

Diagnosis and patterns of incidence of influenza, influenza-like illness and the common cold in general practice

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SUMMARY. *The incidence of influenza, influenza-like illness and the common cold during the influenza epidemics of 1972 and 1976 as reported to the weekly returns service of the Royal College of General Practitioners was examined by three regional areas and by age group. The results of a postal questionnaire concerned with diagnostic criteria used by participating doctors were also analysed. These two analyses were used to explore the validity of these diagnostic terms as reported in the weekly returns service.*

The two influenza epidemics peaked at about the same time throughout the country and in all age groups simultaneously, although the severity of the epidemic seemed to wane from south to north in 1976. The reported incidence of influenza-like illness and of the common cold was less in the central region than in the north and south during both the two epidemic years. Influenza incidence was maximal in age groups 15–44 and 45–64 years, whereas the reported incidence of influenza-like illness and the common cold was maximal in pre-school children. Additionally, influenza-like illness and the common cold appeared to a fairly uniform extent every winter whereas influenza was truly epidemic.

From the questionnaire to general practitioners, the symptoms of rigors, malaise and myalgia and the recognition of an epidemic were the important criteria which differentiated influenza from influenza-like illness.

We conclude that in general practice the distinction between influenza and influenza-like illness is reliably made and has validity in the clinical context and meaning of these diagnostic terms.

Introduction

MORTALITY associated with influenza is high, especially during epidemics such as those of 1918 and 1946.¹ Epidemics of such severity are less frequent nowadays, the last notable year being 1976.^{1,2} Reported morbidity from other respiratory tract disorders both in children^{3,4} and adults⁴ is increased during peak influenza periods. National epidemics of influenza are usually caused by influenza A virus.⁵ Influenza viruses can cause illness which is not necessarily severe and seroconversion has been observed in the absence of clinical illness.⁶ Influenza B occasionally causes local epidemics, especially in closed communities. In this country one of the best

available indices of morbidity in the community is the weekly returns service of the Birmingham Research Unit of the Royal College of General Practitioners,⁷ which includes among its diagnostic rubrics epidemic influenza, influenza-like illness and the common cold. Although it is known that the reporting rates of the general practitioners who contribute to the weekly returns for influenza correlate well with the virus reporting figures issued by the Communicable Diseases Surveillance Centre it is not clear how the general practitioners distinguish between these illnesses clinically.

This study is concerned with the distinction between influenza, influenza-like illness and the common cold. For this purpose, regional and age related incidence data and the diagnostic criteria used in the practices are examined.

Method

Incidence

The weekly returns service of the RCGP Birmingham Research Unit has been fully described elsewhere.^{4,7} In summary, returns are sent in weekly from around 40 practices mainly in England and Wales (one practice is in Scotland and one in Northern Ireland), recording the number of new cases of a series of acute illnesses seen during the previous week. Age-specific data are available. In 1984 102 general practitioners from 36 practices participated.

Reported here are the weekly returns service data from 1972–84 for influenza, influenza-like illness and the common cold. The data were recorded as rates per 100 000 population at risk (persons registered in the practices). Regional data were analysed in three arbitrarily defined groups: north being above the line joining Liverpool and the Wash, south being below a line joining Bristol and Ipswich and central lying between north and south. More detailed examination of incidence data by age group and by region was made for the two influenza epidemic periods in 1972 (15 November 1972 to 30 January 1973) and 1976 (21 January 1976 to 6 April 1976).

Questionnaire

A questionnaire was sent in 1984 to each of the 102 general practitioners involved in the weekly returns service, asking about diagnostic criteria for six respiratory conditions. The results for influenza, influenza-like illness and the common cold are recorded here.

The general practitioners graded each of eight diagnostic criteria for influenza and influenza-like illness and 11 for common cold on a four-point scale; essential (1), important (2), relevant (3) and irrelevant (4). They were allowed to add other criteria. The proportion of general practitioners considering a criterion essential or important (categories 1 and 2) was used as the main method of evaluating the data. Data were also analysed for each criterion individually and after consolidating results by practice. Practice scores were obtained by averaging the results from the constituent partners.

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Analysis

Correlation coefficients were calculated for weekly incidence rates between the three regional areas for 1972 and 1976 for each illness.

Questionnaire data were analysed using chi-squared testing or Fisher's exact test (for smaller numbers) comparing illnesses in the group of general practitioners as a whole.

Results

Incidence data

Four-week incidence rates (new episodes) of influenza, influenza-like illness and common cold during the period October 1972 to August 1986 are summarized graphically in Figure 1. For influenza there were major epidemics at the end of 1972 and in early 1976, and there was a minor epidemic in early 1978. For practical purposes in the case of influenza a four-week incidence rate exceeding 400 per 100 000 population was taken as indicating an epidemic. The incidence of influenza-like illness and common cold was fairly consistent year by year, with the incidence rising from October to February and falling to the lowest levels in August and September. For influenza-like illness the peak four-weekly rate was usually between 400 and 800 per 100 000 population and for the common cold between 800 and 1000.

Weekly incidence data for all three conditions during the two epidemics of influenza (1972 and 1976) are summarized graphically by region in Figure 2. Peak incidence for influenza occurred simultaneously in 1972 in all three regions; in 1976 the regional peaks were separated by just one week. Peak incidence in the central region was similar in both epidemics whereas in the north the 1976 peak was less than that for 1972, and in the

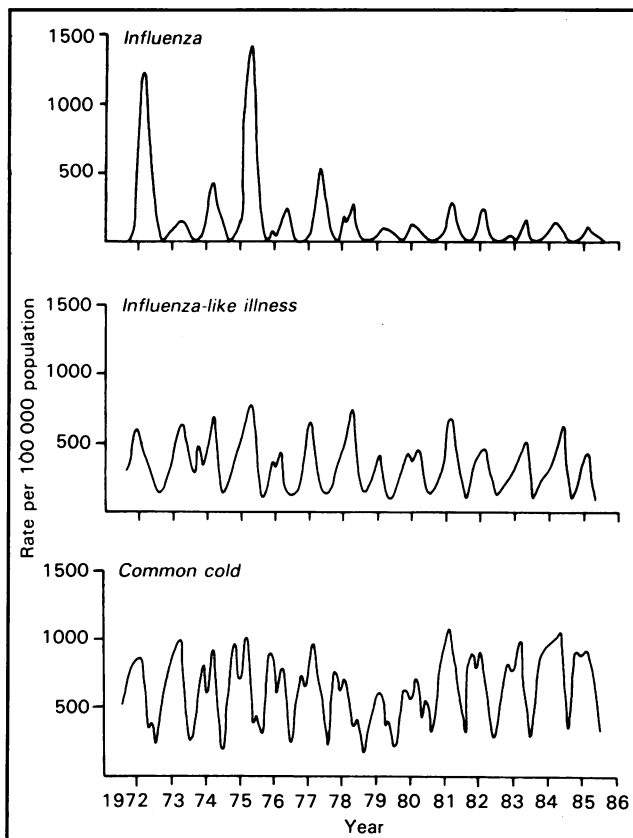


Figure 1. Four-weekly incidence of influenza, influenza-like illness and common cold between October 1972 and August 1986.

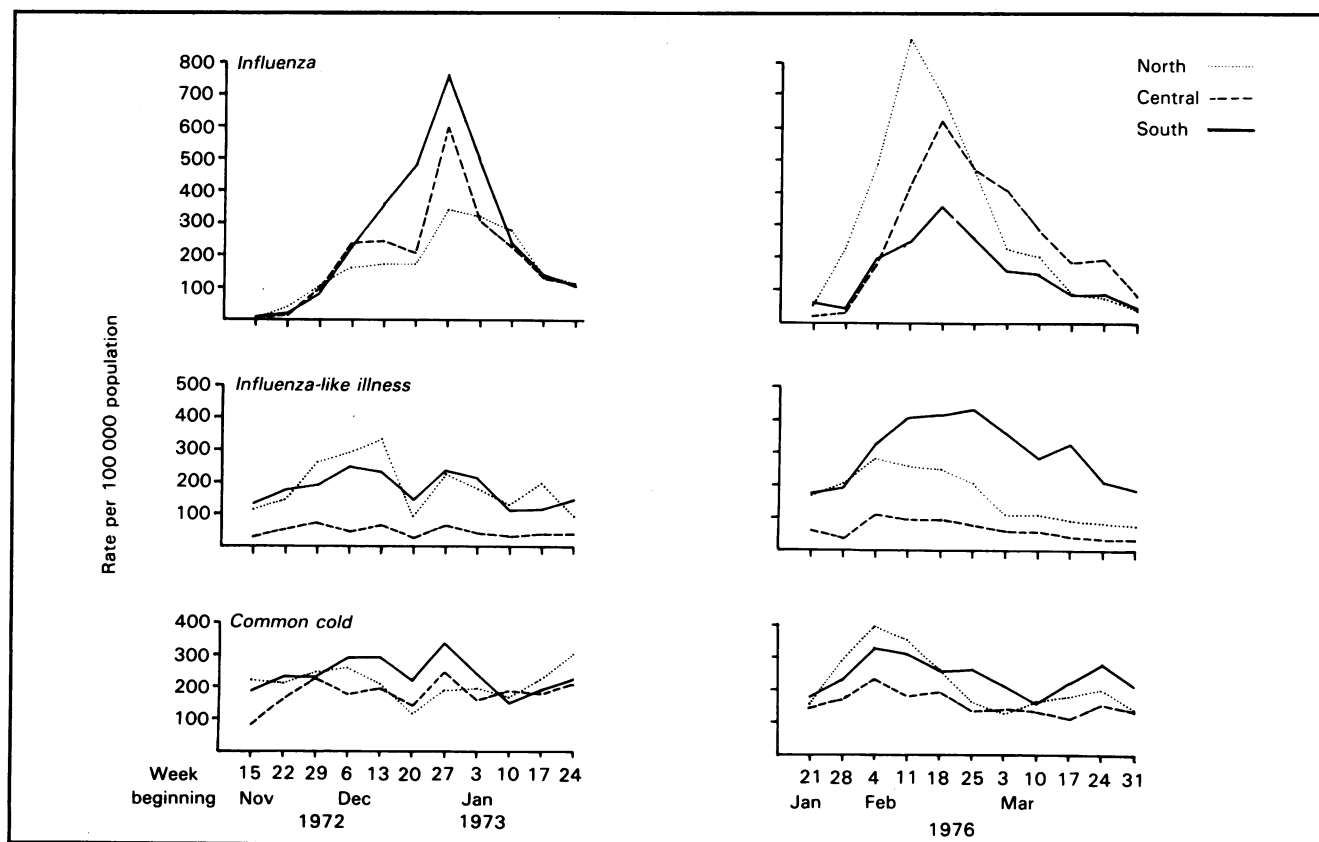


Figure 2. Weekly incidence of influenza, influenza-like illness and common cold by region during the influenza epidemics of 1972/73 and 1976.

south vice versa. The mean weekly incidence over the two epidemics was similar in all regions. Peak incidences for influenza-like illness and for common cold were difficult to identify, with no obvious regional pattern, although in both years, the incidence of influenza-like illness was less in the central than in the other two regions.

The mean weekly incidence of the three illnesses is reported in Table 1 for each region during the 11 weeks covering the duration of the influenza epidemics of 1972 and 1976. Also shown are the Pearson correlation coefficients between weekly rates in three paired regional groups for each illness. The associations for influenza were particularly strong, those for influenza-like illness somewhat less and for common cold, only significant during 1976. The stronger these associations the more truly epidemic the condition.

Weekly incidence data by age are presented for the 1972 epidemic in Figure 3, the picture being very similar for 1976. For influenza, maximum incidence occurred in age groups 15–44 and 45–64 years in both epidemics, whereas for influenza-like illness and for the common cold, maximum incidence occurred in pre-school children. The peak incidence of influenza occurred in the same week in all ages in 1972 and within two weeks in 1976.

Table 1. Mean weekly incidence of influenza, influenza-like illness and the common cold by region and association between regions during the influenza epidemics of 1972/3 and 1976.

	Mean weekly rate per 100 000 population (Pearson correlation coefficients)		
	Influenza	Influenza-like illness	Common cold
1972/3			
North	264.9	175.1	233.7
Central	195.4	46.6	175.5
South	166.5	189.2	219.3
North–Central	(0.94***)	(0.68**)	(0.53)
North–South	(0.86***)	(0.74**)	(0.33)
Central–South	(0.89***)	(0.80***)	(0.35)
1976			
North	152.3	300.5	242.1
Central	261.1	65.6	158.5
South	311.5	168.8	233.1
North–Central	(0.92***)	(0.69**)	(0.72**)
North–South	(0.86***)	(0.48)	(0.78**)
Central–South	(0.72**)	(0.84***)	(0.88***)

*** $P < 0.001$; ** $P < 0.01$.

General practitioners' diagnoses

Of the 102 general practitioners participating in the weekly returns service, 95 (93%) returned the questionnaire. Twenty-one of the respondents worked in practices in a predominantly rural area and 35 were aged 50 years or over.

There was a good consensus among individual general practitioners in the diagnosis of influenza (Figure 4). The major criteria were: fever, being part of an epidemic, malaise and myalgia (all graded either 1 or 2 by more than 90% of the 95 general practitioners) and, to a lesser extent, rigors. Certain criteria were significantly less important in making the diagnosis of influenza-like illness compared with influenza — namely,

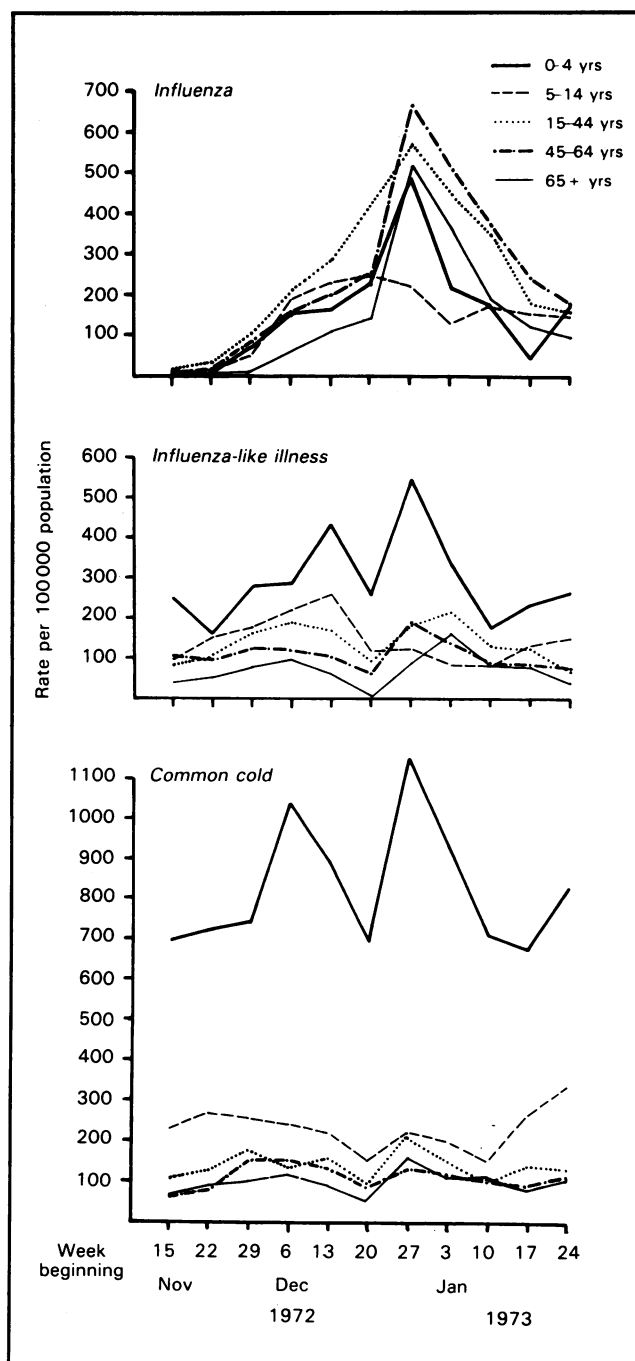


Figure 3. Weekly incidence of influenza, influenza-like illness and common cold by age group during the influenza epidemic of 1972/73.

myalgia ($P < 0.01$), rigors ($P < 0.001$) and being part of an epidemic ($P < 0.001$). For the common cold there was less overall consensus though the symptom of runny nose was deemed essential or important by 98% of general practitioners. Other criteria deemed essential or important by a substantial minority of general practitioners were runny eyes (43%), fever (36%), malaise (36%) and blocked ears (27%).

Discussion

In the general practitioner's consulting room the presenting

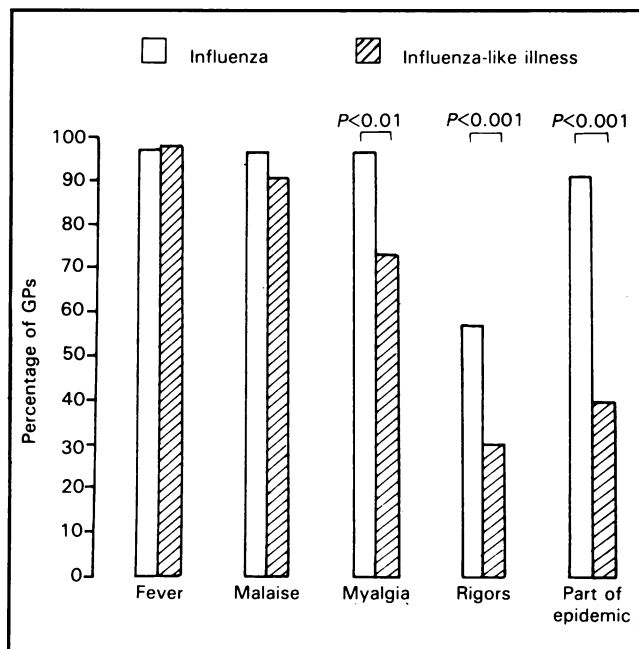


Figure 4. Percentage of general practitioners recording various symptoms as essential or important for the diagnosis of influenza and influenza-like illness ($n = 95$).

symptoms of influenza, influenza-like illness and the common cold merge into each other and it is difficult to devise guidelines whereby these might be distinguished reliably in any individual and with any aetiological or pathological meaning. Conversely, the isolation of pathogenic viruses may be associated with a variety of clinical pictures. In spite of these difficulties, a previous study has shown the distinction between these illnesses is sufficiently well and reliably made by general practitioners, as shown by the accurate recording of epidemic influenza in the weekly returns service when compared with virus isolate reports collected by the Communicable Disease Surveillance Centre.²

Although there were a small number of cases of influenza in each year, there has been no major epidemic since 1976. The data showed that influenza is truly an epidemic condition with 'waves' of illness spreading quickly through the community at substantial intervals. In the intervening years there are small regular seasonal increases. Influenza-like illness and the common cold never achieve the same epidemic characteristics but return at the same time year by year. In this context it was observed in the influenza epidemic years of 1972 and 1976 (and also 1968) that the rates for influenza-like illness bore no consistent relationship to those for influenza nor were they absolutely different from those seen in other years. The lack of such a relationship is further evidence of a discriminating process on the part of recording general practitioners.

Another feature of this study which suggests consistent discrimination in diagnoses is the contrasting incidence of influenza in the north and south regions in the two epidemic years. In 1972, influenza rates were higher in the north than the south and rates for influenza-like illness were similar, whereas in 1976 rates for influenza were higher in the south, and there was a higher incidence of influenza-like illness in the north. In the 1976 epidemic, peak incidence occurred earlier in the south and we might speculate that the illness lost virulence as it spread northwards. Recording for the common cold is similar in the north and south suggesting that this condition does not cause confusion. For influenza-like illness and the common cold, recording was less in the central region than in the other two, but in the

epidemics of influenza, incidence in the central region was intermediate between north and south. Although this does suggest a recording bias for the more minor upper respiratory tract illnesses, it also points to a clear identification of influenza. There was a reduced incidence in the central region of respiratory illnesses arbitrarily classified as minor or trivial in the third general practice morbidity study (1981–82).⁸

The incidence of influenza peaked simultaneously in all age groups but the incidence rates in both epidemics was maximal among people of working age (15–64 years), whereas for influenza-like illness and for the common cold, incidence was maximal among children. Though this provides further evidence of a discriminating diagnostic process, it is difficult to rationalize aetiological. It may be that the background incidence for upper respiratory tract infection in children is consistently so high during winter months that an additional influenza epidemic among them goes unrecognized. However, it might be suspected that the less experienced childhood immune system would 'permit' more influenza.

Analysis of the questionnaire showed that the epidemic characteristic was the most important distinction used by recording general practitioners. When influenza spreads into a practice, it arrives with dramatic onset, affecting large numbers of people within days. Furthermore, its local spread involves patients of all ages and hence we do not see any difference between peak incidence in the different age groups. It also spreads rapidly throughout the country. Influenza-like illness, which presumably embraces illnesses caused by para-influenza viruses does not exhibit the same epidemic characteristics and in practice is probably applied to less severe illness. The questionnaire did not include any questions which could be related to the severity of illness.

General practitioners' opinions were consistent about the distinction between influenza and influenza-like illness. Over 90% of general practitioners considered fever, myalgia, rigors and being part of an epidemic as essential or important. The close correlation between the weekly returns service and virus isolate data² together with this overall consistency jointly validate the weekly returns service in the clinically (and economically) important diagnoses of influenza and influenza-like illness.

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