Queensland Health

Using Intermittent Enhanced Surveillance to Better Understand Varicella-Zoster Virus Epidemiology — Queensland, 2010–2021

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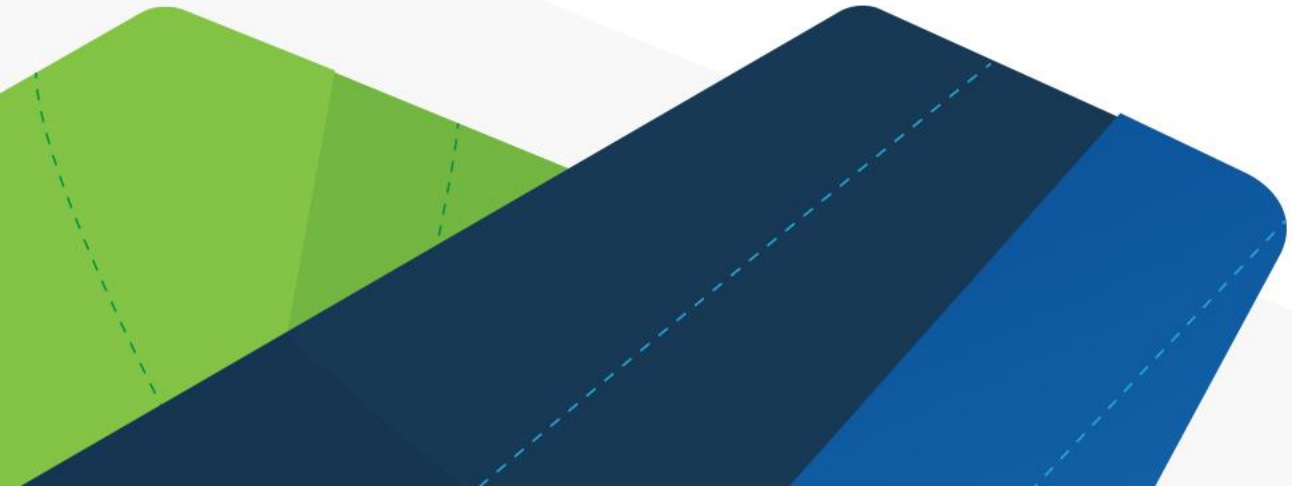
MAE Scholar (2022–2023)



Australian National University

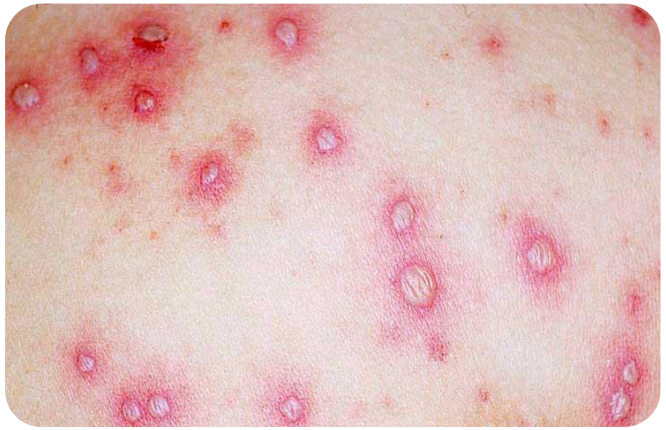
Queensland Government

Background

Varicella-Zoster (VZV): varicella (chickenpox) and herpes zoster (shingles)

Chickenpox

- More common in children and less severe than shingles[1]
- Single dose chickenpox vaccine effective against reducing hospitalisation[2,3,4]
- Single dose vaccine funded under National Immunisation Program (NIP) at 18 months of age (2005)[5] – initially monovalent, then MMRV



Chickenpox vesicular lesions (ruptures and crusts)
(Image source: Royal Children Hospital Melbourne)

Background

Shingles

- Reactivation of VZV via dorsal root ganglia
- More common among older population (≥50 years old)[6]
- Live-attenuated shingles vaccine (ZVL) funded under NIP for people aged 70 years old; catch-up program for 71–79 years (2016)[5]
- Effectiveness of funded ZVL against incidence of shingles declines significantly in 5–10 years[8,9]
- Adjuvanted recombinant shingles vaccine (RZV) provides protection for at least 10 years including frail elderly[9]

Shingles rash
(Image source: Queensland Health)

Aims

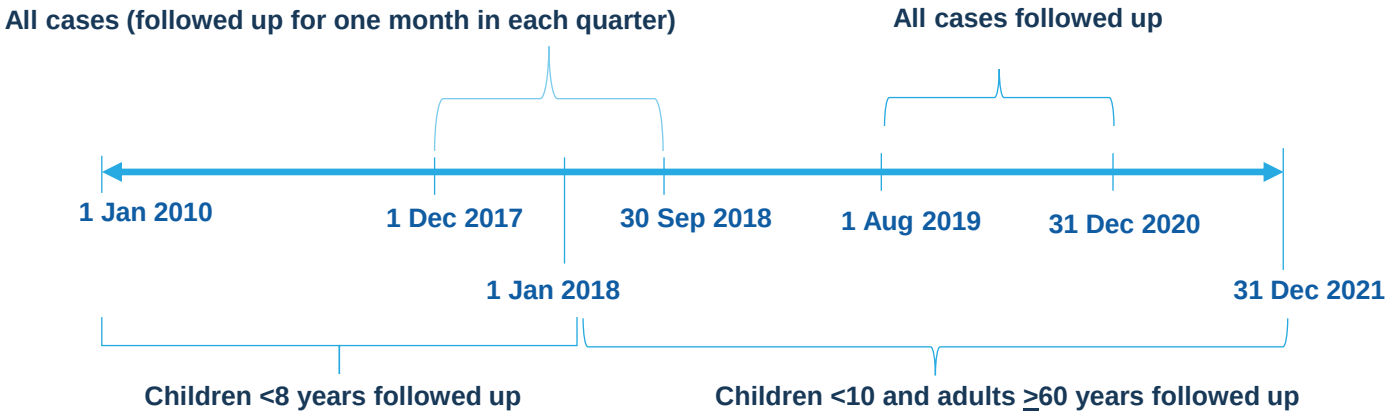
- Determine overall trend of VZV notifications in Queensland
- Determine clinical presentation in specific age groups using intermittent enhanced surveillance
- Understand changes in epidemiology following chickenpox and shingles vaccination programs

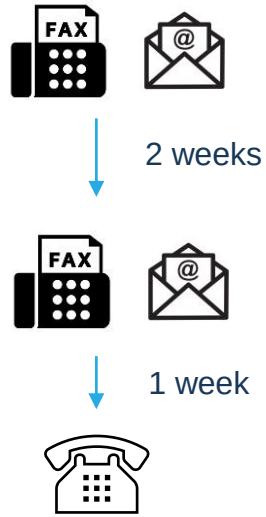
Methods

Study design: Case-series

Study period: 2010–2021

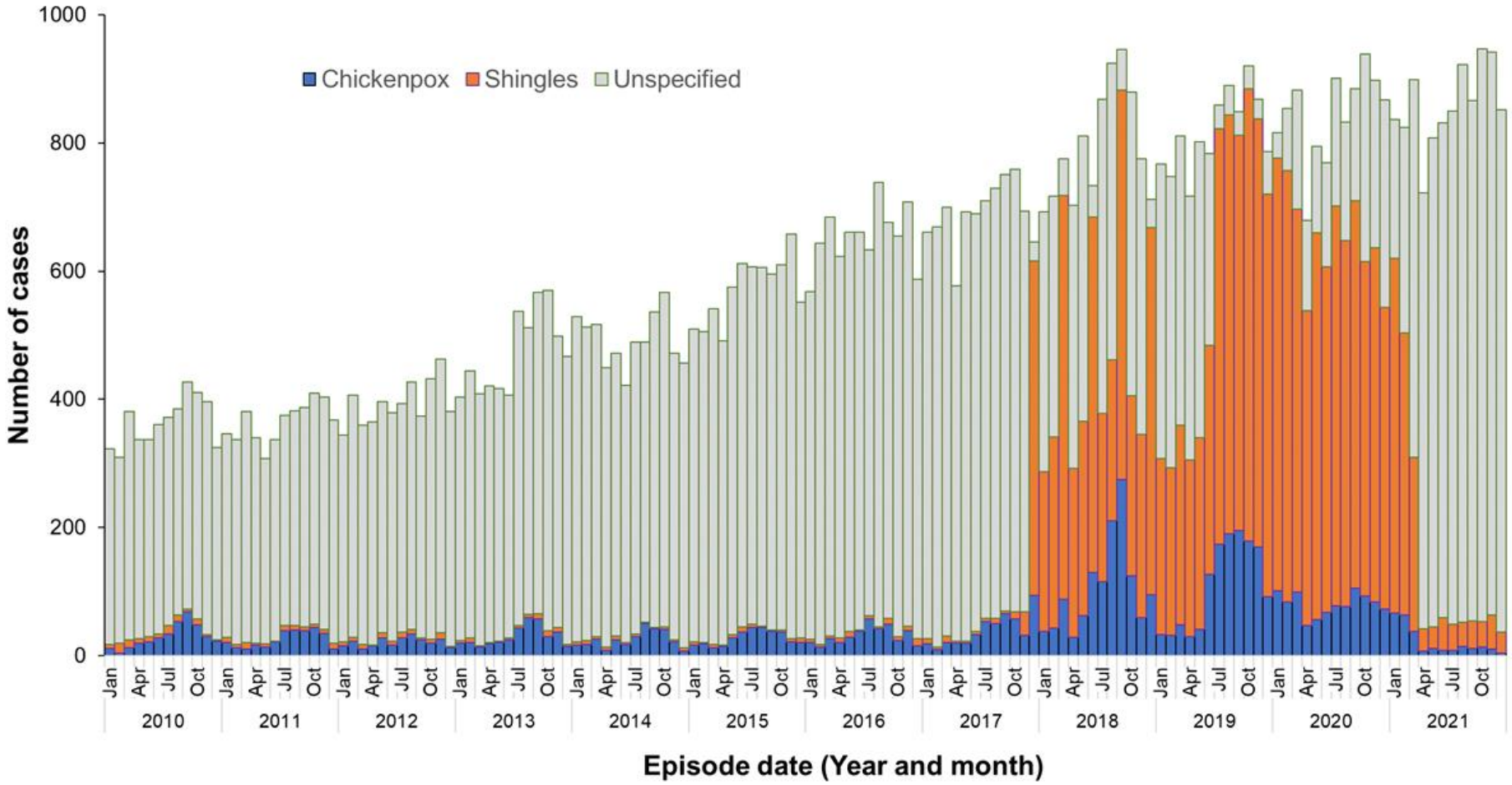
Data sources: Queensland Health Notifiable Conditions System (NoCS) – VZV notifications
Australian Bureau of Statistics – mid year Queensland population





Results

87,759 confirmed cases



VZV notifications by month and year and clinical presentation, Queensland, 2010–2021

70% Unspecified

23% Shingles

7% Chickenpox

Results

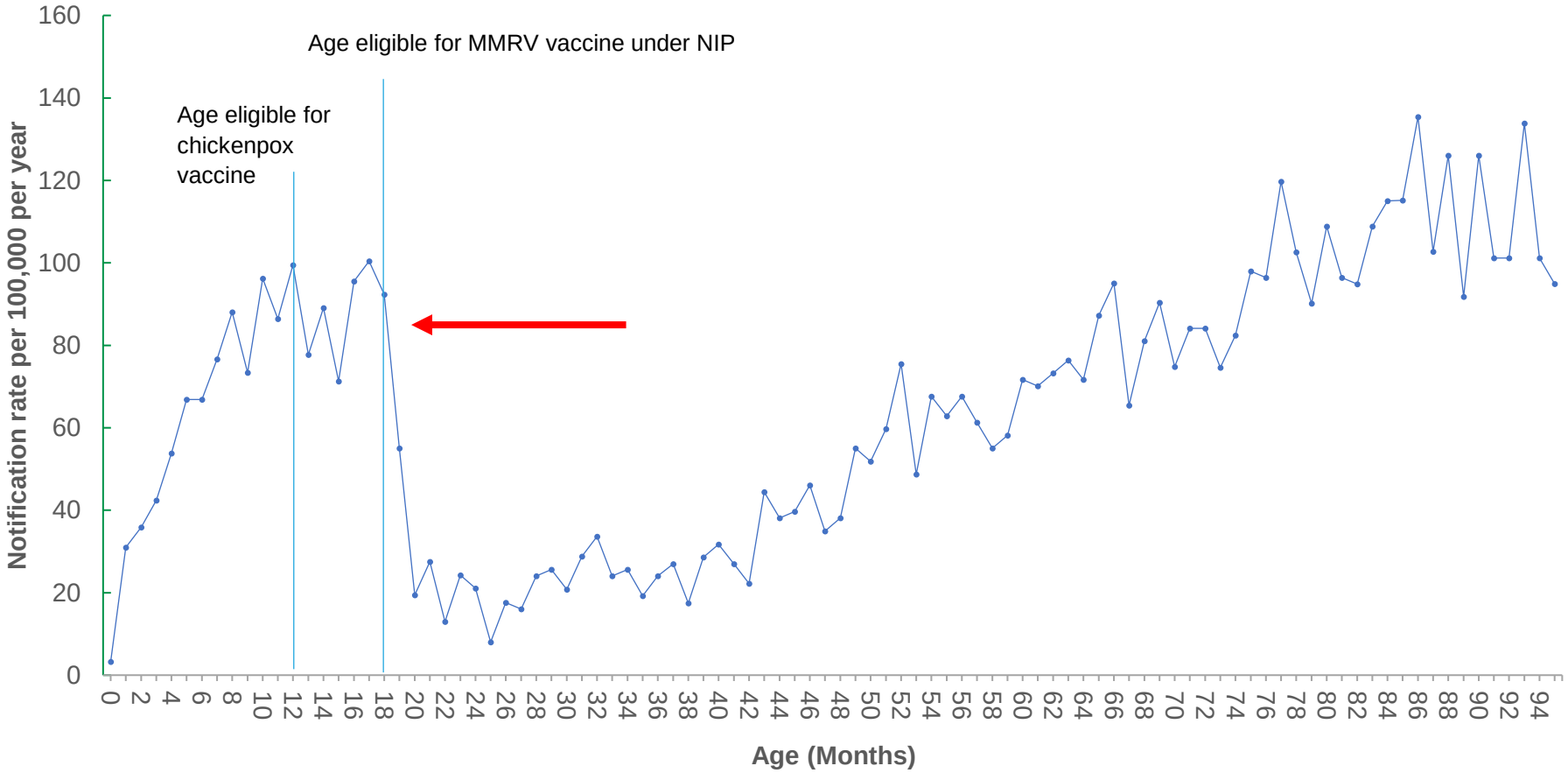
Incidence rate ratio of VZV notifications in Queensland, adjusted by age and sex over the years 2010–2021

Characteristics	IRR**	*P* value	95% CI	
Year* **	1.06	<0.001	1.05	1.06
Age group				
<1	Reference			
1-2	0.72	<0.001	0.61	0.83
3-4	0.82	>0.001	0.71	0.96
5-7	1.65	<0.001	1.43	1.90
8-9	1.97	<0.001	1.71	2.27
10-19	1.39	<0.001	1.21	1.60
20-29	1.44	<0.001	1.26	1.65
30-39	1.58	<0.001	1.38	1.82
40-49	1.61	<0.001	1.40	1.85
50-59	2.28	<0.001	1.98	2.61
60-69	3.17	<0.001	2.77	3.64
≥70	3.42	<0.001	2.98	3.93
Sex				
Male	Reference			
Female	1.08	<0.001	1.02	1.13

*** IRR: Incidence rate ratio or rate ratio*

Results

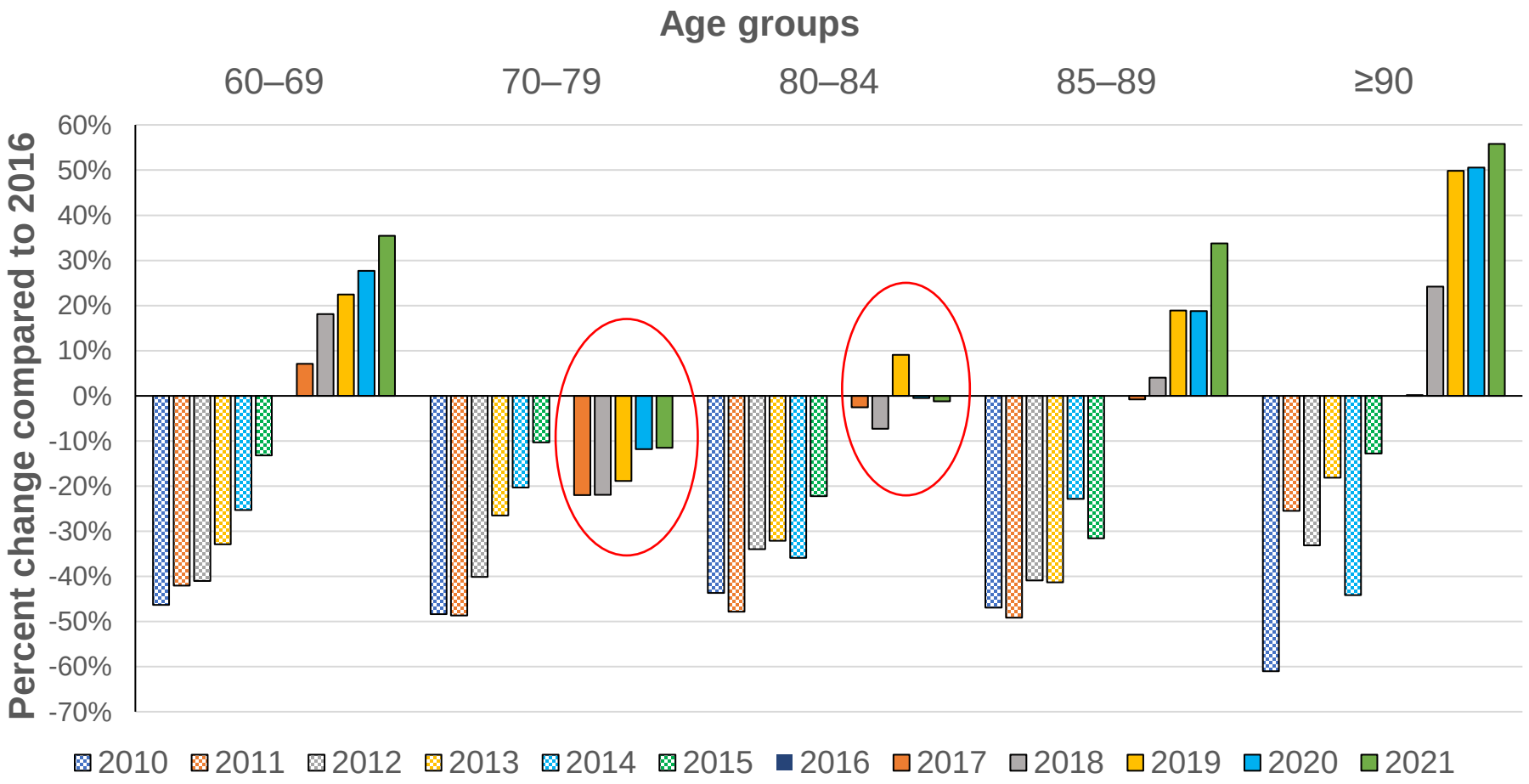
Impact of chickenpox vaccination program



Chickenpox clinical presentation with enhanced surveillance among <8 years (2010–2021)

Results

Impact of Shingles vaccination program



Percent change in notification rate of shingles for each age group by year, compared to 2016

Summary

- VZV notification rate has increased over the years 2010–2021 in Queensland
- Intermittent enhanced surveillance useful to understand vaccine impact
- Impact of chickenpox vaccine and shingles vaccine
  - Decline in the rates from 18 months of age
  - Decrease in notification rate of shingles among 70–79 years of age after vaccination program
- Better control may be possible by introduction of a second dose of chickenpox vaccine in childhood and the use of more effective shingles vaccines[8,10]

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Acknowledgements

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