

# The Effect of Forest Fires in 2015 on Asthma and Comparison with a Control Group in 2016



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## Aim

To describe the effect of air pollution induced by regional forest fires on respiratory disease, with special attention to asthma, in 2015.

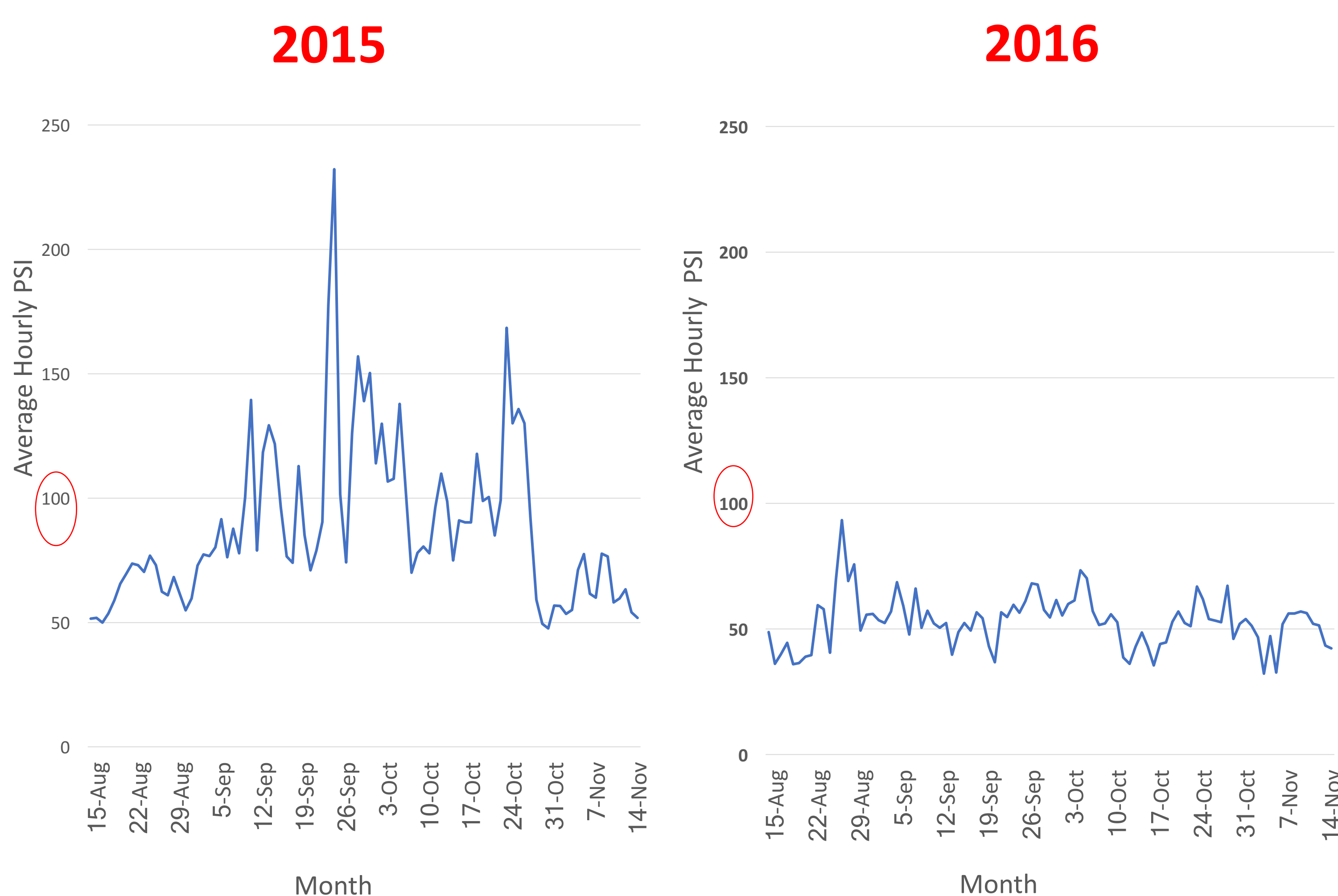
## Method

- A prospective study was carried out on all patients who visited a respiratory clinic in Singapore.
- Data collected: asthma exacerbations/ hospitalisations, Asthma Control Test (ACT) scores of asthmatic patients, spirometry, adjustments in medications
- Period of study: September – October 2015 (Haze)
- Comparison made with control group in September – October 2016 (No Haze)

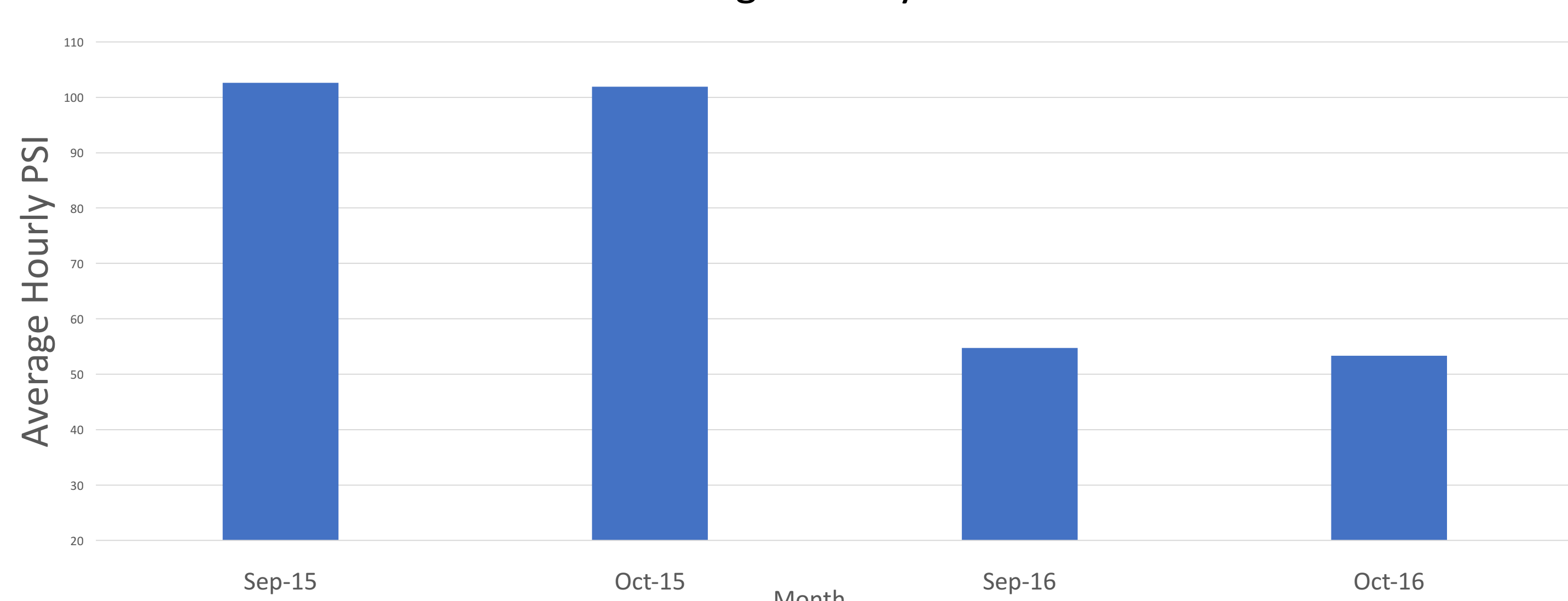
## Background

- Singapore experienced increased air pollution (haze) for 2 months in 2015 arising from increased forest fires.
- Previous studies (Respirology 2000 Jun; 5(2): 175-182) demonstrated minimal effect, with no increase in hospitalisation.

Average Hourly PSI (Aug-Nov) 2015 (Haze) vs 2016 (No haze)



Average Hourly PSI



## Results

Table 1: Demographics and Spirometry: Case (Haze 2015) vs Control (no haze 2016)

Categories	Case (haze 2015)	Control (no haze 2016)	p-value	NS (not significant)
Mean age (years)	46.08	47.34	0.665	NS
Age range (years)	16-93	5-94	NA	NA
Sex (% male)	33.33	33.82	NA	NA
Mean FEV1 asthmatics(%)	91.9	91.8	0.974	NS
Mean FVC asthmatics (%)	102.6	99.9	0.404	NS
Mean FEV1 ratio asthmatics (%)	76.3	79.1	0.0979	NS

Table 2: Comparison of Asthma Exacerbations, Hospitalisations and Treatment, Case (Haze 2015) vs Control (no haze 2016)

% of total	Case (haze 2015)	Control (no haze 2016)	p-value	Significance
N	74	125		
Asthma patients	51 (68.9%)	64 (51%)	0.007	p<0.01
Hospitalisation	4 (5.4%)	1 (0.8%)	0.022	p<0.05
Asthma exacerbation	21 (28.4%)	19 (15.2%)	0.013	p<0.05
Nebulisation	4 (5.4%)	5 (4%)	0.323	NS
Oral steroids	5 (6.8%)	8 (6.4%)	0.460	NS
ACT change	7.1 (0-18)	6.7 (0-15)	0.825	NS

## Effect of Haze 2015 on asthmatics

Key statistics:

- Total number of asthmatics: **51**
- **28.4%** experienced asthma exacerbation
- **5.4%** required hospitalisation (significant)
- **6.8%** required an increase in Prednisolone (not significant(NS))
- Mean ACT score: **15.8** (range: **7-25**; standard deviation: **5.08**; NS)
- Mean change in ACT from baseline: **7.1** (range: **0-18**; standard deviation: **4.75**; NS)

## Conclusion

Forest fires significantly impacted the health of patients with respiratory disease, particularly asthmatics, as demonstrated by **increase in hospitalisations and asthma exacerbations**