A Comparison of Self-report and Health Care Provider Data to Assess Surveillance Definitions of Influenza-like Illness in Outpatients

Angela M. Barbara, PhD,[1] Mark Loeb, MD,[1-3] Lisa Dolovich, PharmD,[4,5] Kevin Brazil, PhD,[3,6] Margaret L. Russell, MD, PhD[7]

ABSTRACT

Objective: Several surveillance definitions of influenza-like illness (ILI) have been proposed, based on the presence of symptoms. Symptom data can be obtained from patients, medical records, or both. Past research has found that agreements between health record data and self-report are variable depending on the specific symptom. Therefore, we aimed to explore the implications of using data on influenza symptoms extracted from medical records, similar data collected prospectively from outpatients, and the combined data from both sources as predictors of laboratory-confirmed influenza.

Methods: Using data from the Hutterite Influenza Prevention Study, we calculated: 1) the sensitivity, specificity and predictive values of individual symptoms within surveillance definitions; 2) how frequently surveillance definitions correlated to laboratory-confirmed influenza; and 3) the predictive value of surveillance definitions.

Results: Of the 176 participants with reports from participants and medical records, 142 (81%) were tested for influenza and 37 (26%) were PCR positive for influenza. Fever (alone) and fever combined with cough and/or sore throat were highly correlated with being PCR positive for influenza for all data sources. ILI surveillance definitions, based on symptom data from medical records only or from both medical records and self-report, were better predictors of laboratory-confirmed influenza with higher odds ratios and positive predictive values.

Discussion: The choice of data source to determine ILI will depend on the patient population, outcome of interest, availability of data source, and use for clinical decision making, research, or surveillance.

Key words: Influenza; influenza-like illness; surveillance definition; data source

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2012;103(1):69-75.

As part of most influenza surveillance systems, patients who meet specific symptom criteria will have culture samples taken for laboratory testing.[1,2] Several surveillance definitions of influenza-like illness (ILI) have been proposed.[2-6] The Centers for Disease Control and Prevention (CDC) in the United States defines ILI as the presence of fever (temperature of 38 degrees Celsius or greater) and one of either cough or sore throat or both, in the absence of a *known* cause other than influenza.[7] Health Canada's Flu Watch uses a variant of the CDC definition of ILI: fever and cough plus one or more of the following – sore throat, arthralgia, myalgia, or prostration (www.phac-aspc.gc.ca/fluwatch). Several studies have found that the grouping of high fever and cough is the best predictor of influenza.[8-11] What these ILI definitions have in common is the presence of fever plus one or more symptoms of respiratory illness.

Data about influenza symptoms can be obtained from multiple sources. For example, symptoms can be reported by multiple informants, such as self-reports and health care providers; or by multiple methods, such as symptom checklists and medical record data. In prior work, we found that agreements between health record data and self-report varied for respiratory-related symptoms.[12] Therefore, factors that might influence the sensitivity, specificity and predictive values of ILI include the actual surveillance definition, but also the data source from which the symptom data contained in the ILI definition are taken. The impact of these factors will be relevant to both public health researchers and clinicians in determining choice of ILI definitions.

Most studies evaluating the surveillance definitions of influenza have relied on physician or health record data.[3,8,13,14] Some also included a patient survey following entry into the study and physician examination or review of medical records.[15,16] Nicholson and colleagues (1997) had weekly phone surveillance for symptoms and then home visits for symptomatic patients.[17] Vaccine effectiveness studies have also used clinical data, as well as self-report from research participants.[18-20]

The goal of the current study was to assess the utility of two sources of data in determining the surveillance definitions for ILI and their association with laboratory-confirmed influenza. Using data from the Hutterite Influenza Prevention Study,[18] we compared data collected retrospectively from medical record extraction, similar data collected prospectively from research participants, and the combined data from both sources.

Author Affiliations

1. Department of Pathology and Molecular Medicine, McMaster University, Hamilton, ON
2. Department of Medicine, McMaster University, Hamilton, ON
3. Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON
4. Department of Family Medicine, McMaster University, Hamilton, ON
5. Centre for Evaluation of Medicines, McMaster University, Hamilton, ON
6. St. Joseph's Health System Research Network, Hamilton, ON
7. Department of Community Health Sciences, University of Calgary, Calgary, AB

Correspondence: Angela Barbara, Infectious Diseases Research Unit, Pathology & Molecular Medicine, McMaster University, 1280 Main Street West, MDCL 3200, Hamilton, ON L8N 4K1, Tel: 905-525-9140, ext. 21478, Fax: 905-389-5822, E-mail: barbara@mcmaster.ca, amgbarbara@gmail.com

Acknowledgements: We thank Cassandra Howse, Dominik Mertz, Pardeep Singh and Lorraine Moss for their feedback on earlier drafts of this manuscript.

Conflict of Interest: None to declare.

Table 1. Descriptive Characteristics of All Participants in the Hutterite Influenza Prevention Study (RCT), Participants With Medical Record Data Who Provided Swab Specimens (ILI Analyses), PCR-positive Influenza Cases and PCR-negative Influenza Participants

Characteristic	RCT	ILI Analyses			
			PCR Positive		p-value†
	All n (%)*	All n (%)	Yes n (%)	No n (%)	
Total	3273	142	37	105	
Age group (years)					0.003
<7	533 (16.3)	52 (36.6)	12 (32.4)	40 (38.1)	
7-15	835 (25.6)	22 (15.5)	13 (35.1)	9 (8.6)	
16-22	390 (11.9)	11 (7.7)	3 (8.1)	8 (7.6)	
23-49	1053 (32.2)	38 (26.8)	7 (18.9)	31 (29.5)	
50-64	302 (9.2)	11 (7.7)	0	11 (10.5)	
≥65	160 (4.9)	8 (5.6)	2 (5.4)	6 (5.7)	
Sex, female	1858 (56.8)	86 (60.6)	22 (59.5)	64 (61)	0.87

* Percentage per column.
† p-value for Pearson chi square test for PCR-positive participants compared with PCR-negative participants.

METHODS

Study design and population

Residents of 46 Hutterite colonies in the Canadian provinces of Alberta (n=22), Saskatchewan (n=22) and Manitoba (n=2) participated in influenza surveillance for a cluster randomized controlled trial (RCT) to determine if the vaccination of healthy children and adolescents with inactivated influenza vaccine would reduce laboratory-confirmed influenza in other residents of these communities. There were 947 healthy children aged 36 months to 15 years who received either seasonal influenza vaccine or hepatitis A vaccine and 2,326 other residents of Hutterite communities who were followed to assess the indirect effect of vaccinating the children. Full details of the trial are described elsewhere.[18]

Participant reports of influenza-related symptoms

Study surveillance for influenza took place from December 28, 2008 to June 23, 2009. All participants in the Hutterite Influenza Prevention Study recorded their influenza-related symptoms (fever, cough, runny nose, sore throat, headache, sinus problems, muscle ache, fatigue, ear ache, and chills) using daily diaries. Fever was defined as a temperature ≥38 degrees Celsius; each participating family was given a thermometer to record temperatures. Trained research nurses visited the Hutterite colonies twice per week to check diary entries and interviewed individual participants (or parents, in the case of infants) to confirm their reported symptoms, assess other symptoms and collect information regarding outpatient visits made to medical offices and hospital emergency departments for flu-like symptoms; the latter information included physician name, health care facility, and location.

Health care provider reports of influenza-related symptoms

For each reported medical visit, a one-page "Patient Information Request" form was faxed to the medical facility asking for patient record data regarding presenting symptoms, using the same list of symptoms as on the participant study diaries. Clinicians were blinded to the patient's self-reported symptoms. The institutional review boards at McMaster University, University of Calgary, University of Saskatchewan, and University of Manitoba approved the study. All participants gave written consent to allow us to obtain health record information if they visited a doctor or hospital with flu-related symptoms during the 2008-2009 influenza season.

Faxes were sent to the physician offices or medical facilities between March 2009 and September 2009. A response indicating that there was "no visit" was followed up by (at least one) fax to an alternative medical facility, based on feedback from the original responder or geography. Data from the first medical visit reported by participants and confirmed by the health care provider were included in the analysis.

Laboratory confirmation of influenza

During the colony visits, research nurses took nasopharyngeal swab samples from study participants who reported two or more symptoms or physician-diagnosed otitis media. Specimens were submitted to the public health laboratories in the respective provinces to be tested for influenza by Polymerase Chain Reaction (PCR). Influenza was confirmed by the detection of viral Ribonucleic Acid on the basis of reverse transcriptase Real Time Polymerase Chain Reaction (RT-PCR) targeting matrix gene for influenza A and non-structural gene for influenza B.[18] PCR has been demonstrated to be more sensitive to viral culture alone; compared to direct immunofluorescence and cell culture assay, RT-PCR was 95% sensitive and 100% specific for detecting influenza. It is therefore considered the "gold standard" for detecting influenza.[15,16,21,22]

Statistical analyses

We calculated the frequency of individual symptoms using three strategies: a) those reported in the medical records; b) those self-reported by participants; c) those reported in either the medical record OR by self-report (combined data sources). For each data strategy, we used the Pearson chi-square statistic to test for differences in the number of symptom reports between participants with and without PCR-confirmed influenza. We then calculated the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) for each symptom by data source, using PCR results as the gold standard for diagnosis of influenza. We used univariate logistic regression analysis to evaluate the association of each symptom with PCR-positive influenza. Odds ratios were calculated to determine the strength of association between symptom and PCR-confirmed influenza and 95% confidence intervals were calculated to estimate the precision of each odds ratio. We then included those individual symptoms associated with laboratory-confirmed influenza (where alpha = 0.05) in the ILI definitions to be further analyzed.

Table 2. Symptoms Experienced by PCR-positive Influenza Cases and PCR-negative Influenza Participants, According to Each Data Strategy

Symptoms, Data Source	All n (%*)	PCR Positive n (%)	PCR Negative n (%)	p-value†
All	142	37	105	
Fever				
Medical record	45 (31.7)	25 (67.6)	20 (19.5)	<0.0001
Participant	22 (15.5)	10 (27.0)	12 (11.4)	0.02
Combined‡	51 (35.9)	26 (70.3)	25 (23.8)	<0.0001
Cough				
Medical record	92 (64.8)	28 (75.7)	64 (60.9)	0.10
Participant	89 (62.7)	29 (78.4)	60 (57.1)	0.02
Combined	111 (78.2)	32 (86.5)	79 (75.2)	0.16
Sore throat				
Medical record	65 (45.8)	19 (51.4)	46 (43.8)	0.43
Participant	55 (38.7)	19 (51.4)	36 (34.3)	0.07
Combined	89 (62.7)	30 (81.1)	59 (56.2)	0.01
Runny nose				
Medical record	44 (31.0)	9 (24.3)	35 (33.3)	0.30
Participant	51 (35.9)	15 (40.5)	36 (34.3)	0.50
Combined	75 (52.8)	19 (51.4)	56 (53.3)	0.84
Headache				
Medical record	16 (11.3)	4 (10.8)	12 (11.5)	0.92
Participant	23 (16.2)	6 (16.2)	17 (16.2)	1.00
Combined	32 (22.5)	8 (21.6)	24 (22.8)	0.88
Sinus problems				
Medical record	26 (18.3)	5 (13.5)	21 (20.0)	0.35
Participant	25 (17.6)	5 (13.5)	20 (19.1)	0.45
Combined	38 (26.8)	7 (18.9)	31 (29.5)	0.18
Muscle aches				
Medical record	9 (6.3)	3 (8.1)	6 (5.7)	0.61
Participant	15 (10.6)	8 (21.6)	7 (6.7)	0.05
Combined	20 (14.1)	9 (24.3)	11 (10.5)	0.08
Fatigue				
Medical record	12 (8.5)	5 (13.5)	7 (6.7)	0.28
Participant	20 (14.1)	9 (24.3)	11 (10.5)	0.08
Combined	29 (20.4)	12 (32.0)	17 (16.0)	0.06
Earache				
Medical record	26 (18.3)	2 (5.4)	24 (22.9)	0.002
Participant	17 (12.0)	2 (5.4)	15 (14.3)	0.09
Combined	30 (21.0)	3 (8.1)	27 (25.7)	0.006
Chills				
Medical record	9 (6.3)	2 (5.4)	7 (6.7)	0.79
Participant	15 (10.6)	4 (10.8)	11 (10.5)	0.96
Combined	22 (15.5)	6 (16.2)	16 (15.2)	0.89

* Percentage of total in column.
† p-value for Pearson chi square test for PCR-positive participants compared with PCR-negative participants.
‡ Combined = symptom identified by medical record OR self-report.

We analyzed ILI case definitions according to the data source(s) used to identify the combination of symptoms: a) those reported in the medical records; b) those self-reported by participants; c) those reported either in the medical record OR by self-report (combined data sources). That is, each individual symptom within the ILI definition was present either in the medical record OR self-reported by the participant; e.g., a participant had fever and cough *if* fever was reported by either self-report OR medical record *and* cough was reported by either self-report OR medical record. We excluded combinations of symptoms with less than 10 PCR-positive cases for each data strategy.[23]

We used the Pearson chi-square statistic to test for differences in number of cases for each ILI definition between PCR-positive and PCR-negative participants, for each data strategy. The sensitivity, specificity, predictive values, and odds ratios were calculated for ILI definitions using the three data strategies; laboratory-confirmed influenza was considered the gold standard. All analyses were conducted using SPSS 16.0 (SPSS Inc., Chicago, IL).

RESULTS

Of the 3,273 participants in the Hutterite Influenza Study (Table 1), 252 (8%) reported at least one outpatient medical visit during the influenza season and 176 visits (70%) were confirmed by medical record information. Twenty-six participants did not meet the criteria for collecting a swab sample (15 were asymptomatic and 11 reported one symptom) and 8 participants were excluded from the analysis because swab samples were collected after eight days of symptom reporting. Therefore, of the 176 participants with both self-report and physician-recorded data, 142 (81%) individuals were tested for influenza by PCR; this is the sample included in the present analyses of ILI symptoms.

The sex and age distributions of all participants in the RCT and of the sample included in the ILI analyses are shown in Table 1. The age distributions differ; those included in the ILI analyses were younger. The mean age was 26.0 years for all RCT participants and 22.1 years for the 142 individuals included in the present analyses. Sixty-two (44%) had been vaccinated against influenza. Reported symptoms were not significantly different between the 62 individuals who were vaccinated and the 80 individuals not vaccinated.

Of those included in the ILI analyses, 37 individuals (26%) were PCR positive. Children and adolescents less than 16 years of age accounted for 52% of the sample and 68% of PCR-confirmed cases of influenza. PCR-positive cases were younger than PCR-negative cases (mean, 17.0 versus 23.9 years, p=0.07). We found higher PCR-positivity rates in children aged 7-15 years (59%) compared to younger children (23%) and adults aged 23-49 years (18%).

Table 3. Symptoms, as Reported by Data Source, Predicting Influenza

Symptoms, Data Source	n	Sensitivity	Specificity	PPV	NPV	Logistic Regression		
						Odds Ratio	95% Confidence Intervals	p-value
Fever								
Medical record	45	0.68	0.81	0.56	0.88	8.90	3.81-20.58	<0.0001
Participant	22	0.27	0.89	0.45	0.78	2.87	1.12-7.37	0.03
Combined*	51	0.70	0.76	0.51	0.88	7.56	3.28-17.45	<0.0001
Cough								
Medical record	92	0.76	0.39	0.30	0.82	1.99	0.85-4.65	0.11
Participant	89	0.78	0.43	0.33	0.85	2.72	1.13-6.51	0.03
Combined	111	0.86	0.29	0.25	0.84	2.11	0.74-5.97	0.16
Sore throat								
Medical record	65	0.51	0.56	0.29	0.77	1.35	0.64-2.87	0.43
Participant	55	0.51	0.66	0.35	0.79	2.02	0.95-4.33	0.07
Combined	89	0.81	0.44	0.34	0.87	3.34	1.35-8.29	0.01
Muscle aches								
Medical record	9	0.08	0.94	0.33	0.74	1.46	0.35-6.14	0.61
Participant	15	0.22	0.93	0.53	0.77	3.86	1.29-11.55	0.02
Combined	20	0.24	0.90	0.45	0.77	2.75	1.03-7.30	0.04
Fatigue								
Medical record	12	0.14	0.93	0.42	0.75	2.19	0.65-7.37	0.21
Participant	20	0.24	0.90	0.45	0.77	2.75	1.03-7.30	0.04
Combined	29	032	0.84	0.42	0.78	2.49	1.05-5.89	0.04

PPV = positive predictive value; NPV = negative predictive value.
* Combined = symptom identified by medical record OR self-report.

Table 4. Symptom Combinations, According to Data Source, of All Participants, PCR-positive Influenza Cases and PCR-negative Participants

Symptoms, Data Source	All n (%)	Influenza Positive n (%)	Influenza Negative n (%)	p-value†
All	142	37	105	
Fever *and* cough				
Medical record	32 (22.5)	18 (48.6)	14 (13.3)	<0.0001
Participant	20 (14.1)	10 (27.0)	10 (9.5)	0.01
Combined data‡	45 (31.7)	23 (62.2)	22 (21.0)	<0.0001
Fever *or* cough				
Medical record	105 (73.9)	35 (94.6)	70 (0.67)	0.001
Participant	91 (64.1)	29 (78.4)	62 (59.0)	0.04
Combined data‡	117 (82.4)	35 (94.6)	23 (21.9)	0.02
Fever *and* sore throat				
Medical record	32 (22.5)	18 (48.6)	14 (13.3)	<0.0001
Participant	20 (14.1)	10 (27.0)	10 (9.5)	0.01
Combined data	45 (31.7)	23 (62.2)	22 (21.0)	<0.0001
Fever *and* (cough *or* sore throat)				
Medical record	38 (26.8)	22 (59.5)	16 (15.2)	<0.0001
Participant	22 (15.5)	10 (27.0)	12 (11.4)	0.02
Combined data	51 (35.9)	26 (70.3)	25 (23.8)	<0.0001
Fever *and* cough *and* (sore throat *or* muscle aches *or* fatigue)				
Medical record	20 (14.1)	12 (32.4)	8 (7.6)	<0.0001
Participant	15 (10.6)	9 (24.3)	6 (5.7)	0.002
Combined data	34 (24)	21 (56.8)	13 (12.4)	<0.0001

* Percentage of total per row.
† p-value for Pearson chi square test for PCR-positive participants compared with PCR-negative participants.
‡ Combined data = individual symptoms within the ILI case definition identified by medical record OR self-report.

The influenza A virus was found in 19 (51%) of the 37 influenza virus positive participants; influenza B was found in 18 (49%) participants. Because we used data from participants' first confirmed medical visits reported during the influenza season, 117 swab samples (82%) were collected prior to the introduction of the novel H1N1 pandemic influenza virus in Canada on April 23, 2009.[24] Therefore, only 4 (11%) of the 37 PCR-positive cases were identified during the H1N1 pandemic.

Table 2 compares the proportions of reported symptoms by data source between participants who tested positive and those who tested negative for influenza. Compared to PCR-negative participants, PCR-positive cases were significantly more likely to have fever (regardless of the data source) and participant-reported muscle aches. PCR-positive cases also had significantly more sore throat according to data from combined sources. The symptoms that were unrelated to PCR-positivity (runny nose, headache, sinus problems, and chills) and those negatively related to PCR positivity (earache) were excluded from subsequent analyses.

Table 3 presents the sensitivity and logistic regression analyses for the five symptoms found to be related to PCR positivity. Cough had the highest sensitivity for each data source (76-86%). Physician-recorded fever had the highest PPV (56%) and odds ratio (8.9, 95% CI 3.81-20.58; p=0.0001). Based on these findings, we further analyzed five surveillance definitions for ILI: fever *and* cough; fever *or* cough; fever *and* sore throat; fever *and* (cough *or* sore throat), which meets the CDC criteria; and fever *and* cough *and* (sore throat *or* muscle aches *or* fatigue), which meets the Flu Watch criteria. Because of the low prevalence among PCR-positive cases, we did not analyze the symptom combinations of fever *and* fatigue (physician, n=4; participant, n=6; combined, n=11) or fever *and* muscle aches (physician, n=3; participant, n=4; combined, n=10).

Table 5. Surveillance Definitions, as Reported by Data Source, Predicting Influenza

Symptoms, Data Source	n	Sensitivity	Specificity	PPV	NPV	Logistic Regression		
						Odds Ratio	95% Confidence Intervals	p-value
Fever *and* cough								
Medical record	32	0.49	0.87	0.56	0.83	6.16	2.61-14.49	<0.0001
Participant	20	0.27	0.90	0.50	0.78	3.52	1.33-9.33	0.01
Combined data*	45	0.62	0.79	0.51	0.86	6.20	2.75-13.99	<0.0001
Fever *or* cough								
Medical record	105	0.95	0.67	0.95	0.67	8.75	1.99-38.50	0.004
Participant	91	0.78	0.59	0.31	0.84	2.51	1.05-6.03	0.039
Combined data	117	0.95	0.22	0.30	0.92	4.91	1.10-21.96	0.037
Fever *and* sore throat								
Medical record	21	0.35	0.94	0.62	0.80	6.57	2.45-17.63	<0.0001
Participant	14	0.22	0.95	0.57	0.77	4.55	1.46-14.18	0.01
Combined data	36	0.59	0.87	0.61	0.86	9.53	4.01-22.63	<0.0001
Fever *and* (cough *or* sore throat)								
Medical record	38	0.59	0.85	0.58	0.86	8.16	3.51-18.99	<0.0001
Participant	22	0.27	0.89	0.45	0.78	2.87	1.12-7.37	0.03
Combined data	51	0.70	0.76	0.51	0.88	7.56	3.28-17.45	<0.0001
Fever *and* cough *and* (sore throat *or* muscle aches *or* fatigue)								
Medical record	20	0.32	0.92	0.60	0.80	5.82	2.15-15.77	0.001
Participant	15	0.24	0.94	0.60	0.78	5.30	1.74-16.17	0.003
Combined data	34	0.57	0.88	0.62	0.85	9.29	3.88-22.21	<0.0001

* Combined data = individual symptoms within the ILI case definition identified by medical record OR self-report.

Table 4 compares the prevalence of each surveillance definition, according to each data strategy, between PCR-positive and PCR-negative participants. PCR-positive individuals had significantly more ILI according to each surveillance definition, regardless of data source. Table 5 presents the sensitivity and logistic regression analyses for the five surveillance definitions. Overall, two symptom complexes – namely, fever *and* sore throat; fever *and* cough, *and* (sore throat *or* muscle aches *or* fatigue) – based on combined data sources, had odds ratios over 9.0 and PPVs over 60%. For each ILI definition, the PPV was higher when based on medical record data. Medical record documentation of fever *or* cough had the highest PPV overall (95%). The case definition of fever *or* cough had the highest sensitivities (78-98%) and the lowest specificities (22-67%).

DISCUSSION

In this study, we explored the implications of using two different data sources independently and jointly as predictor variables to evaluate surveillance definitions of ILI. As seen in other studies,[3,9] cough alone had the highest sensitivity, regardless of data source (76-86%). Unlike self-reported cough and self-reported sore throat, physician-recorded cough and physician-recorded sore throat were *not* more prevalent in PCR-positive subjects compared to PCR-negative subjects. Cough and sore throat are non-specific symptoms. Participants were prompted by our research nurses to report symptoms that could potentially be related to respiratory illness. Physicians, who were blind to participant responses and interested in participants' overall health, including symptoms unrelated to influenza, would likely record cough and sore throat regardless of etiology.

We found that PPVs for ILI based on medical records were the same or higher than ILI based on self-report data for each surveillance definition. This was consistent with previous findings by Govaert and colleagues[16] that predictive values are higher in subpopulations who consult a general practitioner for influenza symptoms. They found a PPV of 30% for fever, cough *and* acute onset based on questionnaire data compared to 40% for the sample symptom complex according to physician records.[16] We found a more substantial difference in the medical records (95%) compared to self-reports (31%) for fever *or* cough. Family physicians, having clinical experience with patient consultations for influenza, may be well placed to infer the significance of symptom combinations. Indeed, physicians have been found to correctly diagnose influenza infection in >60-70% of patients on the basis of clinical symptoms alone.[25]

In contrast to other studies,[8,9,11] we found other symptom combinations had PPVs that were similar or higher than fever *and* cough for medical record data. With the exception of fever *or* cough, we found low to modest PPVs (45-62%). It is important to note that PPV is influenced by influenza prevalence; that is, PPV will improve with greater circulation of the influenza virus. With lower prevalence rates of influenza, it would be less likely that a person meeting the ILI definition will have a PCR-positive test, resulting in lower PPV.[26]

Laboratory confirmation of influenza may have been influenced by other factors, such as timing of swab sample collection compared to onset of symptoms. Our study focused on influenza surveillance definitions, which are based on signs and symptoms rather than other factors that may give rise to the likelihood of influenza, such as vaccination uptake, differences in exposure, genetic variation, comorbidity or other biological factors.

Researchers and public health clinicians should consider the issue of measurement error and reporting variations when designing studies. The choice of data source(s) should correspond with the study question or objective. For example, the data source used will have implications for studies evaluating the effectiveness of influenza vaccination or other interventions. Our findings indicate that using medical record data to determine ILI, due to higher PPVs, will maximize the effectiveness of an intervention. Using highly specific ILI definitions will also result in higher estimates of vaccine effectiveness; whereas, less specific ILI (and highly sensitive) definitions (such as fever *or* cough using combined data) will result in lower estimates.[27,28] For overall disease burden and use of health services, combined information from both data sources may be more appropriate because of their higher sensitivities.[5,29] To identi-

fy all potential cases of ILI, combining symptom data from both medical records and self-report will also result in a higher rate of detection.

Our study sample was made up of a disproportionate number of younger children under the age of seven years (37%) and adults between the ages of 23 and 49 years (27%). Compared to older persons, young children have had higher rates of both seasonal influenza and the 2009 H1N1 pandemic influenza.[30,31] Because our study looked at outpatient medical visits rather than hospitalizations, the age distribution of our sample is not surprising. A US population-based surveillance study found a high burden of influenza infection among outpatients under the age of five years.[32]

Individuals over 65 years of age are considered to be at high risk for developing complications of influenza and ILI. However, this age group was under-represented in our sample. Other studies have found that older persons reported less influenza symptoms and ILI.[33,34] The Hutterite population is younger than the overall Canadian population: 5% of Hutterites are 65 years of age or older in contrast to 13% of the Canadian population.[35] Older people make up a small proportion of any Hutterite colony population because of the high fertility rates and large number of children found in all colonies.[36] A larger sample size would have allowed us to stratify our analyses by age group and other demographic characteristics.

A recognized limitation of this study is that it was conducted within a specific cultural and religious population of outpatients during a single influenza season. The results may not be generalizable to all patient populations during other influenza seasons. Hutterites perceive that good physical health is a gift from God and ill health is a burden one must bear.[36] This may lead to less awareness of and/or reluctance to report or complain about bodily symptoms, which may explain the lower proportions of self-reported ILI and individual symptoms. Another limitation is that, because we limited the analyses to participants who had data from both sources, the sample size was modest, resulting in odds ratios with wide confidence intervals. We are unable to say how the above limitations have affected our results or the direction of the bias.

Further research should explore data source use in determining ILI surveillance definitions and their association with laboratory-confirmed influenza in other populations with data collected over multiple influenza seasons.

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Received: March 1, 2011
Accepted: August 2, 2011

RÉSUMÉ

Objectif : Plusieurs définitions du syndrome grippal (SG) à des fins de surveillance ont été proposées, d'après la présence de symptômes. Les données sur les symptômes peuvent être obtenues auprès des patients, dans les dossiers médicaux ou les deux. Les recherches passées ont montré que la concordance entre les données des dossiers médicaux et les données autodéclarées est variable, selon le symptôme à l'étude. Nous avons donc voulu explorer la validité d'utiliser des données sur les symptômes de la grippe extraites des dossiers médicaux, des données semblables recueillies prospectivement auprès de malades ambulatoires et des données combinant ces deux sources comme variables prédictives de la grippe confirmée en laboratoire.

Méthode : À l'aide des données d'une étude sur la prévention de la grippe dans la communauté huttérienne, nous avons calculé : 1) la sensibilité, la spécificité et la valeur prédictive de chaque symptôme compris dans les définitions à des fins de surveillance; 2) la fréquence à laquelle ces définitions étaient corrélées à la grippe confirmée en laboratoire; et 3) la valeur prédictive de ces définitions.

Résultats : Des 176 participants pour lesquels nous avions des données autodéclarées et des dossiers médicaux, 142 (81 %) ont été dépistés pour la grippe et 37 (26 %) ont obtenu un résultat positif à l'épreuve de détection de la grippe par la méthode PCR. Pour toutes les sources de données, la fièvre (seule) et la fièvre combinée à la toux et/ou au mal de gorge étaient hautement corrélées à une épreuve RPC positive pour la grippe. Les définitions du SG à des fins de surveillance fondées sur les symptômes indiqués dans le dossier médical seulement, ou à la fois dans le dossier médical et la déclaration du patient, étaient de meilleures variables prédictives de la grippe confirmée en laboratoire (rapports de cotes et valeurs prédictives positives plus élevés).

Discussion : Le choix de la source de données pour déterminer le SG dépend de la population de patients, du résultat attendu, de la disponibilité des sources de données et de l'utilisation des données pour la prise de décisions cliniques, la recherche ou la surveillance.

Mots clés : grippe; syndrome grippal; surveillance (définition); source de données

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