

Clinical Features and Outcomes of Medically-Attended Influenza in Community-Dwelling Older Adults

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Background

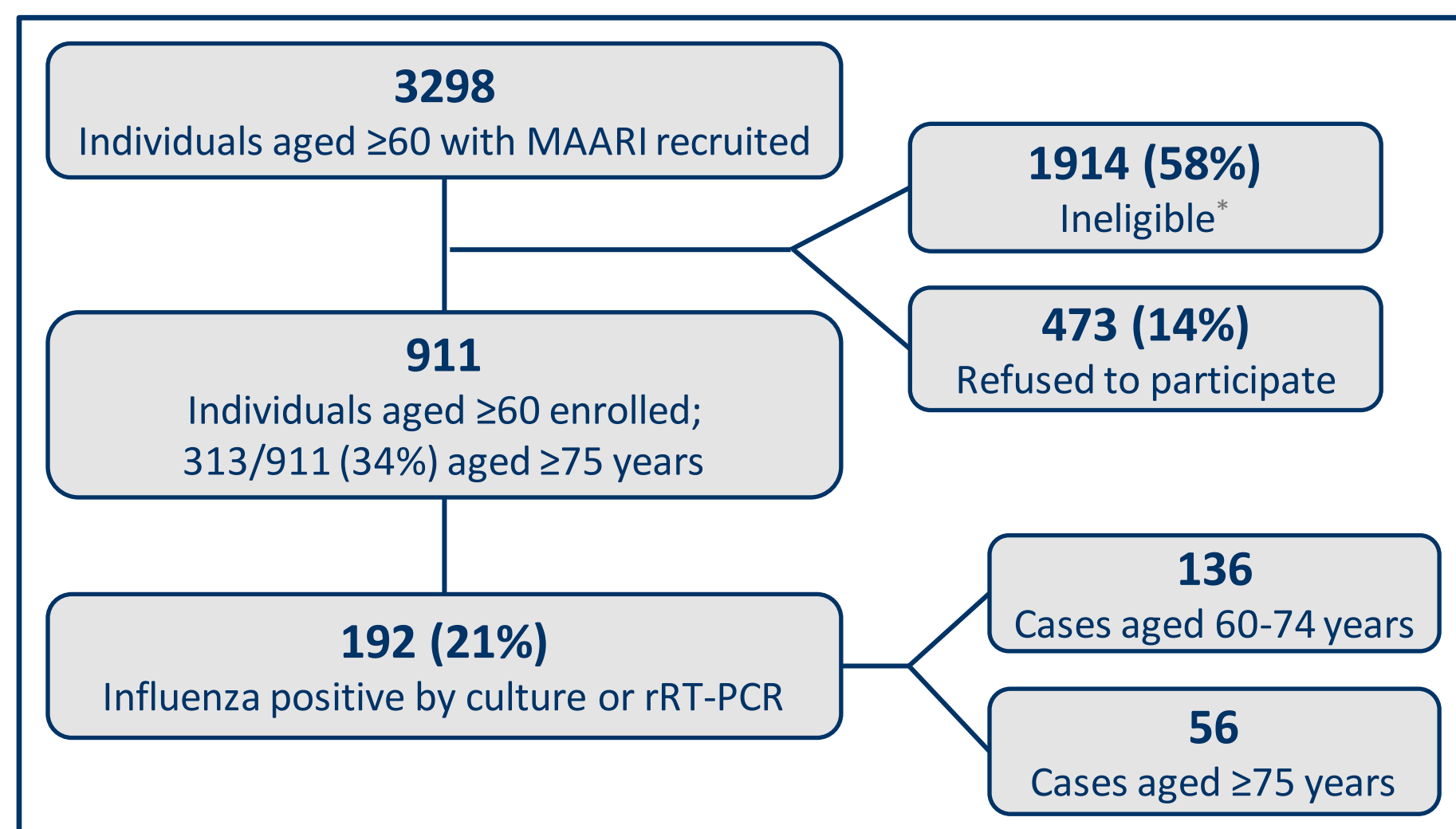
- Clinical features and outcomes of influenza have not been well characterized for infections among community-dwelling older adults.
- Gaps in literature exist for adults ≥75 years of age with influenza infections identified using highly sensitive and specific diagnostic tests (i.e. PCR), as opposed to non-specific outcomes such as influenza-like illness (ILI).

Methods

- Source population: population cohort of ~50,000 adults and children living in a 14 zip code area around Marshfield, WI (Marshfield Epidemiologic Study Area).
- Individuals were prospectively enrolled and tested for influenza after a medically attended acute respiratory illness (MAARI) encounter over 5 influenza seasons.
- Nasopharyngeal swabs were collected from all consenting adults. Influenza was confirmed by rRT-PCR during four influenza seasons (2005-06 through 2008-09); viral culture was used in 2004-05.
- Illness characteristics were obtained via interview; antiviral treatments, pneumonia diagnoses, and hospital admissions were collected from electronic medical records.
- Clinical features and illness outcomes among influenza cases aged ≥75 years were compared to (1) persons of the same age with MAARI who were negative for influenza, and (2) influenza cases aged 60-74 years.

Enrollment Flow Diagram

Figure 1. Recruitment, enrollment, and influenza test status of individuals aged ≥60 years, 2004-05 through 2008-09 influenza seasons



* Ineligibility reasons included previous receipt of antiviral therapy, institutionalization, inability to consent, lack of symptom eligibility, and illness duration exceeding limit.

Results

Table 1. Clinical and demographic characteristics of influenza positive and influenza negative participants aged ≥75 years

	Total	Influenza Positive	Influenza Negative
No. Enrolled	313	56	257
Median age, years (range)	80 (75-94)	80 (75-89)	80 (75-94)
Male, no. (%)	135 (43)	25 (45)	110 (43)
HR*, no. (%)	214 (68)	36 (64)	178 (69)
Vaccinated [^] , no. (%)	261 (83)	42 (75)	219 (85)

* HR: high risk. Patients with ≥2 visits for pre-specified ICD-9 codes within 12 months prior to enrollment were considered high risk. ICD-9 codes were chosen based on ACIP classifications.

[^] Vaccinated with the same-season influenza vaccine ≥14 days before illness onset.

Table 2. Select illness features in influenza-positive participants aged ≥75 years, compared to test-negative, MAARI controls of the same age

	Influenza Positive	Influenza Negative	p-value
No. Enrolled	56	257	
Cough, no. (%)	55 (98)	228 (89)	0.03
Fatigue, no. (%)	49 (88)	228 (89)	0.80
Feverishness, no. (%)	34 (61)	150 (58)	0.86
Headache, no. (%)	37 (66)	128 (50)	0.03
Muscle ache, no. (%)	36 (64)	125 (49)	0.10
Nasal congestion, no. (%)	38 (68)	186 (72)	0.69

Figure 2. Influenza subtype results by age group: 60-74 and ≥75 years

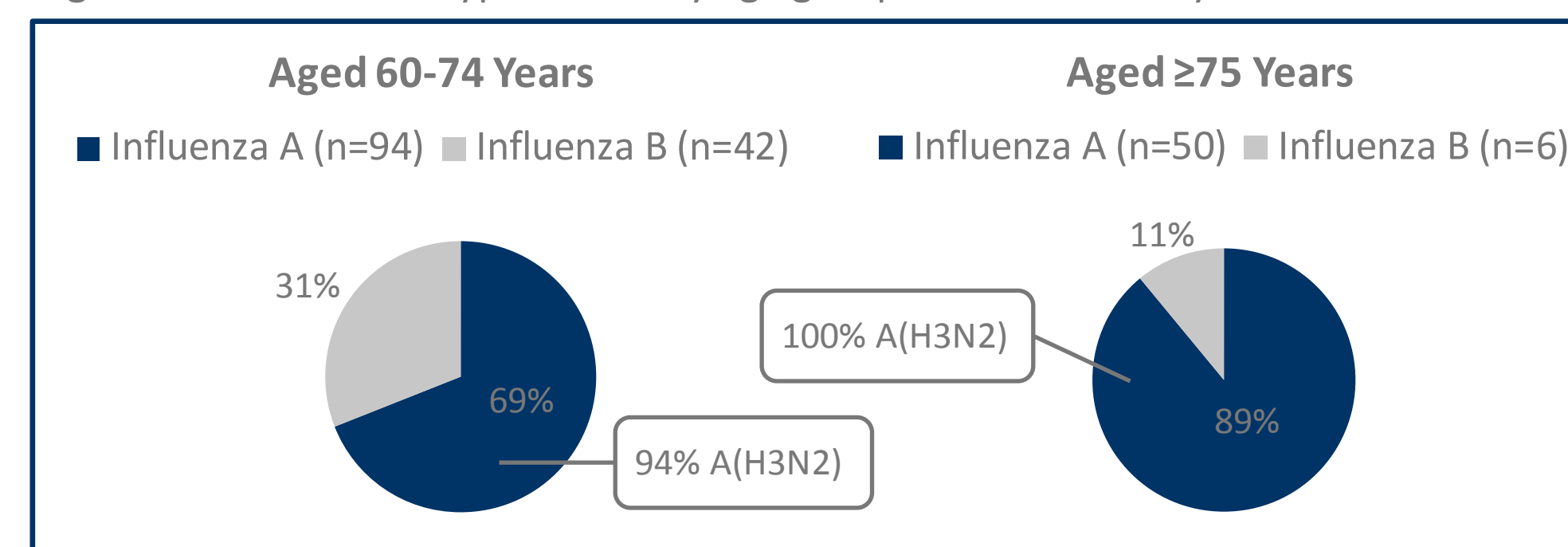


Table 3. Characterization of illnesses among influenza positive participants aged 60-74 and ≥75 years

	Aged 60-74 Years	Aged ≥75 Years	p-value
No. Enrolled	598	313	-
No. Positive (%)	136 (23)	56 (18)	0.09
Select symptoms			
Cough, no. (%)	134 (99)	55 (98)	1.00
Fatigue, no. (%)	128 (94)	49 (88)	0.12
Feverishness, no. (%)	105 (77)	34 (61)	0.04
Headache, no. (%)	100 (74)	37 (66)	0.30
Muscle ache, no. (%)	99 (73)	36 (64)	0.37
Nasal congestion, no. (%)	106 (78)	38 (68)	0.14
Treatment and outcomes			
Antiviral prescription*, no. (%)	17 (13)	6 (11)	0.73
Hospitalized*, no. (%)	22 (16)	13 (23)	0.25
Pneumonia diagnosis [^] , no. (%)	5 (4)	2 (4)	0.47

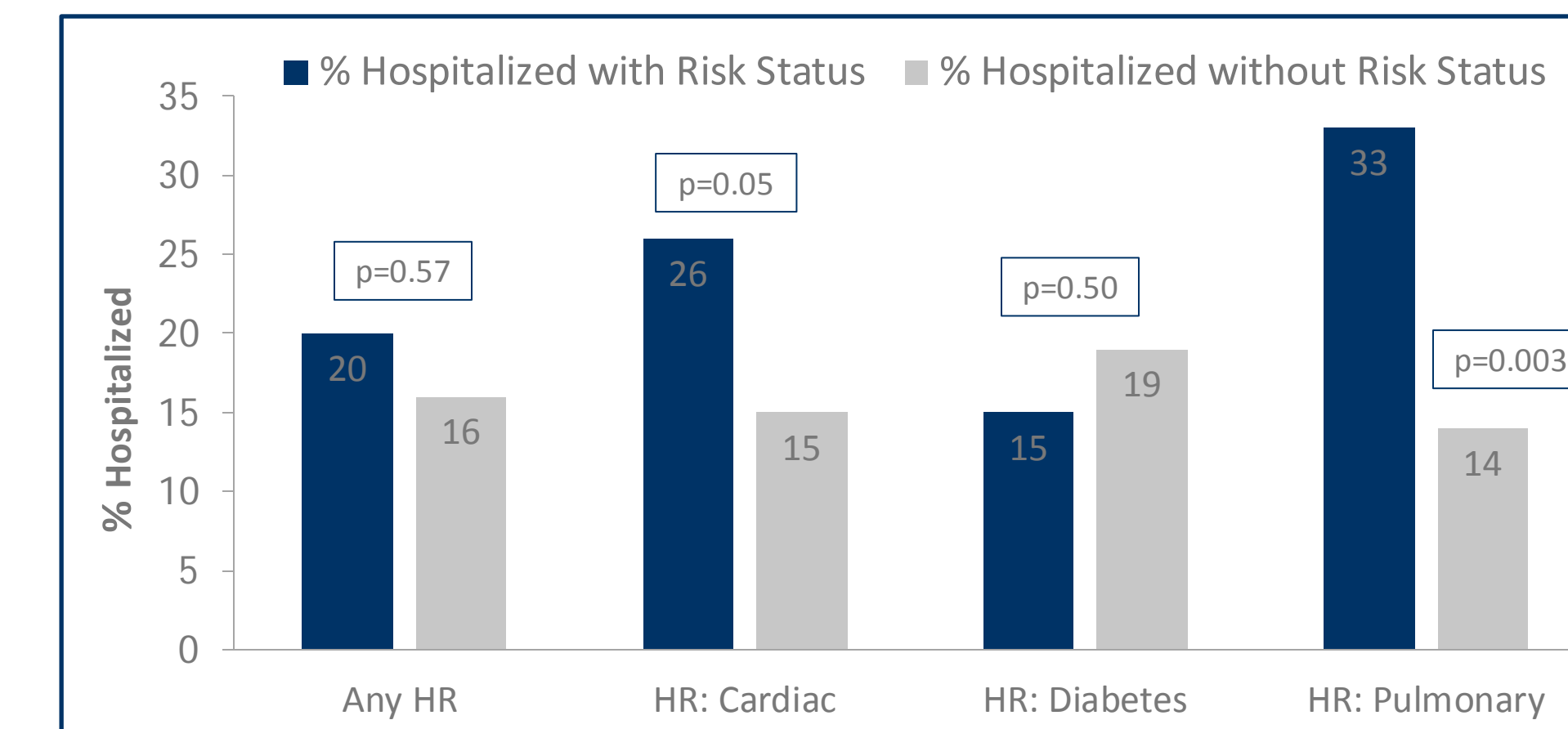
* Within 30 days on illness onset, defined as earliest onset of feverishness, cough, or sore throat.

[^] Pneumonia diagnosis required both radiographic confirmation and clinical treatment.

Table 4. Individual risk factors for hospitalization within 30 days of illness onset among participants aged 60-74 and ≥75 years

	Age 60-74 Years			Age ≥75 Years		
	% of Hosp.	% of Not Hosp.	p-value	% of Hosp.	% of Not Hosp.	p-value
No. hosp./not	(n=89)	(n=509)		(n=76)	(n=237)	
Male	47	37	0.09	46	42	0.55
Vaccinated	79	71	0.15	87	82	0.35
HR: any	71	55	<0.01	86	63	<0.01
HR: cardiac	42	28	0.01	82	48	<0.01
HR: diabetes	38	23	<0.01	36	22	0.01
HR: pulmonary	45	23	<0.01	43	22	<0.01
Influenza positive	27	22	0.30	17	18	0.83

Figure 3. Risk of hospitalization among influenza positive participants aged ≥60 years by high risk status



Limitations

- Many of the older adults recruited were ineligible to participate; the most common ineligibility reason in this age group was an extended duration of illness at clinical encounter (>10 days: 2004-05 through 2006-07, >7 days: 2007-08 and 2008-09).
- A limited number of influenza infections were identified within our older age group (≥75 years), restricting our power for comparisons.

Conclusions

- In this small population of community-dwelling older adults,
 - Clinical presentation was similar in influenza cases aged 60-74 years, cases aged ≥75 years, and test-negative, MAARI controls aged ≥75 years; and
 - Hospitalization was common following MAARI encounters; a similar proportion of cases in both age groups (16% and 23%, respectively) and test-negative controls aged ≥60 years (18%) were hospitalized within 30 days of illness onset.
- Chronic lung disease was associated with increased risk of hospitalization among influenza cases.

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