



Health Research Symposium

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**Human parechovirus infection in Hong Kong
neonates, infants and young children**

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Background



Rhinovirus



Picornaviridae

Poliovirus



Hepatitis



EV71, CoxA



Parechoviruses
HPeVs



Gastroenteritis

Paralysis Meningitis Encephalitis

Reye's syndrome Myocarditis

Respiratory infection

Rash

Highly contagious

- high viral load in stool & respiratory tract
- long durations of shedding
- non-enveloped, resistant

Common childhood infection

- fecal-oral route
- droplets
- nosocomial
- swimming pool... ..



Should we include parechovirus in routine diagnostic test ?

How common is parechovirus in Hong Kong ?

How severe are these infections ?

Any special at-risk groups ?

Any seasonality ?



Prince of Wales Hospital
Serves ~25,000 children <5yr



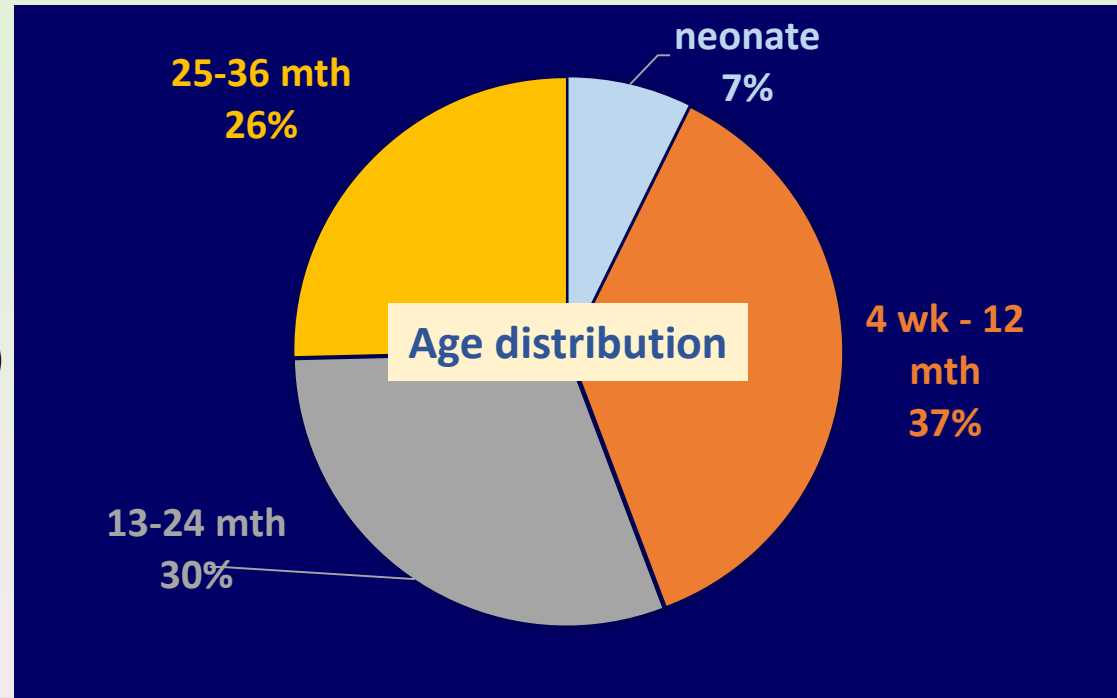
Age \leq 36 months
Admitted for suspected acute viral illnesses

Cross-sectional study
24 months, Mar 2014 – Feb 2016

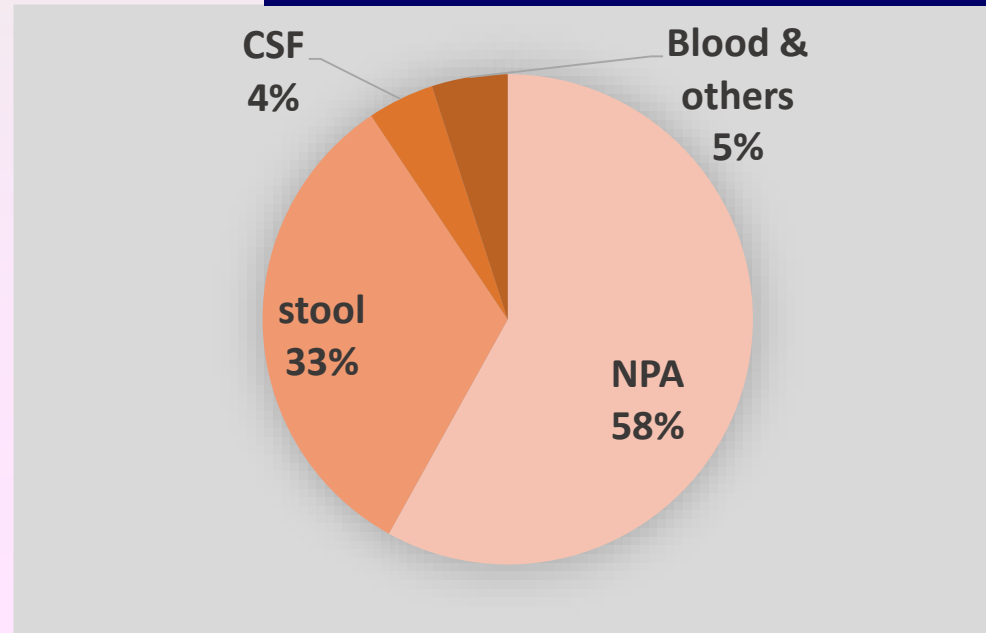
Age- / time- / syndrome- stratified random sampling

Real-time RT-PCR cover all types of parechoviruses

3911 children (129-225 / month)



4567 specimens



88 parechovirus infected children

2.3 %

(Jan Dec 2015)

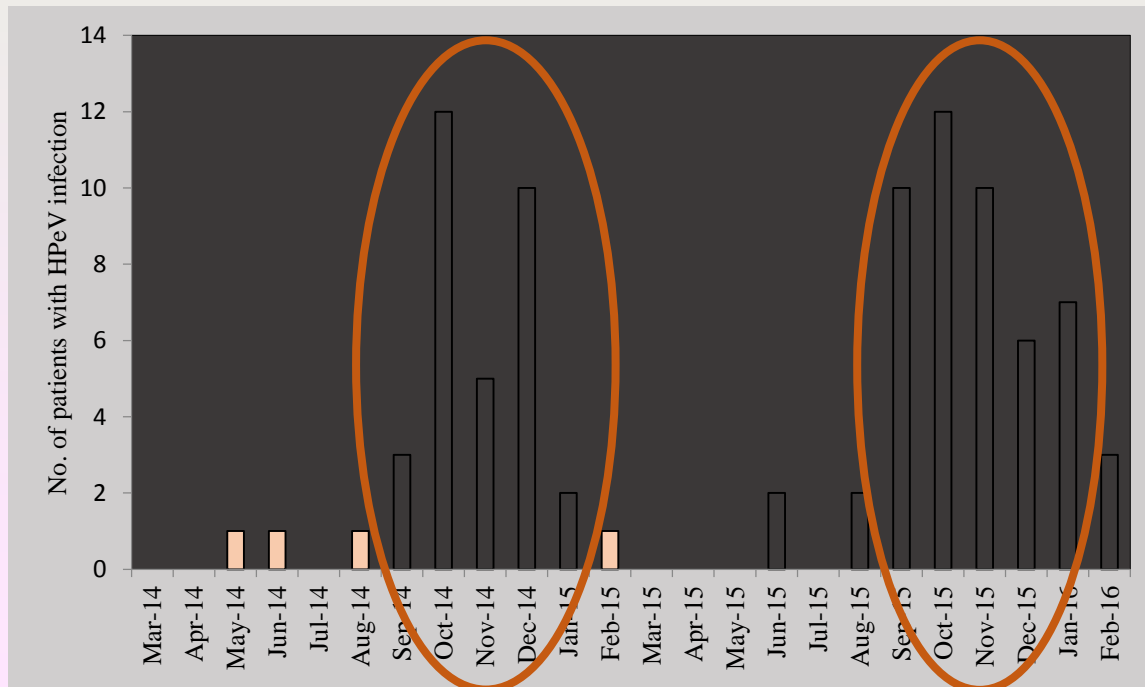
Norovirus:	7.9 %
Influenza A:	7.5 %
RSV:	2.9%
Adenovirus:	0.9%

Results & interpretation

88 parechovirus-infected children

Temporal distribution

Sharp seasonality:
88% cases: Sept – Jan, **Autumn - Winter**



Unlike enterovirus
(summer)

Results & interpretation

88 parechovirus-infected children

Sex - distribution



1.3 : 1

Not different from testing population

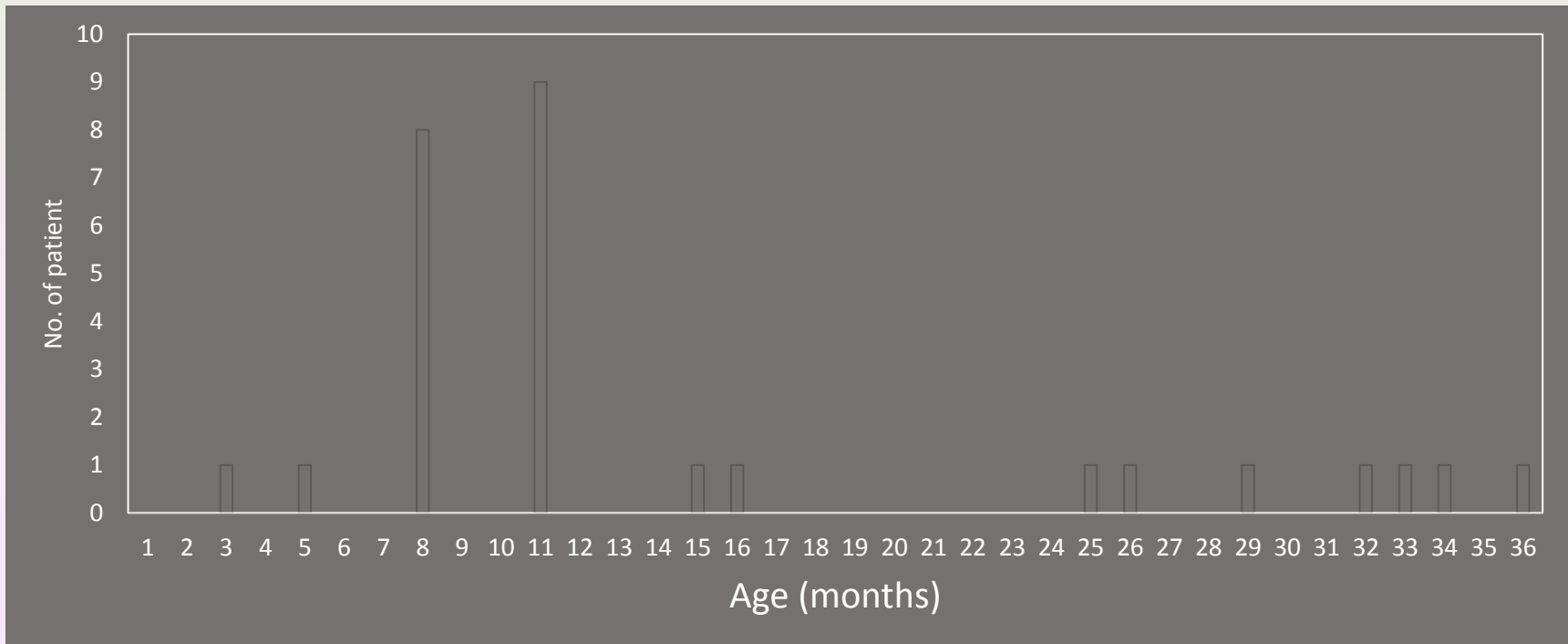
Influenza A	1.2 : 1
RSV	1.3 : 1
Adenovirus	1.4 : 1
Rotavirus	1.5 : 1

Results & interpretation

88 parechovirus-infected children

Age - distribution

6 – 24 months

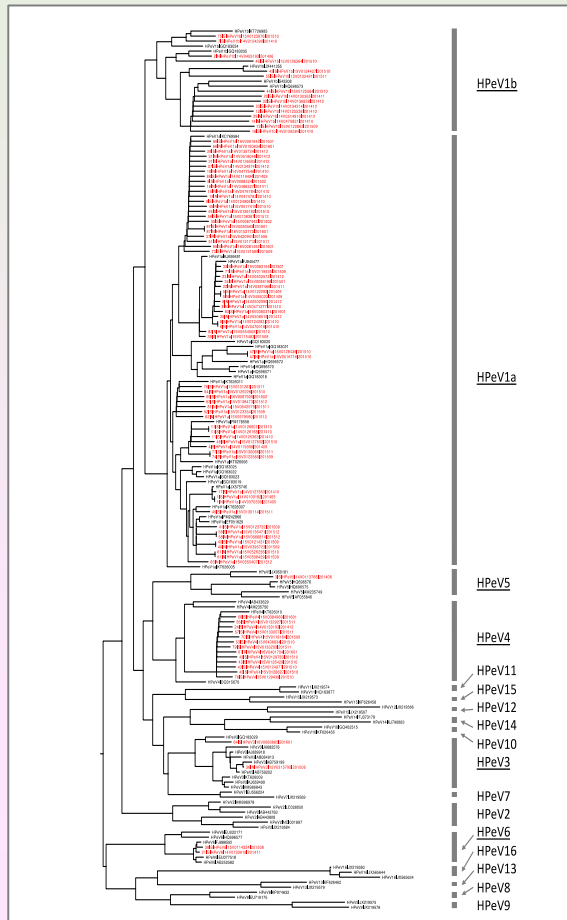


Results & interpretation

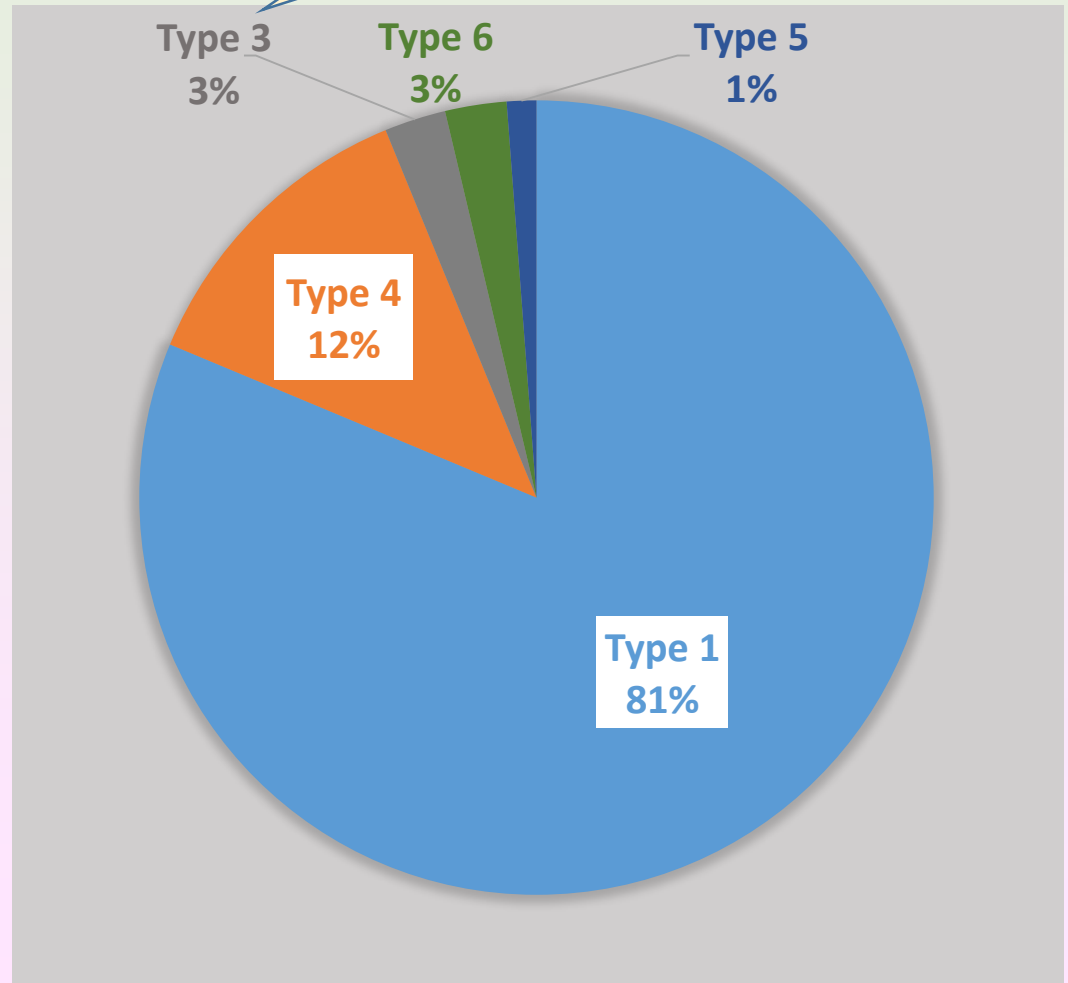
80 parechovirus-infected children

Type - distribution

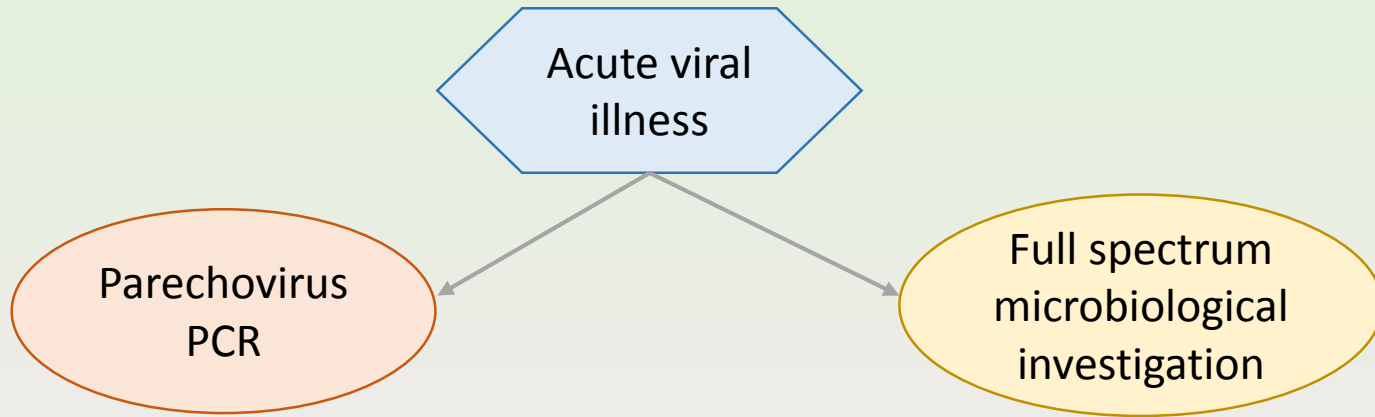
Neonatal sepsis
Meningoencephalitis
Myocarditis



VP1 gene of HPeV1-16



Results & interpretation



+ / -
Multiplex PCR
Diarrhoeal viruses
Astro, adeno 40/41,
sapovirus, aichi

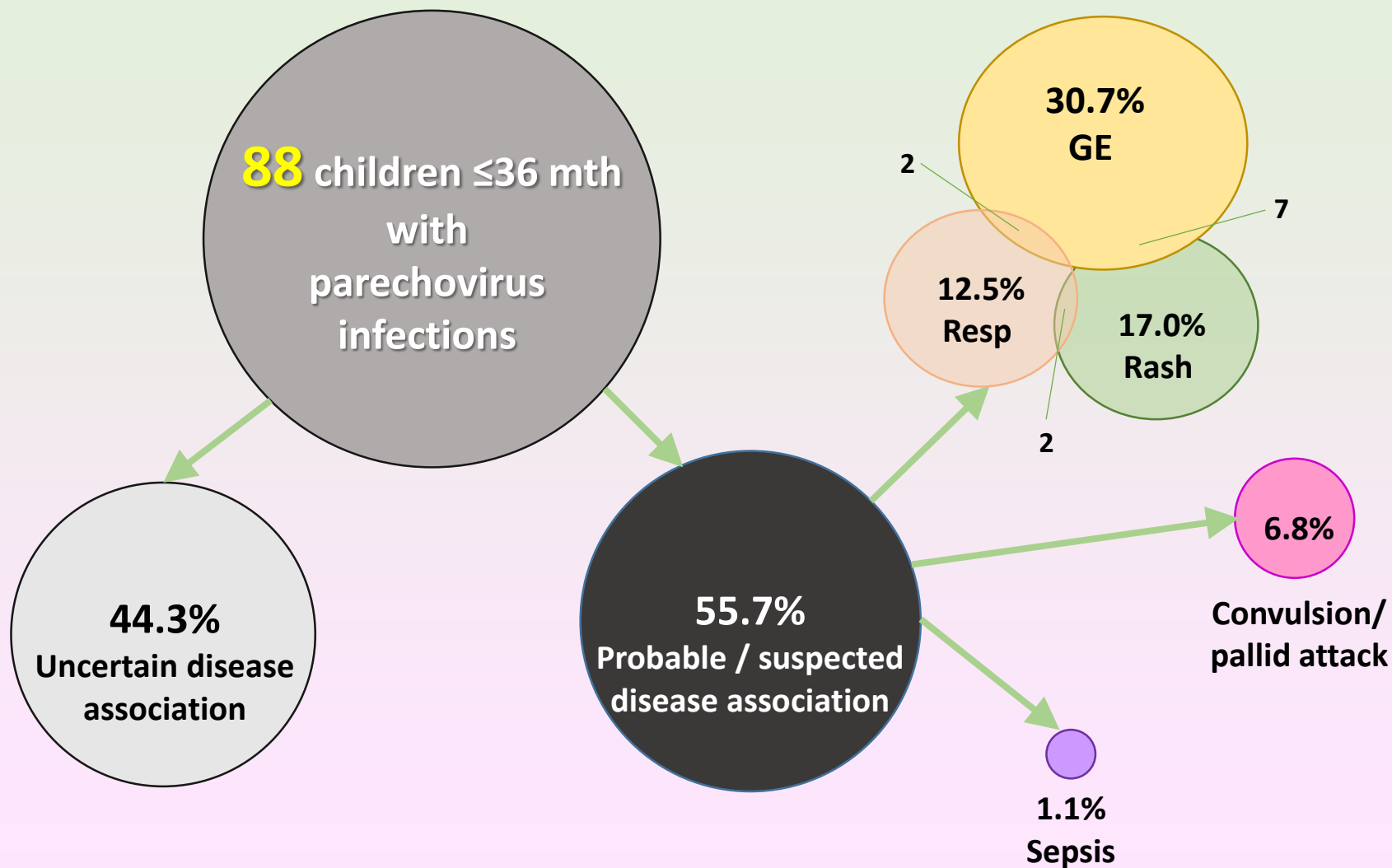
+/-
HHV6 PCR

+ ve	Probable	- ve
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+ ve	Uncertain	+ ve
		(compatible pathogen)

+ ve	Suspected	+ ve
		(non -compatible pathogen)

Results & interpretation



Gastroenteritis

Mild

Diarrhea 93%

Vomiting 44%

Respiratory illness

Cough, runny nose

Shortness of breath 46%

Pneumonia 9%

Rash

Generalized

Maculopapular

Fever

+/- GE & resp.

Sepsis

6-day baby girl

Fever, tachycardia, metabolic acidosis, impending shock

All infection markers were negative

HPeV3 was the only pathogen found

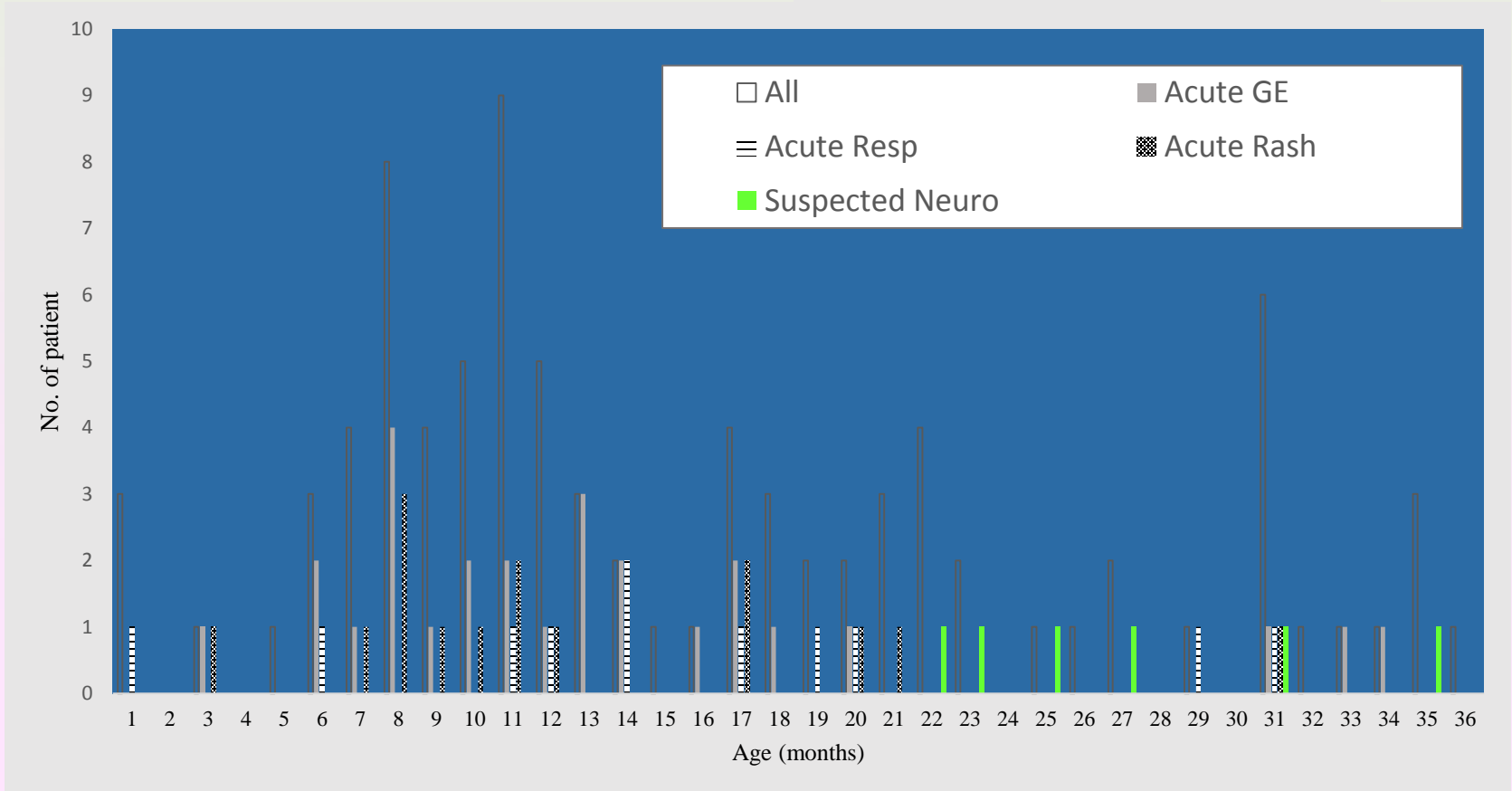
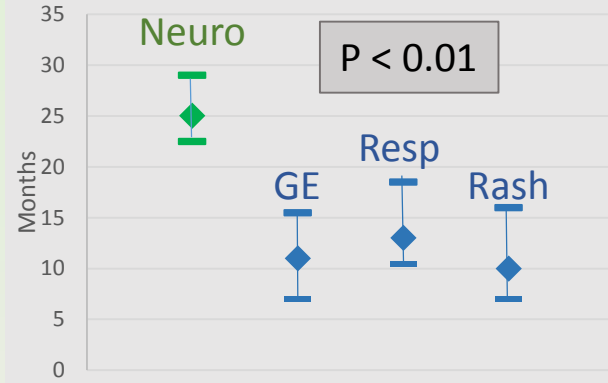
Parechovirus co-infection

**Co-infected with other
respiratory viruses**
Bronchiolitis / pneumonia 60%

**Co-infected with other
Resp. & GI viruses**
Convulsion & pallid attack

Results & interpretation

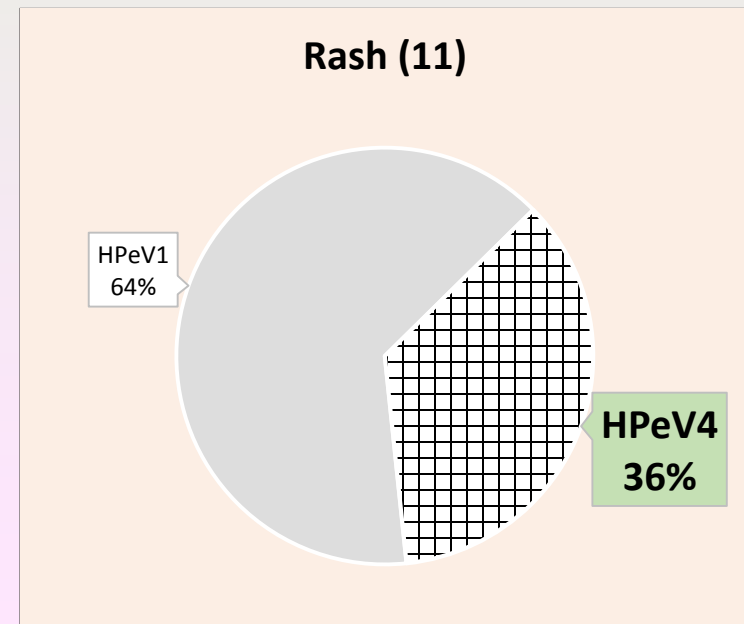
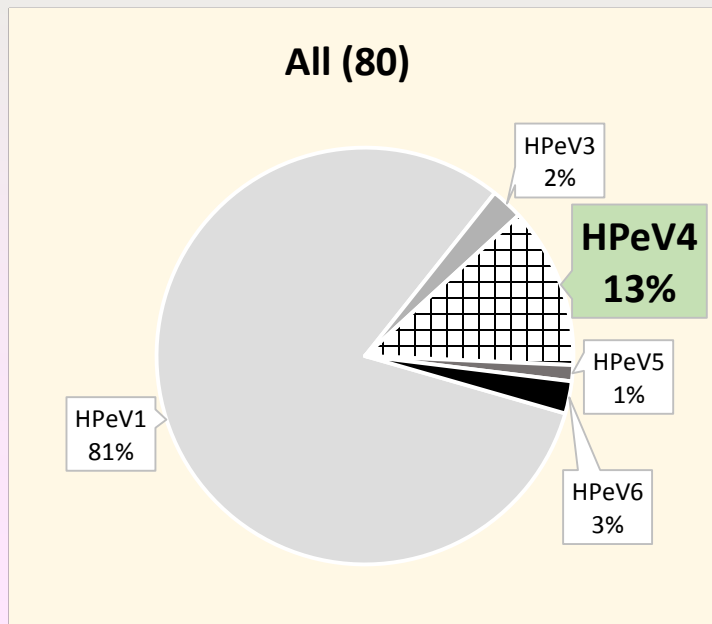
Age vs. symptom



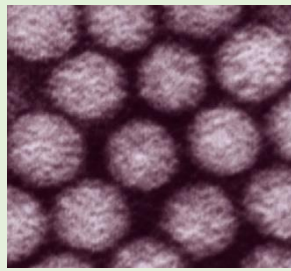
Results & interpretation

Type vs. symptom

HPeV 4	
Rash	36%
No rash	3%
P = 0.001	

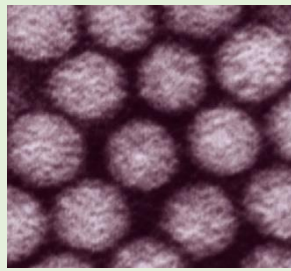


Summary



- **Autumn & winter** were the peak seasons.
- HPeV detected in **2.3%** children hospitalized for acute viral illnesses.
- **56%** of infections probably accounted for the illness.

Summary



- **Gastroenteritis, respiratory & rash** illnesses were the most common.
- **Neonatal sepsis** probably due to **HPeV 3**.
- **Rash** was more likely associated with **HPeV 4**.
- **HPeV coinfection** might increase severity of **respiratory** viral infections.
- **HPeV coinfection** might participate **CNS** complications especially in 2-3 yr old.

Conclusions

Diagnostic test for parechovirus should be made available in Hong Kong

- ✓ Autumn & winter
- ✓ Neonatal sepsis
- ✓ 2nd line test for severe unexplained respiratory & CNS complications

Acknowledgements

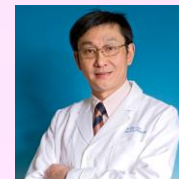
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