

A community outbreak of legionnaire disease, Montpellier, France, 2003



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Introduction

• Background of outbreak

- Between 31 July and 4 August, 12 cases of Legionnaire's Disease were notified to the French authorities (Ddass)
- Cases were resident in Montpellier or had travelled to Montpellier in the 10 days before the onset of the disease

• Objectives of investigation

- Describe the outbreak
- Identify a common source of contamination
- Propose and implement control measures

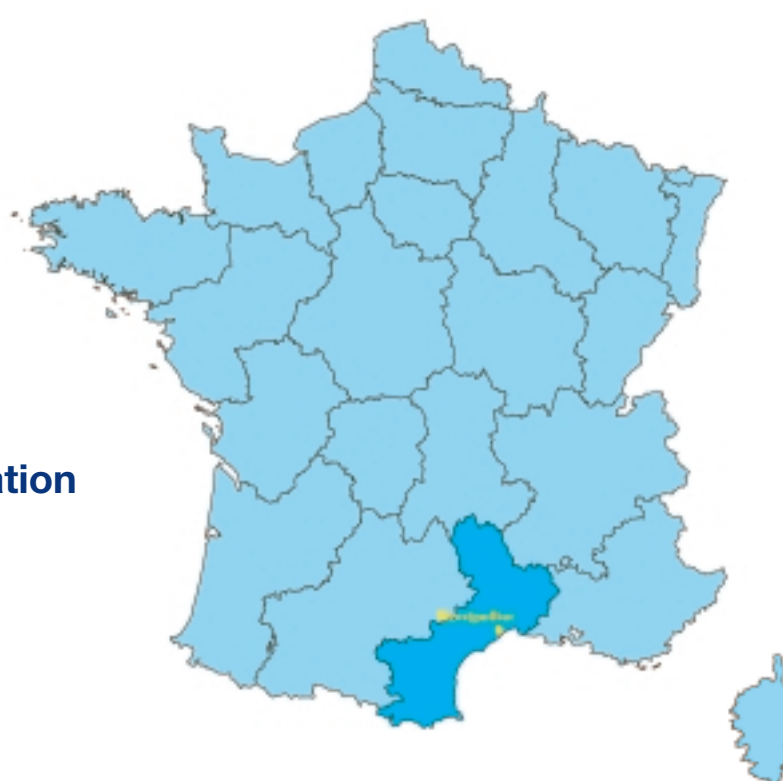


Figure 1: Montpellier geographical situation

Methods

• Epidemiologic investigation

- Case definition:
 - Case: person with evidence of pneumonia who stayed in Montpellier in the 10 days before onset and with laboratory diagnosis of Legionnaire's Disease.
 - "Unique resident" case: case who spent only one day in the city 10 days before onset
- Health professionals of Montpellier, other Ddass in France and European working group for Legionella infections (Ewgli), were asked for immediate notification of cases
- Notified cases traced and interviewed using a standard questionnaire

• Environmental investigation in Montpellier

- All humid cooling towers (CTs) listed
- Other potential contamination sources checked

• Laboratory methods (National Reference Centre)

- Sub-typing using pulsed-field gel electrophoresis (PFGE)
- Comparison of human and environmental isolates

• Meteorology

- meteorological parameters collected (temperature, humidity, wind)

Results

• Epidemiologic investigation

- 31 cases (*Legionella pneumophila* serogroup 1 – Lp1) with onset between 15 July and 12 August 2003, including 8 "unique resident" cases
- Aged from 36 to 92 (Median 55 years)
- 19 men, 12 women (sex ratio 1.6)
- Only one common factor: coming to the centre of the city within the 10 days before the onset of the disease. All "unique resident" cases came in this area the same day, the 21 July
- Strains of Lp-1 among 8 patients identical

Figure 2: Number of Legionnaire's disease cases by onset date, Montpellier, July-August 2003



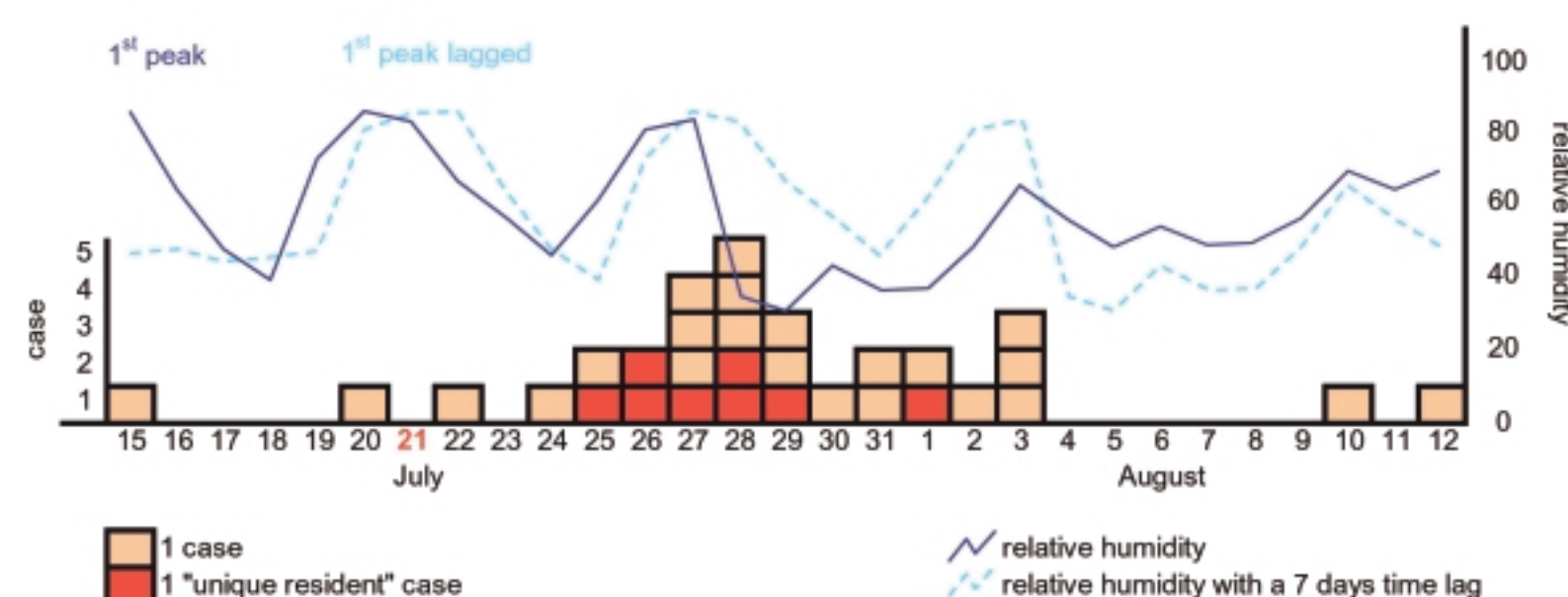
• Environmental investigation

- 36 CTs including 8 in the centre of Montpellier
- 15 CTs contaminated by Lp-1 including 5 with concentration levels higher than 10⁶ UFC/l
- 11 different strains of Lp-1, 5 in the same CT of the centre of Montpellier. None identical to the human strain
- 25 CTs disinfected including 10 stopped before 14 August
- No Lp-1 in the other possible sources of contamination

• Meteorological data analysis

- Significant correlation between epidemic curve and relative humidity (r.h) with a 7 days time lag (median incubation of the "unique resident" cases)

Figure 3: Correlation between epidemic curve and relative humidity, Montpellier, July-August 2003



Conclusion

• Despite the absence of biological evidence, epidemiological investigation suggested a common contamination by one or more CTs

- Identical human profile
- Only one common factor: coming to the centre of the city
- All "unique resident" case in the same area, the same day
- Several CTs infected by Lp-1, 2 in the common area with concentration levels higher than 10⁶ UFC/l
- 11 different strains identified in CTs
- Propitious weather for survival and spread of *Legionella* in aerosols
- No case 10 days after the 14 August (end of controls in the CTs)
- No Lp-1 in public distribution system and domestic water samples

• Outbreak rapidly controlled

- High reactivity of the Ddass
- Many CTs disinfected or/and stopped
- Strong collaboration between different partners
- Analysis focused on "unique resident" cases

• Improvement of legislation about CTs recommended