

FLU SEASON HAS A BIG EFFECT ON KIDS—AND THEIR FAMILIES

DECEMBER 2008

HIGHLIGHTS

Among individuals with employer-sponsored insurance during flu seasons 2005–2006 and 2006–2007:

- More than 5 percent of children used health services due to influenza-like illness (ILI) compared to 2.6 percent of the elderly and 2.2 percent of adults during flu season 2006–2007. Trends were similar in flu season 2005–2006.
- A greater proportion of families with children had ILI-related healthcare utilization than families without children. For example, among three-person families, over 55 percent of families with children had ILI-related healthcare utilization, while nearly 38 percent of adult-only families had ILI-related healthcare utilization during flu season 2006–2007. Trends were similar in flu season 2005–2006.
- Use of antiviral medication among all patients with ILI was low during both flu seasons. While not all cases of ILI are influenza, even in the peak of the flu season, 4 to 6 percent of patients with ILI had a filled prescription for an antiviral medication.

INTRODUCTION

Every year, 5 to 20 percent of the U.S. population contracts the influenza virus, resulting in health consequences that range from respiratory illness to death.¹ The influenza virus is easily transmitted from person to person through respiratory droplets and other small particles in the air.² Because the virus is better able to survive cold, dry weather, incidence of influenza occurs in a seasonal pattern, which lasts from fall to late spring in the United States.

Efforts to prevent influenza infection include vaccination against the virus, precautions such as hand-washing, and the use of antiviral medication. Individuals who are particularly susceptible to the virus, recently exposed to the virus, unable to obtain the vaccine, or exhibiting symptoms of the flu may consider taking an antiviral medication to stave off illness or minimize the severity of illness.³ A new class of antiviral medications, which includes oseltamivir (Tamiflu®) and zanamivir (Relenza®), provides treatment for and protection against types A and B influenza and is increasingly replacing the earlier class of antiviral medications (amantadine and rimantadine), which only provides protection against type A influenza and carries greater potential for adverse side effects.⁴

Although most episodes of the flu last one to two weeks and do not require medical intervention, some populations are particularly vulnerable to and weakened by the virus and may require medical care.⁵ These vulnerable populations include children, pregnant women, the elderly, and persons with compromised immunity due to other serious illness. Prevention efforts to reduce the transmission of influenza tend to target these populations.

¹Type A influenza, which can infect humans and animals, tends to cause more virulent epidemics than type B influenza.



For instance, the Centers for Disease Control and Prevention recommends that parents, caregivers, and other persons in close contact with children under the age of five receive the flu vaccine and take other precautions to protect children and to prevent the transmission of the virus.⁶ Furthermore, evidence indicating that children play a significant role in the community-wide transmission of the influenza virus continues to emerge.⁷

DATA AND METHODS

This study is based on data contained in the 2005–2007 MarketScan[®] Commercial Claims and Encounters and Medicare Supplemental and Coordination of Benefits Databases. These databases include the healthcare experience of millions of individuals with employer-sponsored health insurance through large and medium-sized, self-funded employers with geographically dispersed employee populations. The MarketScan Databases are constructed from fully adjudicated inpatient, outpatient, and outpatient prescription drug medical claims, starting from 1996.

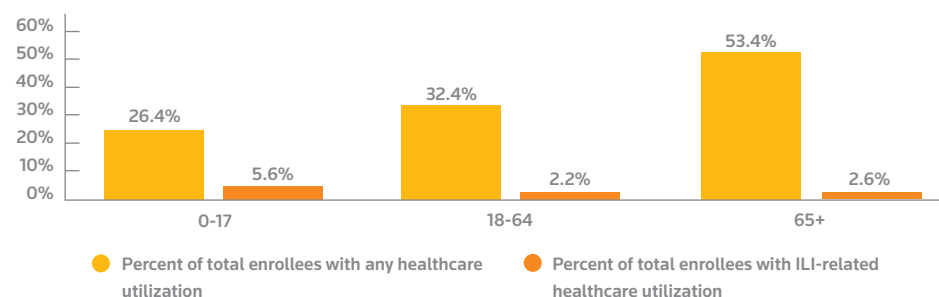
Influenza-related utilization was determined by identifying claims with principal diagnoses with ICD-9-CM codes for influenza-like illness (ILI).¹¹ To assess seasonal patterns in healthcare utilization and influenza-like illness, the time periods of analysis were two flu seasons: October 2, 2005, through July 1, 2006, and October 1, 2006, through June 30, 2007. The study population was limited to individuals with full-month enrollment and prescription drug coverage, resulting in nearly 17 million commercially insured individuals and up to three million Medicare Supplemental enrollees in each season. Definitions of ILI were garnered from the Department of Defense’s Electronic Surveillance System of Early Notification of Community-Based Epidemics (ESSENCE-ILI).⁸ The percent of visits attributable to ILI were measured weekly, including hospital admissions, outpatient doctor office visits, and emergency room visits. Three age groups were compared: children (0–17), nonelderly adults (18–64), and the elderly (65 and older).

This study also measured prescription fills for antiviral medication among patients with a principal diagnosis of ILI. For individuals identified as having ILI, we determined if they had a prescription fill for an antiviral medication in the same week of their diagnosis. Finally, the potential transmission of the flu virus among family members was also investigated. We conducted a focused family-level analysis based on family size (two to three persons) and family composition (adults only or adults and children) to measure the proportion of family members who had healthcare utilization with a principal diagnosis of ILI in each flu season.

OBSERVATIONS

- A greater percentage of elderly enrollees (53.4 percent) than adult (32.4 percent) or child enrollees (26.4 percent) used any inpatient or outpatient health services in flu season 2006–2007. Of enrollees in each age group, a greater percentage of children (5.6 percent) used ILI-related health services than adults (2.2 percent) and the elderly (2.6 percent) (Figure 1). Trends were similar in flu season 2005–2006.
- Approximately 1 in 18 children, 1 in 38 elderly persons, and 1 in 45 adults used ILI-related inpatient or outpatient services in each flu season.

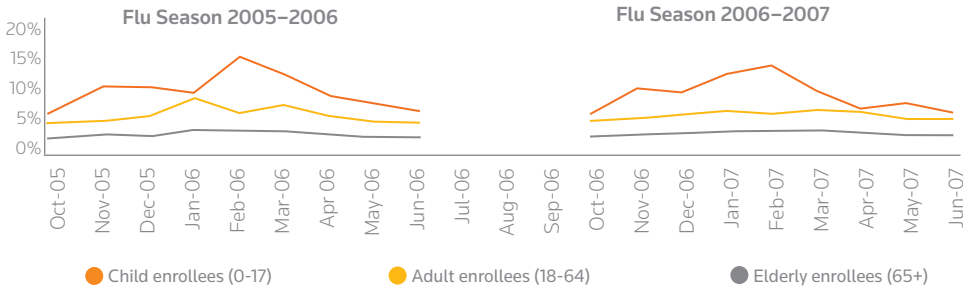
FIGURE 1 Percent of Total Enrollees With Any Healthcare Utilization and With Utilization Related to Influenza-Like Illness, Flu Season 2006–2007



¹¹ICD-9-CM Codes: 079.89, 079.99, 460, 462, 464.00, 464.10, 464.20, 465.0, 465.8, 465.9, 466.0, 466.19, 478.9, 484.8, 485, 486, 487.0, 487.1, 487.8, 490, 780.6, 784.1, 786.2

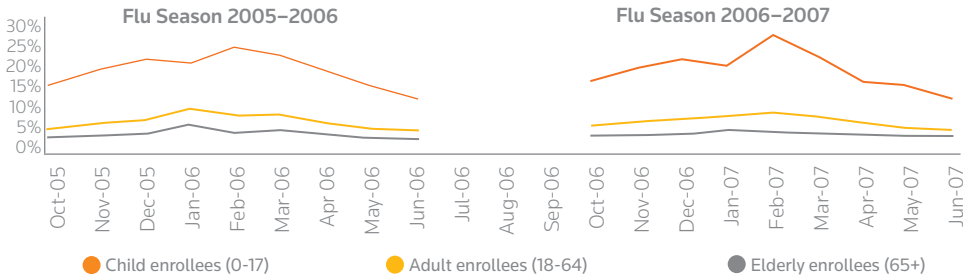
- The percent of hospital admissions with a principal diagnosis of ILI for each age group was higher among children and the elderly than non-elderly adults in both flu seasons (Figure 2).
- The percentages of outpatient doctor office visits and emergency room visits with a principal diagnosis of ILI for each age group were higher among children and non-elderly adults than the elderly in both flu seasons (Figures 3 and 4).
- Influxes in ILI-related healthcare utilization during flu season 2005–2006 occurred initially in late December, dipped in January, and then peaked in late February. During flu season 2006–2007, influxes in ILI-related healthcare utilization began in late December and peaked in February. The patterns displayed in the MarketScan data resemble the patterns reported by the CDC Sentinel Provider Surveillance Network.⁹

FIGURE 2 Percent of Weekly Hospital Admissions* With Influenza-Like Illness



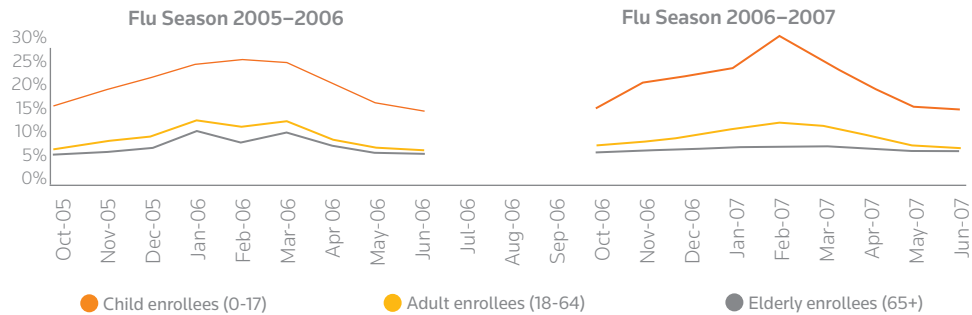
*Percentages represent the portion of total weekly hospital admissions within each age category that have a principal diagnosis of influenza-like illness.

FIGURE 3 Percent of Weekly Outpatient Doctor Office Visits* With Influenza-Like Illness



*Percentages represent the portion of total weekly outpatient doctor office visits within each age category that have a principal diagnosis of influenza-like illness.

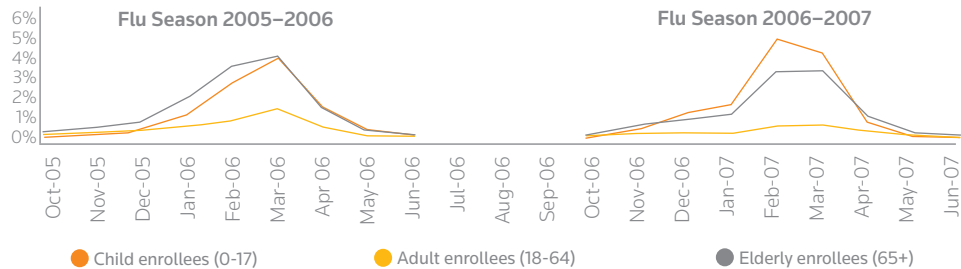
FIGURE 4 Percent of Weekly Emergency Room Visits* With Influenza-Like Illness



*Percentages represent the portion of total weekly emergency room visits within each age category that have a principal diagnosis of influenza-like illness.

- A greater proportion of children and nonelderly adults with a principal diagnosis of ILI had a filled prescription for an antiviral medication during the same week of their diagnosis compared to the elderly with ILI in both flu seasons (Figure 5). Even in the peak of the flu season, the percent of patients with ILI who had a filled prescription for an antiviral medication was between 4 and 6 percent.

FIGURE 5 Percent of Patients With Influenza-Like Illness* With a Filled Prescription for Antiviral Medication in the Week of Their Diagnosis



*Of the total number of patients with a principal diagnosis of ILI in a week, the percent of patients who also had a filled prescription for an antiviral medication in the week of diagnosis is presented. Counts and percentages are determined within each age group.

- Among two-person families, a greater proportion of families with children had ILI-related healthcare utilization than adult-only families during the flu season (Figure 6). For example, just over half of families with one adult and one child (55.2 percent) had no ILI-related healthcare utilization, while close to three-quarters (72.3 percent) of two-person adult-only families had no ILI-related utilization during the 2006-2007 flu season (Figure 6). The percentages for flu season 2005-2006 are very similar to those presented for flu season 2006-2007.
- Similarly, among three-person families, a greater proportion of families with children had ILI-related healthcare utilization than adult-only families during flu season 2006-2007 (Figure 7). For example, a greater percentage of three-person adult-only families (62.3 percent) had no ILI-related healthcare utilization than three-person families with children (44.5 percent) during the flu season. The percentages for flu season 2005-2006 are very similar to those presented for flu season 2006-2007.

FIGURE 6 Two-Person Families With ILI-Related Healthcare Utilization, Flu Season 2006–2007

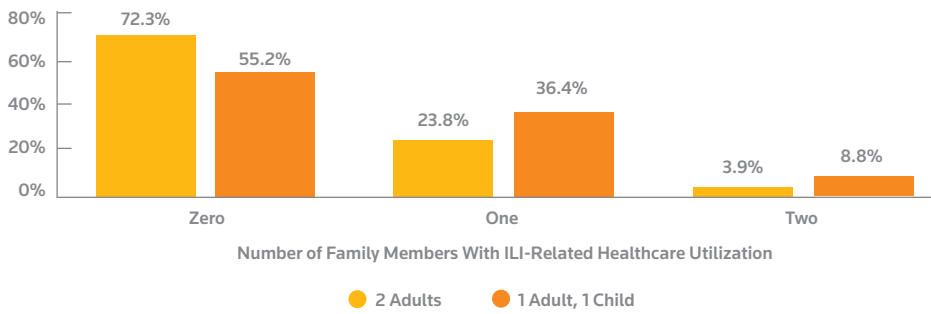
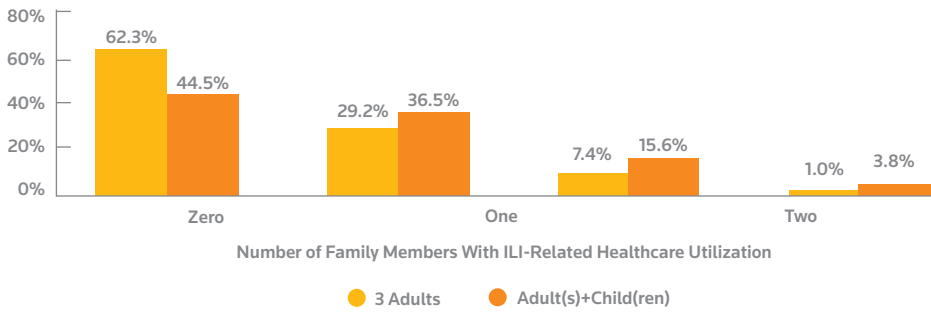


FIGURE 7 Three-Person Families With ILI-Related Healthcare Utilization, Flu Season 2006–2007



LIMITATIONS

This study is subject to the limitations associated with administrative claims data and should be interpreted in light of these limitations. Only instances of influenza-like illness for which health services were used are captured. Thus, the data only demonstrate which demographic groups with employer-sponsored health insurance are more likely to use health services when they have influenza-like illness and cannot support inferences about which groups are more likely to contract ILI. Furthermore, we track filled prescriptions and therefore cannot determine how many providers prescribed antiviral medication nor at which point during the flu season or patients' illness antiviral medication was taken, if at all. In addition, this study is based on principal diagnoses of ILI only; however, if individuals presented with other conditions and ILI was coded as the secondary or higher diagnosis, it would not have been captured in this analysis. Finally, individuals insured under the same policy were identified as family members; however, it is possible that a portion of families we identified as being adult-only actually include child family members who are insured under separate insurance policies, resulting in more adult-only families in our analysis than actually exist among the population. This is likely to result in an underestimate of the differences in ILI-related healthcare utilization between adult-only and families with adults and children.

Our study population is likely healthier and may have greater access to health services than the entire U.S. population, as the MarketScan Commercial and Medicare Supplemental Databases represent the healthcare experience of individuals with employer-sponsored insurance. Alternatively, the data can be employed in comparisons of the commercially insured population with other populations of interest.

CONCLUSION

This analysis demonstrated that, among individuals with employer-sponsored insurance, a greater proportion of children (5.6 percent) used ILI-related health services than adults (2.2 percent) and the elderly (2.6 percent) during flu season 2006–2007. The study underscores the effects of ILI on healthcare utilization among children and persons in close contact with children. A greater percentage of weekly hospital admissions, outpatient doctor office visits, and emergency room visits were ILI-related for children than adults and the elderly in the flu seasons 2005–2006 and 2006–2007. This observation may reflect the higher proportion of chronic illness underpinning healthcare utilization among the elderly, while conditions such as ILI are less likely to be the principal reason for utilization.

Additionally, a greater percentage of children and adults with a principal diagnosis of influenza-like illness had a prescription fill for an antiviral medication during the week of their diagnosis than elderly persons with ILI. The higher volume of filled prescriptions for antiviral medication among children with ILI could be due to the critical role children play in the transmission of the virus, their high volume of ILI-related health services utilization, and their particular vulnerability to developing severe illness due to the virus. While only a portion of ILI is influenza, these low levels of prescription fills raise questions about the use of antiviral medication among the elderly, as the portion of elderly patients with ILI with a filled prescription for antiviral medication was unexpectedly low.

This research also validates prevention efforts that target parents, caregivers, and other persons in close contact with children. Our family-level analysis shows that families with children are more likely to have ILI-related healthcare utilization than adult-only families. Likewise, more adult-only two- and three-person families had no ILI-related healthcare utilization in a flu season than families with children, indicating that interventions to reduce the spread of ILI among children and their caregivers should continue to be emphasized.

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