

Sjukhusförvärvad influensa på skånska sjukhus 2013-19

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Influenza A subtype H3N2 is associated with an increased risk of hospital dissemination – an observational study over six influenza seasons

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Bakgrund

- Sjukhusförvärvad influensa (HAI) har historiskt varit förknippad med högre mortalitet (9-22%) än sjukhuskrävande samhällsförvärvad influensa (3-12%). Vanligt förekommande och underrapporterat problem
- Tidigare studier: 3-35% av inlagda med influensa smittade på sjukhuset
- Många äldre studier med bristfällig tillgång till snabb diagnostik och antiviral behandling/profylax. Enstaka säsonger eller utbrottsrapporter.
- Ingen som jämfört olika säsonger och eventuell koppling till influensa subtyper
- Sedan 2013 subtypas influensa A i Skåne

Frågeställningar

- Hur stor andel av patienter som slutenvårdas med influensa har smittats under vårdtiden i en modern svensk sjukhusmiljö?
- Föreligger säsongsvariationer?
- Påverkas dessa av vilka influensa-subtyper som förekommer?
- Hur hög är mortaliteten i sjukhusförvärvad influensa i en modern slutenvårdsmiljö i Skåne?



4,110 adult hospitalized patients in Skåne with PCR-verified influenza A or B infection:
950 influenza A(H1N1)pdm09
1,858 influenza A(H3N2)
1,277 influenza B
17 influenza A, non-subtyped
8 influenza subtype co-infections

Sampled ≥ 2 days after admission or ≤ 5 days after a previous discharge from in-patient care

No

3,394 patients

Community-acquired influenza

Yes

716 patients

Medical record review confirming debut of symptoms compatible with influenza

- ≥ 3 days after admission to any ward, or
- ≥ 2 days after admission to ward with confirmed ongoing hospital-acquired influenza spread, or
- ≤ 0.5 days after discharge from ≥ 3 days of previous in-patient care

No

286

Community-acquired influenza

Yes

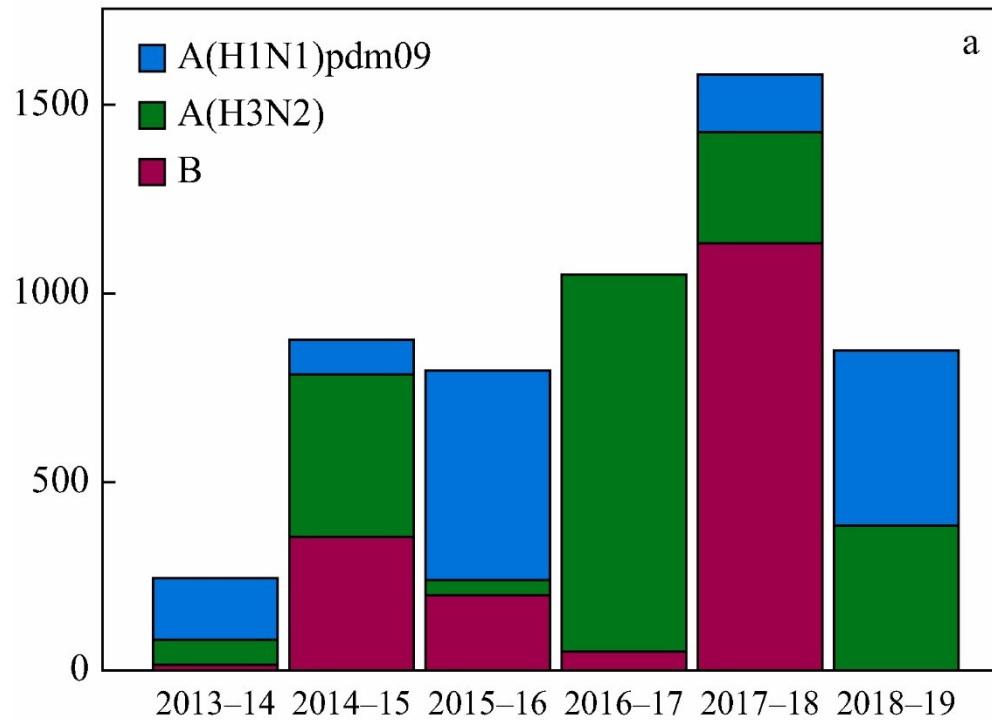
430

Hospital-acquired influenza

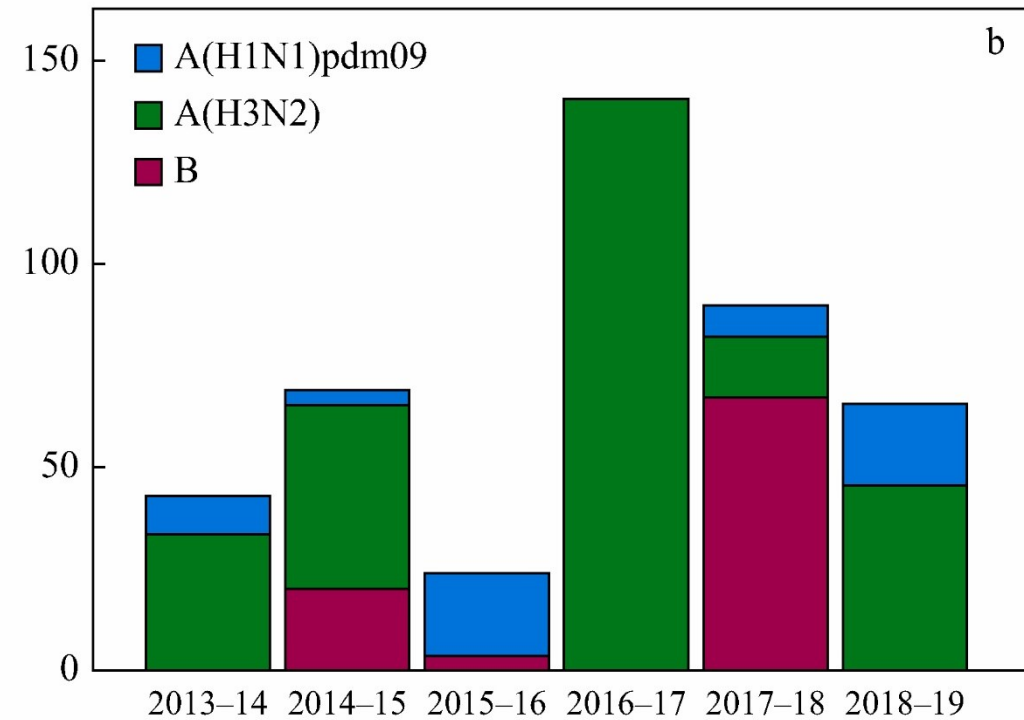


Resultat

Community-acquired influenza infections,
2013–14 - 2018–19



Hospital-acquired influenza infections,
2013–14 - 2018–19



Subtyper, medianålder och mortalitet

Community- and hospital-acquired influenza, median age, and mortality

	Influenza A and B, total ^a	Influenza A(H1N1)pdm09	Influenza A(H3N2)	Influenza B
Total number of hospitalized influenza cases ^a (<i>N</i> , %)	4110	950 (23.1)	1858 (45.2)	1277 (31.1)
Community-acquired influenza cases ^b (<i>N</i> , %)	3680	890 (24.2)	1577 (42.9)	1190 (32.3)
Median age of community-acquired influenza cases (years, IQR)	75 (62–84)	64 (50–74)	78 (69–85)	76 (65–84)
Hospital-acquired influenza cases ^c (<i>N</i> , %)	430 (10.5)	60 (14)	281 (65.3)	87 (20.2)
Median age of hospital-acquired influenza cases (years, IQR)	78 (68–85)	71 (59.25–79.5)	80 (70.5–87)	77 (69–84)
Mortality, hospital-acquired influenza cases (all-cause within 30 days, <i>N</i> , %)	40 (9.3)	6 (10)	27 (9.6)	7 (8)



Solitära och klustrade fall –relation till influensa subtyp

Distribution of solitary and clustered cases of hospital-acquired influenza, divided by subtype

	Influenza A(H1N1)pdm09	Influenza A(H3N2)	Influenza B
Solitary cases of hospital-acquired influenza infections (<i>N</i>)	36	75	55
Clustered cases of hospital-acquired infections (<i>N</i>)	24	206	32
Number of clusters per cluster size (<i>N</i>)			
2	9	24	7
3	2	6	6
4–9	0	17	0
10–15	0	3	0
Total number of clusters (<i>N</i>)	11	50	13



Conclusions

- HAI H3N2 was associated with an increased risk of hospital dissemination.
- HAI was associated with substantial both in-hospital and 30-day mortality, despite high access to timely diagnostics and antiviral treatment.
- Our findings bear relevance for future seasonal influenza preparedness and show that subtyping of influenza A HAI may prove to be useful in defining relevant infection control measures necessary to prevent hospital outbreaks.



Potentiella orsaker till H3N2 dominans

1. ”Barndomsinfluensan”

- **Relative inferior immunity and increased susceptibility among the fragile elderly** who dominate the hospital environment.

Subtype-specific immunological memory profiles achieved from previous childhood influenza infections, where elderly in our study mainly were exposed to circulating variants emanating from the 1918 H1N1 ‘Spanish flu’, may provide a lifelong better protection against H1N1 variants than against H3N2 influenza



2. Sämre vaccineffekt?

- **Current influenza vaccines may provide inferior protection against H3N2** e as compared with H1N1 e and influenza B infection, which has been stated in recent reports

As immunization rates among the elderly in our study setting were relatively high, it is plausible that subtype-specific differences in vaccine efficacy could influence our findings.

3. Skillnader i virusegenskaper?

- **Inherent viral properties of the different influenza subtypes may impact clinical presentation and contagiousness in different populations of individuals, e.g., differences in the amount of exhaled virus from an infected person, infectious dose (amount of virus needed to cause infection), length of infectious period, and disease symptoms.** The 2019 coronavirus pandemic has clearly demonstrated that subtle changes of the SARS CoV-2 virus may have a substantial impact on these parameters



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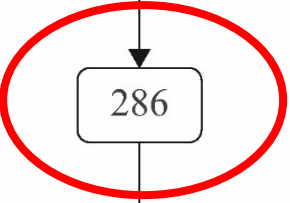
Community-acquired influenza

Yes

430

Hospital-acquired influenza

Missed cases



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TACK!

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To Prevent Influenza!

Do not take any person's breath.

Keep the mouth and teeth clean.

Avoid those that cough and sneeze.

Don't visit poorly ventilated places.

Keep warm, get fresh air and sun-
shine.

Don't use common drinking cups,
towels, etc.

Cover your mouth when you cough
and sneeze.

Avoid Worry, Fear and Fatigue.

Stay at home if you have a cold.

Walk to your work or office.

In sick rooms wear a gauze mask
like in illustration.



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