

# THE IMPACT OF INFLUENZA LIKE ILLNESS (ILI) IN CHILDREN ON WORKING ADULTS

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## BACKGROUND

Influenza like illness (ILI) related activity varies across influenza seasons. In week 3, 2014 the overall weekly ILI general practice consultations in England was 8.7 per 100,000 population; 6.8 per 100,000 in Wales; 7.9 per 100,000 in Scotland and 23.6 per 100,000 in Northern Ireland. In 1-4 year olds the ILI consultations were 16.1 per 100,000 in England and Wales.<sup>1</sup> Not only does ILI cause use of health care resources<sup>2</sup> and suffering for the infected child, the condition may also result in days off school<sup>3</sup> and parents needing to take days off from work<sup>4</sup>. ILI may be due to influenza viruses or other respiratory viruses and social contacts.<sup>5</sup>

## OBJECTIVES

This UK survey evaluated the impact of child ILI on working adults' health, productivity and healthcare resource use (HCRU); and evaluated ILI's impact on the children.

## METHODS

This study was a prospective online cohort survey of volunteers. Eligible participants were aged ≥18 years, in full or part time work and with a minimum one child ≤17 years residing in household. Recruitment and follow up took place nationally (UK) between October 2012 and May 2013 by means of letters to employers, nurseries, schools and online advertisements. Participants had to give consent

before getting access to the survey. Demographics, employment status, morbidities (asthma, chronic obstructive pulmonary disease, other lung disease, diabetes, liver disease, heart disease, kidney problems, neurological disease, weak immune system (e.g. receiving cancer treatment), other) and influenza vaccination history were collected for all household members. During follow up, households were contacted fortnightly by SMS/email and prompted to complete the online survey if any relevant ILI related events had occurred, e.g. influenza vaccination, ILI symptoms, time off work/education, presenteeism<sup>6</sup>, and HCRU. ILI was defined as at least one systemic symptom (fever/feverishness, malaise, headache, or myalgia) and at least one respiratory symptom (cough, sore throat, or shortness of breath). Transmission of ILI from children to adults was estimated using a variable ranking the timing of the household ILI incidences when multiple ILI incidences within a given survey period. Also adults were asked if they believed they got their ILI from a child in the household. Descriptive statistics were used to describe ILI related events.

## RESULTS

■ Across 938 participants/households there were 1895 adults with mean age 40.6 years, 52.7% females; and 1695 children with mean age 8.7

years, 46.8% females. The most prevalent condition was asthma (Table 1). The average number of household members was 3.8 (standard deviation 0.9) and in 761 households two or more adults were working.

- 91/306 (29.7%) adult ILI incidences were related to a child ILI. 69 of these (75.8%) had symptom duration >3 days. 31 incidences of 86 full/part time/self employed or in full time education (36.0%) reported taking time off work with 22/31 (71.0%) taking ≥2 days off. 13/91 (14.3%) had general practice visits and 6/91 (6.6%) received prescriptions (Table 2).
- 215/306 (70.3%) adult ILI incidences were unrelated to a child ILI. 164 of these (76.3%) had symptom duration >3 days. 80 incidences of 208 full/part time/self employed or in full time education (38.5%) reported taking time off work with 62/80 (77.5%) taking ≥2 days off. 42/215 (19.5%) had general practice visits and 35/215 (16.3%) received prescriptions (Table 2).
- The majority of the adults agreed that because of ILI the stresses of their job were harder to handle. The majority of adults with ILI somewhat agreed that despite having ILI they were able to finish hard tasks at work (Figure 1).

■ There were total 310 child ILI incidences. 67 adults reported time off because of child ILIs with 30/67 (44.8%) taking ≥2 days off. This represents 67 adults out of total 152 working adults (44.1%) in the households with child ILI.

■ 180 child ILI incidences (58.1%) had time off education with 81/180 (45.0%) taking ≥3 days. 59/310 (19.0%) had general practice visits, 48/310 (15.5%) received prescriptions, 5/310 (1.6%) had outpatient visits and 1 child ILI incidence had an inpatient visit (Table 3).

## CONCLUSIONS

Based on the survey, approximately 1/3 of adult ILIs were related to prior household child ILI. ILI in a household often required absence from work and ILI in children often resulted in time off education. General practice visits were the most frequent burden to the National Health Service. The results provide insight into the burden of ILI, however generalisability of the survey results should be made with caution because of the small sample size. Furthermore, there was no clinical proof of adult ILI being caused by child ILI, however timing of symptoms and direct question regarding source of ILI were used to estimate a relationship.

**Table 1. Characteristics of all members in the 938 participating households**

Variable	Adults	Children
N	1895	1695
Age (years) mean (std)	40.6 (8.8)	8.7 (4.3)
Females %	52.7%	46.8%
Asthma %	8.4%	7.3%
Diabetes %	2.8%	0.3%
At least one morbidity*	17.3%	10.2%
Full, self, or part time employed or full time education** %	95.5% (1808/1895 responses)	96.4% (106/110 responses)
Flu vaccination^ (%)	18.3% (343/1875)	5.3% (88/1665)
Intend to get flu vaccination		
Yes	46 (3.0%)	16 (1.0%)
No	1438 (94.7%)	1522 (96.8%)
Don't know	35 (2.3%)	34 (2.2%)
Total responses	1519	1572

\*Asthma, chronic obstructive pulmonary disease, diabetes, heart disease (not including high blood pressure), kidney problems, neurological disease (e.g. stroke), other lung disease, liver disease, immune system weak (Immunosuppressed) e.g. on cancer type medicines, other  
\*\*Children 16 or 17 years old could be in employment ^Vaccination status at survey start

**Table 3. Clinical, health care resource use and time off education in child influenza like illness (ILI) incidences\***

Variable	n (%) [N]
Age (years) mean (std)	8.1 (4.0) [290]
Female	144 (49.7) [290]
Asthma	28 (9.7) [290]
Diabetes	0 [290]
At least one morbidity**	38 (13.1) [290]
ILI symptoms	[310]
High temperature	224 (72.3)
Feeling unwell	301 (97.1)
Headache	233 (75.2)
Pain in muscles	135 (43.6)
Cough	269 (86.8)
Short of breath	59 (19.0)
Sore throat	253 (81.6)
ILI duration	[310]
< 1 day	4 (1.3)
1-3 days	78 (25.2)
>3 days	228 (73.6)
Duration of time off education because of ILI	[180]
<1 day	5 (2.8)
1 day	30 (16.7)
2 days	64 (35.6)
3 days	20 (11.1)
>3 days	61 (33.9)
ILI incidences with NHS24*** call	13 (4.2) [310]
ILI incidences with practice telephone consultation	22 (7.1) [310]
ILI incidences with general practice visit	59 (19.0) [310]
ILI incidences with hospital outpatient visit	5 (1.6) [310]
ILI incidences with hospital inpatient visit	1 (0.3) [310]
ILI incidences with prescription	48 (15.5) [310]
ILI incidences with OTC^ medication use	234 (75.5) [310]

\*310 child ILI incidences during follow up in 290 children \*\*Please see Table 1  
\*\*\*NHS24:National Health Services 24 hour call service ^OTC:Over the counter medication

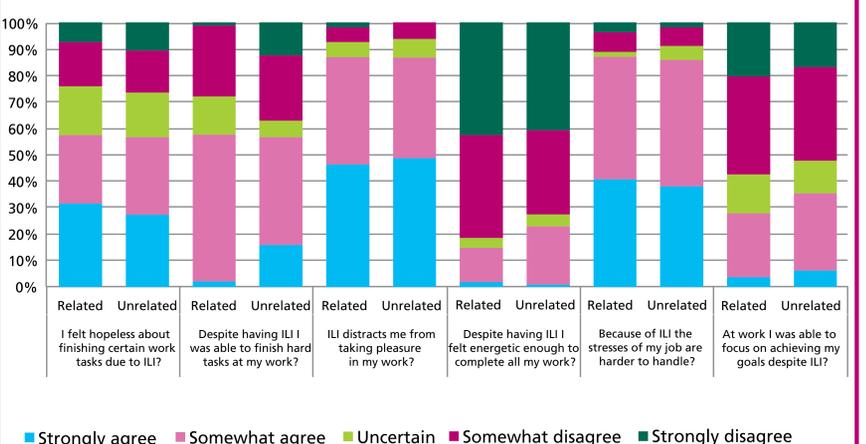
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**Table 2. Clinical, health care resource use and time off work in adult influenza like illness (ILI) incidences related\* and unrelated\*\* to prior household child ILI**

Variable	Adult ILI related to child ILI n (%) [N]	Adult ILI unrelated to child ILI n (%) [N]
Age (years) mean (std)	40.9 (7.2) [89]	41.0 (8.5) [202]
Female	56 (62.9) [89]	110 (54.5) [202]
Asthma	7 (7.9) [89]	20 (9.9) [202]
Diabetes	0	6 (3.0) [202]
At least one morbidity***	18 (20.2) [89]	40 (19.8) [202]
ILI symptoms	[91]	[215]
High temperature	45 (49.5)	106 (49.3)
Feeling unwell	88 (69.7)	208 (96.7)
Headache	74 (81.3)	184 (85.6)
Pain in muscles	70 (76.9)	164 (76.3)
Cough	74 (81.3)	171 (79.5)
Short of breath	44 (48.4)	80 (37.2)
Sore throat	76 (83.5)	183 (85.1)
ILI duration	[91]	[215]
< 1 day	0	1 (0.5)
1-3 days	22 (24.2)	50 (23.3)
>3 days	69 (75.8)	164 (76.3)
Duration of time off work because of ILI	[31]	[80]
<1 day	2 (6.5)	4 (5.0)
1 day	7 (22.6)	14 (17.5)
2 days	10 (32.3)	17 (21.3)
3 days	7 (22.6)	18 (22.5)
>3 days	5 (16.1)	27 (33.8)
ILI incidences with NHS24* call	4 (4.4) [91]	5 (2.3) [215]
ILI incidences with practice telephone consultation	5 (5.5) [91]	16 (7.4) [215]
ILI incidences with general practice visit	13 (14.3) [91]	42 (19.5) [215]
ILI incidences with hospital outpatient visit	2 (2.2) [91]	0
ILI incidences with hospital inpatient visit	0	0
ILI incidences with prescription	6 (6.6) [91]	35 (16.3) [215]
ILI incidences with OTC^ medication use	76 (83.5) [91]	171 (79.5) [215]

\*91 ILI incidences during follow up in 89 adults \*\*215 ILI incidences during follow up in 202 adults  
\*\*\*Please see Table 1 \*NHS24:National Health Services 24 hour call service ^OTC:Over the counter medication

**Figure 1. Presenteeism in adult influenza like illness (ILI) incidences related to prior household child ILI and in adult ILI incidences unrelated to household child ILI\***



\* Only the household member responding to the survey was able to answer the presenteeism questions