

# Dual Seasonal Patterns and Increased Late Summer and Autumn Activity of Human Noroviruses in Hong Kong during 2014-2016

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About Us

## Background

- Human noroviruses are a diverse group of diarrheagenic RNA viruses that are leading causes of acute gastroenteritis and foodborne illnesses in all ages worldwide.
- These viruses generally have higher activities in winter months and are thus also known as “winter-vomiting viruses”.

## Aim

- To study norovirus seasonality in Hong Kong which is a subtropical coastal city in southern China with a climate towards temperate region.

## Methods

- A hospital-based norovirus surveillance has been established in Hong Kong since March 2014 (Figure 1).
- Laboratory-confirmed hospitalized norovirus infections in both children and adults were recruited.
- Stool samples were collected and noroviruses were dual-genotyped by Sanger sequencing of RNA polymerase and viral protein 1 (VP1) genes.
- Norovirus seasons were defined as three consecutive months showing highest local activities.

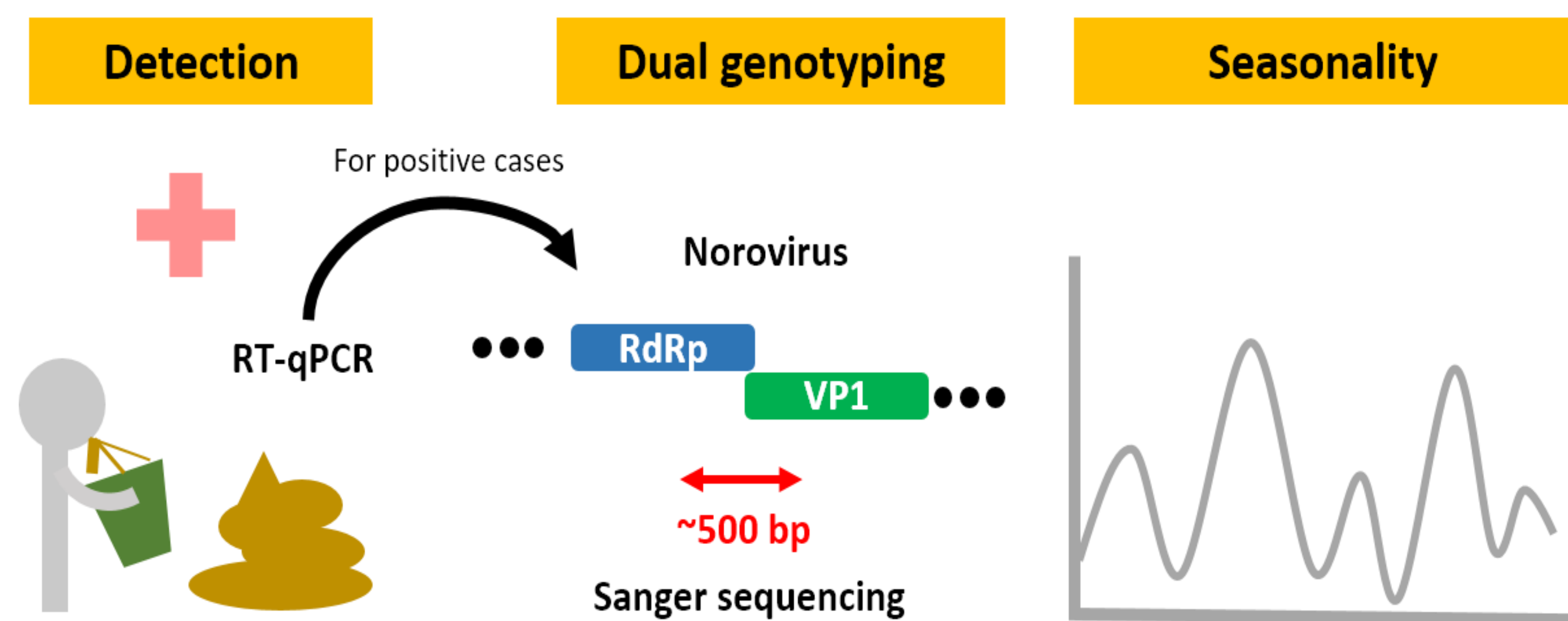


Figure 1. Molecular surveillance of norovirus in patients hospitalized with acute gastroenteritis.

## Results

- From March 2014 through December 2016, a total of 995 cases were studied.
- Virus genotype was determined in 892 (89.6%) cases.
- Dual (bimodal) seasonal patterns, consisting of late summer/autumn and winter seasons, for noroviruses were observed (Figure 2).

## Acknowledgements

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## Results (cont'd)

- Late summer/autumn seasons peaked every year from August to October and they were attributed to GII.4 Sydney 2012 (Figure 3).
- In sharp contrast**, winter seasons peaked in January to February (2014/15 and 2015/16) and they were attributed to another genotype called GII.17 Kawasaki that emerged in Asia in late 2014 (Figure 3).
- In the past three years, numbers of hospitalized norovirus infections in **late summer/autumn seasons have more than doubled (111%)** and that in **winter seasons have nearly halved (48%)** (Figure 2).
- Early surveillance data suggested that the past winter of 2016/17 was predominated by another previously uncommon non-GII.4 genotype called GII.2.

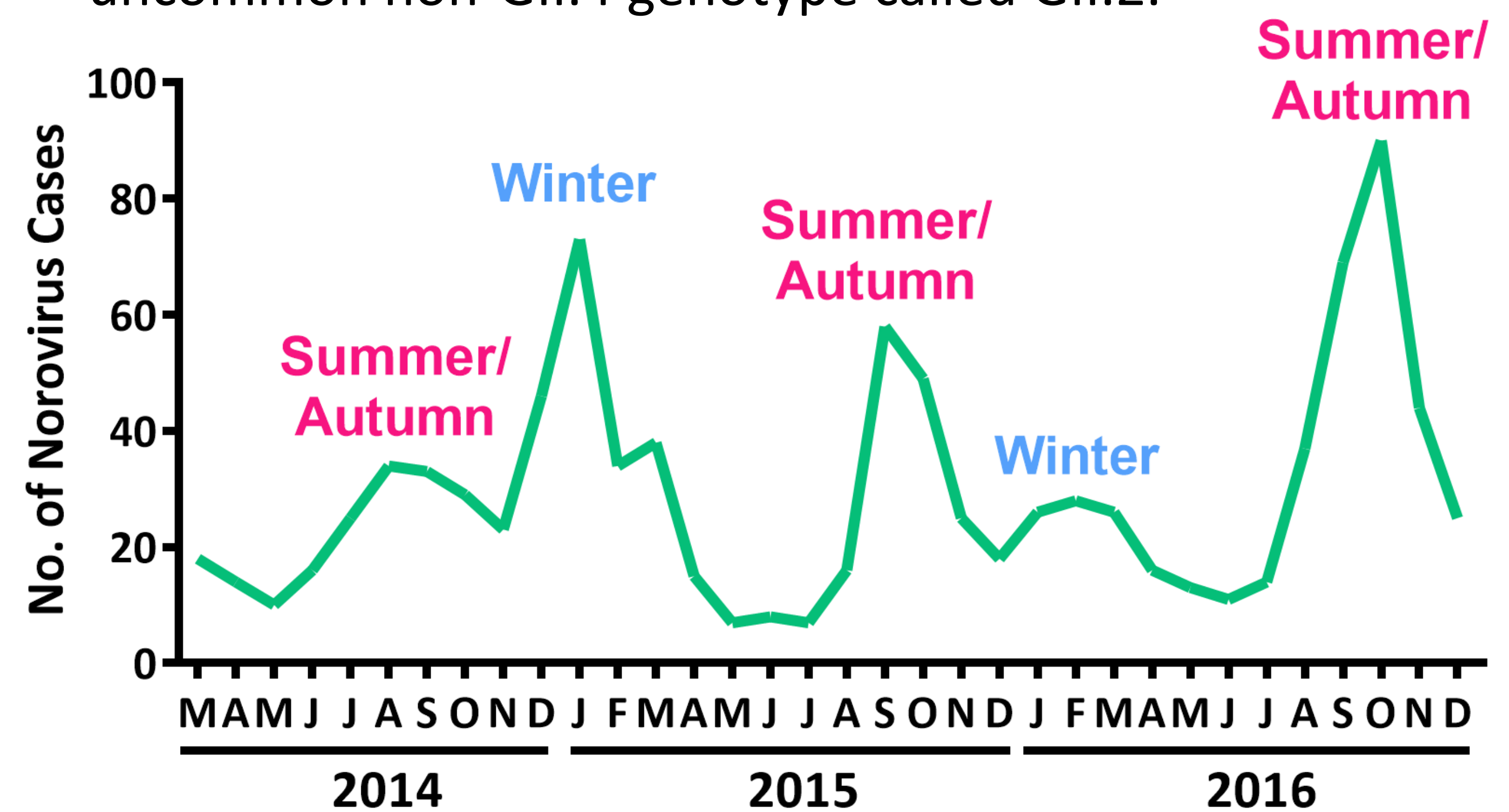


Figure 2. Dual seasonal patterns of norovirus infections

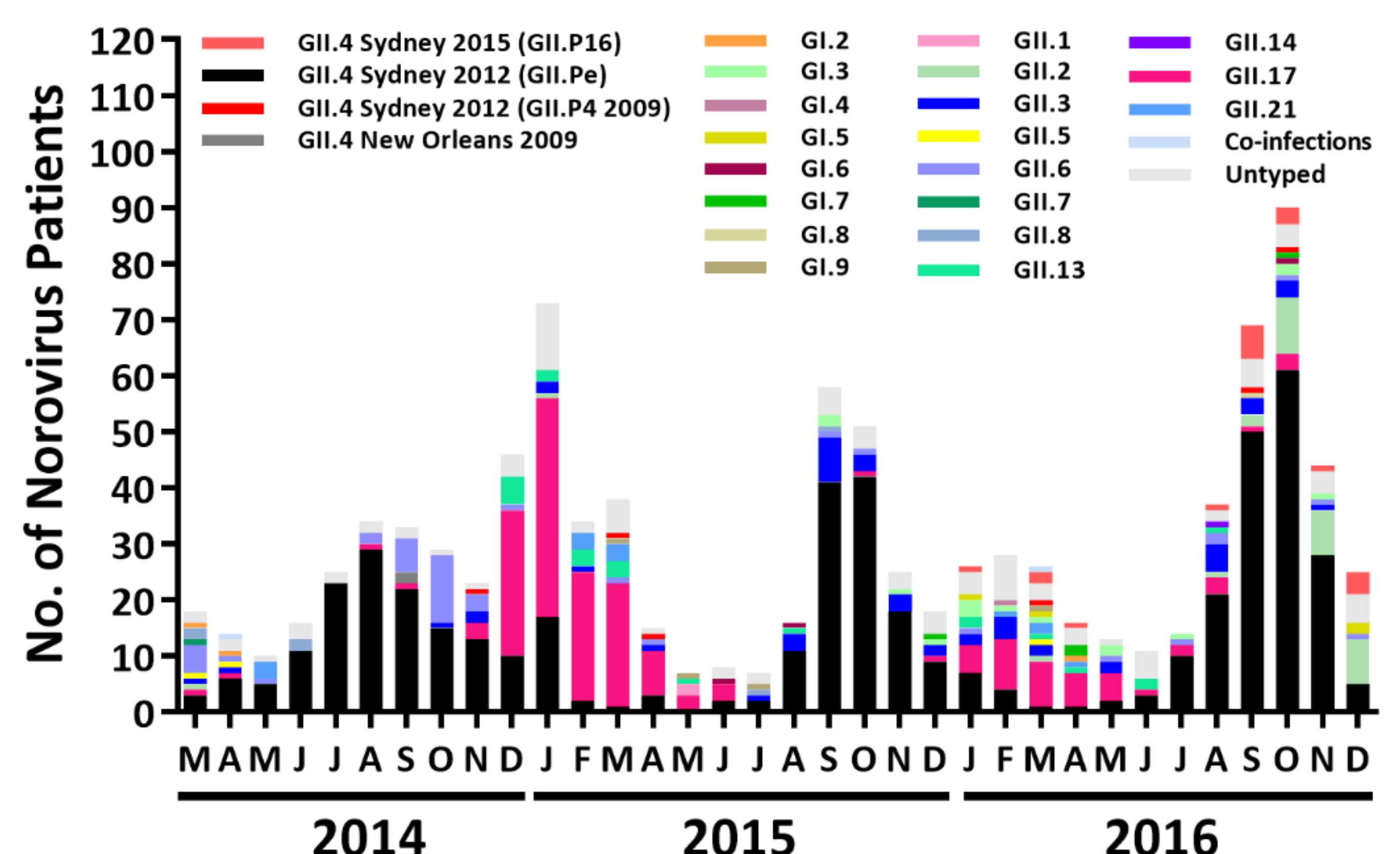


Figure 3. Temporal distribution of norovirus VP1 genotypes

## Conclusions

We provided evidence showing dual seasonal patterns for noroviruses caused by different genotypes in Hong Kong. Late summer and autumn activity of noroviruses was on the rise.