

# Thunderstorm Asthma



Dr John Goswell

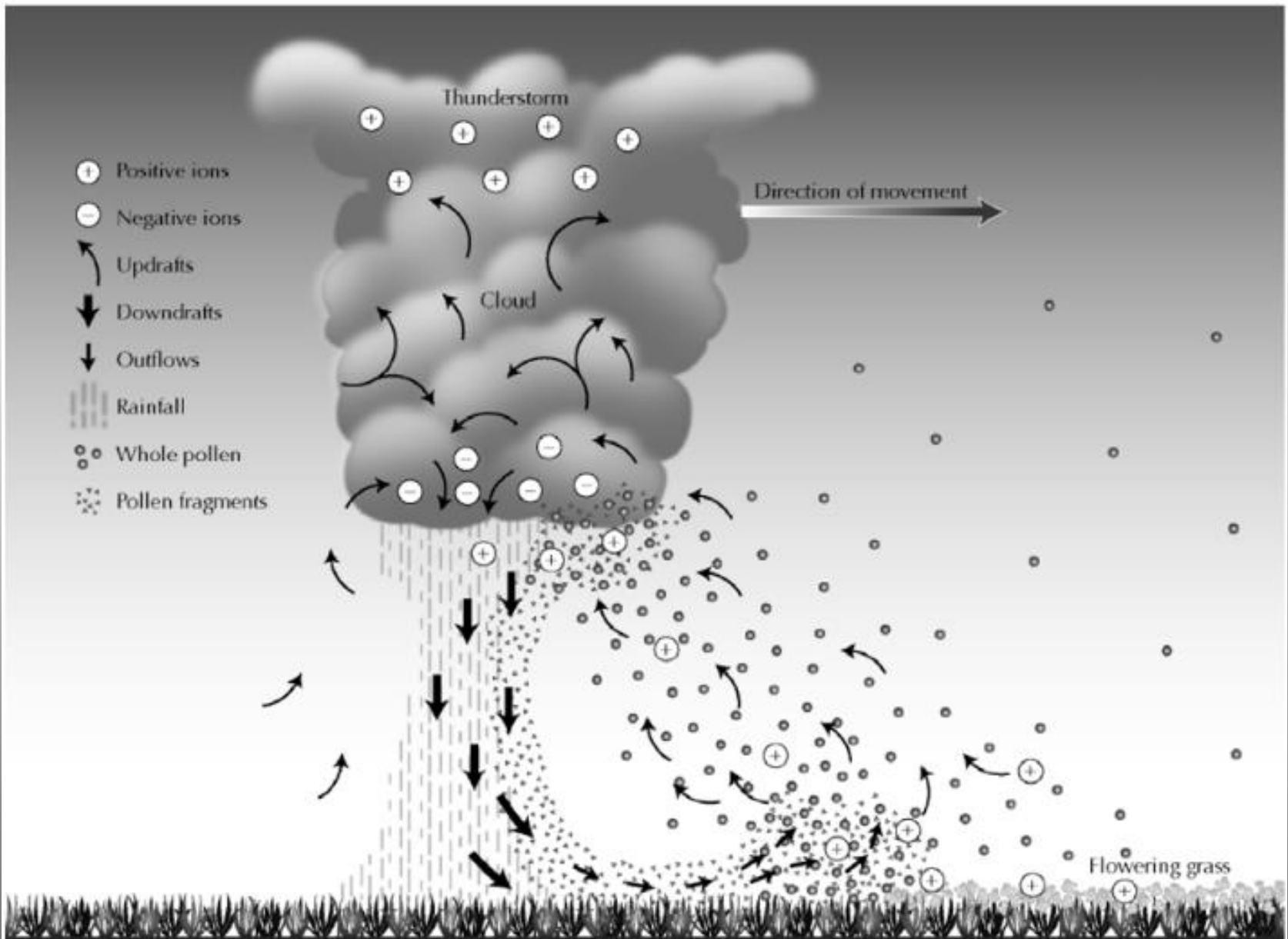
# Thunderstorm Asthma

Defined as:

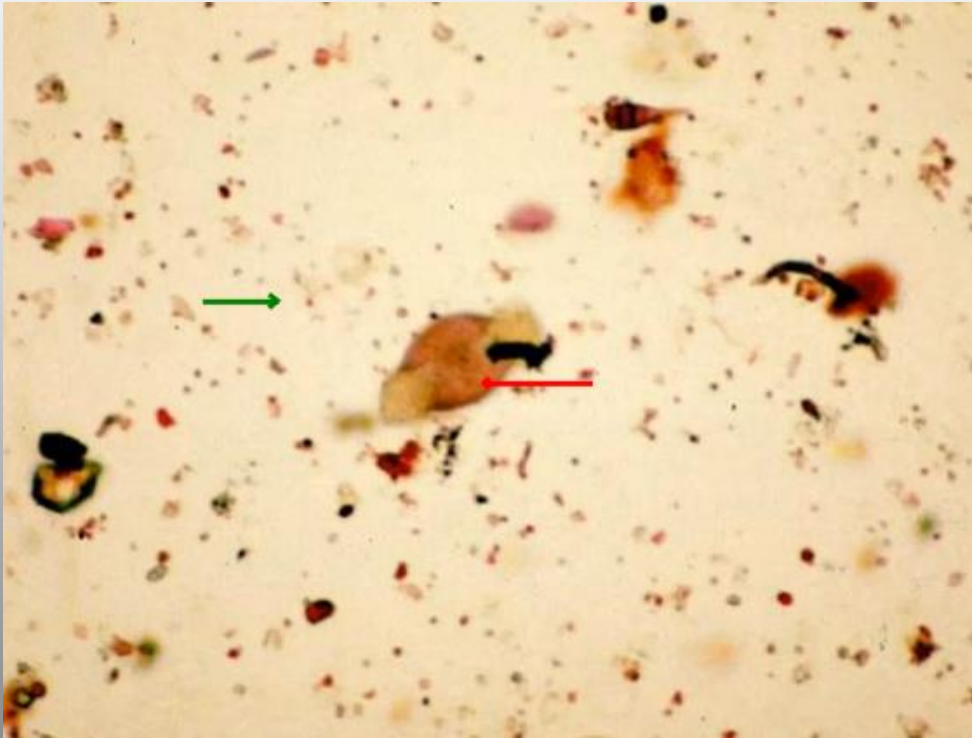
multiple presentations of acute asthma attacks or  
bronchospasms immediately after a thunderstorm

National Asthma Council





# Ryegrass Pollen



Red arrow

– pollen grain rupturing

Green arrow

– starch particle

# The Perfect Storm

Climate change has brought:

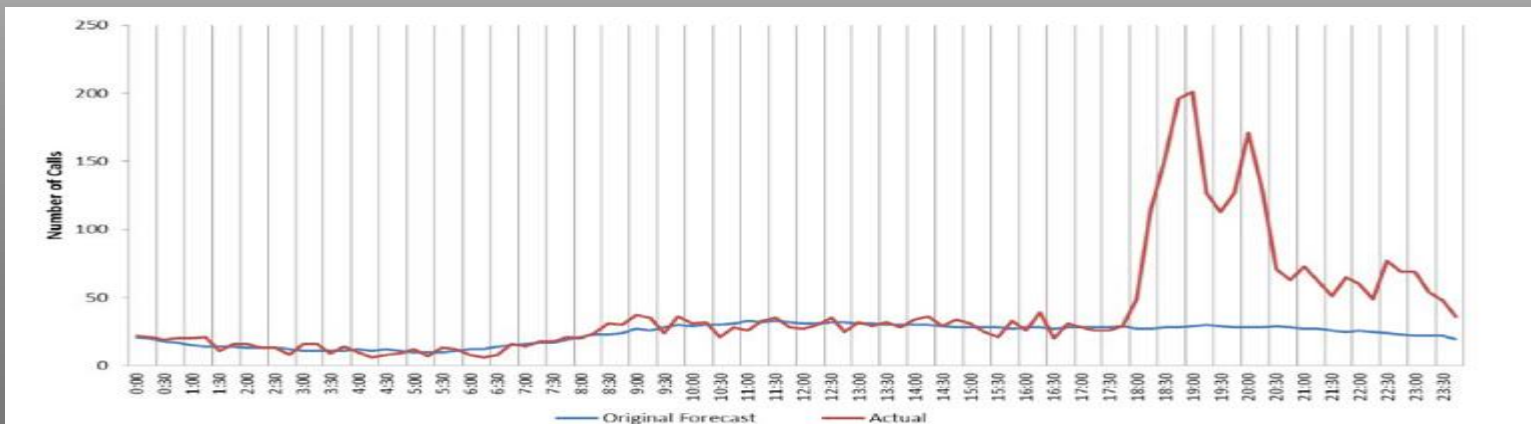
- Increased spring temperatures and rain
  - Increased ryegrass
  - Increased pollens
- Increased storms



“Due to constant climate change, future TA events are likely to become more common, more disastrous and more unpredictable”.

# Melbourne 21<sup>st</sup> Nov 2016

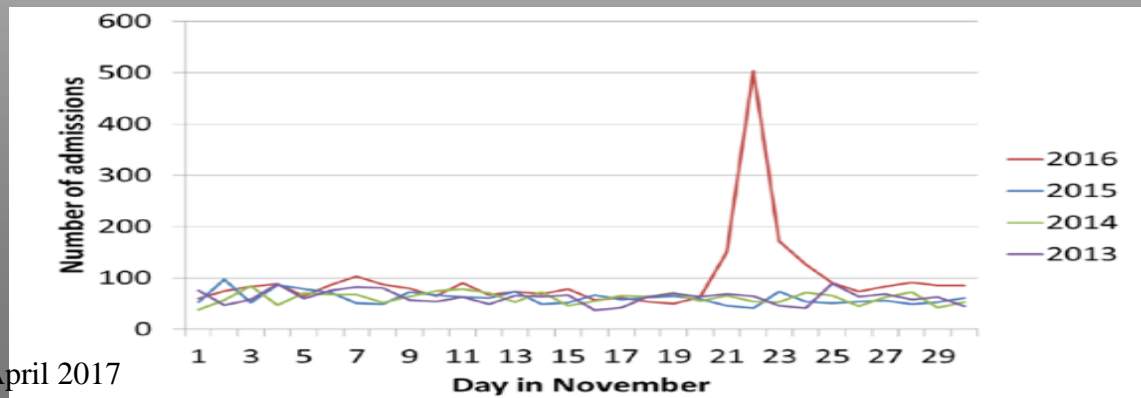
- Very high pollen count (100grains/m<sup>3</sup>)
- Temp dropped from 35deg (5pm) to 20deg (7:30pm)
- Thunderstorm with severe wind gusts (not rain)
- Within an hour emergency services started getting calls re respiratory distress
- 1,326 calls by midnight (ambulances could only attend 500)
- Of the 814 ambulance calls were generated, 643 were code 1



# Melbourne 2016

## In the first 30 hours

- 3,365 excess respiratory related presentations to the EDs
- 476 excess asthma related admissions
- 60% had no prior history of asthma
- 3,000% increase in asthma ICU admissions



# Melbourne 2016

In total

- ~10,000 people were treated for asthma in EDs
- 10 died





# Melbourne 2016 deaths

- All 10 had a previous diagnosis of asthma
- Some died within 15 minutes of onset of symptoms
- Only three had asthma management plans
- Of the ten deaths, 7 were men
- Three had waited more than 30 mins for an ambulance

# Melbourne- Primary Health Care

- Marked increase of presentations of asthma to after hour services and general practices (the next day)
- GPs made a substantial contribution to the event
- Limited by
  - Medication
  - Equipment
  - Space
  - Personnel
  - And limited by the paucity of information coming through

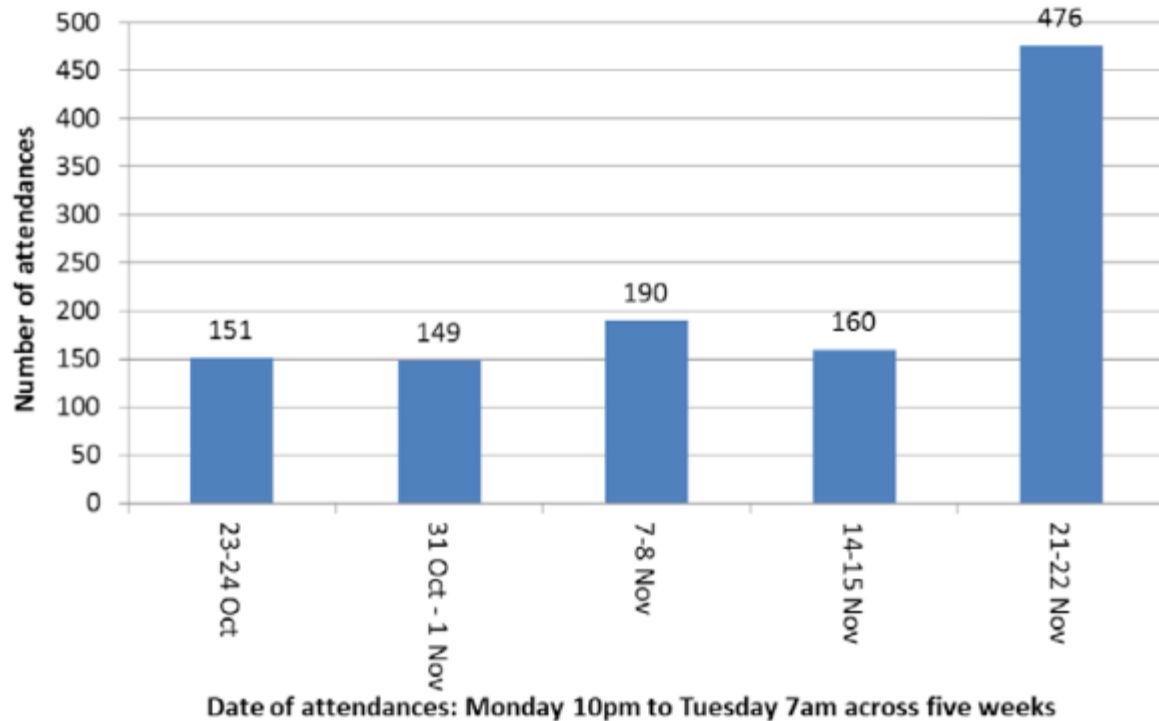
# Melbourne- Primary Health Care

## Pharmacies assisted by

- Giving advice and medication to people that presented to their pharmacies
- Providing supplies of salbutamol to hospitals when they ran out

# Melbourne- Primary Health Care

Figure 27: Number of attendances at all Supercare Pharmacies on 21–22 November 2016 compared with the preceding four weeks, Monday 10 pm to Tuesday 7 am

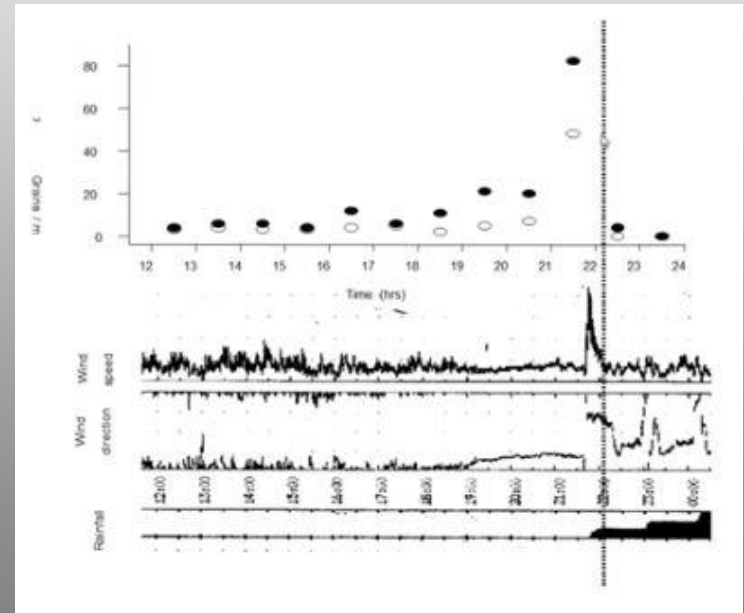


# Tamworth- 1<sup>st</sup> Nov 1990

- Brief thunderstorm
- 110 people presented to ED at Tamworth and Quirindi hospitals
- 38 required admission
- At least another 123 were treated by GPs.

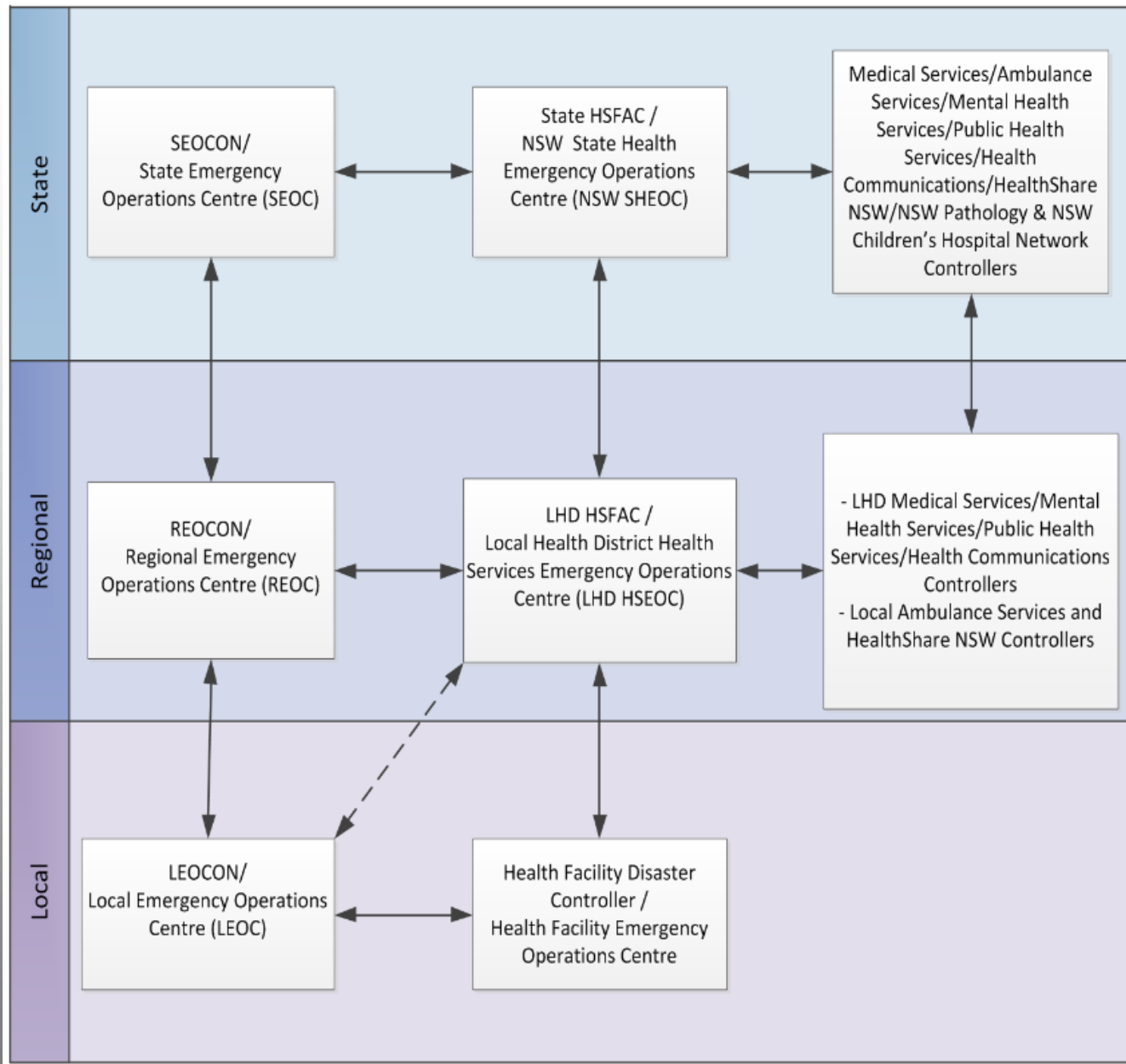
# Wagga Wagga- 1<sup>st</sup> June 1997

- 215 presentations to ED for asthma
- 41 required admission
- 2 needed ICU

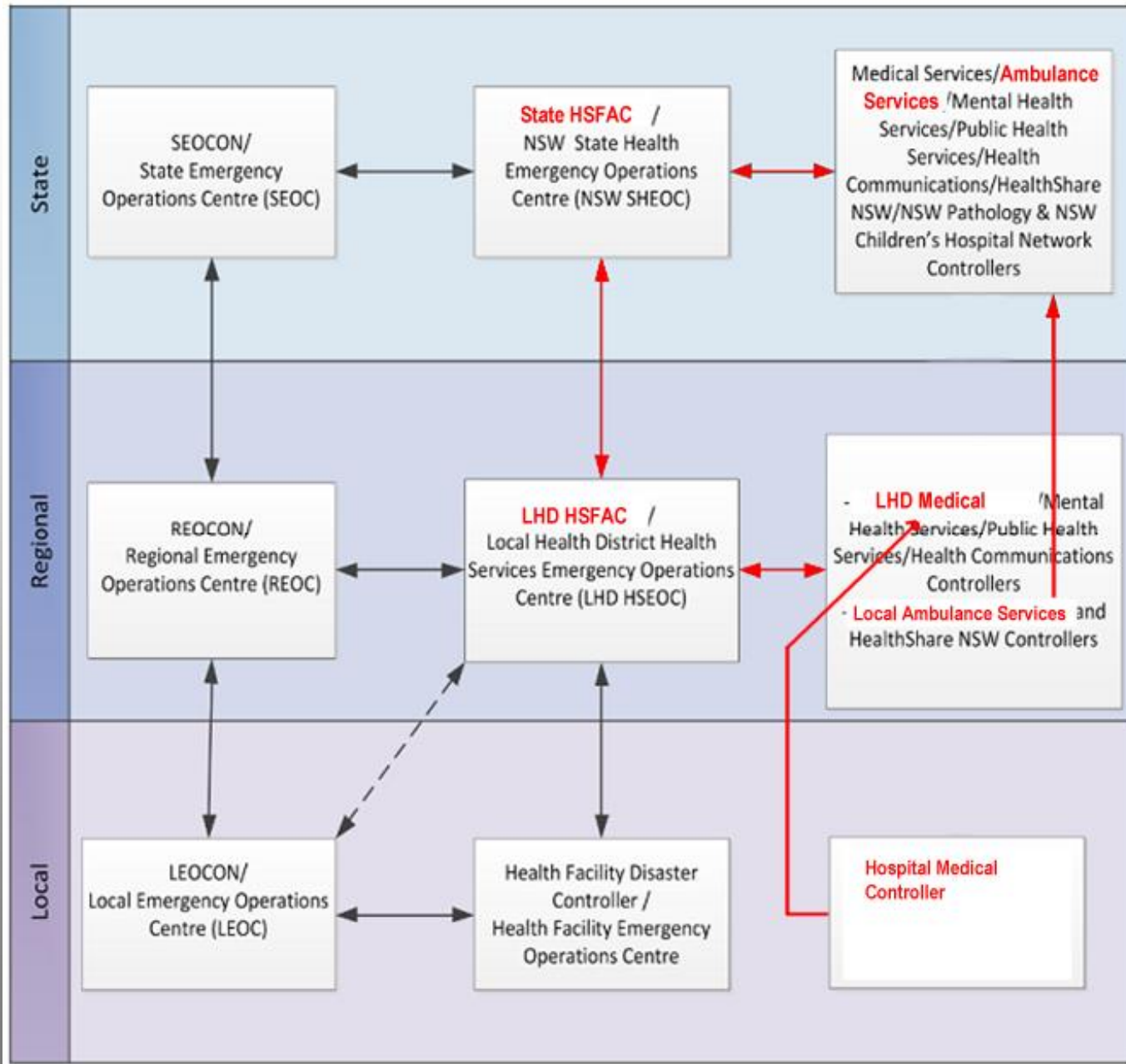


# Planning

- Disaster management
- General practices
- Community pharmacies







# Ambulance Services

- Options
- Cancel scheduled staff breaks
- Call in more staff
- Cancel non-urgent calls
- Increased call-taking staff
- Escalate to state ambulance services

# Hospital Medical Controller

Larger hospitals (JHH, BH, MDH, CDH)

## Options:

- Divert staff from wards to ED
- Call in more staff
- Arrange for increased supplies
- Escalate to the LHD Med controller

# LHD Medical Controller

## Options:

- Move staff from one hospital to another
- Control where patients are managed
- Escalate to the HSFAC

# HSFAC

## Options

- Call in staff from other hospitals
- Coordinate with other services eg pharmacy
- Source supplies
- Re-allocate services
- Escalate to state HSFAC
- Call on the HNECCPHN EOC

# State HSFAC

- Options
- Bring in staff from outside the region
- Bring in supplies from outside the region
- Escalate to the SEOCON

# HNECCPHN EOC

- May activate on its own
- May be called upon by the HSFAC
- Could use its resources to coordinate care
- Could source and/or distribute consumables
- Could call upon primary health carers to help
- Has the most reliable contact database



# GPs in TA

- Likely to see a sudden increase in the acute presentations of asthma?
- Safely keeping these people out of hospital will make a big difference
- May be called upon by the PHN
- Can help by working extended hours



# GPs in TA

- Can contact the PHN to find out what is happening
- Need to have up-to-date asthma management plans for asthmatic patients
- Need to consider that all patients with seasonal allergic rhinitis (ryegrass) are at risk

# GPs in TA

- Need to have considered thunderstorm asthma in their disaster planning
- Need to consider whether they are resourced for such an event
  - Space
  - Staff
  - Salbutamol
  - Delivery systems
  - Emergency drugs

# Emergency drugs

- Oxygen
- Salbutamol puffers/nebules
- Ipratropium puffers/nebules
- Prednisone 25mg tablets/IV hydrocortisone 100mg
- IV Magnesium??
- Adrenalin

# Emergency equipment

- Spacers
- Nebulizer
- Oximeter
- IV access

## Improvised large volume spacer using plastic soft drinks bottle.



M Woollard, and I Greaves Emerg Med J 2004;21:341-350



Emergency spacer

# Pharmacies

- May see an increase in people presenting with shortness of breath wanting puffers
- Important triage
- May be asked to provide supplies to hospitals, patients and/or GPs
- Should have an action/disaster management plan
- May be contacted by the PHN
  - Supplies
  - Extended hours

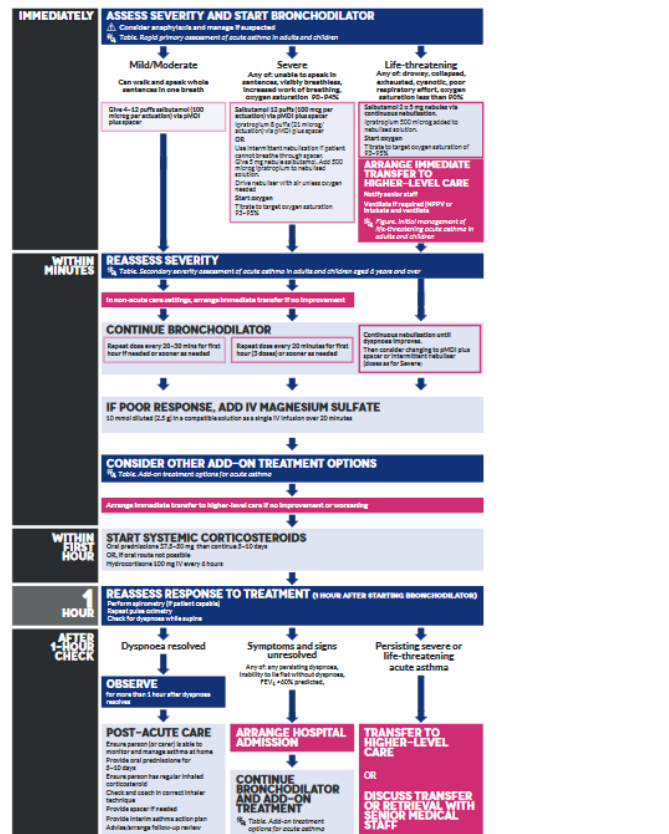
# Prevention

- Forecasting
  - Monitoring risk factors
  - Public alerts
- Treating asthma effectively (ICS)
- Asthma management plans
- Sublingual immunotherapy?
- Indoors when at risk
- Masks?



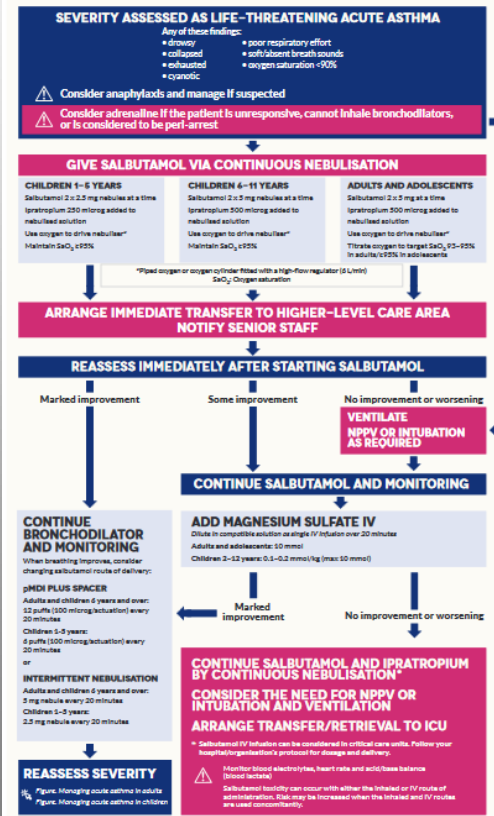
# Treatment

Figure. Managing acute asthma in adults



For more details on the initial management of life-threatening acute asthma, see Initial management of life-threatening acute asthma in adults and children

Figure. Initial management of life-threatening acute asthma in adults and children



Initial management of life-threatening acute asthma. This figure shows in more detail the first stages (immediate and within minutes) shown in the figures Managing acute asthma in adults and Managing acute asthma in children

# Thanks

- Ian McCarthy (LHD Disaster Coordinator)
- Liz Grist (LHD HSFAC)
- Prof. David Durrheim (LHD Public Health Controller)

# Resources

- National Asthma Council – Information paper for health professionals

[https://d8z57tiamduo7.cloudfront.net/resources/NAC-TA-Paper-2022\\_web.pdf](https://d8z57tiamduo7.cloudfront.net/resources/NAC-TA-Paper-2022_web.pdf)

- Air quality

<https://www.tomorrow.io/weather/AU/NSW/Newcastle/006563/health/>

- Asthma First Aid (Asthma Australia)

[https://asthma.org.au/wp-content/uploads/2021/12/AAFA-First-Aid-2022-A4\\_CMYK\\_v7\\_Blue-1.pdf](https://asthma.org.au/wp-content/uploads/2021/12/AAFA-First-Aid-2022-A4_CMYK_v7_Blue-1.pdf)

# Resources

## Managing acute asthma (National Asthma Council)

- Acute asthma in adults

[https://d30b7srod7pe7m.cloudfront.net/uploads/2020/08/Figure\\_Managing-acute-asthma-in-adults\\_web.pdf](https://d30b7srod7pe7m.cloudfront.net/uploads/2020/08/Figure_Managing-acute-asthma-in-adults_web.pdf)

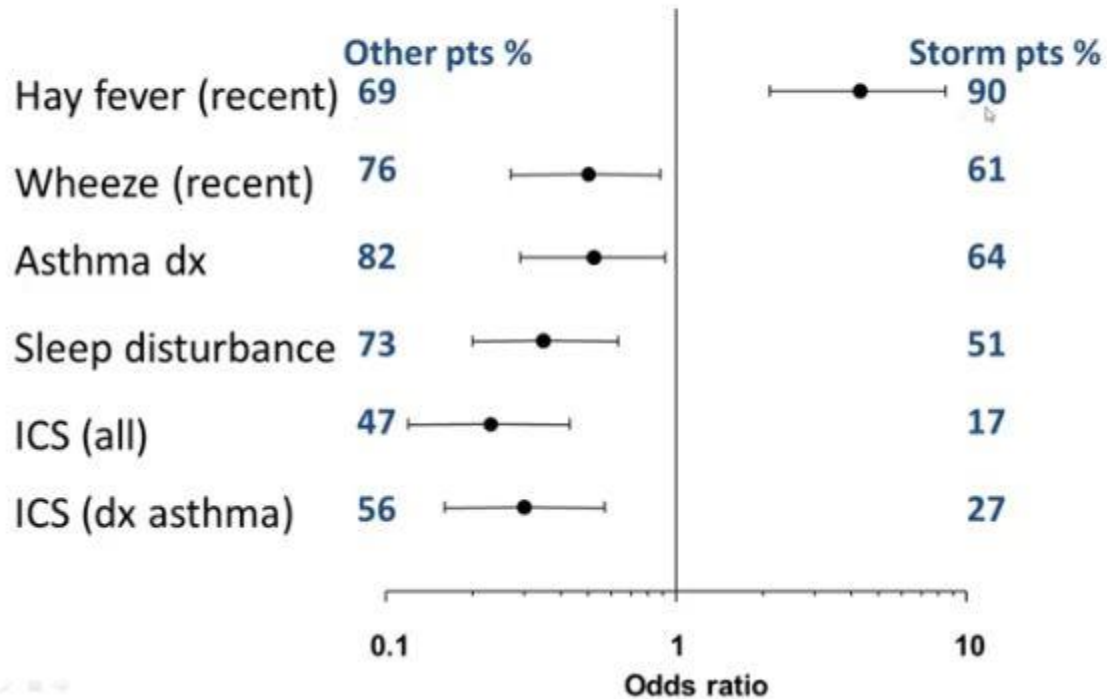
- Life-threatening asthma in adults and children

[https://d30b7srod7pe7m.cloudfront.net/uploads/2020/08/Figure\\_Initial-management-of-life-threatening-acute-asthma-in-adults-and-children\\_web.pdf](https://d30b7srod7pe7m.cloudfront.net/uploads/2020/08/Figure_Initial-management-of-life-threatening-acute-asthma-in-adults-and-children_web.pdf)

# Some solutions

- Obtaining medications from hospitals and community pharmacies
- Triage
- Altering management strategies
- Extending clinic hours

## Who is at risk?

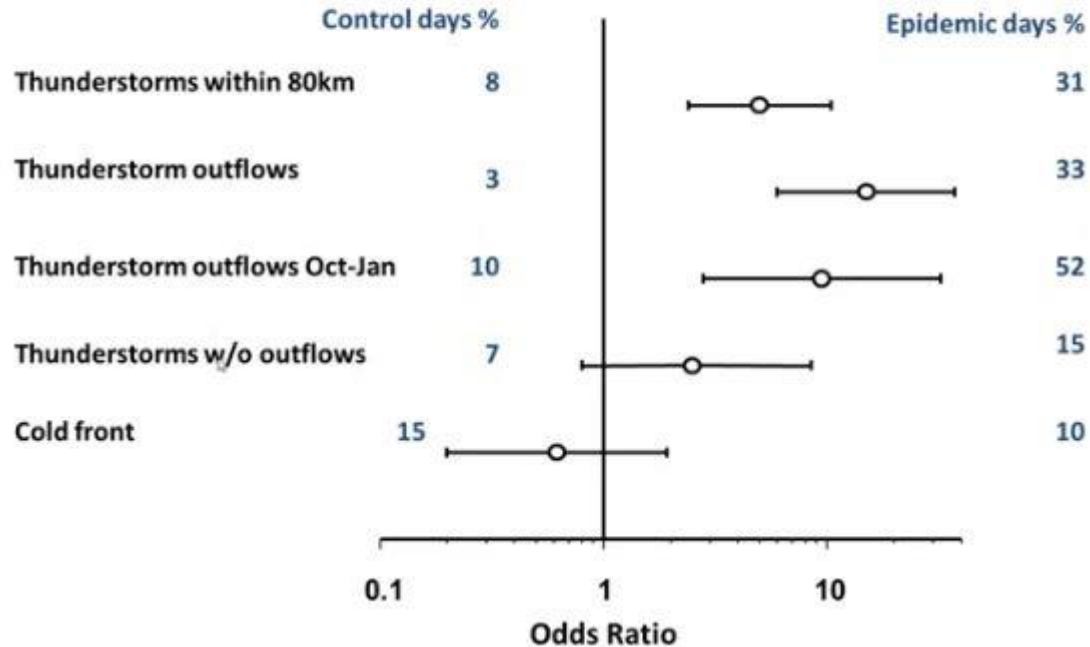


In a study of those people who presented to Wagga Wagga District Hospital on 1<sup>st</sup> Jan 1995, ninety percent had a recent history of hayfever. This was a closer association than having known asthma.

From Prof. Guy Marks presenting to the Centre of Excellence in Severe Asthma

<https://www.severeasthma.org.au/thunderstorm-asthma/>

# Thunder, outflows and asthma



Of 48 epidemic asthma events in 6 NSW country hospitals from 1995 to 1998, 52% were associated with thunderstorm outflow events in October to January.

From Prof. Guy Marks presenting to the Centre of Excellence in Severe Asthma

<https://www.severeasthma.org.au/thunderstorm-asthma/>