

Assessing Impact of Barn Temperature Declines on Treated Pneumonia Cases of Dairy Calves Under 60 Days Old

Gwen Shee Kwan Phung
Advisor: Dr. Kevin Janni

Introduction

- Pneumonia is a respiratory disease, common in calves between one to five months old.
- Pneumonia reduces the growth rate of calves, increases mortality and increases labor required to treat infected calves.
- Barn thermal environment is one of many factors that contribute to incidence of pneumonia in calves.
- An uncomfortable thermal environment will build up stress in calves. Stress suppresses the immune system and makes the calves more susceptible to pneumonia.

Objective

- To find a relation between barn environment changes (i.e. daily hourly temperature declines) and pneumonia treatments of the calves under 60 days of age.

Methods

- Dry-bulb and dew-point temperature data for February, March, May and June 2015 from a calf facility that housed up to 150 calves in individual pens was compared with calf treatment records which included calf ages and the number of calves treated for pneumonia.

- Declines in hourly average temperature were calculated.
- Temperature decline criteria were established to see if an association between the number of daily temperature declines and the number of calves treated for pneumonia.
- The criteria are as follow:

- ❖ At least four 0.69 - 0.97 °C (1.25-1.75 °F) hourly declines,
- ❖ and/or at least three 0.98 - 1.25°C (1.76-2.25 °F) hourly declines,
- ❖ and/or at least two > 1.26 °C (2.26 °F) hourly declines.

- Daily hourly temperature declines that fit into these criteria were considered significant enough to be a stressor that increased incidences of pneumonia treatments one to four days later.

Results

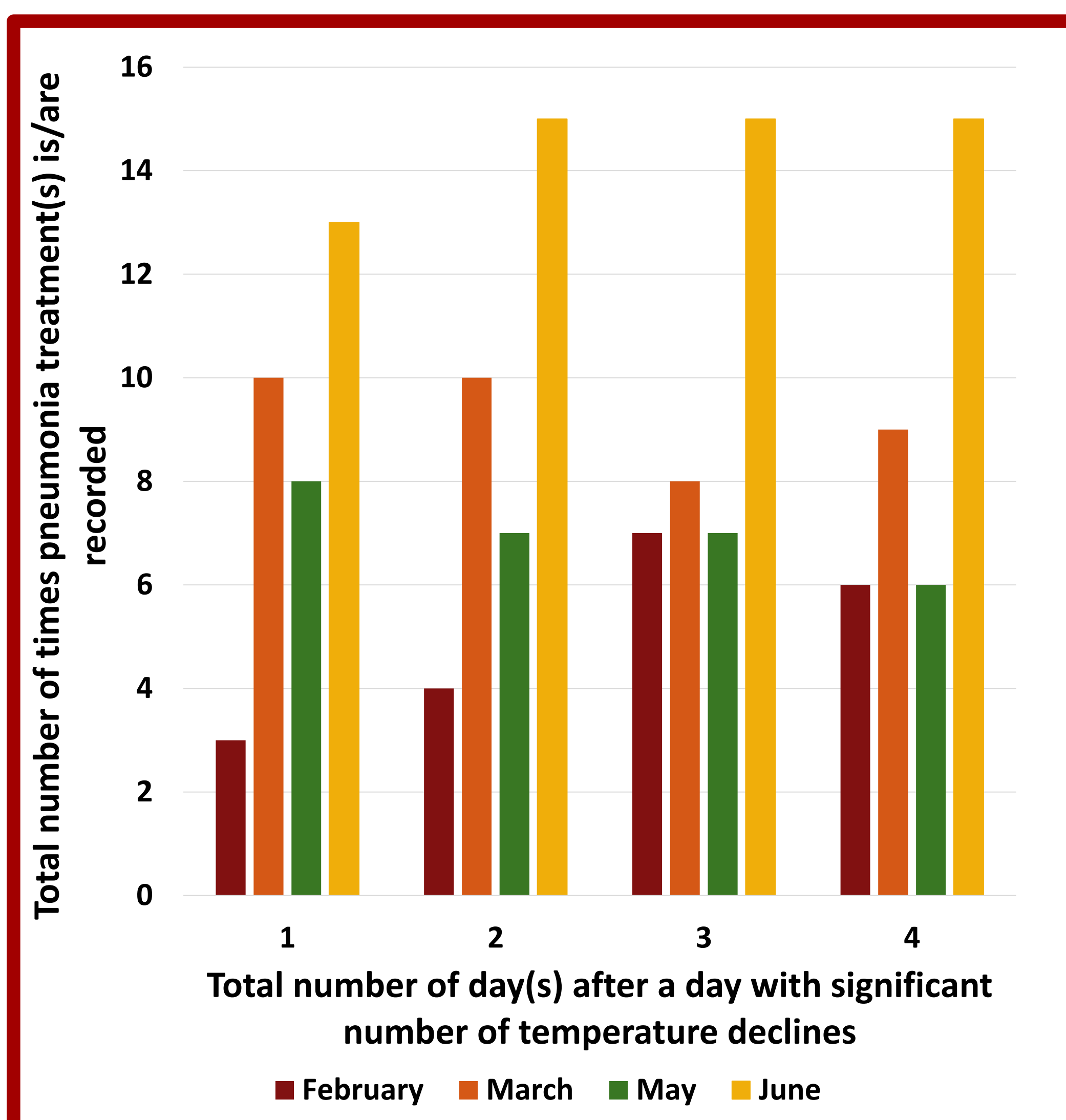
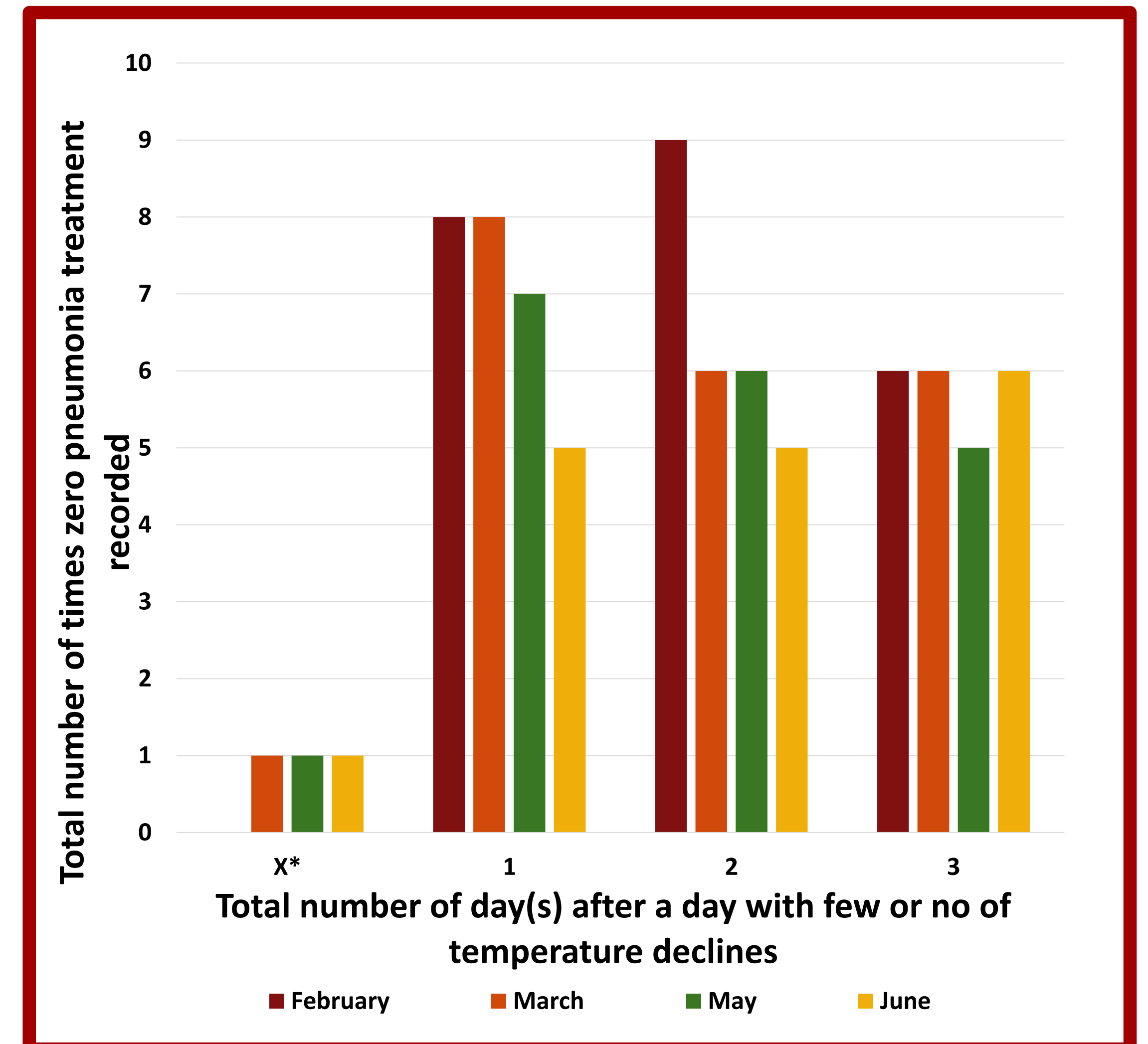


Figure 1. Number of times pneumonia treatment(s) were recorded for February, March, May and June 2015 after one to four day(s) with significant temperature declines of at least 0.42 °C (0.75°F).



*Indicates the number of times no Pneumonia treatment recorded after one to three days with significant temperature declines

Figure 2. Number of times no pneumonia treatment was recorded for February, March, May and June 2015 after one to three day(s) with few or no significant temperature declines

Month	Number of Pneumonia treatments	Number of days when Pneumonia treatment(s) were recorded after a day with at least two times of daily temperature declines of > 1.26°C (2.26°F)			
		1 day	2 days	3 days	4 days
February	27	5	5	2	3
March	24	8	8	7	6
May	28	4	3	3	3
June	41	10	12	11	10
Total		27	28	23	22

Table 1. The number of days when pneumonia treatment(s) were recorded after a day with at least two daily temperature declines of > 1.26 °C (2.26°F)

Conclusions

1. Hourly temperature declines of at least 0.42 °C (0.75°F) were associated with pneumonia treatment(s) recorded one to four day(s) later.
2. Zero incidence of pneumonia treatment was associated with insignificant temperature declines one to three days before.
3. Two or more hourly temperature declines of at least 1.26 °C (2.26°F) in one day had the strongest association with number of pneumonia treatment(s) recorded one to two day(s) later.