



# CD Info



Richard M. Daley, Mayor

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**CDInfo** is a surveillance newsletter intended to promote prevention of morbidity and mortality by providing useful data and practical recommendations for clinicians, laboratorians, and infection control personnel who diagnose, treat or report infectious diseases in Chicago.

## Influenza-associated admissions to hospital intensive care units in Chicago, 2009-2011

In response to the influenza pandemic that emerged in 2009, existing [influenza case reporting recommendations were revised](#)<sup>1</sup> in September 2009 to include the reporting of all deaths and all hospitalizations in patients for whom an influenza test was positive. Prior to the start of the 2010-11 influenza transmission season, the hospitalization reporting requirements were altered so that only patients with an [influenza-associated admission to an intensive care unit \(ICU\) were reportable](#).<sup>2</sup> Since October 2009, these case reports have provided information about the attributes of Chicagoans who have been most severely affected by influenza. This edition of **CD Info** supplements the weekly [Chicago Flu Updates](#),<sup>3</sup> and provides a preliminary summary of influenza associated-ICU admission surveillance in Chicago over the past two seasons

In 2009-10, 110 Chicago residents with specimens positive for influenza between mid-October (surveillance week 40) and mid-April (surveillance week 15) were reported as having been admitted to an ICU. For the same period in 2010-11, 97 patients were reported. Seventeen (15%) of the 2009-10 patients were reported as influenza-associated deaths, and in 2010-11, there were 11 (11%) deaths among ICU patients. Although the primary use of ICU case reporting is to monitor the severity of infections and risk factors for severe outcomes, the temporality of ICU admissions has correlated with another indicator of influenza activity, the weekly proportion of [hospital emergency department visits attributable to influenza-like illness \(ILI\)](#).<sup>4</sup> In 2009-10, both ICU admissions and ILI increased abruptly in mid-October, peaked in November, and then declined similarly. In the current season, the correlation was visible but less pronounced, as ILI peaked in February, two weeks prior to the week in which the highest number of reported ICU patients were tested (Figure 1).

In 2009-10, the influenza subtypes reported in ICU patients correlated with the results obtained from Chicago laboratories that perform influenza testing based on polymerase chain reaction (PCR) technology. In that season, all 110 ICU infections were associated with the 2009 Influenza A (H1N1) subtype, and local PCR results reflected a similar dominance of this subtype. In 2010-11, the 2009 A (H1N1) subtype remained the strain most commonly identified in ICU patients (48%), but influ-

**Figure 1. Number of influenza-associated intensive care unit admissions reported in Chicago residents by week of specimen collection, and percent of visits made to Chicago emergency rooms due to influenza-like illness, October 10, 2009-April 16, 2011**



enza A (H3N2) and influenza B also emerged (25% and 27% respectively) (Table). PCR reporting, which includes results of all specimens, not just those of ICU patients, has shown a different distribution, with the three strains being identified in nearly identical proportions (32%, 36%, and 32%, respectively) (Figure 2). This discrepancy could be related to differences in influenza specimen submission and subtyping practices across the hospitals that have reported ICU admissions, but it might also suggest the possibility that an infection with the 2009 A (H1N1) subtype is more likely to result in severe illness than an infection with the other subtypes.

<sup>1</sup> [https://www.chicagohan.org/c/document\\_library/get\\_file?p\\_l\\_id=18118&folderId=29621&name=DLFE-147.pdf](https://www.chicagohan.org/c/document_library/get_file?p_l_id=18118&folderId=29621&name=DLFE-147.pdf)

<sup>2</sup> [https://www.chicagohan.org/c/document\\_library/get\\_file?p\\_l\\_id=28960&folderId=24344&name=DLFE-144.pdf](https://www.chicagohan.org/c/document_library/get_file?p_l_id=28960&folderId=24344&name=DLFE-144.pdf)

<sup>3</sup> [http://www.cityofchicago.org/city/en/depts/cdph/supp\\_info/influenza/current\\_flu\\_situationinchicago2011.html](http://www.cityofchicago.org/city/en/depts/cdph/supp_info/influenza/current_flu_situationinchicago2011.html)

<sup>4</sup> [https://www.chicagohan.org/c/document\\_library/get\\_file?p\\_l\\_id=28960&folderId=24345&name=DLFE-95.pdf](https://www.chicagohan.org/c/document_library/get_file?p_l_id=28960&folderId=24345&name=DLFE-95.pdf)

ICU admissions were reported for Chicagoans of all ages over the past two seasons. When grouped by 10-year age intervals, the highest proportion of cases in both seasons were reported in patients in their 50s. In 2009-10 though, the median age was 39 years, and just 5% of cases were aged 70 years or older. In 2010-11, the median age was 48 years and 16% were at least 70 years old.

Three underlying medical conditions – chronic lung diseases including asthma, heart disease, and diabetes – were most frequently reported in both seasons. Although the racial-ethnic disparities in ICU admissions were less pronounced in 2010-11 than in the pandemic season, individuals reported as non-Hispanic Black continued to account for a higher number of cases than reported non-Hispanic Whites, Hispanics, and Asians.

In 2009-10, 18 (60%) of 30 Chicago acute care hospitals reported at least one influenza-associated ICU admissions in Chicago residents; in 2010-11, 12 (40%) hospitals reported cases. Though surveillance in both seasons was passive, contextually there were differences from one year to the next. In 2009-10, there was a heightened level of awareness of the pandemic, which could have contributed to aggressive influenza testing and case reporting. On the other hand, in that season influenza-associated hospitalization - with or without ICU admission - was reportable, and 13% of case reports did not contain information on the highest level of care received during the admission. This could have resulted in an undercount of the reported hospitalizations that involved admission to the ICU.

Influenza-associated ICU admission remains a notifiable condition, and should be reported within 24 hours via the Illinois National Electronic Data Surveillance System (INEDSS). Reporting questions may be directed to 312-746-5911.

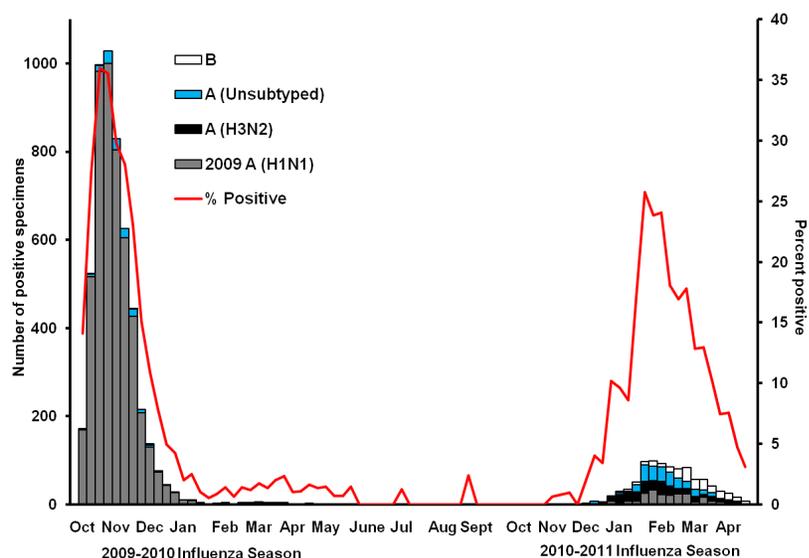
**Table. Selected attributes of influenza-associated intensive care unit admissions reported in Chicago residents for surveillance weeks 40-15, by season<sup>1</sup>**

Attribute	Influenza season			
	2009-2010		2010-2011	
	No.	Percent	No.	Percent
<b>Influenza Type<sup>2</sup></b>				
2009 A (H1N1)	110	100	29	48
A (H3N2)	0	0	15	25
B	0	0	16	27
<b>Age (in years)</b>				
0-4	13	12	14	14
5-18	21	19	12	12
19-24	6	5	3	3
25-49	38	35	21	22
50-64	24	22	28	29
65+	8	7	19	20
<b>Race/Ethnicity</b>				
NH-Black	49	45	37	38
NH-White	16	15	28	29
Hispanic	36	33	20	21
Asian	2	2	4	4
Other/Unknown	7	6	8	8
<b>Total</b>	<b>110</b>		<b>97</b>	

<sup>1</sup> Includes cases with specimen collection dates during October 10, 2009-April 17, 2010 (2009-2010 season) and October 9, 2010-April 16, 2011 (2010-2011 season). Percents do not always add up to 100 due to rounding.

<sup>2</sup> In 2010-11, 37 (38%) patients were reported as not having influenza typing done; percents are based on a denominator of 60 for that season.

**Figure 2. Influenza-positive tests and types reported by local laboratories serving Chicago hospitals that are equipped to identify influenza types by week, October 10, 2009-April 16, 2011**



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