

Introduction

On June 11, 2009, the World Health Organization (WHO) declared a pandemic of a previously unrecognized strain of the H1N1 virus. In Spain, the Ministry of Health and Social Policy who, jointly with the Social Security System, implemented several preventive measures and decreed that suspected cases of influenza qualified for short-term sickness absence and should remain at home.

The pandemic, therefore, is likely to have had an important impact on businesses given its incidence in the young adult population, disruption of usual business operations and increased costs.

Objective

To compare the surveillance of cases of sickness absence due to illness caused by influenza and influenza-related illness in the period 2007-2009, and the first three months of 2010, registered in Catalonia (Spain), using a time series approach.

Subjects and methods

This was a time series of cases of sickness absence in the publicly insured worker population in Catalonia. Cases of sickness absence are initially certified by primary care providers of the national health service and, the Catalanian Institute of Medical Evaluations. All incident cases with diagnosis code (International Classification of Diseases, 9th Edition), start date of the absence period, sex, age, and economic activity (n=11 sectors), were obtained.

Two study periods were established: 1) the "epidemic period" (January 1, 2007 through September 30, 2009) and 2) the "pandemic period" (October 1, 2009 through March 31, 2010). The number of new sickness absence episodes per week due to influenza (ICD9 codes 487 and 488) and influenza + influenza-related illness (codes 460-466, 480-486) were counted, total and by economic activity sector, age and gender.

The number of new sickness absence episodes due to influenza per week during the pandemic period was represented graphically, together with the median number of cases in epidemic period and the maximum and minimum values.

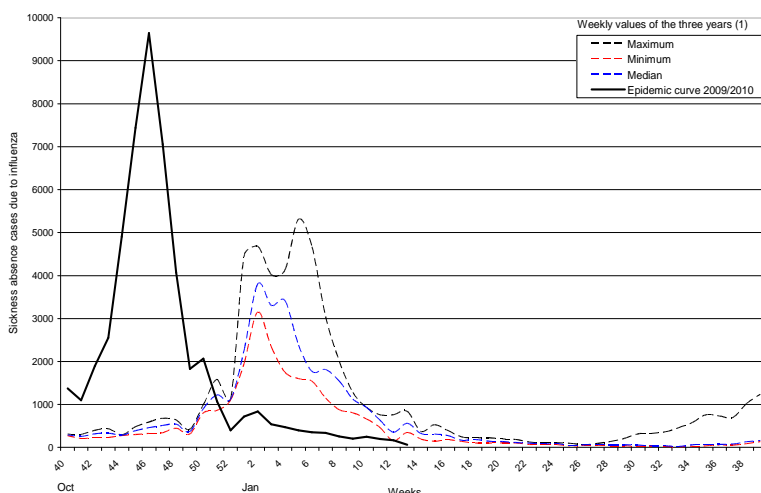
The endemic-epidemic index (EEI) per week of the pandemic period was calculated as the ratio between the observed number illness cases during the pandemic period, and the expected number of cases, taken as the median of the numbers of cases during the epidemic period, where The corresponding 95% confidence intervals were calculated using the delta method, considering the observed and expected number of cases as independent random variables.

Results

Table 1. Distribution of cases absence due to influenza and influenza + influenza-related illness, 2007-2009, 2010 (January-March) in Catalonia.

	Epidemic period (01/01/07 - 09/30/09)				Pandemic period (01/01/09 - 03/31/10)			
	Influenza		Influenza + influenza-related illness		Influenza		Influenza + influenza-related illness	
	Cases	%	Cases	%	Cases	%	Cases	%
Gender								
Male	57,761	53.9	329,071	50.4	24,181	48.2	73,036	45.8
Female	49,466	46.1	323,269	49.6	26,039	51.8	86,564	54.2
Age at onset of absence episode (years)								
<25	13,756	12.8	108,938	16.7	6,295	12.5	20,487	12.8
25-34	37,439	34.9	235,194	36.1	16,935	33.7	55,109	34.5
35-44	29,133	27.2	165,115	25.3	15,368	30.6	45,499	28.5
45-54	18,716	17.5	95,198	14.6	8,682	17.3	26,680	16.7
55-64	8,039	7.5	46,754	7.2	2,890	5.8	11,574	7.3
>64	144	0.1	1,141	0.2	50	0.1	251	0.2
Economic activity sector								
Primary sector	946	0.9	4,948	0.8	331	0.7	973	0.6
Domestic housekeeping	207	0.2	993	0.2	323	0.6	877	0.5
Extraterritorial agencies	54	0.1	462	0.1	4	0.0	17	0.0
Manufacturing industry and energy production	20,051	18.7	115,773	17.7	7,562	15.1	23,569	14.8
Construction	7,895	7.4	48,410	7.4	3,386	6.7	10,152	6.4
Commercial/vehicle repair	16,026	14.9	102,173	15.7	8,221	16.4	26,194	16.4
Hotel and restaurant businesses	3,062	2.9	20,431	3.1	1,878	3.7	5,722	3.6
Transportation/communication	5,386	5.0	33,247	5.1	3,504	7.0	11,140	7.0
Finance, real estate and services	14,318	13.4	92,165	14.1	7,038	14.0	23,481	14.7
Government	9,169	8.6	54,218	8.3	3,029	6.0	10,577	6.6
Health, education and other social activities	8,542	8.0	53,398	8.2	11,767	23.4	36,631	23.0
Not known	21,571	20.1	126,122	19.3	3,177	6.3	10,267	6.4
Total	107,227	100.0	652,340	100.0	50,220	100.0	159,600	100.0

Figure 1. Weekly frequency of cases of sickness absence cases due to influenza, 2007-2009, 2010 (January-March) in Catalonia, maximum, median and minimum values in epidemic period, and number of new cases in pandemic period.



(1) Between weeks 1 and 39 the maximum, median and minimum values for each week is obtained from the three years observed (2007, 2008 and 2009). From week 40 to 52 these values are obtained in 2007-2008.

Table 2. Weekly distribution of cases of sickness absence episodes due to influenza and influenza + influenza-related illness, occurring during the week of acme in each variable, in Catalonia (pandemic period), endemic-epidemic index (EEI) and 95% confidence intervals.

	Influenza			Influenza + influenza-related illness		
	Week	EEI†	95% CI	Week	EEI†	95% CI
Gender						
Male	46	17.57	(11,11-27,80)	44	2.85	(2,49-3,26)
Female	46	25.29	(17,92-35,68)	46	3.48	(3,03-4,00)
Age at onset of absence episode (years)						
<25	46	20.79	(13,29-32,53)	44	2.57	(2,42-2,74)
25-34	46	21.35	(14,19-32,12)	46	3.03	(2,57-3,57)
35-44	46	25.84	(17,14-38,96)	44	3.82	(3,31-4,42)
45-54	46	19.68	(13,66-28,35)	44	3.77	(3,17-4,49)
55-64	45	12.17	(7,57-19,56)	46	2.59	(1,95-3,43)
>64	-	-	-	43	2.20	(1,16-4,18)
Economic activity sector						
Primary sector	46	22.80	(16,68-31,16)	46	2.38	(1,78-3,17)
Domestic housekeeping	-	-	-	-	-	-
Extraterritorial agencies	-	-	-	-	-	-
Manufacturing industry and energy production	46	20.99	(12,59-34,99)	44	2.69	(2,33-3,11)
Construction	44	16.30	(13,49-19,70)	44	2.50	(1,84-3,41)
Commercial/vehicle repair	46	24.13	(15,86-36,70)	46	3.10	(2,81-3,42)
Hotel and restaurant businesses	47	26.00	(16,93-39,92)	45	3.54	(3,36-3,74)
Transportation/communication	46	30.27	(18,45-49,65)	46	4.46	(4,12-4,83)
Finance, real estate and services	46	20.42	(16,96-24,58)	46	2.93	(2,76-3,11)
Government	45	16.27	(13,05-20,28)	45	2.45	(2,13-2,81)
Health, education and other social activities	45	114.25	(104,27-125,19)	44	12.35	(8,60-17,72)
Total	46	20.99	(13,96-31,56)	46	3.13	(2,61-3,76)

EEI† = Endemic-epidemic index; 95% CI=95% confidence interval for the endemic-epidemic index.

Conclusions

Results indicate that in Catalonia there were important differences in the number of new sickness absence episodes due to influenza and related illnesses, as compared to trends in prior years. These differences consisted of shifts in the timing of peak incidence, a doubling in the number of cases, and changes in the distribution of cases by economic activity sector and gender.

The greater incidence of sickness absence observed during the pandemic period could be explained by:

- the near universal susceptibility of humans to the new strain of virus
- the preventive measures recommended by health authorities, which generally favored workers staying home if suspected of having the flu

The change in the distribution of sickness absence by gender, with women making up a greater proportion of cases during the pandemic period, could be explained in part by a greater presence in the health and education workforce as compared to the manufacturing sector. Moreover, prior studies suggest that women are more likely to stay at home to care for a dependent family member who is ill.