Hospital-Acquired Influenza in Canberra Hospital 2017

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We declare no conflicts of interest

Background

- Acquisition of influenza virus in hospital associated with increased morbidity, mortality and healthcare costs[1,2]
- Spread facilitated by healthcare workers, other patients and visitors[3]

[1] Macesic N, Kotsimbos TC, Kelly P, Cheng AC. Hospital-acquired influenza in an Australian sentinel surveillance system. Med. J. Aust. 2013;198(7):370-2.
[2] Vanhems P, Benet T, Munier-Marion E. Nosocomial influenza: encouraging insights and future challenges. Curr. Opin. Infect. Dis. 2016;29(4):366-72.
[3] Salgado CD, Farr BM, Hall KK, Hayden FG. Influenza in the acute hospital setting. Lancet Infect. Dis. 2002;2(3):145-55.

Background

- Previous studies have examined general trends over several seasons[1-4]
  - High number of cases in 2017 allowed focused single-centre examination

[1] Álvarez-Lerma F, Marín-Corral J, Vilà C, Masclans JR, Loeches IM, Barbadillo S, González de Molina FJ, Rodríguez A. Characteristics of patients with hospital-acquired influenza A (H1N1)pdm09 virus admitted to the intensive care unit. J. Hosp. Infect. 2017;95(2):200-6.
[2] Macesic N, Kotsimbos TC, Kelly P, Cheng AC. Hospital-acquired influenza in an Australian sentinel surveillance system. Med. J. Aust. 2013;198(7):370-2.
[3] Vanhems P, Benet T, Munier-Marion E. Nosocomial influenza: encouraging insights and future challenges. Curr. Opin. Infect. Dis. 2016;29(4):366-72.
[4] Weedon KM, Rupp AH, Heffron AC, Kelly SF, Zheng X, Shulman ST, Gutman P, Wang D, Zhou Y, Noskin GA, Anderson EJ. The impact of infection control upon hospital-acquired influenza and respiratory syncytial virus. Scan. J. Infect. Dis. 2013;45(4):297-303.

Study aims

- Compare and contrast patients with community-acquired (CA) and hospital-acquired (HA) influenza
- Evaluate characteristics of patients, management and outcomes

Methodology

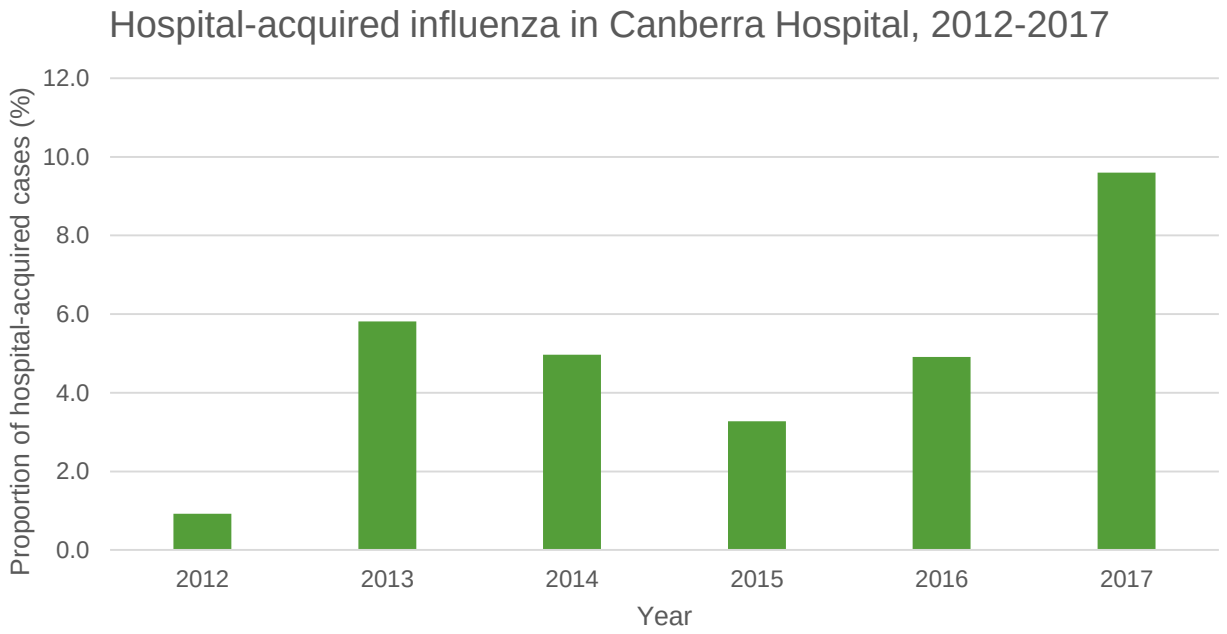
- Design: retrospective observational study
- All adult influenza cases April-October 2017 included
- Data from FluCAN and hospital information systems
- Hospital-acquired influenza: symptom onset ≥48h after admission
- Focussed analysis on hospital-acquired cases

Statistical analysis

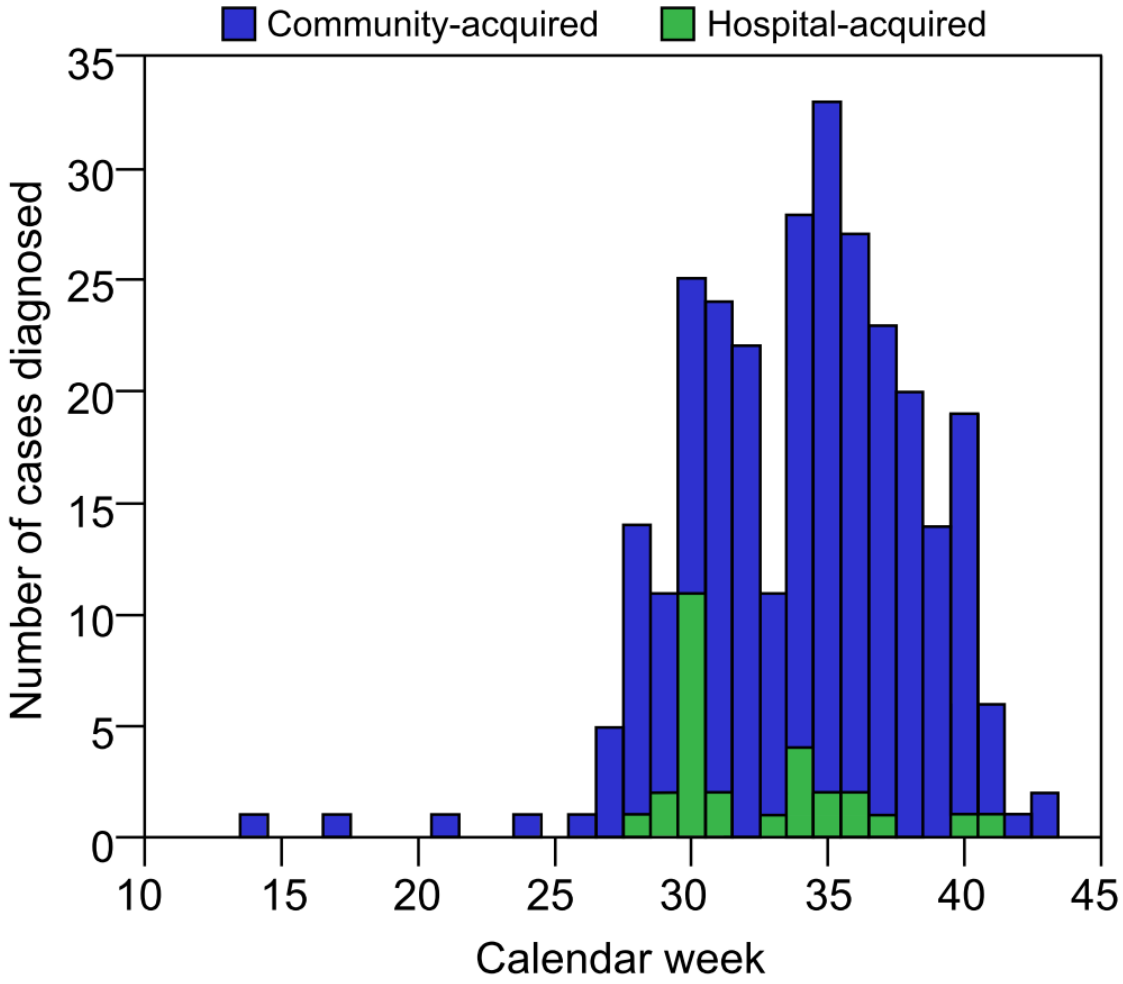
- Performed using IBM SPSS Statistics 22 software
- Continuous variables: Mann-Whitney U test
- Categorical variables: χ^2 test or Fisher's exact test
- Multivariate logistic regression and linear regression to control for age

Results

- Total of 292 patients included in study
  - 28 (9.6%) HA and 264 (90.4%) CA
- 66.1% of cases due to influenza A



Number of community and hospital-acquired influenza diagnoses per calendar week in 2017



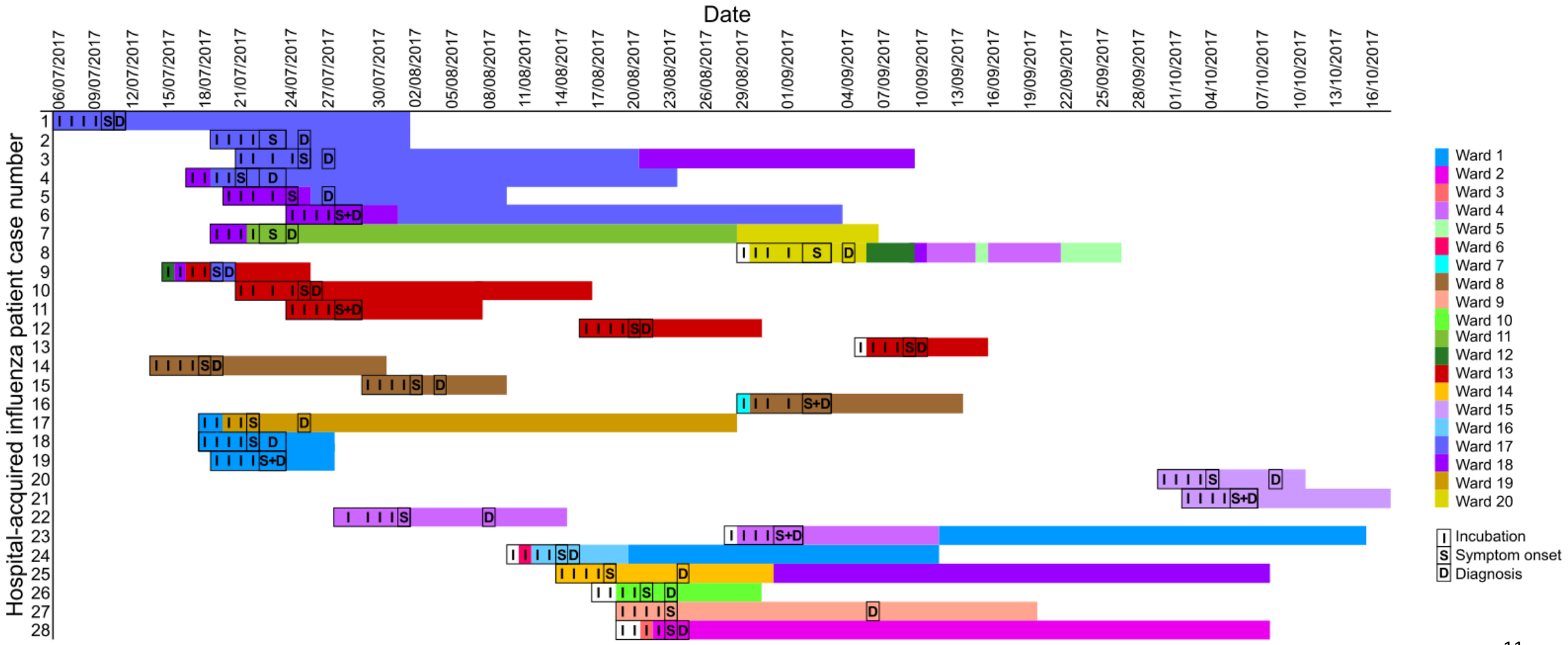
Characteristics

- No significant difference in baseline characteristics
- Vaccinated in 2017: 60% CA; 41% HA
- CA group presented with an influenza-like-illness (ILI)
- HA group presented with a non-ILI

Management and outcomes

- HA influenza diagnosed sooner than CA influenza
- 62.5% of HA cases treated within 48 hrs vs. 39.8% of CA cases
- HA group had a longer length of stay after diagnosis than CA group (13 vs. 5 days)
- No difference in ICU admission or mortality

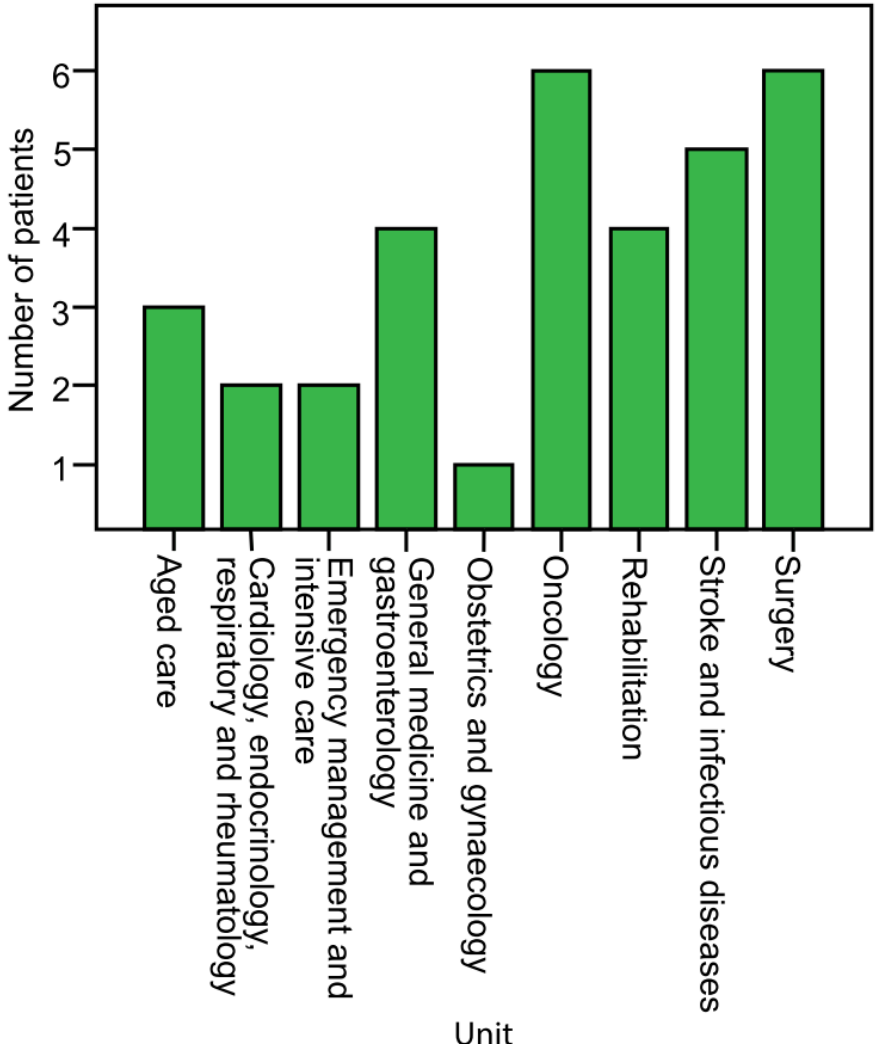
Ward placement of hospital-acquired influenza patients during incubation period, symptom onset, diagnosis and post-diagnosis



Infection control

- Median of 5 bed moves for HA patients
  - 8 patients moved at least once after diagnosis
- 22 HA patients in multiple-occupancy rooms during incubation period
- 17 HA patients shared a ward with another HA patient during incubation period
- Post diagnosis 9 HA patients moved into double rooms

Hospital-acquired influenza cases present in units during patient incubation period



Discussion

- HA cases occurred in clusters, contrast to previous study[1]
  - Data suggestive of in-hospital transmission
    - Transferring of patients associated with increased risk of acquiring infection[2]
    - Longer length of stay provides greater opportunity for transmission

[1] Huzly D, Kurz S, Ebner W, Dettenkofer M, Panning M. Characterisation of nosocomial and community-acquired influenza in a large university hospital during two consecutive influenza seasons. J. Clin. Virol. 2015;73:47-51.
[2] Eveillard M, Quenon J-L, Rufat P, Mangeol A, Fauvelle F. Association between hospital-acquired infections and patients' transfers. Infect. Control Hosp. Epidemiol. 2001;22(11):693-6.

Discussion

- Differences in presentation could lead to underdiagnosis
  - HA patients mostly presented with non influenza-like-illness
- When symptoms were identified, diagnosis was prompt
- Proportion of patients receiving treatment within ideal window was low
  - Affects outcomes[1]
  - Early treatment may decrease infectivity[2]

[1] Harper SA, Bradley JS, Englund JA, File TM, Gravenstein S, Hayden FG, McGeer AJ, Neuzil KM, Pavia AT, Tapper ML, Uyeki TM, Zimmerman RK. Seasonal Influenza in Adults and Children - Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management: Clinical Practice Guidelines of the Infectious Diseases Society of America. Clin. Infect. Dis. 2009;48(8):1003-32.
[2] Ng S, Cowling BJ, Fang VJ, Chan KH, Ip DKM, Cheng CKY, Uyeki TM, Houck PM, Peiris JSM, Leung GM. Effects of Oseltamivir Treatment on Duration of Clinical Illness and Viral Shedding and Household Transmission of Influenza Virus. Clin. Infect. Dis. 2010;50(5):707-14.

Limitations

- Study design as an observational study
- Epidemiologic analysis only focussed on HA patients
- Threshold of 48hrs to define HA influenza may have led to misclassification of CA as HA

Conclusion

- 2017 influenza season resulted in high numbers of hospital-acquired influenza
- Cluster pattern of HA influenza suggestive of intra-hospital transmission
  - There is a need for increased infection prevention and control
  - Further research is required into the role of healthcare workers, patients and visitors in transmission