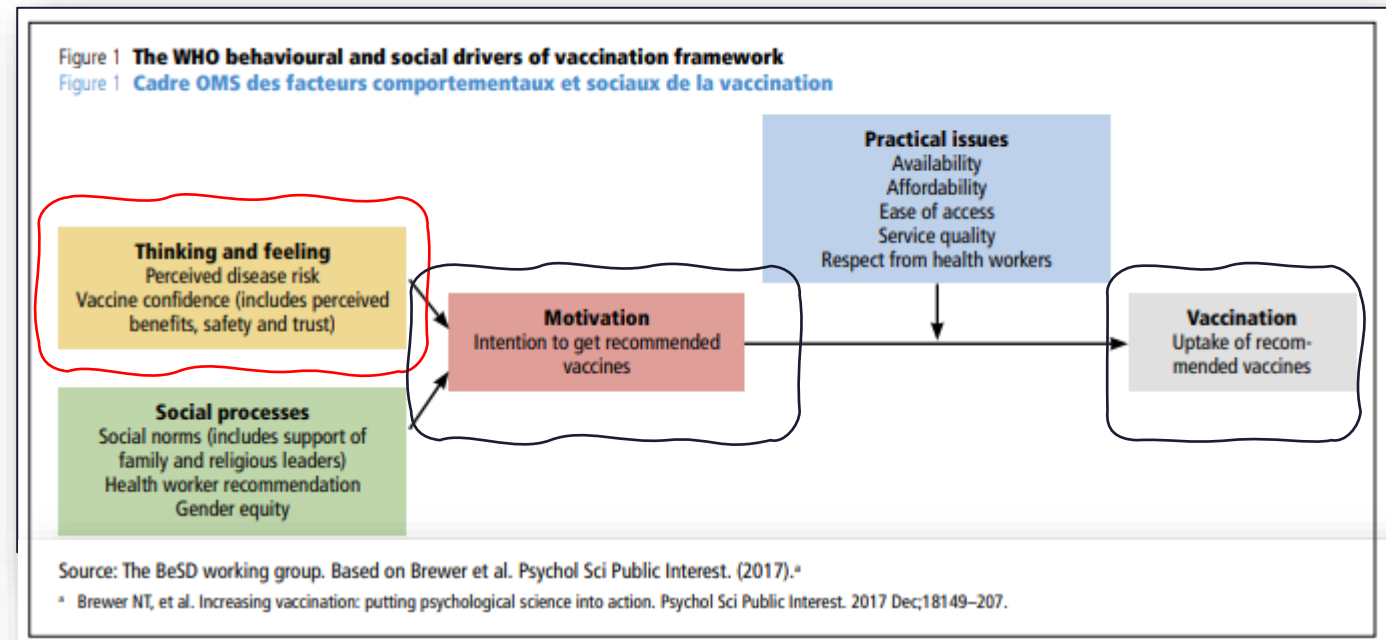
New South Wales has recorded the highest number of cases (19,653), followed by Queensland (11,728).

# Vaccine hesitancy: Role of cognition (thinking) & emotion (feeling)



2022 WHO position on vaccine hesitancy <sup>2</sup>:

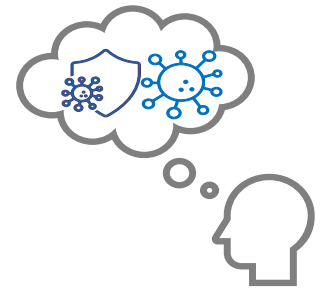
*“A motivational state of being conflicted about, or opposed to, getting vaccinated; this includes intentions and willingness.”*



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# Research aim

Investigate mental imagery as modifiable psychological factor underpinning vaccine-related thinking, feeling, hesitancy, & behaviour during pregnancy, and after pregnancy (0-6 months post-delivery).





# Mental imagery: an emotional & persuasive form of mental evidence



 Behavior Therapy  
Volume 47, Issue 5, September 2016, Pages 702-719

## Emotional Mental Imagery as Simulation of Reality: Fear and Beyond—A Tribute to Peter Lang

Julie L. Ji<sup>1</sup>, Stephanie Burnett Heyes, Colin MacLeod, Emily A. Holmes<sup>2</sup>  

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<https://doi.org/10.1016/j.beth.2015.11.004>  [Get rights and content](#) 

### Feature Review

## Mental Imagery: Functional Mechanisms and Clinical Applications

Joel Pearson,<sup>1,\*</sup> Thomas Nasclaris,<sup>2</sup> Emily A. Holmes,<sup>3,4</sup> and Stephen M. Kosslyn<sup>5</sup>

Mental imagery research has weathered both disbelief of the phenomenon and inherent methodological limitations. Here we review recent behavioral, brain imaging, and clinical research that has reshaped our understanding of mental imagery. Research supports the claim that visual mental imagery is a depictive internal representation that functions like a weak form of perception. Brain imaging work has demonstrated that neural representations of mental and perceptual images resemble one another as early as the primary visual cortex (V1). Activity patterns in V1 encode mental images and perceptual images via a common set of low-level depictive visual features. Recent translational and clinical research reveals the pivotal role that imagery plays in many mental disorders and suggests how clinicians can utilize imagery in treatment.

**Trends**  
Recent research suggests that visual mental imagery functions as if it were a weak form of perception.

**Evidence suggests overlap between visual imagery and visual working memory – those with strong imagery tend to differ 4 for memory performance.**



**Brain imaging work suggests that representations of perceptual and mental images resemble one another as early as V1.**

Received: 25 November 2018 | Revised: 25 February 2019 | Accepted: 4 April 2019  
DOI: 10.1111/ap.12406

INVITED CONTRIBUTION

Australian Psychologist 

## The essential role of mental imagery in cognitive behaviour therapy: What is old is new again

Lisa M. Saulsman<sup>1,2</sup>  | Julie L. Ji<sup>1</sup> | Peter M. McEvoy<sup>3,4</sup> 

<sup>1</sup>School of Psychological Science, The University of Western Australia, Perth, Western Australia, Australia  
<sup>2</sup>Cognitive Behaviour Therapy Services Western Australia, Perth, Western Australia, Australia  
<sup>3</sup>School of Psychology, Curtin University, Perth, Western Australia, Australia

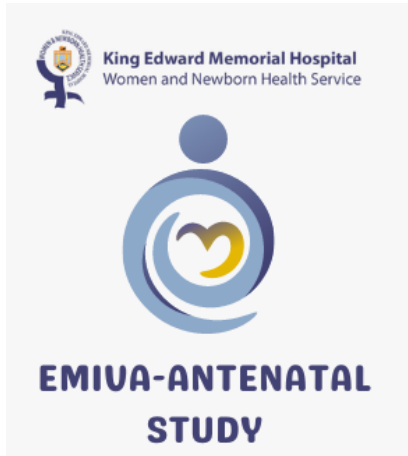
### Abstract

**Objective:** The aim of this review is to highlight the important role of mental imagery in contemporary cognitive behaviour therapy (CBT).

**Method:** In this narrative review, we define mental imagery based on cognitive science research, present the rationale for the incorporation of mental imagery within CBT, and outline four key applications of mental imagery within CBT prac-

- **Flashbacks & flashforwards in the mind's eye: relieve** the past (remember) & **pre-experience** the future (simulate) via **mental imagery**
- More powerful than verbal thinking in evoking **emotions & motivating** (maladaptive & adaptive) behaviours
- **Availability** influences **event judgment** (e.g. risk of negative events) & **anticipated regret**
- Increasing focus on mental imagery symptoms as an **intervention target in clinical psychology**

# The EMIVA Project



## Data collection:

15<sup>th</sup> Dec 2022 - 29<sup>th</sup> Sept 2023



- Pertussis (whooping cough)
- Influenza (flu)
- COVID-19



**$N = 411$  surveyed at baseline.**  
(Excluded  $n = 7$  participants told to avoid vaccines during pregnancy.)

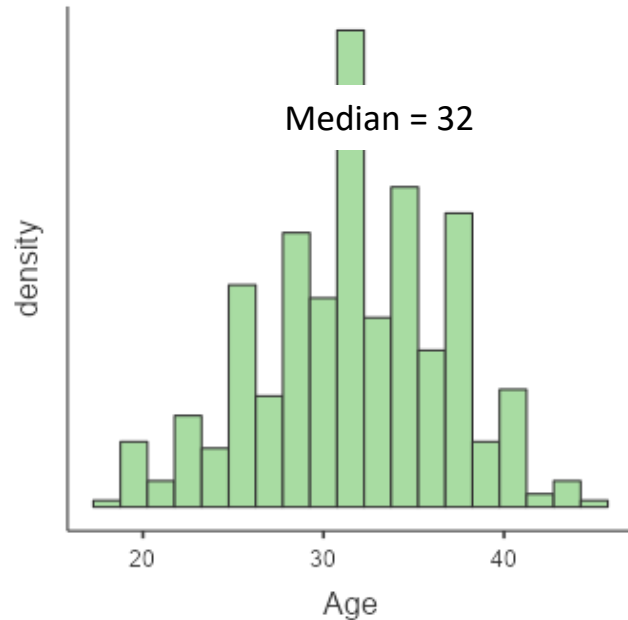


$N = 304$  consented to AIR record access.  **$N = 264$  records identified so far.**

Time

# Method

## Participants



### Education (highest attained)\

	<i>N</i>	%
Primary school & above	4	1%
High school	90	21.5%
TAFE qualification	104	24.9%
Undergraduate degree	140	33.5%
Postgraduate degree	80	19.1%

### Ethnicity (could endorse multiple)

	<i>N</i>	%
Australian	237	57.6%
North/Western European	36	8.8%
South/Eastern European	11	2.7%
South/East Asian	55	13.4%
Aboriginal Australian	26	6.3%
Mid-Eastern/Nth African	13	3.2%
North/East Asian	14	3.40%
South/Central Asian	11	2.7%
People of the Americas	10	2.4%
Sub-Saharan African	19	4.6%



# Method

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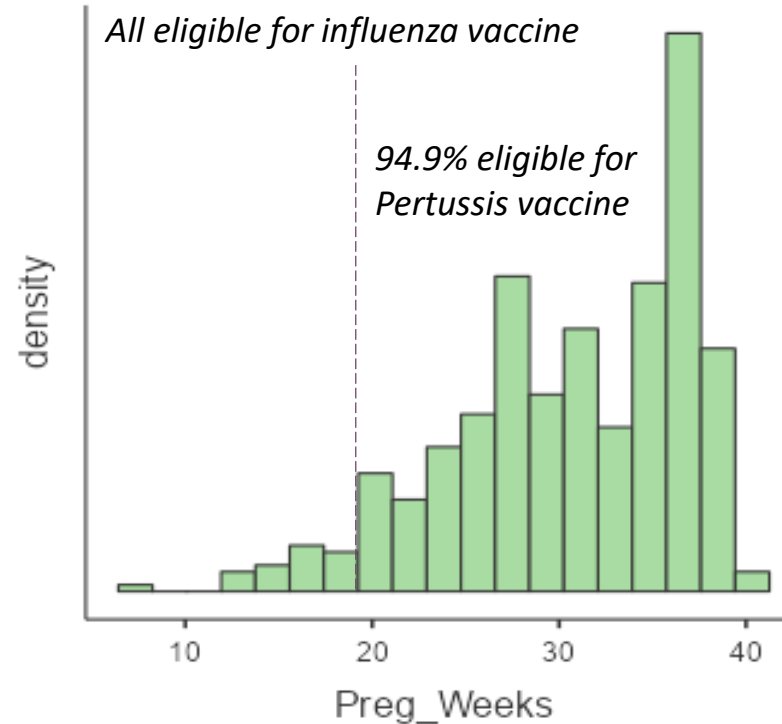
## Participants



### Vaccine eligibility:

#### Vaccination status at baseline

- Pertussis (whooping cough)
  - $N = 141$  (62.2%) vaccinated
- Influenza (flu)
  - $N = 237$  (58.1%) vaccinated
- COVID-19
  - $N = 320$  (21.6%) unvaccinated

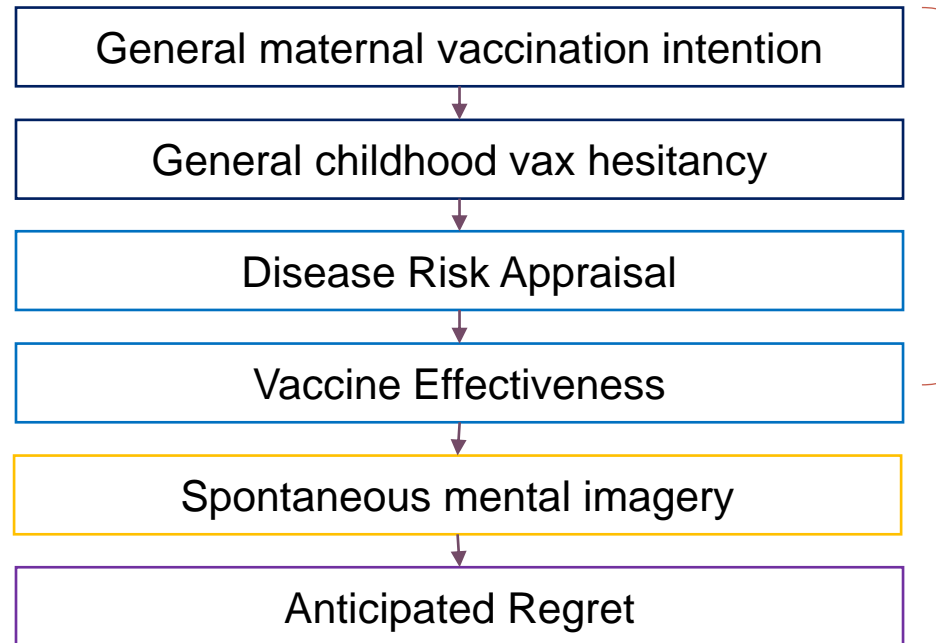


### First pregnancy:

- $N = 147$  (35.3%)
- No relationship between first pregnancy status and baseline vaccination status for Pertussis, Influenza, or Covid.

# Method

## Baseline assessment



**Yes/No - mental pictures/movie clips whilst responding to study so far:**

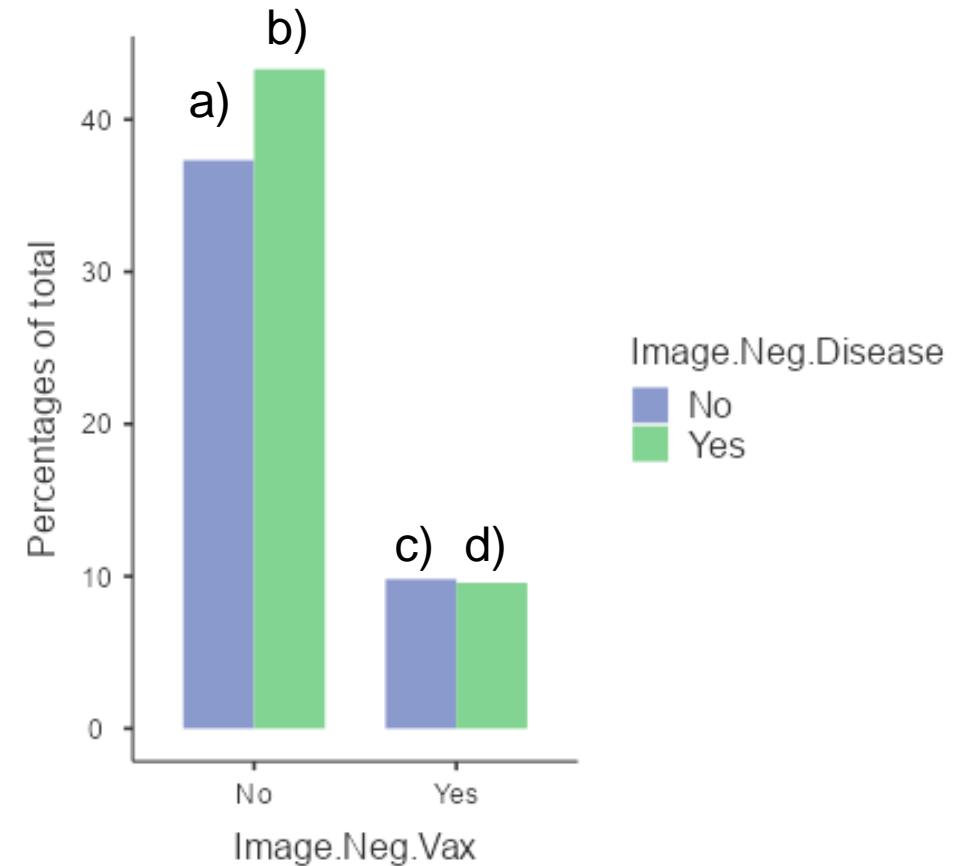
- Negative disease imagery - negative impact from diseases
- Negative vaccine imagery – negative impact from vaccines

## Results: Spontaneous Mental Imagery

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### Self-reported occurrence of spontaneous mental imagery

- a) 63% reported experiencing negative mental imagery, i.e. 37% did not.
- b) 43.30% reported experiencing negative disease-impact related mental imagery, but not negative vaccine-impact related mental imagery
- c) 9.81% reported experiencing negative vaccine-impact related mental imagery, but not negative disease-impact related mental imagery
- d) 9.57% reported experiencing both types of negative mental imagery



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**Majority experienced negative mental images, mostly related to disease, but  $\approx$  1/10 reported negative vaccine imagery.**

## Results: Spontaneous Mental Imagery content

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### Negative disease imagery

*"Baby in NICU. Being unwell myself."*

*"I visualised the effect of whooping cough on a small baby, that can't catch their breath."*

*"I could picture/hear the pain of my baby coughing and crying."*

*"My tiny baby in hospital with breathing issues/oxygen tubes."*

*"Me having COVID-19 as I've had it before & it was not a good experience."*

*"visualised past experience of Covid whilst pregnant (mild to moderate illness, with low grade fever, blocked nose, and cough), particularly visualised sitting up with baby at night both with a cough. also visualised the severity of the cough babies can experience with whooping cough. When thinking about influenza, visualise many of the occupational exposures (e.g. droplet precaution signs on doors at work)"*

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**A combination of flashbacks & flashforwards to emotionally negative scenes due to disease.**

## Results: Spontaneous mental imagery content

---

### Negative & vaccine imagery

*"I saw imagery of the testing equipment used to monitor side effects I had as a result of the Covid vaccinations."*

*"I saw myself getting injected with a vaccine, also saw myself getting ill with covid despite 3 vaccines for it, also saw every person who has had a flu vaccine that I know of come down with serious flu symptoms for more than 2 weeks."*

*"My friend very sick from covid vaccine."*

*"Imagining how the covid shot will affect my baby as I remember how the first shot affected me."*

### Negative disease & vaccine imagery

*"Hospital visits, tubes and wires."*

*"Whooping sound of the cough; baby suffering from dehydration due to sore throat; COVID vaccine adverse effects on the baby or myself during pregnancy."*

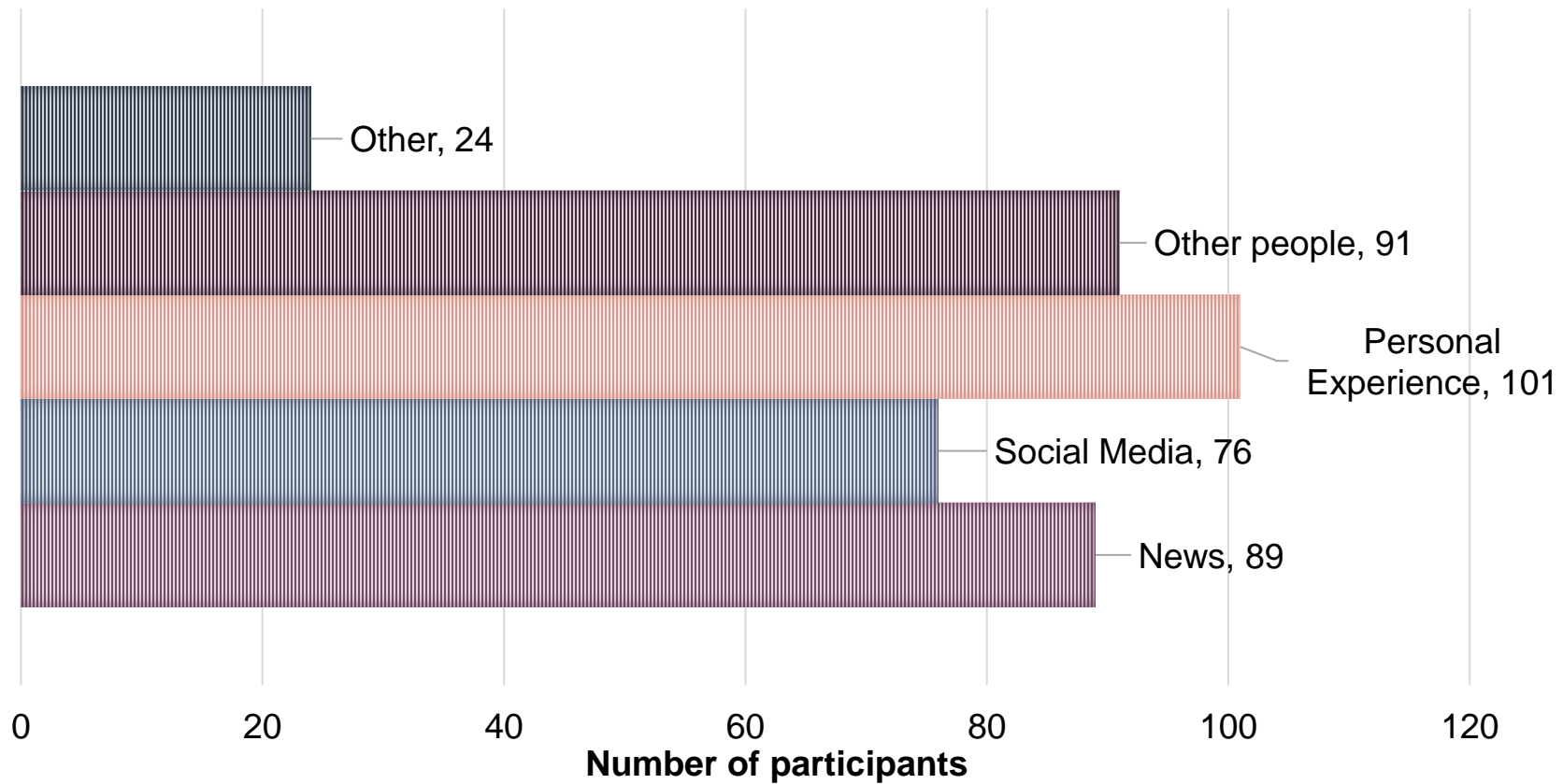
*"flu vaccine - 2 images of a child who was in icu/ severe disability from adverse effect AND the image of parents grieving over the death of their child from the flu. Also, the amount of well people from covid. a friends complicated placenta issues from covid."*

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**A combination of flashbacks & flashforwards to emotionally negative scenes due to disease &/or vaccine.**



# Results: Spontaneous mental imagery source



**Imagery reflects a mixture of news/social media & direct/indirect experience**

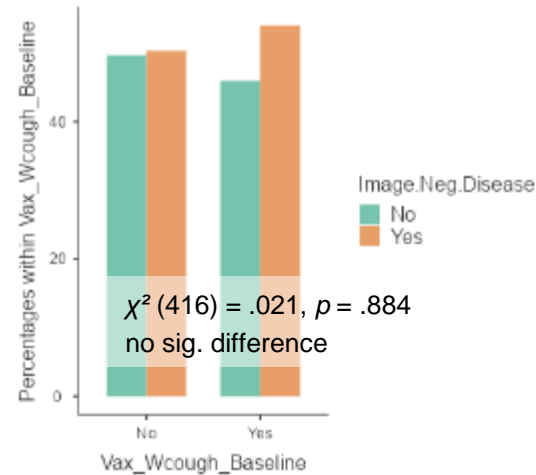
# Results: Cross-sectional sample

## RELATIONSHIP TO BASELINE VACCINATION STATUS

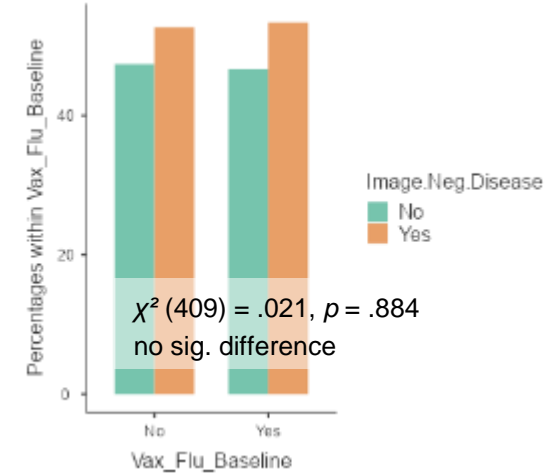
### Negative disease-impact mental imagery

- Common, did not distinguish vaxed vs. unvaxed

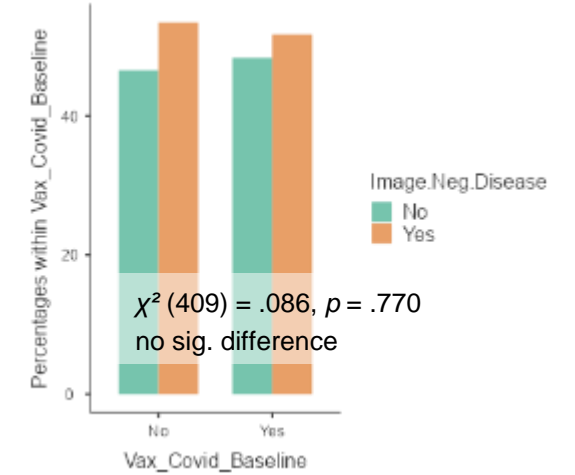
**Pertussis**



**Influenza**

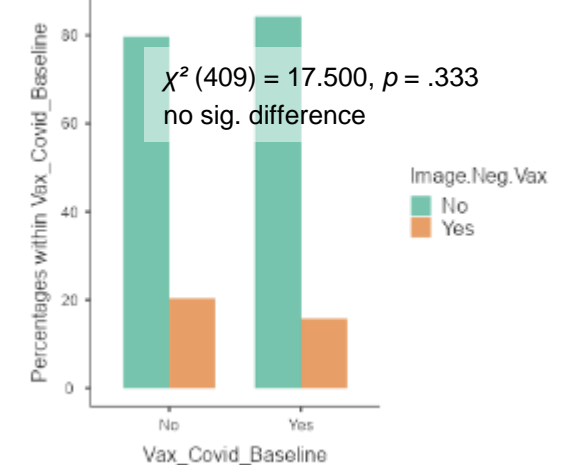
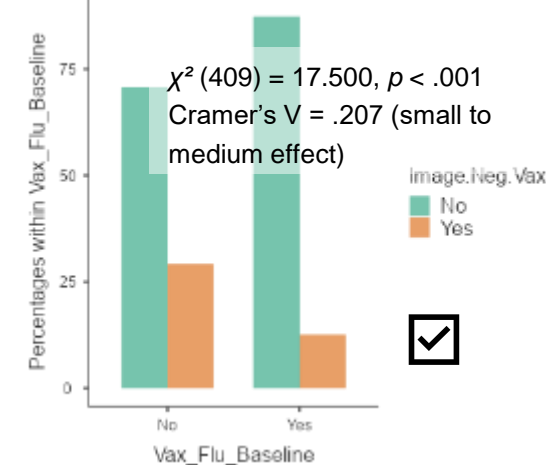
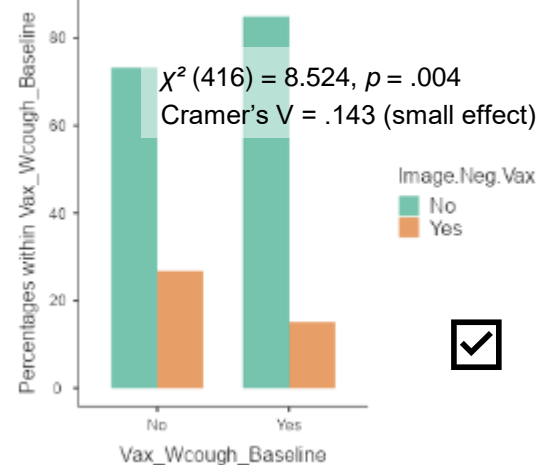


**Covid**



### Negative vaccine-impact mental imagery

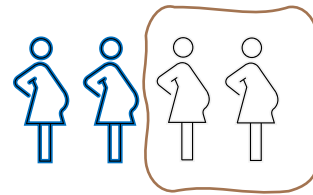
- Less common, more by unvaxed than vaxed (Pertussis & Influenza)



**Participants unvaccinated (Pertussis & Flu) were more likely to report negative vaccine imagery than vaccinated ones.**

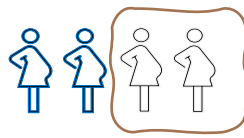


**Hypothesis:** The presence of spontaneous negative vaccine-related mental imagery would be associated with greater hesitancy, lower vaccine uptake, more negative thinking & feeling favouring inaction (not vaccinating)



- Those unvaccinated at baseline

# Results: Unvaccinated sample



## MATERNAL HESITANCY - PERTUSSIS

**Table 1.**

Linear regression model coefficients predicting Pertussis vaccine hesitancy during pregnancy.

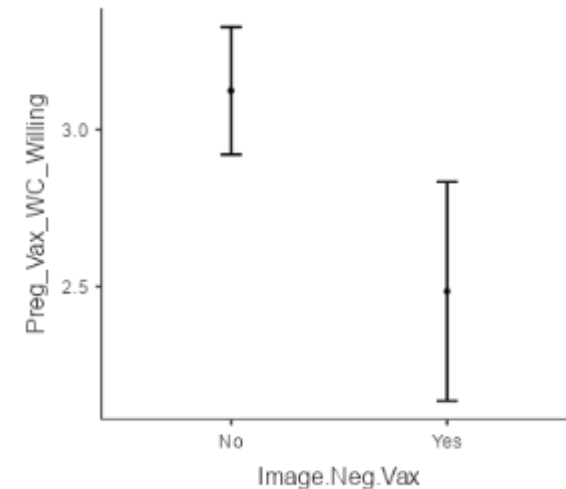
Predictor	Estimate	SE	t	p	$\beta$	95% C.I.	
						Lower	Upper
Intercept	2.289	0.205	11.149	< .001			
<b>General Childhood Vaccine Hesitancy</b>	<b>-0.131</b>	<b>0.031</b>	<b>-4.248</b>	<b>&lt; .001</b>	<b>-0.347</b>	<b>-0.508</b>	<b>-0.185</b>
Disease-specific risk perception							
Likelihood of infection	-0.022	0.151	-0.145	0.885	-0.017	-0.256	0.221
Likelihood of health impact	0.054	0.128	0.419	0.676	0.048	-0.178	0.274
Vaccine protection for infection	-0.249	0.145	-1.714	0.089	-0.200	-0.430	0.031
Vaccine protection for health impact	-0.014	0.100	-0.135	0.893	-0.013	-0.206	0.180
Anticipated Regret (Action Bias)	-0.075	0.065	-1.149	0.253	-0.095	-0.257	0.068
Spontaneous Negative Mental Imagery (Yes – No)							
Disease-impact imagery	-0.096	0.182	-0.526	0.600	-0.074	-0.354	0.205
<b>Vaccine-impact imagery</b>	<b>-0.639</b>	<b>0.210</b>	<b>-3.041</b>	<b>0.003</b>	<b>-0.495</b>	<b>-0.817</b>	<b>-0.173</b>

### Full model

•  $F(8, 134) = 11.417, R^2 = 40.53\%$

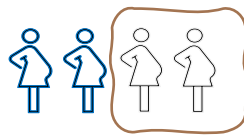
### Negative vaccine-impact mental imagery:

•  $F(1, 134) = 9.2496, R^2_{\Delta} = 4.10\%$



**Negative vaccine imagery independently predicts Pertussis vaccine hesitancy over & above other known factors.**

# Results: Unvaccinated sample



## MATERNAL HESITANCY - INFLUENZA

**Table 3.**

Linear regression model coefficients predicting Influenza vaccine hesitancy during pregnancy.

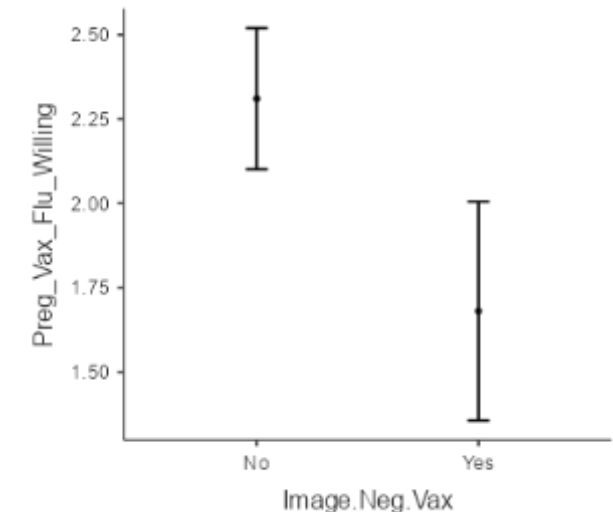
Predictor	Estimate	SE	t	p	95% C.I.		
					$\beta$	Lower	Upper
Intercept	1.081	0.206	5.235	< .001			
<b>General Childhood Vaccine Hesitancy</b>	<b>-0.152</b>	<b>0.031</b>	<b>-4.948</b>	<b>&lt; .001</b>	<b>-0.331</b>	<b>-0.463</b>	<b>-0.199</b>
Disease-specific risk perception							
Likelihood of infection	0.177	0.138	1.284	0.201	0.109	-0.059	0.277
Likelihood of health impact	0.060	0.124	0.482	0.630	0.045	-0.140	0.230
<b>Vaccine protection for infection</b>	<b>-0.335</b>	<b>0.139</b>	<b>-2.411</b>	<b>0.017</b>	<b>-0.201</b>	<b>-0.366</b>	<b>-0.036</b>
Vaccine protection for health impact	-0.049	0.118	-0.410	0.682	-0.036	-0.211	0.139
<b>Anticipated Regret (Action Bias)</b>	<b>-0.145</b>	<b>0.065</b>	<b>-2.236</b>	<b>0.027</b>	<b>-0.154</b>	<b>-0.290</b>	<b>-0.018</b>
Spontaneous Negative Mental Imagery (Yes – No)							
Disease-impact imagery	-0.175	0.180	-0.975	0.331	-0.115	-0.347	0.118
<b>Vaccine-impact imagery</b>	<b>-0.630</b>	<b>0.204</b>	<b>-3.086</b>	<b>0.002</b>	<b>-0.413</b>	<b>-0.677</b>	<b>-0.148</b>

### Full model

- $F(8, 134) = 22.128, R^2 = 54.63\%$

### Negative vaccine-impact mental imagery:

- $F(1, 134) = 9.521, R^2_{\Delta} = 2.94\%$



**Negative vaccine imagery independently predicts Influenza vaccine hesitancy over & above other known factors.**



# Results: Unvaccinated sample



## COVID - WILLINGNESS

**Table 3.**

Linear regression model coefficients predicting Covid vaccine hesitancy during pregnancy.

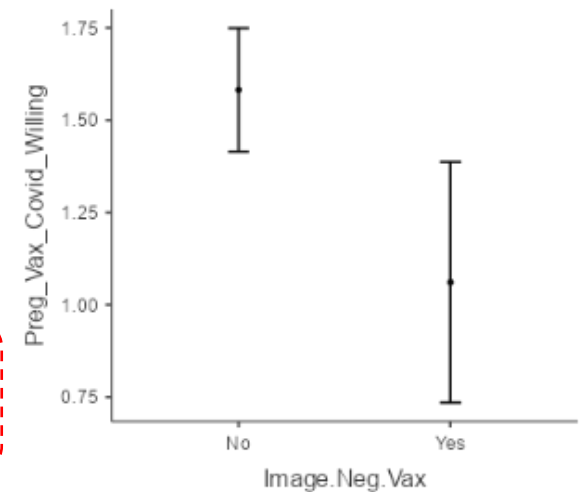
Predictor	Estimate	SE	t	p	$\beta$	95% C.I.	
						Lower	Upper
Intercept	0.314	0.186	1.688	0.093			
<b>General Childhood Vaccine Hesitancy</b>	<b>-0.100</b>	<b>0.028</b>	<b>-3.604</b>	<b>&lt; .001</b>	<b>-0.206</b>	<b>-0.319</b>	<b>-0.094</b>
Disease-specific risk perception							
Likelihood of infection	0.171	0.110	1.552	0.122	0.108	-0.029	0.245
Likelihood of health impact	0.185	0.098	1.883	0.061	0.133	-0.006	0.273
<b>Vaccine protection for infection</b>	<b>-0.254</b>	<b>0.112</b>	<b>-2.272</b>	<b>0.024</b>	<b>-0.170</b>	<b>-0.317</b>	<b>-0.023</b>
Vaccine protection for health impact	0.028	0.097	0.290	0.772	0.022	-0.126	0.169
<b>Anticipated Regret (Action Bias)</b>	<b>-0.123</b>	<b>0.054</b>	<b>-2.289</b>	<b>0.023</b>	<b>-0.137</b>	<b>-0.255</b>	<b>-0.019</b>
Spontaneous Negative Mental Imagery (Yes – No)							
Disease-impact imagery	-0.114	0.154	-0.743	0.458	-0.077	-0.280	0.127
<b>Vaccine-impact imagery</b>	<b>-0.521</b>	<b>0.190</b>	<b>-2.744</b>	<b>0.006</b>	<b>-0.350</b>	<b>-0.602</b>	<b>-0.099</b>

### Full model

- $F(8, 274) = 17.334$ ,  
 $R^2 = 33.60\%$

### Negative vaccine-impact mental imagery:

- $F(1, 274) = 7.531$ ,  
 $R^2_{\Delta} = 1.82\%$



**Negative vaccine imagery independently predicts Covid vaccine hesitancy over & above other known factors.**

# Results: Prospective sample

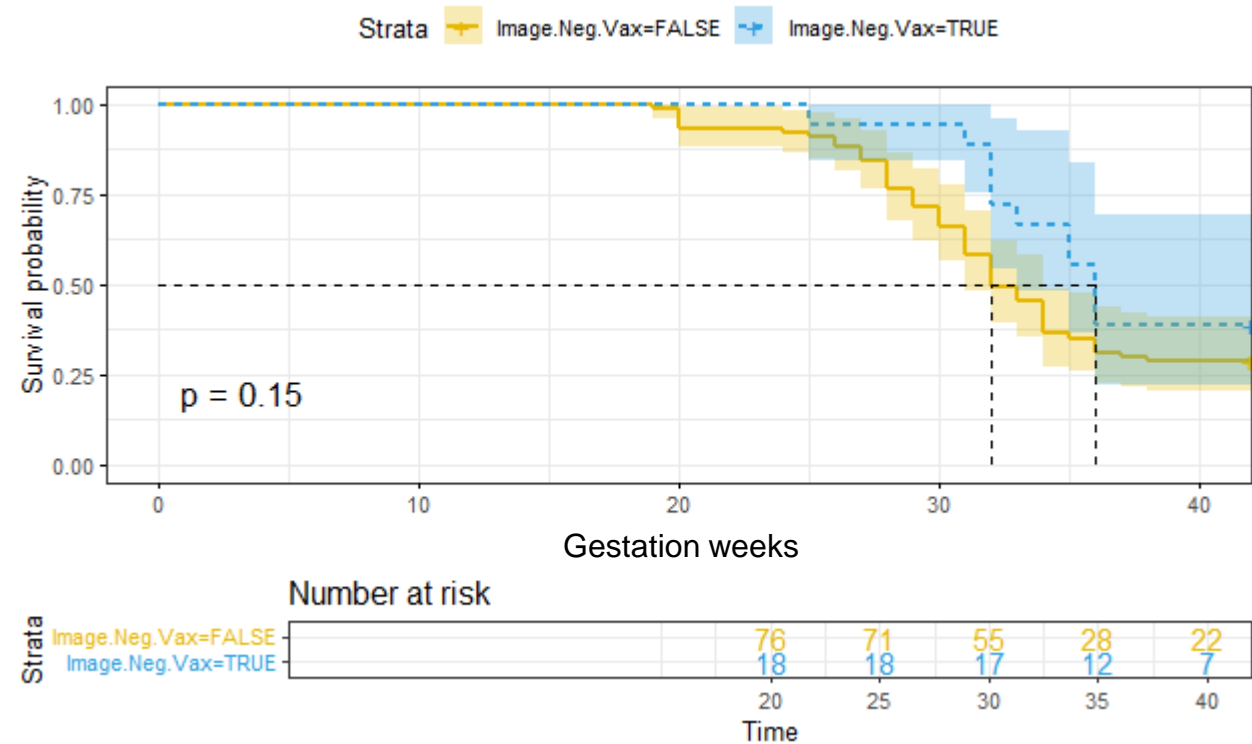
## PERTUSSIS - VACCINATION BEHAVIOUR: UPTAKE TIMING

Unvaxed at baseline:  $N = 157$

- $N = 95$  consented to record access)
- $N = 29$  (30.53%) remained unvaxed at end of pregnancy

*Negative vaccine imagery status:*

- Did not predict vaccine uptake timing,  $b = -.464$ ,  $z = -1.398$ ,  $p = .162$



**Negative vaccine imagery did not predict the timing of vaccine uptake for Pertussis.**

# Results: Prospective sample

## PERTUSSIS – VACCINATION BEHAVIOUR: NON-UPTAKE LIKELIHOOD

Unvaxed at baseline:  $N = 157$

- $N = 95$  consented to record access)
- $N = 29$  (30.53%) remained unvaxed at end of pregnancy

**Table 2.**

Binomial regression model coefficients predicting Pertussis vaccine uptake during pregnancy.

Predictor	Estimate	95% C.I.		SE	Z	p	Odds ratio
		Lower	Upper				
Intercept	-0.265	-1.254	0.724	0.505	-0.525	0.600	0.767
<b>General Maternal Vaccine Hesitancy</b>	<b>0.723</b>	<b>0.052</b>	<b>1.394</b>	<b>0.342</b>	<b>2.110</b>	<b>0.035</b>	<b>2.060</b>
General Childhood Vaccine Hesitancy	-0.013	-0.193	0.167	0.092	-0.140	0.889	0.987
Spontaneous Negative Mental Imagery (Yes – No)							
Disease-impact imagery	0.471	-0.471	1.413	0.481	0.979	0.327	1.601
Vaccine-impact imagery	0.500	-0.848	1.848	0.688	0.727	0.467	1.649

Note. Estimates represent the log odds of Uptake vs. Non-uptake

*Negative vaccine imagery did not predict likelihood of vaccine non-uptake for Pertussis.*

# Results: Prospective sample

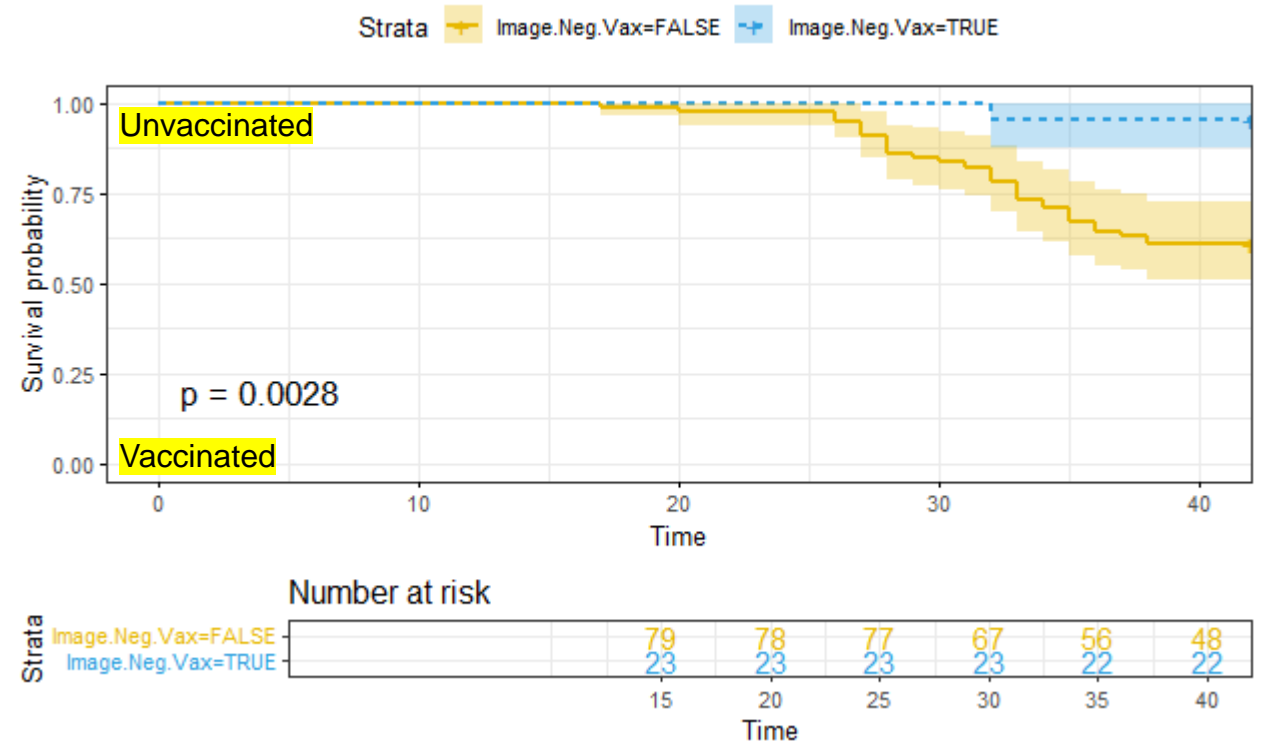
## INFLUENZA – VACCINATION BEHAVIOUR: UPTAKE TIMING

Unvaxed at baseline:  $N = 171$

- $N = 102$  consented to record access
- $N = 70$  (68.6%) remained unvaxed at end of pregnancy

*Negative vaccine imagery status:*

- Significantly predicted vaccine uptake timing,  $b = -2.406$ ,  $z = -2.367$ ,  $p = .018$
- Trend towards predicting vaccine uptake timing over & above general maternal hesitancy,  $b = -1.873$ ,  $z = -1.834$ ,  $p = .067$ .



**Individuals reporting negative vaccine mental imagery also had significantly later vaccine uptake for Influenza.**

**May help to predict behaviour over and above motivation/intention.**

# Results: Prospective sample

## INFLUENZA – VACCINATION BEHAVIOUR: NON-UPTAKE LIKELIHOOD

**Table 4.**

Binomial regression model coefficients predicting Influenza vaccine uptake during pregnancy.

Predictor	b	95% C.I.		SE	Z	p	Odds ratio
		Lower	Upper				
Intercept	-1.468	-2.612	-0.323	0.584	-2.513	0.012	0.230
<b>General Antenatal Vaccination Intention</b>	<b>1.108</b>	<b>0.316</b>	<b>1.899</b>	<b>0.404</b>	<b>2.744</b>	<b>0.006</b>	<b>3.027</b>
General Childhood Vaccine Hesitancy	-0.022	-0.207	0.164	0.095	-0.228	0.820	0.979
Spontaneous Negative Mental Imagery (Yes – No)							
Disease-impact imagery	-0.650	-1.665	0.365	0.518	-1.255	0.209	0.522
<b>Vaccine-impact imagery</b>	<b>-2.217</b>	<b>-4.386</b>	<b>-0.049</b>	<b>1.106</b>	<b>-2.004</b>	<b>0.045</b>	<b>0.109</b>

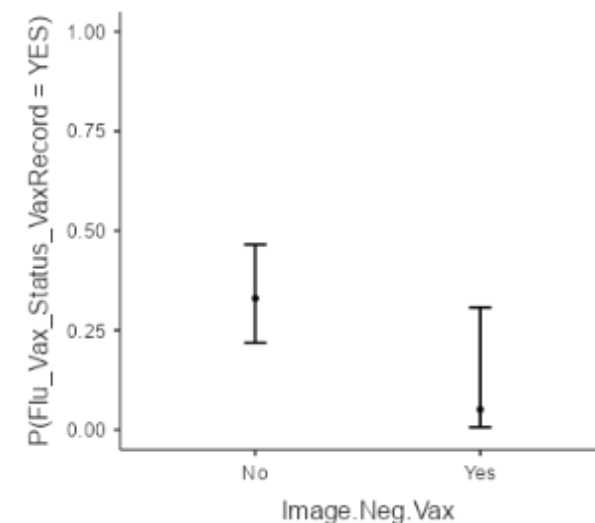
Note. Estimates represent the log odds of Uptake vs. Non-uptake.

### Full model

- $\chi^2 (4) = 26.462, p < .001, R^2_{\text{Nagelkerke}} = 32.10\%$

### Negative vaccine-impact mental imagery:

- $\chi^2 (1) = 6.242, R^2_{\text{Nagelkerke}} = 6.84\%$



**Negative vaccine imagery independently predicts likelihood of Influenza vaccine uptake over & above other known factors.**



# Results: Prospective sample

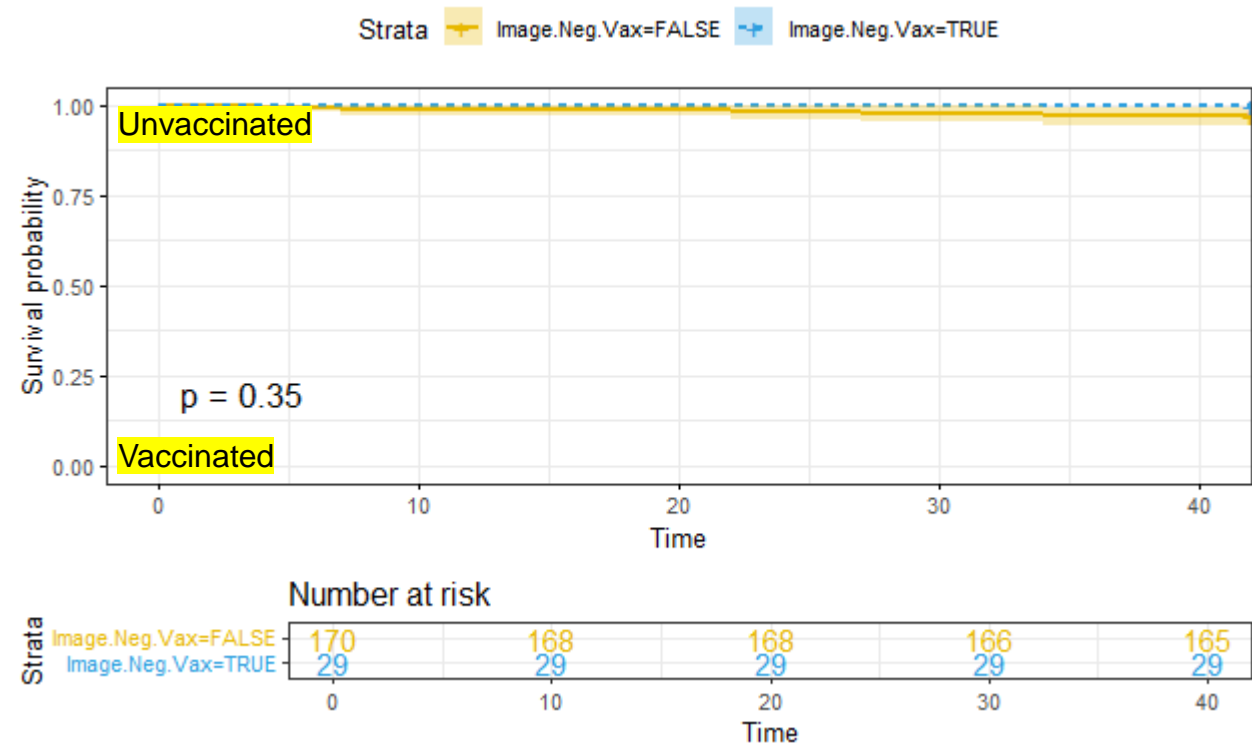
## COVID – VACCINATION BEHAVIOUR: UPTAKE TIMING

Unvaxed at baseline:  $N = 320$

- $N = 199/320$  consented to record access
- $N = 195$  (97.5%) remained unvaxed at end of pregnancy

*Negative vaccine imagery status:*

- Did not predicted vaccine uptake timing,  $b = -18.26$ ,  $z = -.002$ ,  $p = .999$



Covid vaccine uptake timing or status was not related to negative vaccine mental imagery (very few vaccinated).

# Results: Prospective sample

## COVID – VACCINATION BEHAVIOUR: VACCINE NON-UPTAKE LIKELIHOOD

**Table 6.**

Binomial regression model coefficients predicting Covid vaccine uptake during pregnancy.

Predictor	Estimate	SE	Z	p	Odds ratio	95% C.I.	
						Lower	Upper
Intercept	-4.985	1.602	-3.112	0.002	0.007	0.000	0.158
General Antenatal Vaccination Intention	0.598	0.909	0.658	0.511	1.819	0.306	10.800
General Childhood Vaccine Hesitancy	0.019	0.192	0.100	0.920	1.019	0.700	1.484
Spontaneous Negative Mental Imagery (Yes – No)							
Disease-impact imagery	0.932	1.132	0.823	0.410	2.540	0.276	23.364
Vaccine-impact imagery	-15.564	1937.328	-0.008	0.994	0.000	0.000	Inf

Note. Estimates represent the log odds of "Uptake" vs "No Uptake"

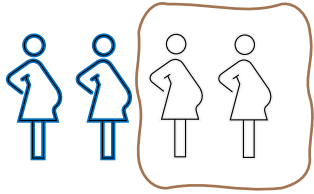
*Overall model not significant:*

- $\chi^2 (4) = 3.048, p = .550,$   
 $R^2_{\text{Nagelkerke}} = 7.26\%$

**Vaccination uptake for Covid was not predicted by known factors – likely due to small sample of vaccinated individuals.**

# Summary of findings

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## Longitudinal prospective sample

- Those unvaccinated at baseline

### Predicts vaccine hesitancy - Pertussis, Influenza, & Covid:

- Presence of negative vaccine-related mental imagery was an independent predictor
- Over & above general childhood vaccine hesitancy, perceived disease risk & vaccine effectiveness, & anticipated regret bias

### Predicts uptake timing (gestation weeks passed) – Influenza only:

- Negative vaccine-related mental imagery predicted later uptake timing
- Trend towards predicting timing above & beyond general maternal vaccine hesitancy (intention)

### Predicts uptake status (yes/no) – Influenza only:

- Negative vaccine mental imagery was an independent predictor
  - Over & above general maternal vaccine hesitancy (intention)
-

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# Implications

First evidence of mental imagery's link to vaccine-related risk perception (thinking) & anticipated regret (feeling)

& as a novel independent ***predictor*** of vaccine hesitancy & behaviour over & above risk perception & anticipated regret.



- Mental availability of **negative vaccine-related mental imagery** is more predictive of vaccine-related thinking & feeling than availability of negative disease-related mental imagery.



- Predicts disease-specific hesitancy above & beyond known factors - i.e. not just epiphenomenal.

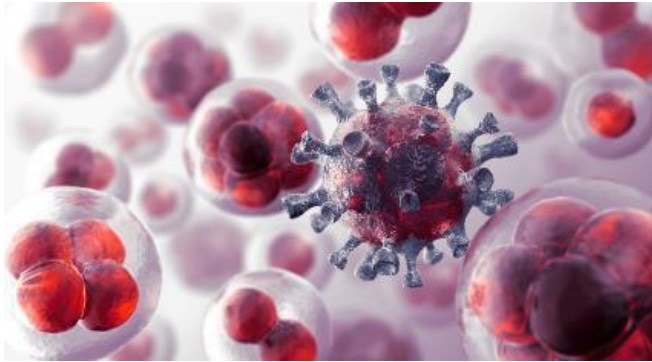


- It predicts the timing and occurrence of Influenza vaccine uptake, above & beyond hesitancy (intention).
- Potentially important behaviour predictor for medium coverage diseases (like flu).



- Indicates negative mental imagery to be a potentially useful novel cognitive target for further research.

# Future directions for research



## A closer look at participants' mental images

- Vast majority of mental images are emotionally negative – sick babies, hospitals, test tubes, coughing. Thus, more negativity may drive avoidance/denial
- Some mental images were also endorsed as **positive** - relating to vaccines:

“A sick baby if I don't vaccinate.”

I could see health babies that were at less risk after having received the whooping cough vaccination

“A person in the hospital very sick wishing they got the vaccination.”

“Transfer of antibodies to baby through placenta.”

“Evidence based research.”



# Future directions for research: can imagery enhance existing interventions?

HUMAN VACCINES & IMMUNOTHERAPEUTICS  
2019, VOL. 15, NO. 11, 2534–2543  
<https://doi.org/10.1080/21645515.2019.1607131>

Taylor & Francis  
Taylor & Francis Group

RESEARCH PAPER

**Vaccine discussions in pregnancy: interviews with midwives to inform design of an intervention to promote uptake of maternal and childhood vaccines**

Jessica Kaufman<sup>a,b\*</sup>, Katie Attwell<sup>c,d,e\*</sup>, Yvonne Hauck<sup>f,g</sup>, Saad B. Omer<sup>h</sup>, and Margie Danchin<sup>a,e,i,j</sup>

## Multi-component P3-MumBubVax intervention

### Motivational Interviewing:

- Structured counselling approach to motivating behaviour change
- Through active listening, eliciting specific concerns, and asking permission to share information or views

Table 1. Motivational Interviewing (MI) Skills Included in MI4MI Training Intervention.

Brief MI Skills	Explanation	Example
Open-ended questions	Explore and understand a patient's stance on vaccination	"What have you heard about these vaccines?"
Affirmation	Show support and appreciation for a patient by highlighting positive attributes	"I can tell you're being very thoughtful about this decision"
Reflection	Confirm understanding of a patient's viewpoint and help patient better understand their own motivations	"It sounds like you are concerned about side-effects from the flu vaccine AND you want to keep your baby healthy"
Ask permission to share	Improve patient receptivity by asking first before presenting more information	"Would it be ok if I share with you what I've learned about using these vaccines during pregnancy?"
Autonomy support	Letting patient know they are in control.	"Ultimately this decision is up to you."

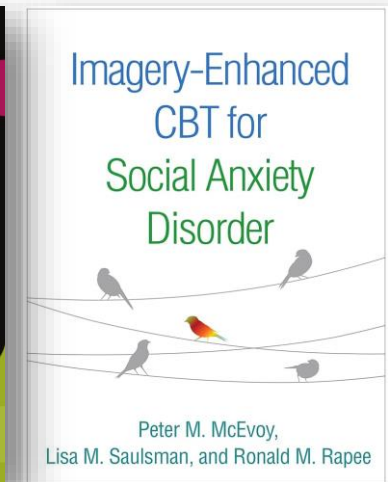
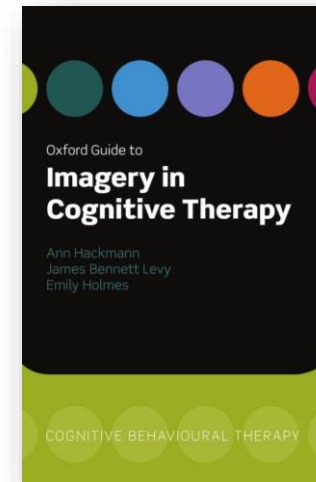
Cataldi, Fisher, Brewer, Spina, Glasgow, Perreira, ... & O'Leary (2022).



A/Prof Katie Attwell

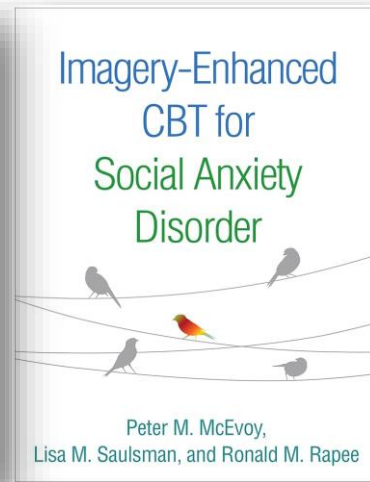
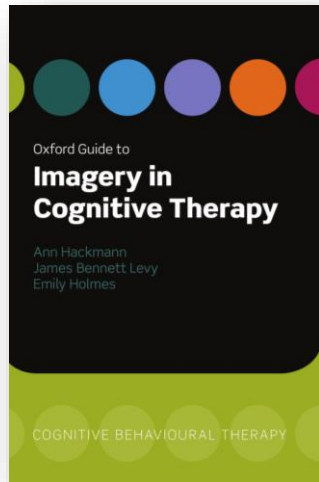


Prof Margie Danchin



# Future directions for research: imagery techniques from clinical psychology

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## Possible ways imagery can enhance vaccine communication:

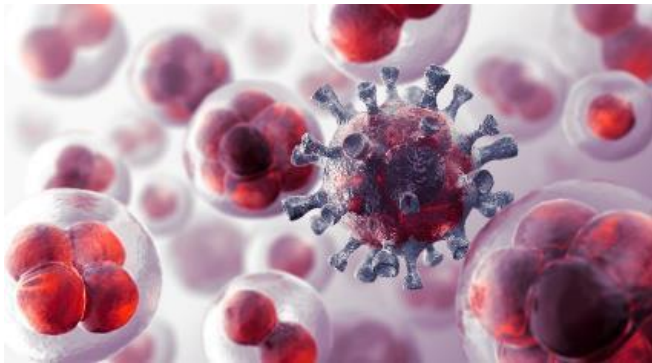
- Imagery-enhanced motivational interviewing:
  - Psychoeducation about imagery
    - Normalise anxiety/fear during decision-making process
    - Reframe anxiety as normal response to uncertainty
- Making the rewarding outcome of action concrete & salient
  - Functional Imagery Training (Jackie Andrade, University of Plymouth)
    - Imagine future events & emotions when her child is protected

## Public health campaigns that promote mental evidence:


- Personal stories/testimonials (with pictures/videos) of “near-hits” – to boost pre-factual mental simulation of “what-if I had chosen not to vaccinate”:
  - Strengthen the association between action & relief, inaction & regret

## Inoculate against misinformation – plug knowledge gaps

- Pictures & video explainers of how vaccines work
-



# Timely research opportunities:

 **Australian Government**  
Department of Health and Aged Care

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## National Immunisation Program update - RSV vaccine

In 2025, eligible pregnant women will be able to receive the respiratory syncytial virus (RSV) vaccine for free under the National Immunisation Program (NIP).

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# THANK YOU



Government of **Western Australia**  
Department of **Health**



**FORREST  
RESEARCH  
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<https://www.linkedin.com/in/drjulieji/>

Email: [julie.ji@plymouth.ac.uk](mailto:julie.ji@plymouth.ac.uk)



[@julieji.bsky.social](https://www.bsky.social/@julieji)

## PROJECT TEAM



A/Prof Katie Attwell



Dr Zoe Bradfield



Prof Chris Blyth



Prof Margie Danchin



Catherine Hughes AM



A/Prof Jane Warland



Prof Colin Macleod



A/Prof Lies Notebaert



Dr Ben Grafton



Dr Julian Basanovic

