Background paper for the working groups
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Summary and a proposal

In order to plan surveillance in a pandemic, the guidance documents developed by ECDC and WHO provide a good framework. However, they are higher level documents and the practical steps to implement a robust system that will be able to deliver the information needed to direct public health action are not yet clearly described. In addition operational documents have to take into account what we know about the pandemic strain, the initial experience in the affected countries in Europe, North America and elsewhere.

The European Union Member States as represented at the ECDC Management Board and the Swedish Presidency Meetings in Jonkoping have made it clear that they expect ECDC working with their specialists and WHO to come up with a coherent pandemic surveillance mechanism for the EU building on what is there already.

The working groups are a forum to discuss the feasibility and utility of various options and possible protocols for implementation. However at the end of the meeting there should be an agreement which surveillance activities should be done in every country and for which it is sufficient if they are only done in some countries (then preferably with common protocols to enhance the comparability of the results and the ability to combine data). It would be important to have also the commitment to share protocols and possibly also the results on a protected website between the countries (and ECDC and WHO).

In the light of the above the following initial proposal is for discussion:

For Early (Comprehensive) Assessment

All countries should report on a weekly basis (rationale and objectives in the respective sections of this document):

- Clinical/virological data (ILI/ARI sentinel surveillance with a subset sampled for virological testing):
  - As long as system functions
- Virological data:
  - To cope with increasing number of test requests a sampling strategy that allows for a representative sample of specimens to continue to come through and for important groups of specimens to be tested (e.g. severely ill (SARI), ICU, seeming clinical treatment failures, atypical presentations etc).

* It is important to note that this meeting and document does not cover evaluations of the effectiveness of, and adverse events associated with interventions pharmaceutical and non-pharmaceutical
Case-based reporting stopping reporting most cases but continuing with two small sub-samples
  - Patients with SARI (severe acute respiratory infection) in ICU, on ventilators and deaths;
  - A subsample of the whole population of laboratory confirmed cases (to be defined)

Some countries with the respective systems in place to report:
- All-cause Mortality Monitoring:
  - Coordinated by EuroMoMo
- Serological Studies
- Outbreak and Analytic Studies
- Alternative systems? (not included in working groups)
  - Google flu
  - Web-based self-reporting

Monitoring (to be reported on a weekly basis), see Annex 2:

Following the early phase in the epidemic curve where comprehensive assessment of the cases has been carried out, the surveillance activities would re-orient to a monitoring phase. The main objective of this monitoring is to provide key information for communication and for decision makers and managers to monitor and manage essential services, including the health services. Ideally, in this period of now high stress on all the public health resources, the data collected should not exceed the basic information needed for these management decisions. It is important that at least in a qualitative way the data-gathering process should be similar in all of the countries.

WHO has suggested several qualitative parameters to better characterise the situation, with five possible areas:

- **Activity:**
  - indicated by any of the following: laboratory confirmed case(s) of influenza, or evidence† of increased or unusual respiratory disease activity
- **Geographic spread:**

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† “Evidence can be based on any or all of the following: data from sentinel sites, data on school or work absenteeism related to respiratory disease, data regarding use of pharmaceuticals for symptomatic relief of respiratory disease, data from out patient department or emergency room visits for respiratory complaints, data from registrations on death due to respiratory disease, informal reports from district health authorities or health care providers, or other similar information sources.”
indicates how the activity is spread on the territory covered by the reporting site. For large countries there could be a number of reporting

♦ **Trend:**
  - Trend refers to changes in the level of respiratory disease activity compared to the previous week.

♦ **Intensity**
  - The intensity indicator is an estimate of the overall level of respiratory disease activity in the population.

♦ **Impact**
  - Impact refers to the degree of disruption of the health care infrastructure in the reporting unit due to influenza.
Background
The emergence of the pandemic virus A(H1N1)v and its early affects on Europe has highlighted a number of urgent needs for information to inform policy and practice such who is at particular risk of developing severe disease, whether there is any antiviral resistance appearing and which age-groups are most affected. Early data from the USA and Canada and the first analyses of case data have given some important insights and generated hypotheses which are summarized in ECDC’s Risk Assessment for A(H1N1)v. The World Health Organization (WHO) and ECDC have already published general pandemic guidelines: Interim Guidance on Surveillance in a Pandemic§ (WHO) and Surveillance and Studies in a Pandemic** (ECDC). These documents were prepared before the emergence of influenza A(H1N1)v. In the light of the experience gained with A(H1N1)v it is necessary to review these proposals for surveillance and monitoring.

Aim of the working groups
The aim of the working groups is to provide a discussion forum for Member States that have already established the described types of surveillance or are in the process/planning stage of doing so. At the end of the meeting there should be an agreement which surveillance activities should be done in every country and for which it is sufficient if they are only done in some countries (then preferably with common protocols to enhance the comparability of the results). It would be good to have also the commitment to share protocols and possibly also the results on a protected website between the countries.

Scope: The scope of this document is what ECDC and WHO call Early Assessment†† and Monitoring. It mentions but does not go into any detail on the later Studies (see Annex 1, table 5) apart from serological surveillance. It also mentions but does not go into modeling studies though some of the data from this will go into mathematical modeling work at National and EU levels.

Proposed EU Systems
Drawing on the WHO and ECDC Documents in the light of the features to date of the Pandemic 2009/10 it is initially possible to identify a number of systems

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† ECDC Risk Assessment for A(H1N1)v - updated

§ WHO (2009b) Global surveillance during an influenza pandemic Draft April 2009

** ECDC Surveillance and studies in a pandemic May 2009

†† WHO refers to this as Early Comprehensive Assessment
operating at the EU level or across enough countries that could be used to assess and monitor the pandemic and these are listed below.

♦ Virological surveillance

♦ ILI/ARI sentinel surveillance

♦ Individual case reporting – death and severe disease

♦ Outbreak studies

♦ Mortality monitoring

♦ Serological studies

This list is not exhaustive but should serve as the starting point for these discussions.
Virological surveillance

**SSiaP Strategic Parameter to be addressed**
No 1. Identify and monitor changing phenotypic / genotypic characteristics of the pandemic strain in Europe including antiviral resistance and pathogenicity markers

**ECDC lead and support** Andrea Ammon and Rene Snacken, CNRL

**Objectives**
♦ Monitor the circulating influenza viruses
♦ Detecting emerging antiviral resistance especially in persons who have not been exposed to antivirals (primary resistance)
♦ Determining for new isolates antigenic similarity to candidate A(H1N1)v vaccines stains and those strains already circulating in Europe
♦ Detecting the emergence of strains with pathogenicity markers

**Who undertaking in Europe**
All Member States through WHO Global Influenza Surveillance Network supported by the Global Influenza Surveillance Network

**Who beyond Europe**
All Member States with National Influenza Centres

**Initial workplan**
♦ Production of routine outputs for Europe on antiviral resistance
♦ Production of routine outputs for Europe on relevant antigenic characteristics including
♦ Alerting of European Competent Bodies to new developments
♦ Contributing to Threat and Risk Assessments
♦ Support for ILI/ARI activities
♦ Quality control and expert advice for serological work

**Anticipated problems and issues**
♦ With increasing number of test requests and as countries or regions switch to syndromic diagnosis need for a sampling strategy that allows for a representative sample of specimens to continue to come through and for important groups of specimens to be tested (e.g. seeming clinical treatment failures, atypical presentations etc).
♦ Communication with the national surveillance authorities and ECDC who do not necessarily see GISN communications
ILI/ARI sentinel surveillance

**SSiaP Strategic Parameter addressed**
3. Confirm / determine case definition and its predictive value,
4. Give estimates of incidence by age-group or other risk parameters,

**Monitoring**

**ECDC lead and support**
Flaviu Plata, Phillip Zucs, Bruno Ciancio

**Objectives**
♦ Main objective: Estimate the ILI/ARI in the population.
♦ Specific objectives: Evaluate the resilience of sentinel networks.
  Increase comparability of data.

**Who undertaking in Europe**
All countries in EU have sentinel surveillance networks. However the data reported varies widely.

The following countries report ILI as main variable: Austria, Belgium, Cyprus, Denmark, UK(England), Estonia, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, UK(Northern Ireland), Norway, Poland, Portugal, Romania, UK(Scotland), Slovakia, Slovenia, Spain, Sweden, UK(Wales).

The following countries report ARI as main variable Bulgaria, Czech Republic, Finland, France, Germany, Latvia.

The following countries report ILI as main variable and also ARI: Belgium, UK(England), Estonia, Lithuania, Luxembourg, Romania, Slovakia, and Slovenia.

The following countries report ARI as main variable and also ILI Bulgaria, Czech Republic, Latvia.

The way rates are calculated varies again in some countries there are population based reports and in other countries encounter based. The percent of the population covered by the sentinel sites is different.

To be more descriptive ILI and ARI should be reported stratified on age groups.
The following countries report age group ILI/ARI: Austria, Belgium, Czech Republic, Denmark, UK(England), Ireland, Malta, Netherlands, Northern Ireland, Norway, Poland, Portugal, Romania, UK(Scotland), Slovakia, Slovenia, Spain, Sweden, UK(Wales). The current age groups are 0 – 4, 5 – 14, 15 – 64, +65.
**Who beyond Europe**
Most countries have an ILI/ARI surveillance system.

**Initial workplan**
- Identify whether countries plan to change the way influenza surveillance is done during the pandemic.
- Identify the indicators to be assessed in order to determine the resilience of a surveillance network.
- Determine a baseline definition and a method to calculate the baseline.

**Anticipated problems and issues**
- Define a method for the evaluation of the resilience of each individual network.
- Implementing EU legal case definitions.
- Ensure comparability of data between countries.
- Ensure representativeness of collected data.
- Define a largely accepted method to determine a baseline.
- Look for alternative solutions for surveillance if the sentinel network gets overwhelmed or if the consultation policy changes and influenza patients are diverted from the GP.
Individual case reporting and analysis

SSiap Strategic Parameter Priorities to be addressed

2. Broad estimate of severity of the pandemic including are-related mortality
4. Give estimates of incidence and by age-group or other risk parameters – especially for the more severe cases
5. Define pattern of disease for the pandemic strain and so define the clinical case definition
7. Determine if the modes of transmission conform to usual

ECDC lead and support
Lead: SUN: Isabelle Devaux, Andrew Amato, Support: SAU: Mika Salminen, PRU: Thomas Mollet, EWRS project

Objectives
The main objective of the surveillance is to provide data for analysis of the development of the epidemic to be able to appropriately guide and support the response taken by the Commission and Member States.

The primary objectives address the natural history of the epidemic and describe the timeline, populations affected, disease spectrum and burden of the New Influenza Virus A(H1N1)v outbreak within the European Union and the greater EEA area. The primary objectives also aim to describe the epidemiology of the disease regionally, to be able to monitor the appearance of the disease in different parts of the region.

The primary objectives of the ECDC coordinated case based surveillance are:
♦ To monitor and describe the evolution of the epidemic in Europe
  o Variables: Time, place, population, laboratory results
♦ To monitor and describe the evolution of disease presentation
  o Symptoms at onset of disease
♦ To monitor and describe morbidity and mortality due to the epidemic
  o Complications, death, hospitalization (possibly replaced by a severity index, which will address the overrepresentation of mild cases who are nevertheless hospitalized in early phases of the epidemic)
♦ To identify risk factors for infection, severe disease and death
  o Predisposing factors, age, gender, occupation
♦ To identify (and compare) protective factors against severe disease and death
  o Post-(and pre?)exposure antiviral prophylaxis, antiviral treatment
♦ To estimate attack rate
In defined timeframes and populations (the estimate on attack rate
will only be possible to perform after each wave of the epidemic
has passed)

**Secondary objectives**
- To monitor quality of data
- To monitor the timeliness of reporting
- To estimate coverage of use of prophylactic measures among those who
  become infected

**Who undertaking in Europe**
Member States, ECDC, WHO

**Initial workplan**
- Review current individual case reporting
  - List of variables => are they appropriate and feasible?
  - Outputs (weekly reports) => are they providing the necessary
    information to base decisions on?
- Develop contingency plan e.g. only patients of intensive care units (ICU),
  patients on ventilators, deceased patients

**Anticipated problems and issues**
As case numbers escalate, the burden of case-based reporting increases on the
Member States.

A contingency plan for individual case reporting for a selected sample (see initial
workplan) of the population or special groups with the appropriate set of
variables will need to be developed.
Severe Acute Respiratory Infection (SARI) surveillance

For practical reasons, SARI surveillance should focus on hospitalised cases of ARI. Subgroups of interest are ARI cases with bacterial superinfection, cases admitted to intensive care (ICU) or cases under mechanical ventilation.

SSiap Strategic Parameter addressed
2. Broad estimate of severity of the pandemic including age-related mortality;
5. Give estimates of disease and especially severe disease by age-group or other risk parameters (e.g. those with chronic conditions, pregnant women).

ECDC feed and support
Phillip Zucs.

Objectives
♦ To monitor the burden of severe pandemic influenza and to allocate resources accordingly;
♦ To identify risk groups for severe pandemic influenza and to target preventive measures accordingly;
♦ To monitor the impact of antiviral treatment and vaccination.

Who undertaking in Europe
(list not exhaustive)
♦ England: Virological monitoring of all patients admitted to acute hospital trusts with severe respiratory illness; denominator: population of England; output: incidence of hospital admissions due to respiratory disease with H1N1swl infection (http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1243467944074)
♦ Netherlands: Aiming to extract data from sentinel GP’s databases on whether or not these patients were referred to a hospital; working on extending the network and having these data available on a daily basis (personal communication, Marianne van der Sande)
♦ Ireland: Hospital surveillance comprising weekly data on total admissions, total Emergency Department admissions and total respiratory admissions (upper respiratory tract infection, lower respiratory tract infection, pneumonia, asthma, chronic bronchitis, and exacerbations of chronic obstructive pulmonary disease) from 9 sentinel hospitals. This system is being strengthened at present, and will serve as the means for measuring age-specific hospitalisation rates for influenza during the pandemic
France: Oscour network: 50 sentinel hospital emergency departments reporting daily numbers of patients with ICD10 codes J10 (influenza due to identified influenza virus) or J11 (influenza, virus not identified); data collected include a severity score (http://www.invs.sante.fr/surveillance/grippe_dossier/surveillance_grippe_saisonniere.htm).

Romania: Age-specific numbers of admissions with ILI, ARI and pneumonia from 21 sentinel hospitals; aggregate total numbers of cases and hospitalisations due to ILI, ARI and pneumonia at district level; nasopharyngeal swabs from severe cases for virological testing (presentation at annual meeting, U:\Meetings and visits\Meetings 2009\2009-06-02--03 ANNUAL FLU Meeting\presentations)

Who beyond Europe
United States: Emerging Infections Program (EIP); surveillance for laboratory-confirmed influenza related hospitalizations in children and adults in 60 counties covering 12 metropolitan areas of 10 states; EIP estimated hospitalization rates are reported weekly. New Vaccine Surveillance Network (NVSN); provides population-based estimates of laboratory-confirmed influenza hospitalization rates for children less than 5 years old residing in three counties; NVSN estimated rates are reported weekly. (http://www.cdc.gov/flu/weekly/fluactivity.htm and presentation at annual meeting, U:\Meetings and visits\Meetings 2009\2009-06-02--03 ANNUAL FLU Meeting\presentations)

Initial workplan
Use the SSiap meeting to “survey” the state of SARI surveillance in MS. Questions to ask:
- Do MS see the need for collecting SARI data at European level?
- Do MS that already have a SARI surveillance system in place see a need for harmonisation in order to enable monitoring at European level?
- Are there MS that would like to implement SARI surveillance and would find an ECDC mockup protocol helpful?

Anticipated problems and issues
- Some countries might not be interested in European dimension of SARI monitoring; systems in place will be fairly heterogeneous and data/outputs difficult to harmonise;
- Some countries might need all their resources for regular morbidity and mortality monitoring and might prefer the easy way of leaving SARI monitoring to MS that have their systems already up and running;
- Methodological issues
- very unclear etiology in the absence of testing, but testing all patients with SARI may become impossible;
- denominator difficult to define (hospital catchment population) or unknown (number of A(H1N1)v infections);
- hospitalisation “threshold” may vary between countries due to cultural differences, and SARI data may therefore not be easily comparable across borders.
Outbreak investigations

Outbreak investigation – in particular: Clinical course and risk factors for severe course and death following infection with influenza virus A(H1N1)v infection

SSiap Strategic Parameter addressed
2. Broad estimate of severity of the pandemic including are-related mortality;
3. Confirm / determine case definition and its predictive value
4. Give estimates of incidence by age-group or other risk parameters
6. Define pattern of disease for the pandemic strain including asymptomatics and mild infections
7. Determine if the modes of transmission conform to usual
8. Determine key parameters for modelling - reproductive number, serial interval,

ECDC lead and support
Coordinated by ECDC (Viviane Bremer and René Snacken)

Objectives
To identify timely patients at risk of complications

Who undertaking in Europe
Member States and university groups

Who beyond Europe
WHO

Initial work plan
♦ Determining what work is underway or planned
♦ What are the approaches used in the countries?
♦ Obtain consensus among MS on the use of the outbreak investigation protocol, determining whether since all MS should use one standard questionnaire
♦ Agreeing on sharing protocols and combining data
♦ Cross-country learning through share-point and regular communications
♦ EPIET seminar

Anticipated problems and issues
Need for standardization and reliable serology
The study, especially retrospective cohort study needs a certain number of deaths and severe courses
Dedicated manpower in the Member States
Monitoring of overall mortality in EU

**SSiap Strategic Parameter Priorities to be addressed**

2. Broad estimate of severity of the pandemic including are-related mortality

**Lead and support:** Anne Mazick (ECDC contact Piotr Kramarz)

**Objectives:**
The objective of EURO-MOMO (European monitoring of excess mortality for public health action) is to develop and operate a coordinated approach to real-time mortality monitoring across Europe. This will enhance the European capacity to assess and manage serious public health risks such as pandemic influenza and potentially other emerging infections as well as environmental conditions with an impact on public health, e.g., heat waves and cold snaps. 2009 is the second year of the 36 months project. The project budget is around 2 million Euro, mostly costs of staff and travel to meetings. The project has 8 work packages coordinated by a Coordination Team with all WP leaders, which convenes annually with regular teleconferences in between. See project website for more details: [http://www.euromomo.eu/](http://www.euromomo.eu/)

**Who undertaking**
EURO-MOMO project coordinated by the Statens Serum Institute.

**Initial workplan**
In view of the current influenza A(H1N1)v situation selected EURO-MOMO members are implementing an emergency EuroMOMO system, using a simple common MOMO algorithm for countries to apply to their weekly mortality data.

a. Data analysis would be run nationally and countries would transfer their national outputs to Statens Serum Instiut who will coordinate the European output in form of a weekly European bulletin including indicators presented as graphs, maps and tables available to target stakeholders, e.g. ECDC, WHO Euro to enable European risk assessment (e.g. with z-scores of weekly excess deaths) and available on Friday lunchtime for the previous week. That should help make mortality data comparable across Europe.

b. A package will be developed containing data input specifications, a simple model, output specifications and a standard reporting template.

c. The system will start very simple, and can then become more detailed underway.

d. System will start in Demark, Ireland, Spain, France, Belgium and in any country that is interested and ready. Thereafter, countries can join anytime if they wish.
e. For the "emergency" system a Serfling based regression algorithm to model weekly excess of all-cause death will be used. The output specifications are more complicated because of reporting delay, a simple method to adjust for this delay is proposed, it will need to be tested if it works for all countries.
f. The algorithm will be provided in the first instance in the software packages: Stata. Once the system has been evaluated and runs stable the package will be made available in other languages as well (SAS, R, SPSS).
g. Age categories will include <1, 1-4, 5-14, 15-44, 45-64, 65-74, 75-84, >85 and the ILI/ARI surveillance age groups: 0-4, 5-14, 15-64, 65+)

**Anticipated problems and issues:**
- Potential "false signals",
- Increases of mortality monitoring related to reporting,
- Interpretation of excess mortality estimates in the presence of multiple concurrent risks, e.g. heatwave and pandemic, etc.
Serological studies

SSiap Strategic Parameter Priorities to be addressed
10. Serological determination of who was infected in the first wave
-> Inform preparedness for second and subsequent waves and targeting vaccines

ECDC lead and support
Lead: SAU Mika Salminen., Support: SAU: VPD, Influenza DSP, SUN: Andrew Amato, CNRL

Objectives
The aim of serological studies will mainly be to look for evidence for pre-existing immunity in representative existing population serum banks (for vaccine priorisation studies) and to later do studies on true attack rates in different stages of the epidemic.

1. Estimation of possible pre-existing immunity
2. Estimation the degree of asymptomatic infection in populations
3. Estimation of infection rates in different waves
4. To investigate for possible cross reactivity between seasonal H1N1 and H1N1v immune responses and/or protective effect

Technical questions
1. If planning serological studies, which tests are to be used? Is laboratory work done locally or could it be considered for outsourcing?
2. Population studies for estimation of evidence for pre-existing immunity to A(H1N1)v or cross-reactivity due to seasonal influenza virus infection in different age groups?
   - if so, will these be
     a) prospective
     - if so, would you be willing to share the sampling strategies and protocols with the ECDC and other Member States
     b) retrospective
     - if so, which types of existing serum banks are you planned to be used, and what is their composition (in regard to sampling times, age brackets and sex)
3. Estimation of serological evidence for subclinical A(H1N1) cases in exposed populations (both in populations that received pre-exposure or post-exposure prophylaxis and those who did not)?
   - if so, would you be willing to share the sampling strategies and protocols with the ECDC and other Member States
4. Population studies on attack (infection) rates in different waves of the epidemic?
- if so, would you be willing to share the sampling strategies and protocols with the ECDC and other Member States

**Who undertaking in Europe**
Member States, currently reviewed

**Who is undertaking outside Europe**
CDC USA

**Anticipated problems and issues**
Availability of tests with high capacity, quality control and data comparability, funding
Annex 1: Tables 4 and 5 from ECDC surveillance and studies in a pandemic May 2009

Table 4 - Early assessment

<table>
<thead>
<tr>
<th>Strategic Parameter</th>
<th>Rationale for determining - the Actions that follow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify and monitor changing phenotypic / genotypic characteristics of the pandemic strain in Europe including antiviral resistance and pathogenicity markers</td>
<td>Provide timely and representative virological input data to WHO Developing a specific pandemic vaccine Deployment of human avian influenza vaccine (if A/H5 type). Determining is any current vaccines would be useful Determine antiviral resistance pattern to direct initial recommendations on use of antivirals Determine if likely to be higher level virulence to prepare clinicians</td>
</tr>
<tr>
<td>2. Broad estimate of severity of the pandemic including are-related mortality</td>
<td>Determining the limits of public health actions that are justified</td>
</tr>
<tr>
<td>3. Confirm / determine case definition and its predictive value</td>
<td>Confirm or refine default case definition for offering testing / treatment (antivirals) To determine when laboratories can reduce the amount of confirmatory testing of cases</td>
</tr>
<tr>
<td>4. Give estimates of incidence by age-group or other risk parameters</td>
<td>Target interventions and refine countermeasures e.g. towards children</td>
</tr>
<tr>
<td>5. Give estimates of disease and especially severe disease by age-group or other risk parameters (e.g. those with chronic conditions, pregnant women)</td>
<td>Target interventions and refine countermeasures e.g. who to give antivirals and human avian influenza and specific pandemic vaccines</td>
</tr>
<tr>
<td>6. Define pattern of disease for the pandemic strain and so define the clinical case definition</td>
<td>Confirm or refine the default influenza case definition and determine the symptoms that should trigger initial testing and / or offering antivirals Determine when laboratories can reduce the amount of confirmatory testing of cases</td>
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<tr>
<td><strong>7.</strong> Determine if the modes of transmission conform to usual</td>
<td>Confirm or refine default control measures</td>
</tr>
<tr>
<td><strong>8.</strong> Determine key parameters for modelling - reproductive number, serial interval,</td>
<td>Modelling of current and near future case numbers for resource management (<em>Now-casting and forecasting</em>)</td>
</tr>
<tr>
<td><strong>9.</strong> Monitoring of bacterial superinfection – bacterial type and resistance</td>
<td>Refine antibiotic recommendations Maybe limit the emergence of antimicrobial resistance</td>
</tr>
</tbody>
</table>

**Table 5 - Later studies and surveillance**

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<table>
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>10.</strong> Serological determination of who was infected in the first wave</td>
<td>Inform preparedness for second and subsequent was and targeting vaccines</td>
<td></td>
</tr>
<tr>
<td><strong>11.</strong> Estimate Antiviral effectiveness</td>
<td>Decide on or refine recommended use of antivirals for treatment Estimate the impact at population level (effect on transmissibility) and refine use for prophylaxis and early treatment</td>
<td></td>
</tr>
<tr>
<td><strong>12.</strong> Estimate Vaccine effectiveness</td>
<td>Decide on or refine recommendations for use of vaccine. To trigger further investigations on pandemic vaccine (improve composition, adjuvants, boosters)</td>
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</tr>
<tr>
<td><strong>13.</strong> Monitor/Study Antiviral safety investigate and evaluate initial concerns</td>
<td>Proper investigation of credible adverse effects Decide on recommendations for antivirals To respond to possible safety concerns and minimise their impact on treatment programmes</td>
<td></td>
</tr>
<tr>
<td><strong>14.</strong> Monitor/Study Vaccine safety and investigate and evaluate initial concerns</td>
<td>To deal properly with possible safety concerns and avoid these adversely affecting immunisation campaigns Proper investigation of credible adverse effects To decide on or refine recommendations for use of vaccine</td>
<td></td>
</tr>
</tbody>
</table>
Annex 2: Suggested data requirements for international monitoring

Data to be reported by all countries on a weekly basis

- **Activity**: can be indicated by any of the following: laboratory confirmed case(s) of influenza, or evidence\(^\text{‡‡}\) of increased or unusual respiratory disease activity
  - Yes, No, No information available for this week
- **Geographic spread** indicates how the activity is spread on the territory covered by the reporting site. For large countries there could be a number of reporting sites. Geographic spread as categorized below:
  - Localized: limited to one area of the country only
  - Regional: appearing in multiple areas representing less than half of the area of the country
  - Widespread: appearing in multiple areas representing more than half of the area of the country
  - No information available: no information available for the previous 1 week period
- **Trend** refers to changes in the level of respiratory disease activity compared to the previous week.
  - Increasing: evidence that the level of respiratory disease activity in the country is increasing compared to the previous week
  - Unchanged: evidence that the level of respiratory disease activity in the country is unchanged compared to the previous week
  - Decreasing: evidence that the level of respiratory disease activity in the country is decreasing compared to the previous week
  - No information available
- **Intensity** The intensity indicator is an estimate of the overall level of respiratory disease activity in the population.
  - Low or moderate: normal or slightly increased observation of population affected by respiratory illness
  - High: a large proportion of the population is currently affected by respiratory illness
  - No information available
- **Impact** Impact refers to the degree of disruption of the health care infrastructure in the reporting unit due to influenza.

\(^{‡‡}\) "Evidence can be based on any or all of the following: data from sentinel sites, data on school or work absenteeism related to respiratory disease, data regarding use of pharmaceuticals for symptomatic relief of respiratory disease, data from outpatient department or emergency room visits for respiratory complaints, data from registrations on death due to respiratory disease, informal reports from district health authorities or health care providers, or other similar information sources."
- Low: demands on health care infrastructure are not above usual levels. Moderate: demands on health care infrastructure are causing some stress to system above usual levels but still below maximum capacity. Severe: demands on health care infrastructure exceeding capacity to provide care. No information available.

**Data to be reported by countries with formal surveillance systems**

- Data from Influenza Like Illness (ILI) - sentinel sites or outpatient visits
  - Number of ILI cases reported in the last 1 week period by age group
  - Number of total outpatient visits for all causes
  - Number of reporting sites

- Data on mortality
  - Number of deaths related to acute respiratory disease by age group
  - Population covered

- Data from Severe Acute Respiratory Illness (SARI) - sentinel surveillance sites or inpatient facilities.
  - Number of new SARI cases admitted in the last 1 week period by age group
  - Number of total admissions (from same facilities as number of SARI cases reported)
  - Number of SARI-related deaths by age
  - Number of SARI sentinel sites reporting

**Data from National Influenza Centres (NICs) or reporting laboratories**