ANNUAL REPORT
2001-2002 INFLUENZA SEASON

European Influenza Surveillance Scheme
European Influenza Surveillance Scheme

Annual Report
2001-2002 influenza season

Utrecht, December 2002

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The European Influenza Surveillance Scheme Annual Report: 2001-2002 influenza season was prepared by the EISS co-ordination staff, with the collaboration of the members of EISS.

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Table of contents

European Influenza Surveillance Scheme: participating countries and institutions 5

Abbreviations 6
Netherlands Institute for Health Services Research (NIVEL) 6

Summary 7

1 Background 8
1.1 Introduction 8
1.2 The surveillance of communicable diseases in Europe 8
1.3 EISS Project 9
1.3.1 Objectives 9
1.3.2 Membership 10
1.3.3 Methods 10
1.3.4 EISS website 10
1.3.5 EISS co-ordination centre 11
1.3.6 Funding 11

2 Influenza activity: 2001-2002 season 12
2.1 Introduction 12
2.2 Methods 12
2.3 Results 12
2.3.1 Clinical data 12
2.3.2 Virological data 16
2.4 Conclusions 18

3 EISS developments during the 2001-2002 season 20
3.1 Objectives 20
3.2 Activities 20
3.3 Conclusions 22

4 References 23

5 Appendices 24
5.1 Partners 24
5.2 Levels of influenza activity 24
5.3 Haemagglutination inhibition (HI) assays from Europe and the UK 26
5.4 EISS Publications 30
5.5 Members 31
## European Influenza Surveillance Scheme: participating countries and institutions

<table>
<thead>
<tr>
<th>Country</th>
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<th>City</th>
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See Appendix 5.5 for further details
Abbreviations

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<tr>
<th>Abbreviation</th>
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<td>Acute respiratory infection</td>
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<td>European Programme for Intervention Epidemiology Training</td>
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<td>European Union</td>
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<td>EuroGROG</td>
<td>European Groupe Régional d’Observation de la Grippe</td>
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<td>FluNet</td>
<td>Global WHO surveillance system of influenza</td>
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<td>GPs</td>
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</tr>
<tr>
<td>GROG</td>
<td>Groupes Régionaux d’Observation de la Grippe</td>
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<td>ILI</td>
<td>Influenza-like illness</td>
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<td>United Kingdom</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Netherlands Institute for Health Services Research (NIVEL)

The EISS co-ordination centre is based at NIVEL in Utrecht, the Netherlands. NIVEL is an independent, non-profit research foundation. In 2001 NIVEL had approximately 160 employees and a gross annual turnover of about 12 million Euros. NIVEL has been in charge of the Dutch sentinel surveillance system since 1970. It is a WHO Collaborating Centre for Primary Health Care and it received full ISO-9001 accreditation for its research activities in December 2001.
Summary

This report consists of three chapters: background information on the European Influenza Surveillance Scheme (EISS), an epidemiological and virological description of influenza activity during the 2001-2002 influenza season and EISS project developments during the 2001-2002 season. The 2000-2001 Annual Report had a special focus on clinical morbidity over time, the present report has a special focus on sentinel and non-sentinel virological data collected during the 2001-2002 season.

EISS has gradually grown over the years and had 18 member countries covering 20 influenza surveillance networks during the 2001-2002 influenza season. Four new members joined the scheme during the 2001-2002 influenza season: Norway, Poland, the Slovak Republic and Romania. During the 2001-2002 season, the EISS project included 26 national reference laboratories, at least 10,500 sentinel physicians and covered a total population of 438 million inhabitants.

The surveillance of influenza by the EISS members is based on an integrated clinical and virological surveillance model. Sentinel primary care physicians report cases of ILI or ARI to a data collection centre and take nose and/or throat swabs from patients for laboratory testing. All laboratory tests are performed by a national reference laboratory. The integration of clinical and virological information allows the presentation of influenza morbidity rates and virological data in the same population.

Influenza activity in Europe during the 2001-2002 influenza season was mild to moderate. Compared to historical data, the intensity was low in eight countries, medium in eleven and high in one country (Spain). Influenza activity was largely due to the influenza A(H3N2) virus. Influenza A(H1N1) viruses were isolated sporadically.

Two novel influenza virus strains were isolated during the 2001-2002 influenza season: influenza A(H1N2) viruses (mainly isolated in the United Kingdom and Ireland, but also in Belgium, France, Germany, the Netherlands, Portugal, Sweden, Switzerland and Romania) and influenza B viruses belonging to the B/Victoria/2/87 lineage (mainly isolated in Germany, but also sporadically in France, Italy, the Netherlands, Norway and Switzerland). With the exception of influenza A(H1N2) detections in England and Ireland and the influenza B belonging to the B/Victoria/2/87 lineage in Germany, these two viruses did not circulate widely in Europe and did not play an important role in influenza activity during the 2001-2002 influenza season.

An influenza B virus belonging to the B/Victoria/2/87 lineage will be included in the 2002-2003 influenza vaccine. The new influenza A(H1N2) subtype is covered by the 2002-2003 vaccine, as the haemagglutinin and neuraminidase components of the H1N2 viruses are antigenically similar to the vaccine components (H1N1 and H3N2).

EISS implemented a number of projects during the 2001-2002 influenza season, including: the creation of a new EuroGROG website, two clinical reporting quality control assessments (in Belgium and Spain); and an active participation in pandemic planning activities at a European level.

EISS collaborates with other EC-funded communicable disease surveillance networks in Europe and actively supports the global WHO FluNet influenza surveillance system.
1 Background

1.1 Introduction

Influenza is an important public health problem in the industrialised world. It is associated with increased general practice consultation rates, hospital admissions (Fleming, 2000) and excess deaths (Simonsen et al., 1997; Fleming, 2000). It must also be considered in terms of increased days lost to absence from work and school, health care planning and influenza pandemic planning.

The WHO established an international network for the surveillance of influenza in 1949 (WHO, 2000). This global surveillance system comprises over 110 national influenza centres, and influenza activity is published every week on the Internet (Flahault et al., 1998). National influenza centres in Europe have participated in this surveillance system since its creation.

The surveillance of influenza morbidity in the general population began in the 1960s in western Europe (in England and Wales) and was based on sentinel physicians reporting clinical cases of influenza to a central registry. In the early 1990s, the integration of virological information was achieved by the collection of nose and/or throat swabs from patients diagnosed with influenza (Fleming et al, 1995). The swabs were sent to national influenza reference laboratories for testing and subtyping. The integration of clinical and virological data collected in the same population is the basis of the EISS project (Fleming and Cohen, 1996; Snacken et al., 1998; Manuguerra et al., 2001).

Efforts to create a European surveillance project have been ongoing since the 1980s. The first project was the Eurosentinel scheme (1987-1991). This was followed by the ENS-CARE Influenza Early Warning Scheme (1991-1994) (Snacken et al., 1995; Fleming and Cohen, 1996), the European Influenza Early Warning and Surveillance Scheme (1995) and EISS (1996-) (Snacken et al., 1998). EISS began with the participation of seven countries: Belgium, France, Germany, the Netherlands, Portugal, Spain and the United Kingdom.

There are many reasons why influenza surveillance networks in Europe have got together to share information. Influenza is a communicable disease that spreads rapidly and efficiently; this means that it is very beneficial for countries to be informed about influenza activity in neighbouring countries (clinical morbidity and the types and strains of influenza virus that are in circulation). Other benefits of working together are that surveillance systems can learn from each other and therefore improve their current surveillance activities. Collaboration also helps the creation and development of influenza surveillance networks across the whole of Europe.

1.2 The surveillance of communicable diseases in Europe

The European Union's competence in public health has steadily increased over time. While some mention of health was present in the early treaties, going back as far as the European Coal and Steel Community (ECSC) Treaty of 1951, its first substantive appearance was in the Single European Act of 1987 (McKee & Maclehose, 2000/2001). This Act enabled the development of the Europe Against Cancer and Europe Against AIDS programmes (McKee & Maclehose, 2000/2001).
It was only in 1992, in Article 129 of the Maastricht Treaty, that a competence in the field of communicable disease was actually defined (McKee & Maclehose, 2000/2001). The Amsterdam Treaty of 1997 (Article 152) reinforced this competency and emphasised that “a high level of health protection should be ensured in the definition and implementation of all Community policies and activities” (McKee & Maclehose, 2000/2001).

The provisions of the different Treaties have enabled the development of a range of policies on communicable disease prevention and control (McKee & Maclehose, 2000/2001). In 1998, the European Parliament and the Council decided that a network for the epidemiological surveillance and control of communicable diseases should be established in the Community (2119/98/EC, 24 September 1998). On 22 December 1999, two Commission Decisions were adopted which further defined this framework.

The first Decision (2000/57/EC) concerned the terms of action for an early warning and response system: events that are potential public health threats are to be monitored and reported. The Decision describes procedures for the exchange of information, and stipulates the action to be undertaken in case of potential threats and in the case of confirmed threats to public health.

The second Decision (2000/96/EC) identifies the communicable diseases and special health issues that have to be covered by epidemiological surveillance in the “Community network”. Influenza is one of the communicable diseases listed in this Decision.

As a result of these two Decisions, a new European early warning and response system for communicable diseases was officially launched on 1 January 2000. EISS is one of the epidemiological surveillance networks that the EC funds to monitor communicable diseases in Europe. EISS is a member of the EC Network Forum, which groups together the different community surveillance projects in Europe (e.g. EuroTB, EPIET, Eurosurveillance).

1.3 The EISS project

1.3.1 Objectives

The EISS project has the following objectives:

- To collect and exchange timely information on influenza activity in Europe;
- To combine clinical and virological data in the same population;
- To identify causal viruses in the population and recognise virological changes;
- To provide standardised information of high quality;
- To strengthen, and harmonise where appropriate, epidemiological and virological methods for assessing influenza activity in Europe

1.3.2 Membership

All countries in Europe are welcome to join EISS. Full members must meet the following criteria:

- The network is nationally or regionally representative;
- The authority of the network is recognised by the national or regional health authority in the country or region;
- Clinical surveillance and virological surveillance are integrated in the same population (community);
- The network has functioned successfully for two years;
- The network can deliver data on a weekly basis.
A total of 11 EU (Belgium, Denmark, France, Germany, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom) and 7 non-EU states (the Czech Republic, Norway, Poland, Romania, Slovenia, the Slovak Republic and Switzerland) were members of EISS during the 2001-2002 influenza season. Since Scotland and Wales have their own influenza surveillance networks, there were 20 networks in EISS during this season. With the exception of the Spanish network, all networks are national; the Spanish influenza surveillance network is made up of 6 regional networks that cover 53% of the total population.

Six networks were “associate” members of EISS during the 2001-2002 season (Ireland, Norway, Poland, Romania, the Slovak Republic and Sweden), as they did not completely fit the membership criteria (Ireland because it hadn’t been in operation for two years and Norway, Poland, Romania, the Slovak Republic and Sweden because they do not yet combine clinical and virological data in the same population). The associate members report clinical and virological data on influenza to the EISS database and are included in the presentation of results where possible.

### 1.3.3 Methods

The clinical surveillance of influenza by the EISS networks is generally based on reports made by sentinel general practitioners. Some of the sentinel surveillance systems also include paediatricians (the Czech Republic, France, Germany, Italy, Romania, Slovenia, Slovak Republic, Spain, Switzerland) and physicians with other specialisations (Slovenia and Switzerland). The physicians usually represent 1-5% of physicians working in the country, community or region.

For the virological surveillance of influenza, the sentinel physicians are asked to take nose and/or throat swabs from patients with influenza-like illness or acute respiratory infection (depending on the sentinel surveillance system). The swabs are sent to a national reference laboratory and tested for influenza viruses (if positive, subtypes are determined). Laboratory tests are based on rapid diagnostic tests (immuno-enzymological or immunofluorescence) and cell cultures with specific identification. Certain laboratories also use reverse transcription polymerase chain reaction (RT-PCR) routinely as a rapid test.

In addition to the respiratory specimens obtained from sentinel practitioners, the laboratories also collect and report results on specimens obtained from other sources (e.g. from hospitals, non-sentinel physicians or institutional homes). This data is collected to better describe influenza activity across Europe, as a range of indices is used to monitor influenza activity in different countries. It also allows the validation of the virological data obtained from sentinel sources.

The clinical and virological data are collected from week 40 to week 20 of the following year. After processing and analysis by national centres, the weekly data are entered into the EISS database (see below) by Thursday of the following week.

### 1.3.4 EISS website

The EISS project involves different partners in each country: sentinel surveillance systems, national influenza reference laboratories and national communicable disease surveillance centres. These various partners are connected via Internet (www.eiss.org) (Snacken et al., 1995), which allows members to enter their data into the EISS database, to view influenza activity in the other networks and to launch detailed clinical and virological queries.
During the influenza season, a Weekly Electronic Bulletin is published on the EISS website. This Bulletin is written by four experts from the EISS group and is based on data entered into the EISS database. It provides a weekly overview of influenza activity in Europe in the form of a written commentary, a table, and graphs for each country.

1.3.5 EISS co-ordination centre

The co-ordination of the EISS project is based at the Netherlands Institute for Health Services Research (NIVEL) in Utrecht, the Netherlands. The role of the co-ordination centre is to:
- Manage the EISS website;
- Manage the EISS database;
- Co-ordinate EISS projects (e.g. harmonisation projects);
- Initiate new projects (e.g. mapping);
- Present results (e.g. write scientific articles);
- Encourage the exchange of information between EISS members;
- Exchange information with key-partners (e.g. EC and WHO);
- Represent EISS at meetings (e.g. EC meetings);
- Manage contracts (with the EC and industry);
- Organise EISS meetings twice a year;
- Write an Annual Report.

1.3.6 Funding

EISS began receiving funding from the European Commission (EC) in November 1999. It has received funding from industry since September 2000 (GlaxoSmithKline and Roche).

The EISS project uses the following formula to separate EC and industry funding:

EC projects: All projects that concern the ongoing running of the surveillance system, the EISS website, the two regular annual meetings of EISS, the harmonisation and standardisation projects (e.g. the quality control studies), and the extension of EISS to other countries in Europe, particularly Member States and applicant countries

Industry projects: All other projects (e.g. the EISS Weekly Electronic Bulletin)

In 2001 and 2002, 70-75% of the total EISS budget was funded by the EC and 25-30% by industry.

EISS has a strict “code-of-conduct” concerning the influence of industry on its activities and publications, including those on its website. Industry is not involved in the management structure of EISS (industry has an observer status at its two annual meetings) or in the preparation of EISS documents, reports and publications.
Influenza activity: 2001-2002 season

2.1 Introduction

During the 2001-2002 influenza season, the EISS project included 26 national influenza reference laboratories, at least 10,500 sentinel physicians and covered a total population of 438 million inhabitants. This chapter provides an overview of influenza activity during the 2001-2002 season and is largely based on an article published in Eurosurveillance (Paget et al., 2002).

2.2 Methods

Clinical and virological data on influenza are presented for week 40/2001 to week 15/2002. Table 1 presents the general characteristics of the different sentinel surveillance systems during the 2001-2002 influenza season. With the exception of Norway, all EISS networks reported cases of ILI or ARI per 100,000 population. The EISS methods are described in section 1.3.3.

2.3 Results

2.3.1 Clinical data

An overview of the influenza activity in the EISS networks during the 2001-2002 winter season can be found in Figure 1 and Table 2. Peak clinical morbidity rates were generally reached around week 04/2002-06/2002, with some networks in the north and east of Europe reaching these levels later in the winter (around week 11/2002). The peak levels of clinical morbidity varied considerably from one network to another, with networks reporting ILI rates ranging from 9 per 100,000 population in Wales to 1,201 per 100,000 population in the Slovak Republic. Clinical morbidity rates of ARI were generally higher and also varied considerably, from 375 per 100,000 population in Romania to 3,320 per 100,000 population in France.

The geographical spread of influenza ranged from sporadic (in six networks) to widespread (in eleven networks), whilst the intensity of the activity ranged from low (eight networks) to high (in Spain). Widespread activity of medium or high intensity was reported in Belgium, France, Germany, Italy, the Netherlands, Portugal, Romania, Spain, Sweden and Switzerland. Sporadic influenza activity of low intensity was reported in the Czech Republic, Denmark, Ireland, Scotland, Slovak Republic and Wales.
### Table 1: Summary characteristics of the sentinel surveillance systems in EISS (Aguilera et al., 2001)

<table>
<thead>
<tr>
<th>Country / network</th>
<th>Year network was started</th>
<th>Year network joined EISS</th>
<th>General practitioners</th>
<th>Paediatricians</th>
<th>Others</th>
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<td>Belgium</td>
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<td>98</td>
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<td>1240</td>
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<td>1995</td>
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<td>1964</td>
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<td>32</td>
<td>0</td>
<td>0</td>
<td>ILI</td>
<td>yes</td>
</tr>
<tr>
<td>Norway</td>
<td>1975</td>
<td>2001</td>
<td>201 practices*</td>
<td>0</td>
<td>0</td>
<td>ILI</td>
<td>yes</td>
</tr>
<tr>
<td>Poland</td>
<td>1946</td>
<td>2001</td>
<td>Not known</td>
<td>0</td>
<td>0</td>
<td>ILI</td>
<td>yes</td>
</tr>
<tr>
<td>Romania</td>
<td>1992</td>
<td>2001</td>
<td>240</td>
<td>102</td>
<td>0</td>
<td>ARI</td>
<td>yes</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>1960</td>
<td>2001</td>
<td>2121</td>
<td>1202</td>
<td>0</td>
<td>ILI</td>
<td>yes</td>
</tr>
<tr>
<td>Sweden</td>
<td>1999</td>
<td>2000</td>
<td>118</td>
<td>0</td>
<td>0</td>
<td>ILI</td>
<td>no</td>
</tr>
</tbody>
</table>

1 Many of the networks were members of pre-EISS surveillance projects in Europe – the Eurosentinel (1987-91) and ENS-CARE Influenza Early Warning System (1992-95) projects.
2 Number of physicians during the 2001-2002 influenza season.
3 ARI: acute respiratory infection; ILI: influenza-like illness.
4 Physicians working in community schools (children) and youth health services.
5 Physicians specialised in internal medicine.
* One or more GP(s) per practice.

### Table 2: Overview of influenza activity in the EISS networks during the 2001-2002 season

<table>
<thead>
<tr>
<th>Country / network</th>
<th>Peak clinical morbidity rate (per 100,000 population)</th>
<th>Week of peak clinical morbidity</th>
<th>Geographical spread (peak weekly level)</th>
<th>Intensity (peak weekly level)</th>
<th>Dominant virus type/subtype (sentinel data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>951</td>
<td>4</td>
<td>Widespread</td>
<td>Medium</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Denmark</td>
<td>235</td>
<td>12</td>
<td>Sporadic</td>
<td>Low</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>England</td>
<td>45</td>
<td>6</td>
<td>Regional</td>
<td>Low</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Ireland</td>
<td>29</td>
<td>12</td>
<td>Sporadic</td>
<td>Low</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Italy</td>
<td>688</td>
<td>5</td>
<td>Widespread</td>
<td>Medium</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>136</td>
<td>9</td>
<td>Widespread</td>
<td>Medium</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Norway</td>
<td>n.a.</td>
<td>9</td>
<td>Widespread</td>
<td>Low</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Poland</td>
<td>69</td>
<td>11</td>
<td>Local</td>
<td>Medium</td>
<td>n.a.</td>
</tr>
<tr>
<td>Portugal</td>
<td>271</td>
<td>4</td>
<td>Widespread</td>
<td>Medium</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Scotland</td>
<td>38</td>
<td>5</td>
<td>Sporadic</td>
<td>Low</td>
<td>A</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>1201</td>
<td>5</td>
<td>Sporadic</td>
<td>Low</td>
<td>B</td>
</tr>
<tr>
<td>Slovenia</td>
<td>86</td>
<td>7</td>
<td>Local</td>
<td>Medium</td>
<td>B</td>
</tr>
<tr>
<td>Spain</td>
<td>399</td>
<td>4</td>
<td>Widespread</td>
<td>High</td>
<td>A(H3N2)</td>
</tr>
<tr>
<td>Sweden</td>
<td>38</td>
<td>11</td>
<td>Widespread</td>
<td>Medium</td>
<td>n.a.</td>
</tr>
<tr>
<td>Switzerland</td>
<td>400</td>
<td>5</td>
<td>Widespread</td>
<td>Medium</td>
<td>B</td>
</tr>
<tr>
<td>Wales</td>
<td>9</td>
<td>6</td>
<td>Sporadic</td>
<td>Low</td>
<td>A</td>
</tr>
</tbody>
</table>

1 Geographical spread: See appendix 5.2.
2 Intensity: See appendix 5.2.
3 The peak clinical morbidity rate may be biased upwards as sentinel physicians in the Slovak Republic began reporting cases of ILI instead of ARI during the 2001-2002 season, some of the sentinel physicians may have continued reporting cases of ARI.
4 Physicians working in community schools (children) and youth health services.
5 Physicians specialised in internal medicine.
* One or more GP(s) per practice.
Figure 1. Clinical and virological sentinel monitoring of influenza in European member countries during the 2001-2002 influenza season

Morbidity rates for influenza-like illness (ILI: Belgium, Denmark, Great Britain, Ireland, Italy, The Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and Norway) or acute respiratory infections (ARI: Czech Republic, France, Germany and Romania) are indicated for week 40 (2001) to week 15 (2002). Isolation/detection of cases of influenza infection are indicated in the bar chart. For Great Britain, morbidity indicator graphs are provided separately for each of the British networks: England, Scotland and Wales, whereas the bar charts on detection of influenza in primary care correspond to the English network. For Norway, the morbidity data is shown by 100 consultations, as for the 2001-2002 influenza season no population denominator was available.

* The number of isolates correspond to the English sentinel network
2.3.2 Virological data

During the 2001-2002 influenza season, twelve out of twenty networks reported that influenza A(H3N2) was the dominant influenza subtype in sentinel specimens, three out of twenty (Slovenia, Slovak Republic and Switzerland) reported that it was influenza B, and one network (Germany) reported that it was both influenza A(H3N2) and influenza B (Table 2).

A total of 14,067 respiratory specimens from sentinel physicians (Table 3) were tested for influenza from the sentinel surveillance systems in EISS and 3,657 (26%) of these were positive for influenza. Of the positive specimens, 2,475 (68%) were typed as influenza A and 1,182 (32%) as influenza B. Of the 1,729 subtyped influenza A viruses, 1,585 (92%) were of the H3N2 subtype, 73 (4%) of the H1N1 subtype and 71 (4%) of the H1N2 subtype.

At least 24,733 respiratory specimens (Table 4) from non-sentinel sources were tested for influenza during the 2001-2002 influenza season (the total number is actually higher as some countries do not know the total number of respiratory samples tested and only report positive test results). A total of 4,932 non-sentinel respiratory specimens were positive for influenza. Of the positive specimens, 4,281 (87%) were typed as influenza A and 651 (13%) as influenza B. Of the 913 subtyped influenza A viruses, 716 (78%) were of the H3N2 subtype, 25 (3%) of the H1N1 subtype and 172 (19%) of the H1N2 subtype.

Two novel influenza virus strains were isolated during the 2001-2002 season: influenza A(H1N2) viruses and influenza B viruses belonging to the B/Victoria/2/87-lineage (Table 5). The influenza A(H1N2) were detected in 12 networks participating in EISS (mainly isolated in England and Ireland, but also sporadically in Belgium, France, Germany, the Netherlands, Portugal, Romania, Scotland, Sweden, Switzerland and Wales). The influenza B/Victoria/2/87-like viruses were detected in 5 networks (mainly isolated in Germany, but also sporadically in France, Italy, the Netherlands and Norway).

Overall, there were 246 detections of the novel influenza A(H1N2) virus and 119 detections of the novel influenza B/Victoria/2/87-lineage viruses reported to EISS (Table 5). The younger age groups (5-19 yr) were predominantly affected by the influenza A(H1N2) and influenza B/Victoria-like viruses (Paget et al., 2002).

The networks participating in EISS also send virus samples to Mill Hill in London for further characterization. The haemagglutination inhibition tables for H1N1 and H1N2, H3N2 and B viruses can be found in Appendix 5.3. The haemagglutinins (HAs) of both H1N1 and H1N2 viruses were antigenically similar to A/NewCaledonia/20/99 (H1N1). The HAs of the majority of H3N2 viruses were antigenically closely related to A/Panama/2007/99. The neuraminidases (NAs) of both H1N2 and H3N2 viruses were antigenically and genetically closely related to the NA of A/Moscow/10/99 (Dr Alan Hay, personal communication). Most of the H1N2 viruses were detected in the UK. The extent of variation in H1N2 viruses in the UK is illustrated by the haemagglutination inhibition assay results (see Appendix 5.3).

Influenza B viruses of both the B/Yamagata/16/88 (which were antigenically similar to B/Sichuan/379/99) and B/Victoria/2/87 lineages circulated. The HAs of the latter were closely related to the HAs of B/Shandong/7/97 and B/Hong Kong/330/01 (Dr Alan Hay, personal communication).
### Table 3: Sentinel virological data per network for the 2001-2002 influenza season*

<table>
<thead>
<tr>
<th>Network</th>
<th>N</th>
<th>N&lt;sup&gt;1&lt;/sup&gt;</th>
<th>A (%)</th>
<th>B (%)</th>
<th>Total subtyped for influenza A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>976</td>
<td>330</td>
<td>69</td>
<td>31</td>
<td>127 0 1 99</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1095</td>
<td>81</td>
<td>72</td>
<td>28</td>
<td>12 0 0 100</td>
</tr>
<tr>
<td>Denmark</td>
<td>131</td>
<td>25</td>
<td>100</td>
<td>0</td>
<td>25 0 0 100</td>
</tr>
<tr>
<td>England</td>
<td>393</td>
<td>82</td>
<td>100</td>
<td>0</td>
<td>82 0 51 49</td>
</tr>
<tr>
<td>France</td>
<td>3657</td>
<td>947</td>
<td>69</td>
<td>31</td>
<td>318 1 1 98</td>
</tr>
<tr>
<td>Germany</td>
<td>3215</td>
<td>780</td>
<td>56</td>
<td>44</td>
<td>402 0 0 100</td>
</tr>
<tr>
<td>Ireland</td>
<td>233</td>
<td>64</td>
<td>98</td>
<td>2</td>
<td>60 7 20 73</td>
</tr>
<tr>
<td>Italy</td>
<td>52</td>
<td>10</td>
<td>70</td>
<td>30</td>
<td>7 0 0 100</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>53</td>
<td>33</td>
<td>79</td>
<td>21</td>
<td>17 0 6 94</td>
</tr>
<tr>
<td>Norway</td>
<td>95</td>
<td>34</td>
<td>97</td>
<td>3</td>
<td>33 0 0 100</td>
</tr>
<tr>
<td>Poland</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a. n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Portugal</td>
<td>244</td>
<td>142</td>
<td>96</td>
<td>4</td>
<td>136 30 1 69</td>
</tr>
<tr>
<td>Romania</td>
<td>945</td>
<td>329</td>
<td>94</td>
<td>6</td>
<td>310 4 3 93</td>
</tr>
<tr>
<td>Scotland</td>
<td>478</td>
<td>40</td>
<td>98</td>
<td>2</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>304</td>
<td>13</td>
<td>100</td>
<td>0</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Slovenia</td>
<td>402</td>
<td>111</td>
<td>12</td>
<td>88</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Spain</td>
<td>1194</td>
<td>399</td>
<td>65</td>
<td>35</td>
<td>96 12 0 88</td>
</tr>
<tr>
<td>Sweden</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a. n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Switzerland</td>
<td>600</td>
<td>237</td>
<td>45</td>
<td>55</td>
<td>104 0 1 99</td>
</tr>
<tr>
<td>Wales</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a. n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Europe (N)</td>
<td>14067</td>
<td>3657</td>
<td>2475</td>
<td>1182</td>
<td>1729 73 71 1585</td>
</tr>
</tbody>
</table>

**Footnote for Table 3 and 4:**

* The frequencies are based on the EISS database downloaded on 27.8.2002 and reports to the EISS coordination centre until 27.8.2002

<sup>1</sup> Total number of respiratory specimens

<sup>2</sup> Total number of respiratory specimens tested positive for influenza A or B

<sup>3</sup> Total number of subtyped influenza A viruses

<sup>4</sup> The non-sentinel virological data for Germany are excluded from Table 4 because only isolations of A(H1N2) and B-Victoria/2/87-like viruses were reported to EISS (Table 5) and therefore no percentages could be calculated

<sup>0*</sup> Countries that do not know the exact total of respiratory specimens tested for influenza (most of them only have data on positive test results)

### Table 4: Non-sentinel virological data per network for the 2001-2002 influenza season*

<table>
<thead>
<tr>
<th>Network</th>
<th>N</th>
<th>N&lt;sup&gt;1&lt;/sup&gt;</th>
<th>A (%)</th>
<th>B (%)</th>
<th>Total subtyped for influenza A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>0*</td>
<td>515</td>
<td>91</td>
<td>9</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>39</td>
<td>4</td>
<td>100</td>
<td>0</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Denmark</td>
<td>84</td>
<td>7</td>
<td>71</td>
<td>29</td>
<td>4 0 0 100</td>
</tr>
<tr>
<td>England</td>
<td>0*</td>
<td>575</td>
<td>93</td>
<td>7</td>
<td>352 0 47 53</td>
</tr>
<tr>
<td>France</td>
<td>19430</td>
<td>1035</td>
<td>82</td>
<td>18</td>
<td>8 0 37 63</td>
</tr>
<tr>
<td>Germany&lt;sup&gt;4&lt;/sup&gt;</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a. n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Ireland</td>
<td>634</td>
<td>3</td>
<td>100</td>
<td>0</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Italy</td>
<td>1456</td>
<td>278</td>
<td>15</td>
<td>85</td>
<td>38 5 0 95</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>0*</td>
<td>315</td>
<td>89</td>
<td>11</td>
<td>246 0 0 100</td>
</tr>
<tr>
<td>Norway</td>
<td>2147</td>
<td>146</td>
<td>92</td>
<td>8</td>
<td>6 0 0 100</td>
</tr>
<tr>
<td>Poland</td>
<td>95</td>
<td>10</td>
<td>100</td>
<td>0</td>
<td>10 0 0 70</td>
</tr>
<tr>
<td>Portugal</td>
<td>353</td>
<td>164</td>
<td>99</td>
<td>1</td>
<td>162 12 0 88</td>
</tr>
<tr>
<td>Romania</td>
<td>59</td>
<td>25</td>
<td>92</td>
<td>8</td>
<td>23 0 0 100</td>
</tr>
<tr>
<td>Scotland</td>
<td>27</td>
<td>194</td>
<td>99</td>
<td>1</td>
<td>1 n.a. 100 n.a.</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a. n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Slovenia</td>
<td>134</td>
<td>15</td>
<td>20</td>
<td>80</td>
<td>0 n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Spain</td>
<td>275</td>
<td>78</td>
<td>85</td>
<td>15</td>
<td>21 0 0 100</td>
</tr>
<tr>
<td>Sweden</td>
<td>0*</td>
<td>1526</td>
<td>96</td>
<td>4</td>
<td>39 2,5 2,5 95</td>
</tr>
<tr>
<td>Switzerland</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a. n.a. n.a. n.a.</td>
</tr>
<tr>
<td>Wales</td>
<td>0*</td>
<td>42</td>
<td>93</td>
<td>7</td>
<td>3 0 67 33</td>
</tr>
<tr>
<td>Europe (N)</td>
<td>24733</td>
<td>4932</td>
<td>4281</td>
<td>651</td>
<td>913 25 172 716</td>
</tr>
</tbody>
</table>
Table 5: Number of influenza A(H1N2) and B/Victoria/2/87-like virus strains reported by network during the 2001-2002 season

<table>
<thead>
<tr>
<th>Network</th>
<th>A/H1N2 (sentinel)</th>
<th>A/H1N2 (non-sentinel)</th>
<th>B/Victoria/2/87-like (sentinel)</th>
<th>B/Victoria/2/87-like (non-sentinel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>England¹</td>
<td>42</td>
<td>165</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>France</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Germany²</td>
<td>1</td>
<td>3</td>
<td>19</td>
<td>83</td>
</tr>
<tr>
<td>Ireland</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Norway³</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Portugal</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Romania</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Scotland</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sweden</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Wales</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Europe</td>
<td>71</td>
<td>175</td>
<td>25</td>
<td>94</td>
</tr>
</tbody>
</table>

* The frequencies are based on the EISS database downloaded on 27.8.2002 and reports to the EISS co-ordination centre until 27.8.2002

¹ In England, two additional H1N2 viruses (non-sentinel) were made after week 15
² In Germany, nineteen additional reports of B/Victoria/2/87-like viruses (4 sentinel, 15 non-sentinel) were made after week 15
³ In Norway, three additional reports of B/Victoria-like viruses were made after week 15

2.4 Conclusions

In most of the EISS countries mild to moderate influenza activity was observed during the 2001-2002 season. Sporadic influenza activity of low intensity was reported in the Czech Republic, Denmark, Ireland, Scotland, Slovak Republic, and Wales. Widespread activity of medium or high intensity was reported in Belgium, France, Germany, Italy, the Netherlands, Portugal, Romania, Spain, Sweden and Switzerland. Peak clinical morbidity rates were generally reached around week 04/2002-06/2002, with some networks in the north and east of Europe reaching these levels later in the winter (around week 11/2002).

The clinical morbidity rates differed considerably between networks (Table 2), even between neighbouring countries (Paget et al., 2002). A number of factors can probably explain the differences, including: the circulation of influenza viruses in Europe, the use of different case definitions (Aguilera et al., 2001), different health care systems (e.g. the density of general practitioners) and different consultation rates for influenza associated with the need to have a medical certificate to be absent from work (Paget et al., 2002). To achieve more comparable data, the EISS group is in the process of exploring common case definitions (Aguilera et al., 2002), it will assess ways to standardize the clinical morbidity rates (e.g. for the number of days absent from work before requiring a medical certificate) and is assessing the conversion of network-specific clinical morbidity rates into a common European index of clinical influenza activity (Uphoff et al., 2000).

In most EISS countries, influenza A(H3N2) was the dominant influenza virus circulating in the population during the 2001-2002 season. In a number of countries, this virus co-circulated with influenza B (e.g. France and Germany). Influenza A(H1N1) viruses were isolated sporadically.
The virological results from sentinel sources (Table 3) revealed that there are large variations in the total number of sentinel samples collected by the networks each season. In terms of sentinel specimens collected per 100,000 population, Slovenia, Belgium, Switzerland and the Czech Republic collected the most sentinel specimens during the 2001-2002 season (data not shown). The EISS group does not have a recommendation on the number of sentinel specimens that each network should collect each week. An inventory carried out in October 2000 found that there was no common sentinel specimen collection protocol in Europe: these ranged from the existence of no protocol to recommendations on the total number of specimens each sentinel physician should collect each week (Aguilera et al., 2001).

Two novel viruses were isolated during the 2001-2002 influenza season: influenza A(H1N2) and influenza B viruses belonging to the B/Victoria/2/87 lineage. With the exception of H1N2 virus detections in England and Ireland and the influenza B viruses belonging to the B/Victoria/2/87 lineage in Germany, these two viruses did not circulate widely in Europe and did not play an important role in influenza activity during the 2001-2002 season (Paget et al., 2002).

The new A(H1N2) strain appears to have arisen by reassortment of the two currently circulating human viruses (H1N1 and H3N2) (Zambon, 2002). Because the new strain is a combination of the two influenza A components contained in the 2001-2002 and 2002-2003 season’s vaccine (H1N1 and H3N2), people who received the vaccine should have developed a good level of immunity to the new strain.

As a result of the novel detections of influenza A(H1N2) and influenza B viruses belonging to the B/Victoria/2/87 lineage, the EISS group has decided that it should collect more detailed virological information during the 2002-2003. Data on the virological strains (e.g. A/New Caledonia/2/99) circulating in Europe will be collected. This new initiative should allow a better comparison of the circulating viruses with the season’s influenza vaccine.

An influenza B virus belonging to the B/Victoria/2/87 lineage will be included in the 2002-2003 influenza vaccine. The composition of the influenza vaccine for the 2002-2003 season (Northern Hemisphere winter) was announced by the World Health Organisation in Geneva (WHO, 2002). The vaccine will contain:
- an A/New Caledonia/20/99 (H1N1)-like virus
- an A/Moscow/10/99 (H3N2)-like virus (the widely used vaccine strain is A/Panama/2007/99)
- a B/HongKong/330/2001-like virus
3 EISS developments during the 2001-2002 season

3.1 Objectives

The following specific objectives were established for the 2001-2002 influenza season.

- Integrate four new influenza surveillance networks into EISS: Norway, Poland, Romania and the Slovak Republic;
- Implement a new indicator of influenza activity;
- Publish the EISS Weekly Electronic Bulletin;
- Launch the EuroGROG website;
- Establish an automatic data transfer between the EISS and WHO FluNet;
- Implement the Denominator Project (objective: all EISS networks present influenza rates based on a population denominator);
- Implement the Clinical Reporting Quality Control Project in Belgium and Spain;
- Collaborate with the EC to prepare for a possible influenza pandemic;
- Organise EISS meetings before and after the 2001-2002 influenza season;
- Prepare a manuscript for Eurosurveillance on the epidemiology and virology of influenza activity during the 2001-2002 influenza season;
- Write an Annual Report for the 2001-2002 influenza season.

3.2 Activities

New members
The four new influenza surveillance networks (Norway, Poland, Romania, Slovak Republic) were successfully integrated into the EISS project. All four members were accepted as “associate” members and actively participated in the project during the 2001-2002 influenza season.

Implement a new indicator of influenza activity
A new indicator of influenza activity was introduced during the 2001-2002 influenza season. EISS now assesses influenza activity according to the geographical spread (a WHO indicator) and the intensity of activity (the new indicator). The new indicator compares the weekly clinical morbidity rate to historical data and indicates whether the rate is low, medium, high or very high (see Appendix 5.2 for further details).

The Weekly Electronic Bulletin
The Weekly Electronic Bulletin was modified and improved for the 2001-2002 influenza season. For example, the map was enlarged and more graphical information was provided (e.g. graphs of weekly age-specific clinical morbidity rates). Twenty-six Bulletins were published during the 2001-2002 season (from week 42/2001 to week 15/2002).

EuroGROG website
EuroGROG is the complementary influenza surveillance scheme that is based at the Institute Pasteur in Paris and covers 29-30 countries in Europe. The difference between EISS and EuroGROG is that whilst EuroGROG collects (limited) descriptive information on influenza activity from a large number of European countries, it does not collect standardised clinical and virological data derived from the same population. The new EuroGROG website and data
collection procedure is similar to EISS. When EuroGROG countries meet the EISS entrance criteria, they will be transferred from EuroGROG to EISS.

**Automatic data transfer between EISS and FluNet**

European networks participating in EISS enter their data into the EISS database every week during the influenza season (from week 40 to week 20 of the following year). Most of the networks also enter their virological data into the WHO-FluNet database. EISS would like to establish an automatic data transfer from the EISS database to FluNet, so that its members only have to enter their virological data into one database. The EISS co-ordination centre visited WHO Geneva to initiate this data transfer and then had a meeting in Paris with the FluNet group. A data transfer procedure was agreed upon and its implementation is scheduled for the 2002-2003 season.

**Denominator Project**

Five networks in the EISS project (Belgium, Denmark, France, Germany and Switzerland) presented influenza rates per 100 consultations during the 2000-2001 season, as they do not know the population covered by their sentinel physicians (in many countries this data is available in the form of patient lists as persons must be registered with a physician) (Schlaud, 1999). A methodology was agreed upon by the EISS group to estimate population denominators in these countries. The method is based on the percentage of network physicians compared to all physicians in the country. For example, if 1% of GPs in the country participate in the sentinel surveillance system, the population denominator is 1% of the total population. Performing this calculation by geographic region is recommended.

The five networks used the proposed methodology, or adapted versions of it, to estimate their weekly population denominators during the 2001-2002 influenza season. This meant that all of the EISS networks, except Norway which was a new EISS member, reported the number of cases of ILI or ARI per 100,000 population during the 2001-2002 season.

The implementation of the EISS denominator project means that it is now much easier to compare the clinical morbidity rates (see Chapter 2).

**Implement the Clinical Reporting Quality Control Project in Belgium and Spain**

The aim of this project was to develop an evaluation protocol to help standardise and harmonise clinical reporting systems in EISS. Jean-Francois Aguilera, based at PHLS in London, in collaboration with the EISS co-ordination centre, developed an evaluation protocol based on WHO and CDC guidelines. The protocol was pre-tested in England and the Netherlands during the 2000-2001 influenza season. A field evaluation of the Belgian (1 week, February 2002) and three regional surveillance systems in Spain (2 weeks, April 2002) was organised during the 2001-2002 influenza season. Evaluation reports, based on a standardised format, have been written and will be posted to the EISS website when finalised.

**Influenza pandemic planning**

The EISS group has been involved in an EU initiative to prepare for a possible influenza pandemic. In the light of these developments, EISS is preparing an enhanced influenza surveillance project which includes the creation of a Network of National Reference Laboratories for Human Influenza. It is also working on improving its integration into EC surveillance and activities.

**EISS Steering Committee**

The co-ordination centre organised the first meeting of the EISS Steering Committee in June 2002. The first meeting included Koos van der Velden (Chairman, EISS co-ordination centre), Jean-Claude Manuguerra (Institut Pasteur, Paris), John Watson (PHLS, London) and John Paget (EISS co-ordination centre). The objective is to organise regular Steering Committee
meetings, with increased members, and to professionalise the management of the EISS project.

**EISS meetings**

Two meetings are organised each year to co-ordinate the activities of EISS, one before the influenza season (September/October) and the second at the end of the season (April/May). The meetings have been organised on a regular basis since 1996 and represent an important moment to exchange information, research findings and initiate new projects.

In October 2001 the meeting was held in Utrecht, the Netherlands, and in April 2002 it was held in Dublin, Ireland.

### 3.3 Conclusions

The EISS project reached most of the objectives it set itself for the 2001-2002 influenza season. The successful launch of the EuroGROG website meant that more general information on influenza activity in 30 countries in Europe was available during the season.

A first Steering Committee meeting was held and the foundations of a more solid surveillance structure are being established. This should allow the EISS project to better deal and manage issues like: the budget, technical questions, the project's objectives, membership, funding, pandemic planning, links with the EC, WHO and industry, links with other EC-funded surveillance projects, EISS publications and reports.
4 References


European Influenza Surveillance Scheme. Annual report: 2000-2001 influenza season. Utrecht, the Netherlands: NIVEL, December 2001 [can be downloaded from the EISS website].


Zambon, MC. Shifty drifter up to no good. Lancet Infectious Diseases 2002; Vol. 2: 269-270.
5 Appendices

5.1 Partners

**European Commission**
Health & Consumer Protection Directorate-General
Luxembourg

**Industry**
GlaxoSmithKline  Roche Pharma
United Kingdom  Switzerland

**Web Service**
Quad Logic
France

EISS would like to thank the National Disease Surveillance Centre in Ireland for partly funding the April 2002 EISS meeting in Dublin, Ireland.

5.2 Levels of influenza activity

Indicators of influenza activity used in the 2001-2002 influenza season:

The levels of influenza activity in European countries reported by EISS members during the 2001-2002 influenza season are based on two assessments of influenza activity:

1. An indicator of the geographical spread of influenza in that country;
2. An indicator of the overall intensity of influenza activity in that country.

Each of these assessments is described below.

1. **Indicators of the geographical spread of influenza**:

Each network defines the geographical spread of influenza according to the definitions outlined below. The definitions are based on those used by the WHO global influenza surveillance system - FluNet

**ILI:** influenza-like illness

**ARI:** acute respiratory infection

**Country:** countries may be made of one (e.g. the Netherlands) or more regions (e.g. France (North and France South))

**Region:** the population under surveillance in a defined geographical area. Countries may be made up of one or more regions for these purposes

**No report:** no report received
No activity: reports indicate no evidence of influenza virus activity. Cases of ILI/ARI may be reported in the country but the overall level of clinical activity remains at baseline levels and influenza virus infections are not being laboratory confirmed. Cases occurring in people recently returned from other countries are excluded.

Sporadic: isolated cases of laboratory confirmed influenza infection in a region, or an outbreak in a single institution (such as a school, nursing home or other institutional setting), with clinical activity remaining at or below baseline levels. Cases occurring in people recently returned from other countries are excluded.

Local outbreak: increased ILI/ARI activity in local areas (such as a city, county or district) within a region, or outbreaks in two or more institutions within a region, with laboratory confirmed cases of influenza infection. Levels of activity in remainder of region, and other regions of the country, remain at or below baseline levels.

Regional activity*: ILI/ARI activity above baseline levels in one or more regions with a population comprising less than 50% of the country's total population, with laboratory confirmed influenza infections in the affected region(s). Levels of activity in other regions of the country remain at or below baseline levels.

* This term is not (generally) to be used in countries with a population of less than 5 million unless the country is large with geographically distinct regions.

Widespread activity: ILI/ARI activity above baseline levels in one or more regions with a population comprising 50% or more of the country's population, with laboratory confirmed influenza infections.

2. Indicators of the intensity of influenza activity:

The intensity of influenza activity is based on the overall level of influenza activity in the country. Each network assesses the intensity of activity based on the historical data at its disposal. Some networks have historical data that date back over 30 years (e.g. England and the Netherlands) and others have data that date back over shorter periods (e.g. Belgium).

Some networks can establish numeric thresholds that define the intensity of influenza activity. For example, if the level of influenza activity rises above 200 cases per 100,000 population in England (and is below 400 cases per 100,000 population), the intensity of activity is considered to be "High" ("higher than average season activity").

EISS uses the following definitions to indicate the intensity of influenza activity in each country:

Low: no influenza activity or influenza activity is at baseline level

Medium: level of influenza activity usually seen when influenza virus is circulating in the country based on historical data

High: higher than usual influenza activity compared to historical data

Very high: influenza activity is particularly severe compared to historical data.
### 5.3 Haemagglutination inhibition (HI) assays from Europe and the UK

#### Antigenic analyses of the HAs of H1N1 and H1N2 viruses from European countries

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<th>A/Beij 262/95</th>
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#### H1N1

- A/Palencia/5/02 8.1.02 < 160 640 160 640 -
- A/Madrid/RR1045/02 11.1.02 40 160 1280 160 1280 1280
- A/Barcelona/90/02 17.1.02 40 320 640 40 640 -
- A/Lisbon/4/02 14.2.02 80 80 640 80 320 640
- A/Poland/8/02 23.2.02 < 40 1280 80 1280 1280

#### H1N2

- A/Stockholm/13/02 Jan-02 40 160 640 80 640 640
- A/England/2/02 3.1.02 < 160 1280 160 1280 -
- A/Belgium/338/02 14.1.02 < 160 1280 80 1280 1280
- A/Lisbon/2/02 14.2.02 < 80 640 80 640 1280
- A/Ireland/3407/02 Mar-02 < 80 640 80 1280 1280
- A/Netherlands/352/02 Mar-02 < 80 1280 80 1280 1280
- A/Switzerland/3100/02 Mar-02 40 160 1280 160 1280 1280
- A/Lyon/807/02 4.3.02 < 80 320 80 640 1280
- A/Sachsen/32/02 5.3.02 < 160 640 80 640 1280
- A/Constanta/879/02 20.3.02 < 80 640 < 640 640
- A/Inverness/5824106/02 1.4.02 < 160 640 80 1280 1280
- A/Montpellier/1120/02 18.4.02 < 160 1280 80 640 1280

1 Source: Dr Alan Hay (WHO Influenza Centre, Mill Hill, UK)
2 < = <40
Antigenic analyses of the HAs of H3N2 viruses from European countries\(^1\)

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\(^1\) Source: Dr Alan Hay (WHO Influenza Centre, Mill Hill, UK)

\(^2\) \(\leq <40\)
### Antigenic analyses of the HAs of B viruses from European countries

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<sup>1</sup> Source: Dr Alan Hay (WHO Influenza Centre, Mill Hill, UK)
<sup>2</sup> < = <40
<sup>3</sup> Hyperimmune sheep serum (supplied by NIBSC)
Antigenic analysis of the HAs of H1N2 viruses from the UK¹

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¹ Source: Dr Maria Zambon (PHLS, London, UK)
² = <40
5.4 EISS Publications

Peer-reviewed articles (until June 2002)


Aymard M, Valette M, Lina B, Thouvenot D, the members of GROG and EISS. Surveillance and impact of influenza in Europe. Vaccine 1999; 17: S30-S41.


EISS reports (until June 2002):


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