

# Influenza (Flu)

## Disease Burden of Influenza

Each year CDC estimates the burden of influenza in the U.S. CDC uses modeling to estimate the number of influenza illnesses, medical visits, flu-associated hospitalizations, and flu-associated deaths that occur in the U.S. in a given season. The methods used to calculate these estimates are described on CDC's webpage, [How CDC Estimates the Burden of Seasonal Influenza in the U.S.](#)

CDC uses the estimates of the burden of influenza in the population and the impact of influenza vaccination to inform policy and communications related to influenza.



How CDC Estimates the Burden of Flu



Why CDC Estimates the Burden of Flu



Past Season Estimates



Frequently Asked Questions about Estimated Flu Burden

### Preliminary In-Season Disease Burden Estimates



The preliminary cumulative burden estimates for the 2019-2020 season have been released. In-season preliminary burden estimates are scheduled to resume for the 2020-2021 season this winter.

### Flu Burden Averted from Vaccination

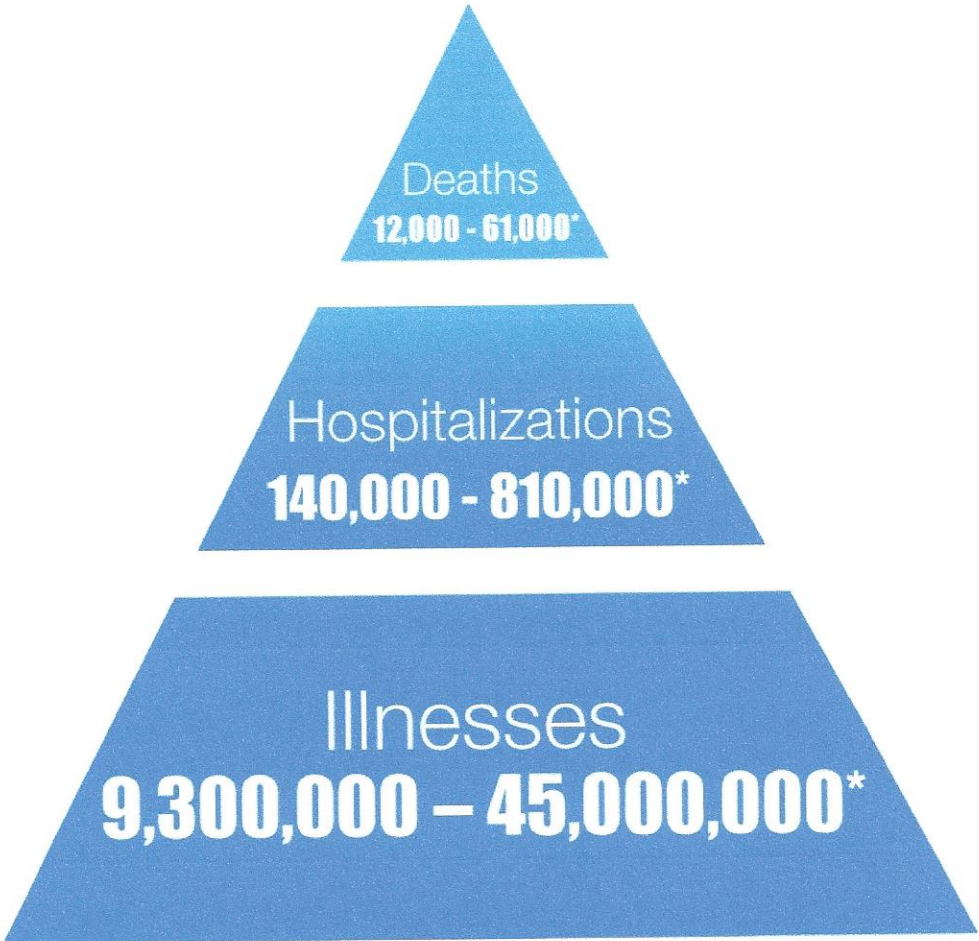


CDC estimates the burden of flu and the impact of annual flu vaccination in the U.S using a model that estimates the numbers of flu illnesses, medical visits and hospitalization prevented by vaccination.

## Figure 1: Estimated Range of Annual Burden of Flu in the U.S. from 2010 – 2020

The burden of influenza disease in the United States can vary widely and is determined by a number of factors including the characteristics of circulating viruses, the timing of the season, how well the vaccine is working to protect against illness, and how many people got vaccinated. While the impact of flu varies, it places a substantial burden on the health of people in the United States each year.

CDC estimates that influenza has resulted in between 9 million – 45 million illnesses, between 140,000 – 810,000 hospitalizations and between 12,000 – 61,000 deaths annually since 2010.



\*The top range of these burden estimates are from the 2017-2018 flu season. These are preliminary and may change as data are finalized.

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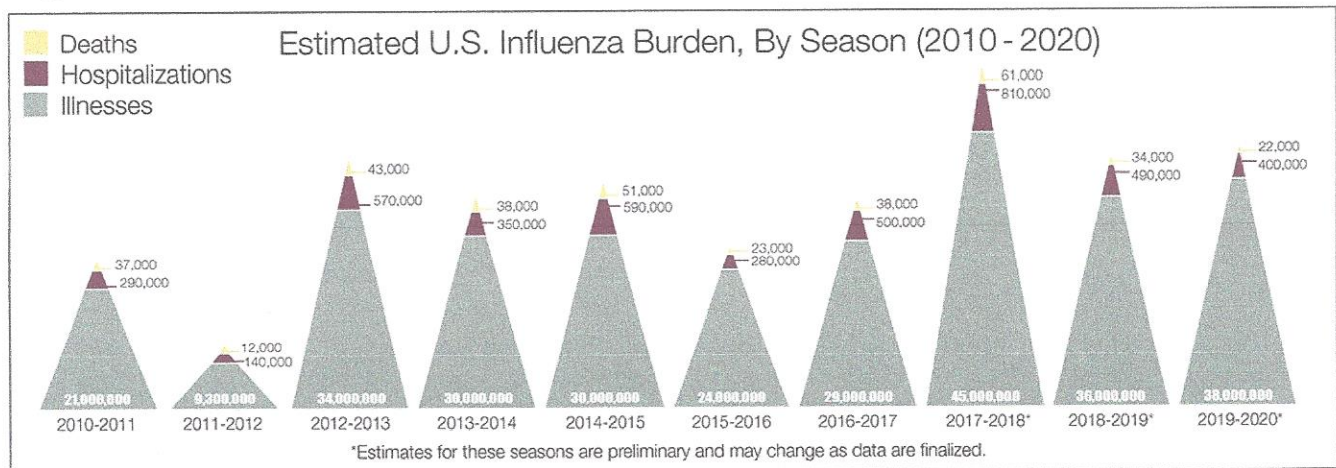
Table 1: Estimated Influenza Disease Burden, by Season — United States, 2010-11 through 2019-20 Influenza Seasons

Season	Symptomatic Illnesses		Medical Visits		Hospitalizations		Deaths	
	Estimate	95% U I	Estimate	95% U I	Estimate	95% U I	Estimate	95% U I
2010-2011	21,000,000	(20,000,000 - 25,000,000)	10,000,000	(9,300,000 - 12,000,000)	290,000	(270,000 - 350,000)	37,000	(32,000 - 51,000)
2011-2012	9,300,000	(8,700,000 - 12,000,000)	4,300,000	(4,000,000 - 5,600,000)	140,000	(130,000 - 190,000)	12,000	(11,000 - 23,000)
2012-2013	34,000,000	(32,000,000 - 38,000,000)	16,000,000	(15,000,000 - 18,000,000)	570,000	(530,000 - 680,000)	43,000	(37,000 - 57,000)

Season	Symptomatic Illnesses		Medical Visits		Hospitalizations		Deaths	
	Estimate	95% U I	Estimate	95% U I	Estimate	95% U I	Estimate	95% U I
2013-2014	30,000,000	(28,000,000 - 33,000,000)	13,000,000	(12,000,000 - 15,000,000)	350,000	(320,000 - 390,000)	38,000	(33,000 - 50,000)
2014-2015	30,000,000	(29,000,000 - 33,000,000)	14,000,000	(13,000,000 - 16,000,000)	590,000	(540,000 - 680,000)	51,000	(44,000 - 64,000)
2015-2016	24,000,000	(20,000,000 - 33,000,000)	11,000,000	(9,000,000 - 15,000,000)	280,000	(220,000 - 480,000)	23,000	(17,000 - 35,000)
2016-2017	29,000,000	(25,000,000 - 45,000,000)	14,000,000	(11,000,000 - 23,000,000)	500,000	(380,000 - 860,000)	38,000	(29,000 - 61,000)
<b>Preliminary estimates*</b>	<b>Estimate</b>	<b>95% UI</b>	<b>Estimate</b>	<b>95% UI</b>	<b>Estimate</b>	<b>95% UI</b>	<b>Estimate</b>	<b>95% UI</b>
2017-2018*	45,000,000	(39,000,000 - 58,000,000)	21,000,000	(18,000,000 - 27,000,000)	810,000	(620,000 - 1,400,000)	61,000	(46,000 - 95,000)
2018-2019*	36,000,000	(31,000,000 - 45,000,000)	17,000,000	(14,000,000 - 21,000,000)	490,000	(390,000 - 770,000)	34,000	(26,000 - 53,000)
2019-2020*	38,000,000	(34,000,000 - 47,000,000)	18,000,000	(15,000,000 - 22,000,000)	400,000	(350,000 - 500,000)	22,000	(18,000 - 29,000)

\* Estimates from the 2017-2018, 2018-2019, and 2019-2020 seasons are preliminary and may change as data are finalized.

**Figure 2: Estimated U.S. Influenza Burden, By Season**



## Supporting Research

### Flu-related illness and hospitalization

#### United States

- Q&A: Seasonal Influenza-Associated Hospitalizations in the United States.
- Study: Annual estimates of the burden of seasonal influenza in the United States: A tool for strengthening influenza surveillance and preparedness [↗](#) . Influenza Other Respir Viruses. 2018
- Study: Estimating influenza disease burden from population-based surveillance data in the United States. [↗](#) PLoS One. 2015
- Study: [The US Influenza Hospitalization Surveillance Network](#) [↗](#) . Emerg Infect Dis. 2015
- Study: [Hospitalizations associated with influenza and respiratory syncytial virus in the United States, 1993-2008](#) [↗](#) . Clin Infect Dis. 2012
- Study: [Influenza-associated hospitalizations in the United States](#) [↗](#) . JAMA. 2004

#### Global

- Study: Estimates of global seasonal influenza-associated respiratory mortality: a modelling study [↗](#) . Lancet. 2017
- Web article: Seasonal flu death estimate increases worldwide.
- Study: [Global role and burden of influenza in pediatric respiratory hospitalizations, 1982-2012: A systematic analysis](#) [↗](#) . PLoS Med. 2016
- Web article: CDC Collaborative Study: Influenza Important Cause of Respiratory Hospitalizations Worldwide.

*Visit [Flu Burden Averted by Vaccination](#) for CDC estimates of flu-related illness and hospitalization averted by vaccination.*

### Flu-related deaths

- Q&A: Estimating Seasonal Influenza-Associated Deaths in the United States: CDC Study Confirms Variability of Flu.
- Background on CDC web site: Under-counting of Flu-related Deaths.
- Study: Estimates of deaths associated with seasonal influenza—United States, 1976–2007. MMWR. 2010
- Study: [Mortality associated with influenza and respiratory syncytial virus in the United States](#) [↗](#) . JAMA. 2003

*Visit [Flu Burden Averted by Vaccination](#) for CDC estimates of flu-related deaths averted by vaccination.*

### Economic impact of influenza

- Study: [The annual impact of seasonal influenza in the US: measuring disease burden and costs](#) [↗](#) . Vaccine. 2007
- CDC Foundation: [Flu Prevention Infographic, "Business Challenges"](#) [↗](#) .

### Additional Resources

- [Flu Burden Averted by Vaccination](#)
- [Past Flu Seasons](#)
- [Flu News and Spotlights](#)
- [Flu Activity and Surveillance](#)
- [Health Professionals: References and Resources](#)