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PAEDS Paediatric Active Enhanced Disease Surveillance

Post vaccination febrile seizures: Clinical severity and outcome data is reassuring

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Outline

- Background on febrile seizures
- Study aims and methods
- Findings and discussions
- Conclusions and future direction

Background: Febrile seizures (FS)

- Caused by sudden change in one's body temperature

- Most common type of seizure in childhood
  - 1 in 30 children
  - 6 months and 6 years of age
  - Peak incidence in the second year of life
  - 30% will have a second episode

- No known long term neurological effect

Background: Post-vaccination febrile seizures (PVFS)

- Associated with
  - Whole cell pertussis vaccine
  - Measles containing vaccine
  - Trivalent influenza vaccine

- Decrease parent and provider confidence on vaccine safety

Clinical question

- Child presents with FS following 12 month old MMR vaccine
  - Is this child's FS any different to a FS due to another cause (i.e respiratory illness)?
  - Will they have another FS with subsequent vaccinations?

Aims

- Describe the epidemiological profile of children with post-vaccination FS (PVFS) and non-PVFS
- Describe the clinical severity and outcomes of PVFS and non-PVFS cases
- Describe the recurrence rates of FS

Methods: Participant recruitment

- 1 May 2013 to 30 June 2014
- Children < 6 years
- Presenting with their ***first FS*** at PAEDS sites
  - Children's Hospital at Westmead, Sydney
  - Royal Children's Hospital, Melbourne
  - Princess Margaret Hospital, Perth
  - Women's and Children's Hospital, Adelaide
  - Lady Cilento Children's Hospital, Brisbane

Methods: Case definition

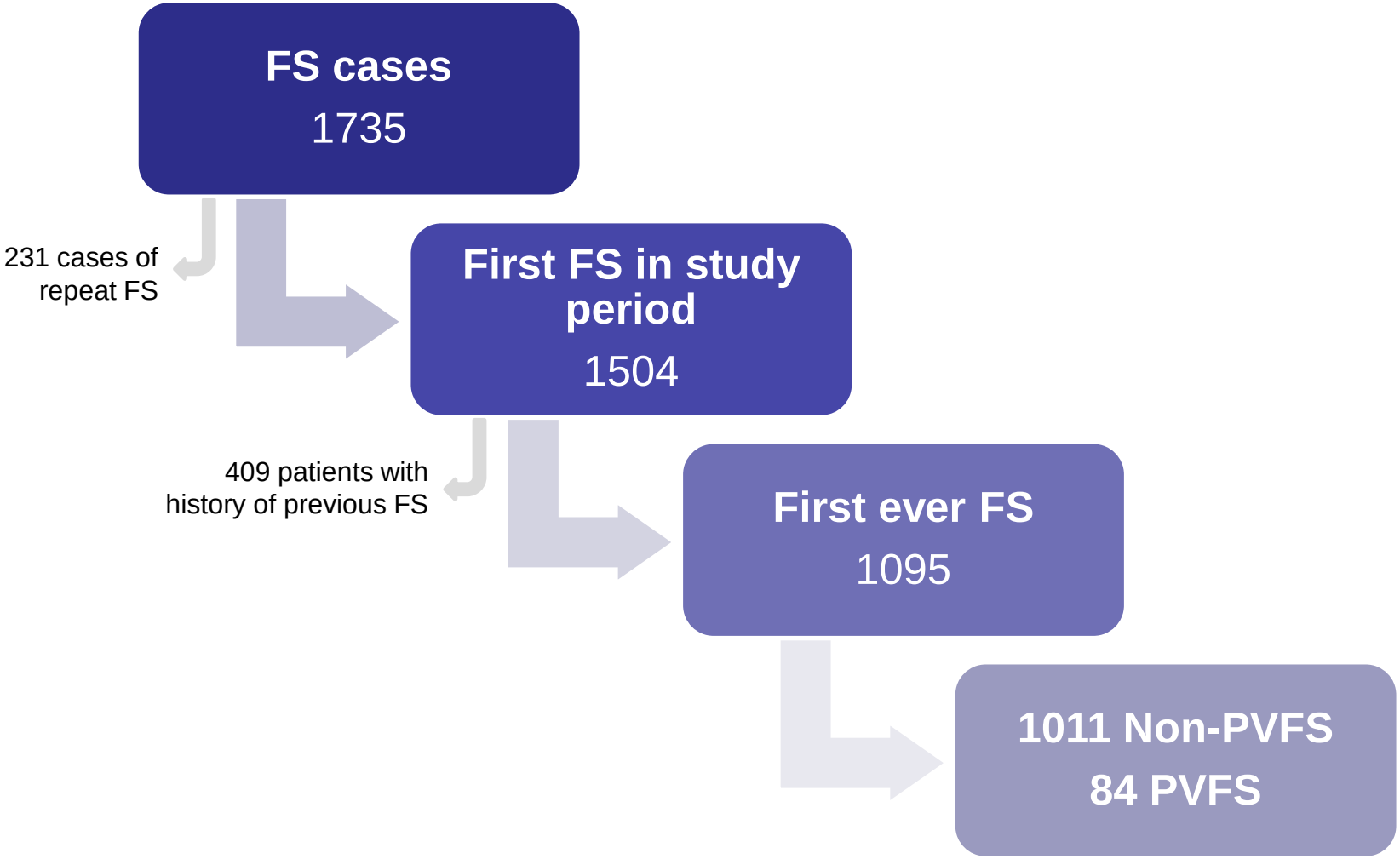
- PVFS
  - Seizure, associated with fever documented either by a parent and/or health provider, occurring within 14 days of any vaccine

- Non-PVFS
  - Febrile seizure outside the abovementioned period following vaccination

Methods: Data collection

- Medical and vaccination history
- Clinical features on presentation/admission
- Investigations
- Management
- Clinical outcome

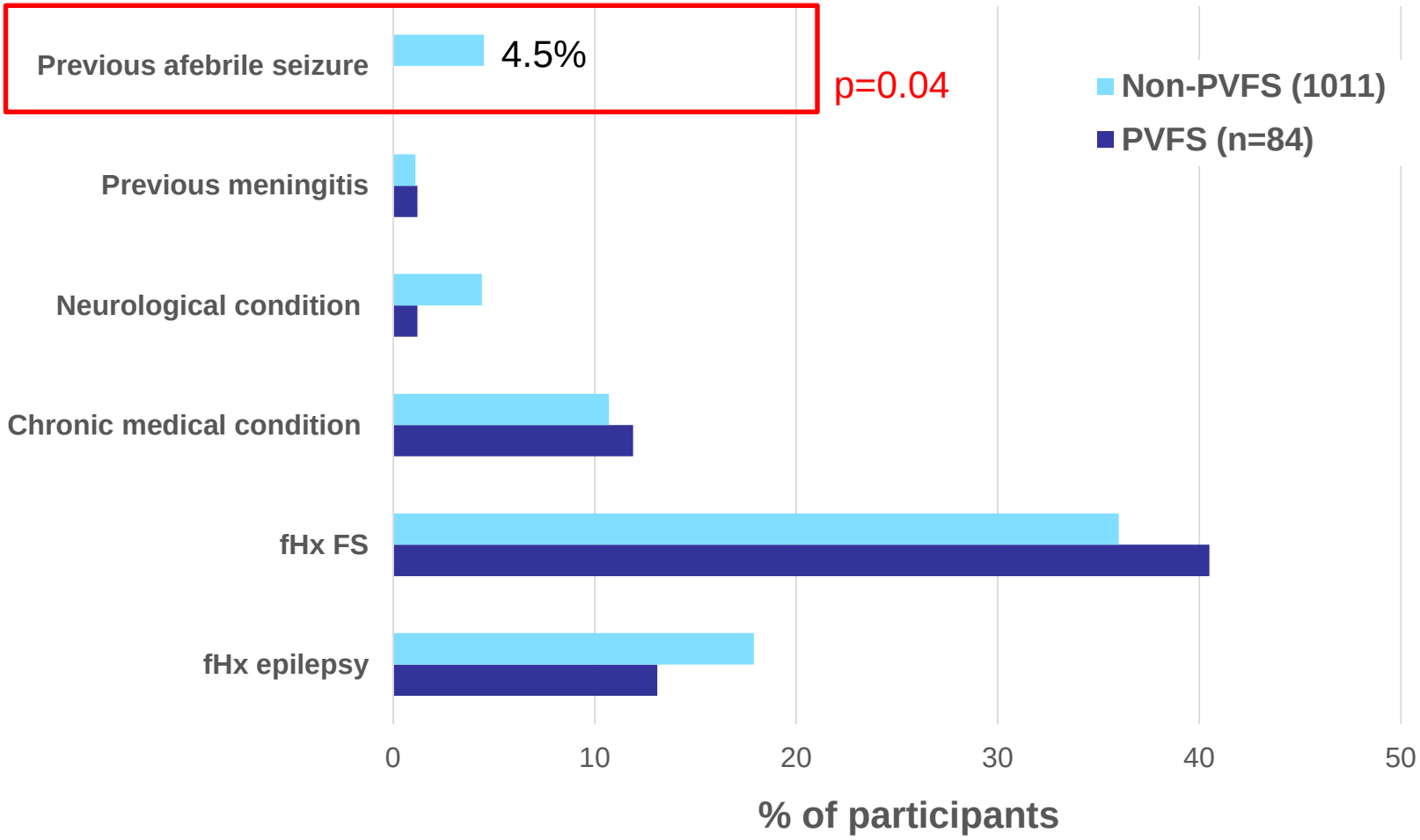
Results: Study population



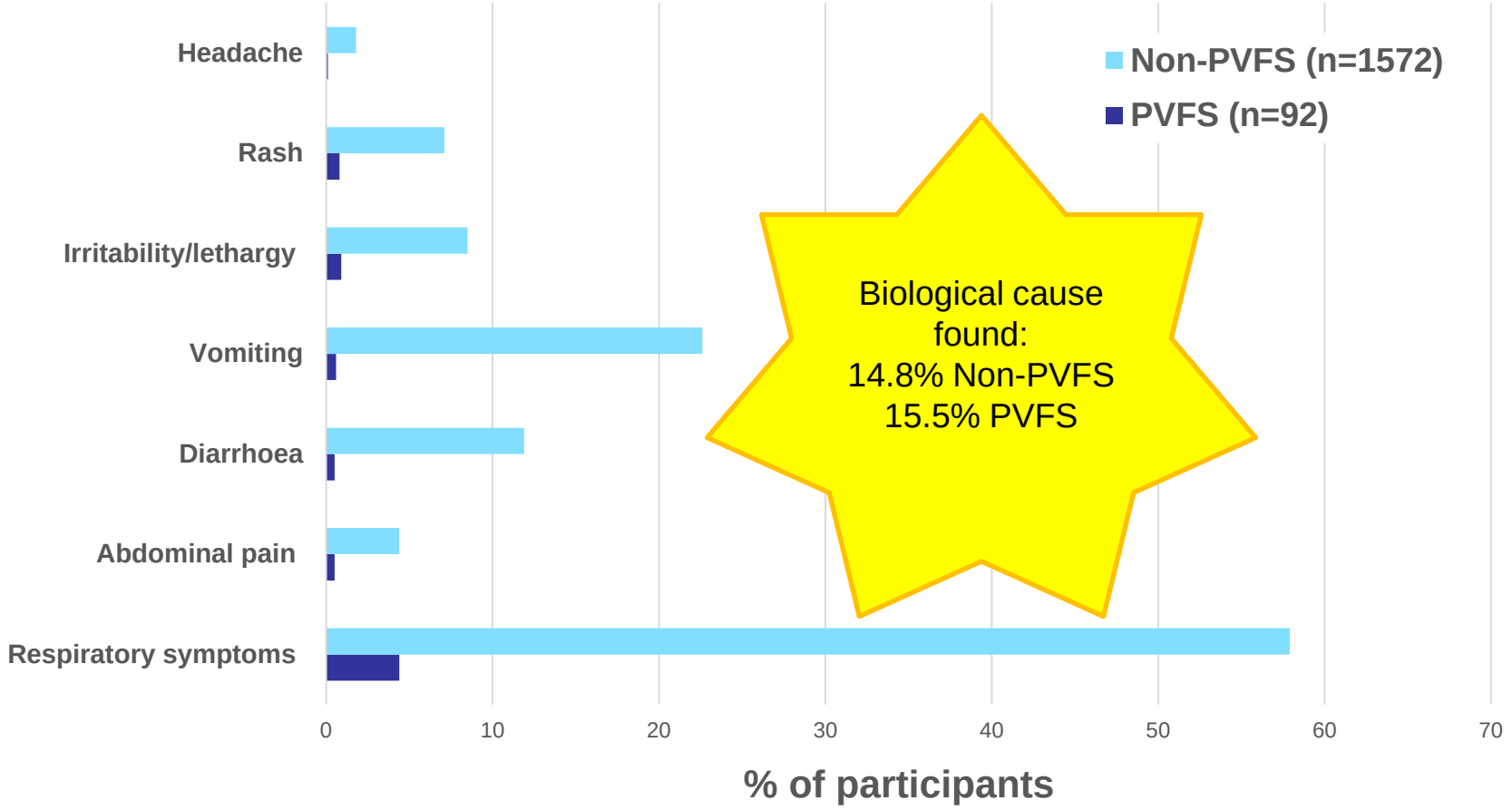
Results: Participant details

	Non-PVFS (%)	PVFS (%)	
n	1011	84	
Age (months)	20.5 (14.2-28.9)	13.4 (12.4-18.3)	<0.001
Sex (male)	549 (54.3%)	38 (45.2%)	0.11
Indigenous	29 (2.9%)	1 (1.2%)	0.73
Birthweight			
<1500g	16 (1.6%)	1 (1.2%)	0.58
1500-2000g	50 (4.9%)	3 (3.6%)	
2500-4000g	709 (70.1%)	68 (81.0%)	
>4000g	98 (9.7%)	9 (10.7%)	
Gestation			
<28 weeks	7 (0.7%)	0 (0.0%)	0.44
28-31 weeks	5 (0.5%)	1 (1.2%)	
32-36 weeks	78 (7.7%)	4 (4.8%)	
>36 weeks	860 (85.1%)	78 (92.9%)	

Results: Participant medical history



Results: Clinical features



Results: Seizure severity and outcome

	Non-PVFS (%)	PVFS (%)	Unadjusted OR	p
n	1011	84		
Seizure duration > 15 minutes	264 (26.1%)	25 (29.8%)	1.14 (0.70-1.86)	0.6
Repeat seizure within 24h admission	105 (10.4%)	8 (9.5%)	0.89 (0.41-1.84)	0.7
Medications				
During admission	92 (9.1%)	11 (13.1%)	1.51 (0.77-2.93)	0.23
On discharge	44 (4.4%)	3 (3.6%)	0.81 (0.25-2.68)	0.74
Length of stay >1 day	146 (14.4%)	16 (19.0%)	1.40 (0.79-2.47)	0.25
ICU admission	23 (2.3%)	2 (2.4%)	1.01 (0.26-4.38)	0.99
Death	1 (0.1%)	0 (0.0%)		
Readmission within 48h with FS	10 (1.0%)	0 (0.0%)		

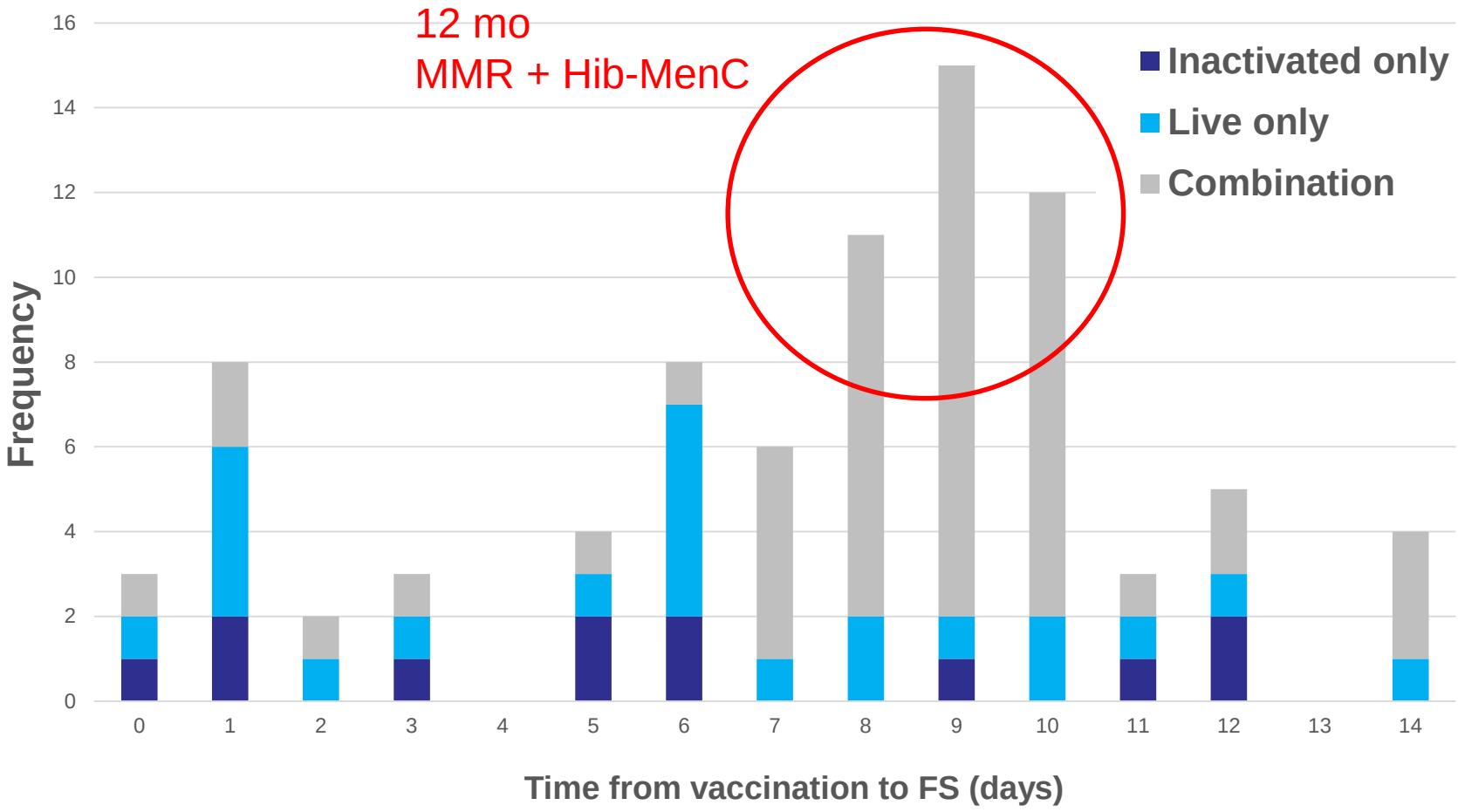
NO difference in severity or outcome

Results: Vaccines involved

PVFS	n
Total	84
PVFS following inactivate vaccine only	12 (14.3%)
PVFS following live vaccine	72 (85.7%)

Live vaccine involved	n
MMR	44 (61.1%)
MMRV	18 (25%)
Varicella	2 (2.8%)
Rotavirus	8 (11.1%)

Results: Timing of PVFS by vaccine type



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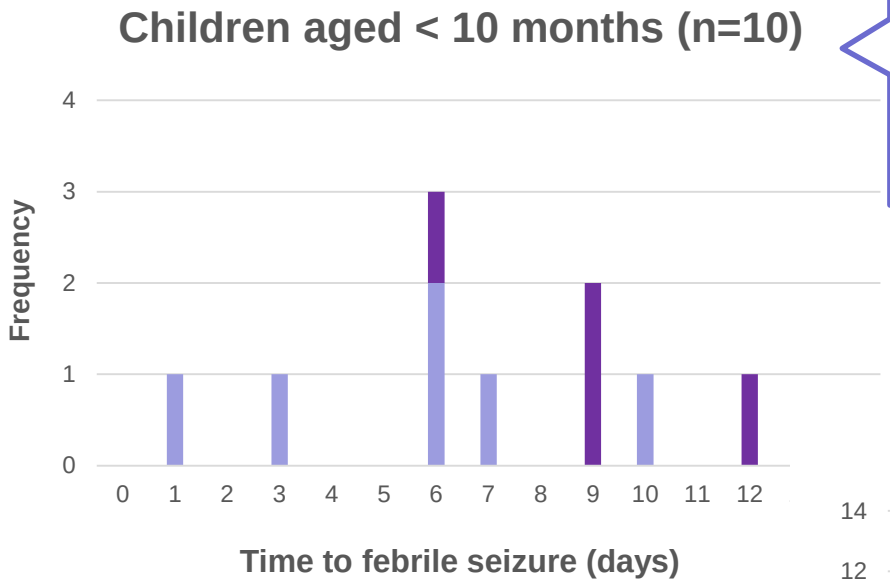
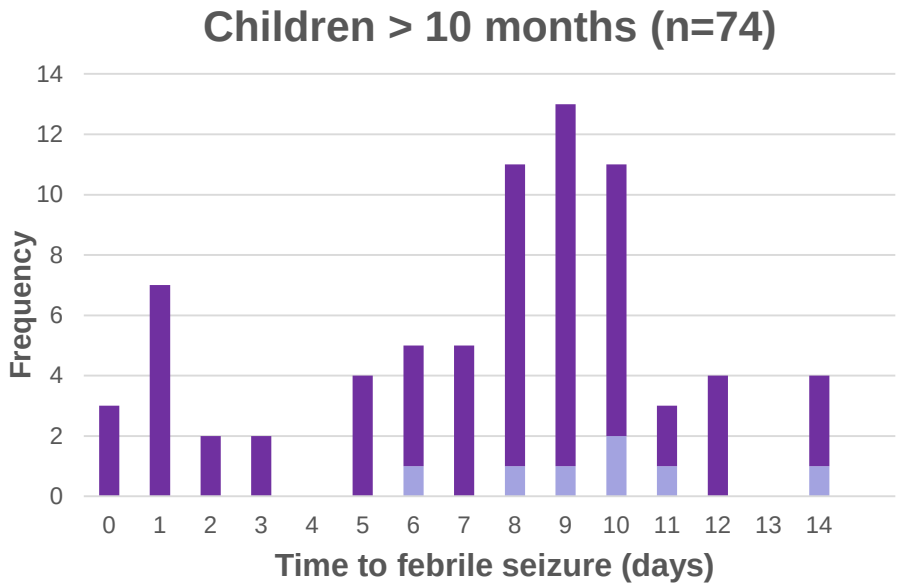
Results: PVFS by age and biological cause found



6wks, 4mo, 6mo:
Hep B, DTPa, HiB, IPV, 13vPCV

6 wks, 4mo: + Rotavirus

12mo: MMR + Hib-MenC
18mo: MMR + V / MMRV
4yo: DTPa-IPV



Biological cause found

Biological cause not found

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Conclusions

- PVFS account for small proportion of first FS presenting to hospitals in Australia
- No difference in clinical severity or outcomes between PVFS and non-PVFS
- Majority of PVFS are simple FS requiring hospital stay 1 day or less, with no medications required
- Majority of PVFS are associated with a live-attenuated vaccine

Discussion

- Strengths
  - PAEDS network
    - Active surveillance
    - Prospective case ascertainment
  - Detailed clinical data

- Challenges
  - Short study period
    - Recurrence rates difficult to determine
  - Limited to paediatric hospitals only

Future studies

- Recurrence rates of FS following PVFS
- Genetic markers
- Developmental outcomes

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