**Epidemiology and Infection**

**Supplementary Material**

**Meteorological factors and respiratory syncytial virus seasonality in subtropical Australia.**

C. Morley 1, K. Grimwood1,2, S. Maloney3, R. S. Ware2.

1 Department of Paediatrics, Gold Coast Health, Gold Coast, Australia; 2 Menzies Health Institute Queensland, Griffith University, Gold Coast, Australia; 3 Pathology Queensland Gold Coast Laboratory, Gold Coast, Australia.

Correspondence: Carla Morley, Department of Paediatrics, Gold Coast University Hospital, 1 Hospital Boulevard, Southport, QLD, Australia, 4215

Email: [cmmorley1@gmail.com](mailto:cmmorley1@gmail.com)

**Literature review**

A literature review was conducted to determine other subtropical locations that have explored respiratory syncytial virus seasonality (with Cfa Köppen Classification). We searched Pubmed up to and including July 31st 2017. We used search terms ‘respiratory syncytial virus’ AND ‘seasonality,’ OR ‘respiratory syncytial virus’ AND ‘epidemic’ this yielded 692 titles, of these we identified 8 studies in sub tropical locations according to the Cfa Köppen Classification by searching titles and abstracts. The reference list of articles identified were also searched and relevant articles retrieved, this resulted in a further 5 relevant studies, for a total of 13 studies included in the review.

**Supplementary Table**. Seasonality of respiratory syncytial virus in subtropical locations studied based on the Köppen Classification of Cfa [[1](#_ENREF_1)].

|  |  |  |
| --- | --- | --- |
| **Site** | **Latitude** | **RSV activity** |
| Baguio City, Philippines [[2](#_ENREF_2)]  Hong Kong [[3](#_ENREF_3), [4](#_ENREF_4)]  Sao Paulo, Brazil [[5](#_ENREF_5)]  Taiwan [[6](#_ENREF_6)]  Pretoria, South Africa [[7](#_ENREF_7)]  Delhi, India [[8](#_ENREF_8)]  Houston, Texas [[8](#_ENREF_8)]  Porto Alegre, Brazil [[9](#_ENREF_9)]  Jacksonville, Florida [[10](#_ENREF_10)]  Hangzhou, China [[11](#_ENREF_11)]  Suzhou, China [[12](#_ENREF_12)]  Buenos Aires, Argentina [[13](#_ENREF_13)]  Montevideo, Uruguay [[14](#_ENREF_14)] | 16.4° N  22.4° N  23.6° S  25.0° N  25.7° S  28.4° N  29.6° N  30.0° S  30.3° N  30.3° N  31.3° N  34.6° S  34.9 ° S | Peak in autumn  Peak in spring – summer  Peak autumn to winter  Continuous with peaks in spring and autumn  Peak in autumn  Almost continuous, peak  late autumn - winter  Mid-autumn to winter  Peak in winter  Continuous, peak late autumn to winter  Peak in winter to spring  Peak in winter  Peak in winter  Peak in spring |

0

5

10

15

20

RSV cases

2008

2010

2012

2014

2016

Date

**Supplementary Figure.** Respiratory syncytial virus positive swabs (Jul 2007 – Jun 2016).

The three-month moving average of the number of RSV test positives showing the year-on-year trend of RSV results is shown in the Supplementary Figure. This demonstrates the general consistency of peak RSV activity, although occasional year-to-year variation with the number of positive swabs may occur, as seen in 2014.

**REFERENCES**

(1) **Australian Bureau of Metereology**. Climate Classification Maps. (http://www.bom.gov.au/jsp/ncc/climate\_averages/climate-classifications/index.jsp?maptype=kpn#maps) Accessed 15 August 2017.

(2) **Kamigaki T, et al.** Seasonality of Influenza and Respiratory Syncytial Viruses and the Effect of Climate Factors in Subtropical-Tropical Asia Using Influenza-Like Illness Surveillance Data, 2010 -2012. *PLoS One* 2016; **11**(12): e0167712.

(3) **Sung RY, et al.** Epidemiology and aetiology of acute bronchiolitis in Hong Kong infants. *Epidemiology and Infection* 1992; **108**(1): 147-154.

(4) **Tang JW, et al.** Incidence of common respiratory viral infections related to climate factors in hospitalized children in Hong Kong. *Epidemiology and Infection* 2010; **138**(2): 226-235.

(5) **Paiva TM, et al.** Shift in the timing of respiratory syncytial virus circulation in a subtropical megalopolis: implications for immunoprophylaxis. *Journal of Medical Virology* 2012; **84**(11): 1825-1830.

(6) **Chiu SN, et al.** Risk of Respiratory Syncytial Virus Infection in Cyanotic Congenital Heart Disease in a Subtropical Area. *Journal of Pediatrics* 2016; **171**: 25-30 e21.

(7) **Haynes AK, et al.** Respiratory syncytial virus circulation in seven countries with Global Disease Detection Regional Centers. *Journal of Infectious Diseases* 2013; **208 Suppl 3**: S246-254.

(8) **Yusuf S, et al.** The relationship of meteorological conditions to the epidemic activity of respiratory syncytial virus. *Epidemiology and Infection* 2007; **135**(7): 1077-1090.

(9) **Straliotto SM, et al.** Viral etiology of acute respiratory infections among children in Porto Alegre, RS, Brazil. *Journal of Brasilian Society of Tropical Medicine* 2002; **35**(4): 283-291.

(10) **Halstead DC, Jenkins SG.** Continuous non-seasonal epidemic of respiratory syncytial virus infection in the southeast United States. *Southern Medical Journal* 1998; **91**(5): 433-436.

(11) **Wang TL, et al.** [Study on the relations between epidemiology of respiratory syncytial infection in children and climate factors in Hangzhou]. *Zhonghua Liu Xing Bing Xue Za Zhi* 2005; **26**(8): 588-591.

(12) **Ji W, et al.** [Characteristics and the prevalence of respiratory viruses and the correlation with climatic factors of hospitalized children in Suzhou children's hospital]. *Zhonghua Yu Fang Yi Xue Za Zhi* 2011; **45**(3): 205-210.

(13) **Viegas M, et al.** Respiratory viruses seasonality in children under five years of age in Buenos Aires, Argentina: a five-year analysis. *Journal of Infection* 2004; **49**(3): 222-228.

(14) **Hortal M, et al.** Meteorological variables and occurrence of respiratory syncytial virus in Uruguay. *Research in Virology* 1993; **144**(5): 405-408.