DOCUMENT A

MALAYSIA INFLUENZA SURVEILLANCE SYSTEM (M.I.S.S)

CLINICAL
&
LABORATORY SURVEILLANCE

Coordinated by:

Communicable Disease Surveillance Section,
Disease Control Division
MINISTRY OF HEALTH MALAYSIA

September2004

EDITORIAL BOARD

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1.0 INTRODUCTION

1.1 Background

Malaysia is an equatorial country with a population of over 23 millions. It is made up of Peninsular Malaysia and East Malaysia which are separated by the South China Sea. The states of Sabah and Sarawak are located in the East. There is logistic problem in accessing laboratory support because of the separation in East Malaysia.

Malaysia has 15 states. Each state is further divided into districts. There are 131 districts in Malaysia with their own district health office (DHO). The DHO is answerable to the state health department (SHD) which is located in the capital of each state. The SHD reports to the Ministry of Health (MOH) at central level.

Influenza virus surveillance in Malaysia started with the setting up of two WHO collaborating centres at different time. They are Institute for Medical Research (IMR) and University Malaya Medical Centre (UMMC). They are linked to FluNet separately. The number of clinical specimens tested for influenza virus are around 30 samples per month in each laboratory. The specimens are taken from patients attending participating private clinics and patients of UMMC. Therefore the surveillance is confined to these patients coming from an area around the Klang Valley in the central part of the Peninsular Malaysia. The data does not provide a comprehensive picture of the predominant circulating strain of the influenza virus in Malaysia at any one time.

It is therefore necessary to expand virological surveillance to all parts of the country. It will involve more sentinel sites for clinical samples collection in order to obtain better yield. For logistic & laboratory support purposes, more laboratories need to be selected to be part of the laboratories to do influenza diagnostic testing, necessitating capability and capacity building of the laboratories to cater for the extra workload.

1.2 Existing influenza surveillance system

Influenza-like illness (ILI) surveillance was started in September 2003 following an influenza outbreak involving a few boarding schools in the same year. The surveillance system was enhanced in December following an avian flu outbreak in the south-east Asia region. The trend of ILI consultation does not exceed the action threshold which is taken arbitrarily as 1 percent. In few instances there were small peaks exceeding the alert threshold at the national level. However local monitoring i.e. at state and district levels did not show any obvious increase.

Presently, ILI data are collected from government outpatient departments. Sixty eigt percent of 868 clinics take part in this surveillance. The system collected number / consultation rate of ILI cases in the health clinics by age group. All states send their ILI returns monthly after analyzing the data at their levels (appendix 1). However system does not include the private clinics and hospitals.

There is a need to collect ILI data from private clinics especially in the big cities; as they are the main clinics visited by the city population. The users are usually those who could afford the higher clinic bills and are more likely to make trips overseas. It is speculated that seasonal increase in influenza in Malaysia are due to influenza infections brought back by infected people from temperate countries during winter months. As such it is planned to include these clinics in our ILI surveillance system.

Another source of data for influenza is the inpatient data which can be access through the Medical Sub-system of the Health Management Information System (HMIS). However the diagnosis of influenza cannot be ascertained from the aggregated data records of HMIS; whether it is clinically diagnosed or laboratory confirmed cases. The HMIS is also the source or data of any complications of influenza infection which could be utilised further in our disease burden analysis.

Ministry Of Health (MOH) Malaysia has limited data on virological and clinical surveillance of influenza. It is based on cumulative data that were submitted monthly by two laboratories.. In addition if there is an outbreak, the field officers in the states and districts are to investigate the outbreaks and report to the central level.

At present there is only two NIC, the IMR and UMMC. IMR receives specimens from 16 sentinel private clinics in Klang Valley (central part of Kuala Lumpur) and the Paediatric Institute of Kuala Lumpur Hospital; meanwhile UMMC receives specimens from their outpatient clinics and inpatients only (appendix 1).

Veterinary Services Department (DVS) is also actively monitoring the influenza activity in migratory birds and in poultry rearing for livestock market into the country. There is an established network between MOH and DVS which is usually enhanced and activated whenever there is a zoonotic infection globally or locally. This system has been tested and proved to be intact during the recent avian influenza outbreak in Kelantan.

Hence we need to improve the capacity and capability of these identified laboratories, in terms of infrastructures, human and financial resources in order to expand and enhance / strengthen the surveillance of influenza.

2.0 OBJECTIVES

1. To strengthen the influenza surveillance mechanisms in the country in order to provide forewarning of outbreaks and emergence of novel influenza virus.
2. To expand the laboratory surveillance of influenza for confirmation of ILI and use it to estimate the proportion of these cases that are due to influenza.
3. To provide viral isolation to WHO Influenza Reference Laboratory for antigenic analysis to detect new strains and for vaccine formulation.
4. To firm up national vaccine policy based on the local circulating influenza virus.

3.0 METHODOLOGY

3.1 Epidemiological surveillance for influenza

3.1.1 Surveillance sites

Clinical surveillance of ILI involving sentinel sites selected from:

- **government outpatient clinics**

  There are 868 outpatient clinics. These clinics are managed by doctors with the assistance of paramedics. In cities and towns, the ILI cases are managed by the doctors. However in the rural and isolated places, ILI cases are seen by the paramedics i.e. medical assistants who are trained to manage minor ailments.

  The state will select clinics to participate in the surveillance: 2 health centre per district.

  The clinics selected should
  - have good coverage of the population – socio-demographically.
  - have at least 200 clinic attendances per day. In districts with less than 200, a clinic with the highest attendance will be selected.
  - be clinics preferably with history of influenza outbreak.
  - have Medical and Health Officer (MNHO) posted to the clinic.

- **inpatients of government hospitals**

  Patients admitted to all government hospitals with the diagnosis of influenza or have complications secondary to influenza infection must be reported to the Public Health Unit of the hospitals.

- **two private outpatient clinics in each state**

  Private clinics are the main clinics visited by the city people. The users are usually those who could afford the clinic bills. They are more likely to make overseas trips and might be the source of an influenza epidemic.

  Two clinics should be selected by the SHD; one preferably a Paediatric Clinic and the other, a general clinic. The clinics are chosen based on
  - substantial number of attendances representing the target population.
  - willingness to co-operate.

- one private hospital in each state

The hospital is to monitor those coming with influenza and with complications of influenza infection.

Hospital selected must be based on

- substantial number of clinic attendances representing the target population.
- willingness to co-operate.

The expected number of sentinel sites for epidemiological surveillance of ILI is 246 sites.

STATE	GOVT. CLINICS – sentinel sites	PRIVATE CLINIC	PRIVATE HOSPITAL	TOTAL
Perlis	2	1	1	4
Kedah	22	1	1	24
Penang	10	1	1	12
Perak	18	1	1	20
Selangor	18	1	1	20
Kuala Lumpur	2 + 1	16	1	20
Negeri Sembilan	14	1	1	16
Melaka	6	1	1	8
Johor	16	1	1	18
Pahang	22	1	1	24
Terengganu	14	1	1	16
Kelantan	20	1	1	22
Sabah	16	1	1	18
Sarawak	18	1	1	20
Labuan	2	1	1	4
TOTAL	**201**	**30**	**15**	**246**

3.1.2 Case definition

The diagnosis of ILI cases as per case definition below:

ABRUPT ONSET of high grade fever (axilla > 38 ^{o}C or oral > 38.5 ^{o}C) with dry cough within 48 hours **AND** with any of the following symptoms;

- Nasal congestion / blockage
- Sore throat / irritation
- Myalgia
- Convulsion (infants)
- Vomiting (infants)

3.1.3 Duration of surveillance

Surveillance is carried out throughout the year as there is no clear seasonality pattern seen as yet from analysis of the limited data available.

3.1.4 Data Collection.

Data are collected using the format in appendix 2. The flow of data is as in figure 1 below. It is the responsibility of the State Epidemiologist and District Health Officer to analyse the data.

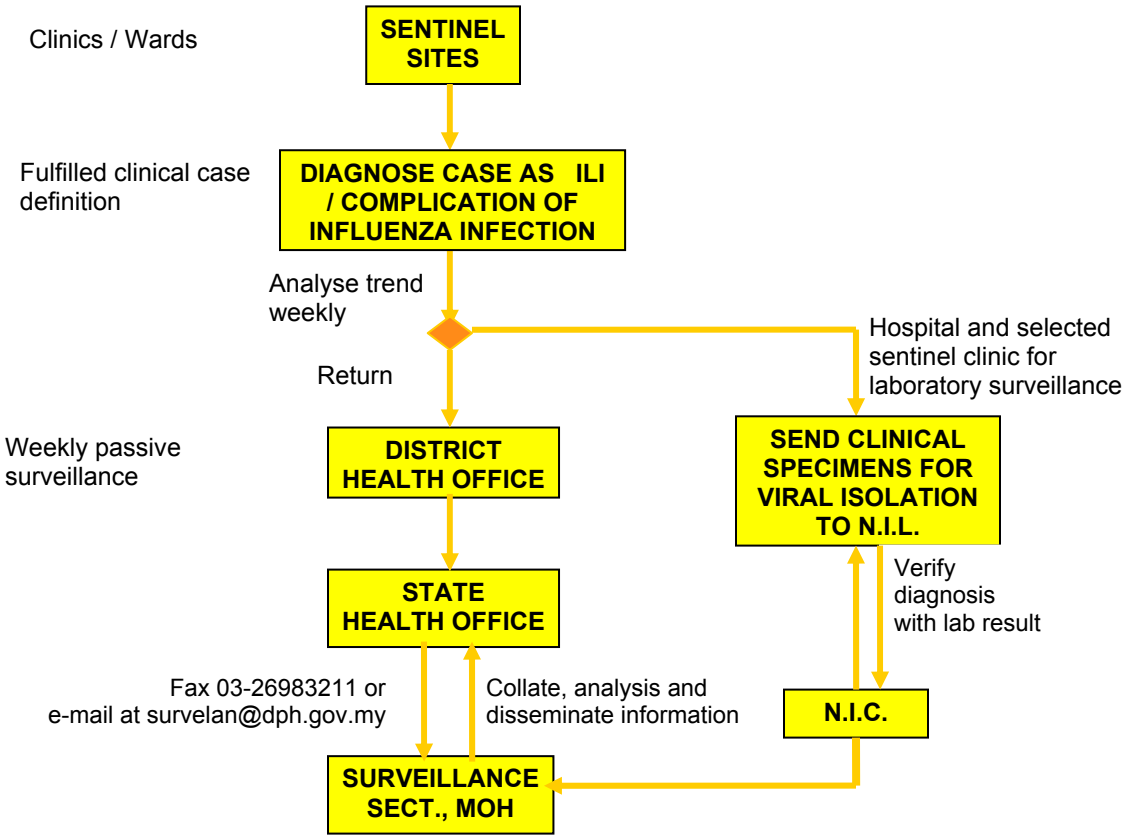
3.1.5 'Active case' detection

As described in para 1.2, there are other sources of data on influenza. The inpatients data is not connected directly to Disease Control Division. Once a month, a staff will go and get the data on:

i. number of inpatients at government hospitals diagnosed as influenza.
ii. number of inpatients at government hospitals who have respiratory complication or died secondary to influenza infection.
iii. number of specimens send to the NICs / NILs requesting for influenza test.

The staff is also responsible in getting data from all NICs and NILs once a month if the laboratories fail to inform centre by middle of the month.

Figure 1: Flow of data / information related to influenza surveillance



3.1.6 Tasks/activities related to influenza surveillance data/information

TASK / ACTIVITY	RESPONSIBILITY	TIME FRAME
Make a diagnosis of ILI or treated a case with medical problems as a result of complication of influenza infection i.e. acute cardiopulmonary problem; case should be recorded in the return form according to age group and diagnosis.	Doctors and / or Medical assistant treating the case	As and when a case is treated
Take clinical specimens as stated in General Guidelines For Respiratory Tract Specimen Collection, Handling And Transportation. Send specimens to respective National Influenza Laboratory (NIL) – according to regions.	Doctors and / or Medical assistant treating the case	As and when a case is treated

TASK / ACTIVITY	RESPONSIBILITY	TIME FRAME
Inform the result of the test to requesting hospital / clinic. Send isolates for sub-typing to IMR whenever necessary. Send isolates for subtyping to WHO Collaborating Centre for Influenza.	National Influenza Centre (NIC) including IMR and UMMC NICs IMR, UMMC	As and when the result is ready.
Analyse local data and study the weekly trend. Alert district health office (DHO) whenever necessary. Then send return to DHO.	Hospitals / Clinics	Weekly (Monday of the week)
Analyse data at district level and study the weekly trend. Alert SHO whenever necessary. Then send return to state health office (SHO).	DHO	Weekly (Tuesday of the week)
Analyse data at state level and study the weekly trend. Alert MOH whenever necessary. Then send return to Ministry of Health (MOH).	SHO	Weekly (Friday of the week)
Analyse data at national level and study the weekly trend. Inquire further from SHO if there is abnormal trend that has not been alerted / acted on. Write report and disseminate regularly in the weekly bulletin.	MOH	Weekly (Tuesday of the next week)
Analyse data for linkages between the epidemiological information and the laboratory information.	MOH	As and when results are available
'Active Case' detection	MOH Head quarter's staff	Once a month

3.2 Laboratory Surveillance for influenza

Epidemiological surveillance demonstrated that ILI incidence is spread out over the country as seen in outbreaks and not just the central region. There is a need to develop more laboratories for influenza virus surveillance. It is also one of the strategies for strengthening influenza surveillance mechanisms in the country in order to provide forewarning of outbreaks and emergence of novel influenza virus.

At present there is only two NIC, the IMR and UMMC. IMR receives specimens from 16 sentinel private clinics in Klang Valley (central part of Kuala Lumpur) and the Paediatric Institute of Kuala Lumpur Hospital; meanwhile UMMC receives specimens from their outpatient clinics and inpatients only.

National Public Health Laboratory (NPHL) has started receiving clinical samples from ILI outbreaks recently; and some local universities laboratories have run the influenza testing for in-ward patients. Four other laboratories have been identified to be involved actively in the laboratory surveillance network for the country. These laboratories are selected based on their strategic locations to serve the states regionally.

At present both NICs send their isolates for sub-typing to the reference laboratory overseas separately. There is also a need to have a National Coordinating Influenza Laboratory (NCIL) which will coordinate the clinical specimens from all the regional laboratories involved in laboratory based influenza virus surveillance in the country. IMR which is also a WHO National Influenza Centre will be designated as NICL; to coordinate all the laboratory activities pertaining to influenza including training and coordinating the sending of specimens to WHO Collaborating Centre for Influenza for sub-typing & identification of new strains of influenza viruses.

3.2.1 Expansion of laboratory capacity

As surveillance of influenza is going to be expanded, more laboratory support is needed to cater for the clinical samples. Therefore 4 other laboratories have been identified to serve the states by regions. They are called as National Influenza Laboratory (NIL);

- National Public Health Laboratory (NPHL);
- National University Hospital Malaysia (HUKM);
- Science University Hospital Malaysia (HUSM)
- University of Sarawak Malaysia (UNIMAS)

However UNIMAS does not want to participate in this surveillance system.

An alternative for East Malaysia is to develop a virology laboratory in Kuching Hospital, Sarawak and / or Queen Elizabeth Hospital Kota Kinabalu, Sabah depending on the resources available. Staff training of the participating laboratories and proposed 2 new sites will begin in November after identifying the existing capacity – manpower and equipment as we have done for the proposed NIL (as in table 1 below).

Table 1: Capacity in the existing and proposed laboratories for influenza virus surveillance

CAPACITY		IMR	NPHL	UMMC	HUKM	HUSM	UNIMAS	TOTAL IN THE COUNTRY
MANPOWER	Patologist	3	1	5	2	1	DOES NOT WANT TO JOIN THE INFLUENZA SURVEILLANCE ACTIVITIES	12
	Medical Officer	3	0	0	1	0		4
	Laboratory Technologist	21	10	5	2	3		41
	Research Officer	5	-	-	-	-		5
EQUIPMENT CAPACITY	PCR	3	1	1	1	1		7
	RT - PCR	1		1				
	Isolation capacity	1	1	1	1	1		5
	Storage -70 ºC	1	1	1		1		4
	UV Scope	1	1	1	1	1		5
	Rapid Test		1			1		1

Existing capacity

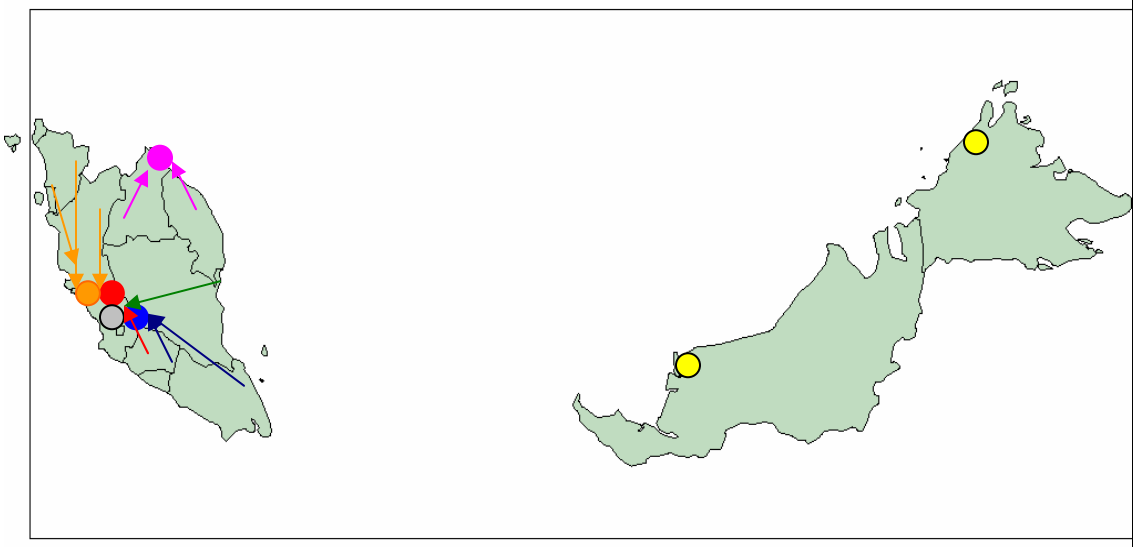
Proposed new national collaborative laboratory

Table 2 and figure 2 show the regions and states that will send specimens to each NIC.

Table 2: Delineation Of Laboratories To Handle Clinical Samples For Influenza Diagnostic Testing

LABORATORIES	SENTINEL SITES IN RESPECTIVE STATES
IMR	Johor, Wilayah Persekutuan Kuala Lumpur, Melaka,
UMMC	Selangor, Pahang
NPHL	Perlis, Kedah, Perak, Penang
HUKM	Negeri Sembilan
USM	Terengganu, Kelantan
? Hospital Queen Elizabeth, Sabah	Sabah
? Hospital Kuching	Sarawak

Figure 2: Maps showing states and their respective NICs



●	**IMR**	●	**HUKM**
●	**NPHL**	●	**SABAH AND SARAWAK**
●	**UMMC**	●	**HUSM**

3.2.2 Sentinel sites

At least two or more government health facilities and **one private clinics in every states** are to be selected to be sentinel sites for clinical specimens collection. The sites are best chosen among the existing sites for clinical surveillance for influenza.

The specimens collection should be coordinated by Pathology Department of State Hospitals, so the transportation of specimens would be carried out smoothly. A centre should submit 5 to 10 specimens per trip. It will give a total of 15 to 30 specimens per day or lesser from each state. For each patient, please fill in the form as in appendix 3. The information will be used in the evaluation of case definition later.

STATE	GOVT. CLINICS – sentinel sites	PRIVATE CLINIC	NO. OF SPECIMEN
Perlis	2	1	15 - 30
Kedah	2	1	15 - 30
Penang	2	1	15 - 30
Perak	2	1	15 - 30
Selangor	2	1	15 - 30
Kuala Lumpur	2	16	90 - 180
Negeri Sembilan	2	1	15 - 30
Melaka	2	1	15 - 30
Johor	2	1	15 - 30
Pahang	2	1	15 - 30
Terengganu	2	1	15 - 30
Kelantan	2	1	15 - 30
Sabah	2	1	15 - 30
Sarawak	2	1	15 - 30
Labuan	2	1	15 - 30
TOTAL	**30**	**30**	**450 – 900 / day**

3.2.3 Specimen collection

For a good yield of virus isolation, case definition of influenza should be strictly followed on choosing ILI patients for clinical specimen. The instruction for specimen collection as in appendix 4 should be adhered to. Please refer to the video on "**Guides in Taking Clinical Specimens for Influenza**".

As there is no clear seasonality of influenza vaccination, the number of specimens collected will be about the same amount. The number will be more when there is an outbreak.

3.2.4 Flow of specimens

The flow of clinical specimens for influenza from the sentinel site to NICs and national influenza laboratories (NILs) for viral isolation and referral of isolates for sub-typing to the WHO Collaborating Centres for Influenza is as shown in figure 3.

3.2.5 Specimens processing

Specimens received by the NILs and NICs will undergo PCR test and isolation of virus. All influenza virus isolates will then be sent to IMR or UMMC for subtyping or be sent to WHO Collaborating Centres by IMR.

3.2.6 Reference of specimens

At present UMMC and IMR are sending their untypable influenza virus to Melbourne separately as both institutions have trained personnel and are licensed in packaging and shipping of biological specimens. As there are many laboratories involved in the surveillance, we propose that the shipping of isolates to WHO Collaborating Centres for Influenza to be coordinated by IMR as it will reduce the cost of shipping.

All specimen will be sent to WHO Collaborating Centres for typing. It will be sent once fortnightly or monthly depending on the number of isolates receive from the NILs.

3.2.7 Data collection

Data are collected at Disease Control Division, Ministry of Health using the format in appendix 5. The flow of data is as in figure 4.

The surveillance information will be disseminated to all states in a collated format. **Information are not meant for treating cases.** Treatment should be based on symptoms or any co-infection.

Figure 3: Flow Chart of clinical specimen for influenza

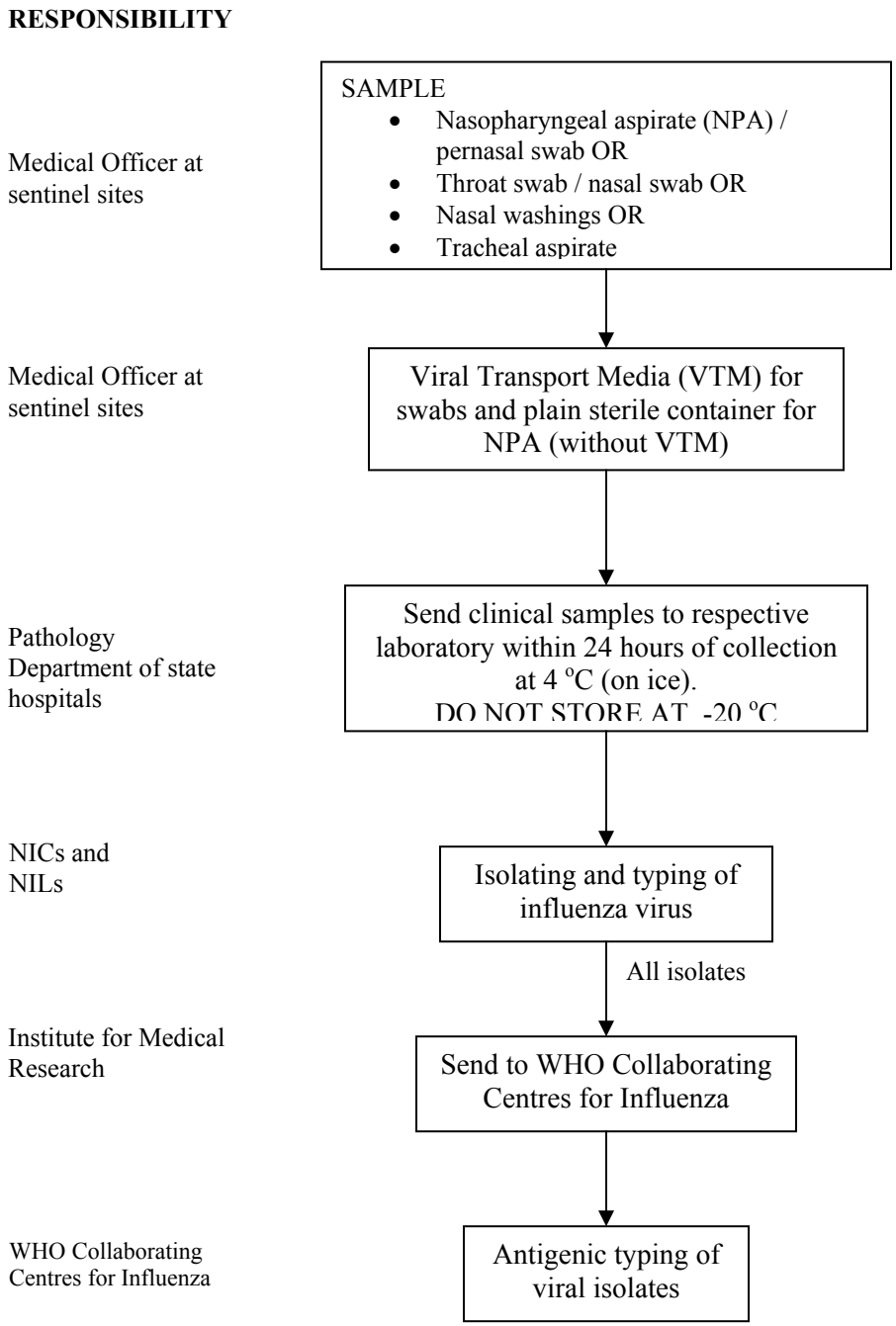
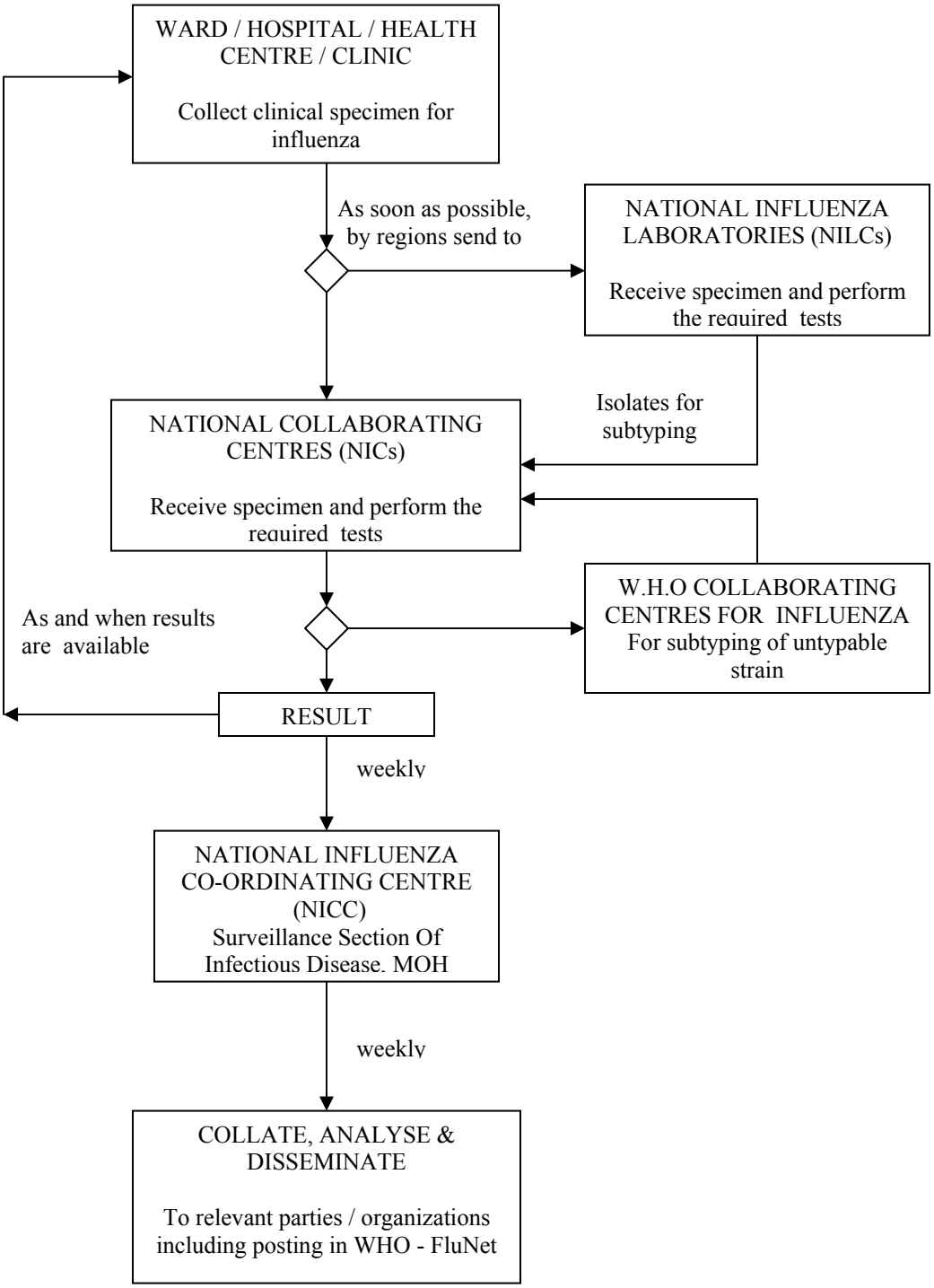


Figure 4: Flow of laboratory data for influenza surveillance



4.0 NATIONAL COORDINATING CENTRE FOR INFLUENZA (NICC)

As the number of laboratories involved in influenza surveillance increases, a national influenza surveillance centre needs to be established to link the epidemiological data and laboratory surveillance information. This center will act as a linkage between the national surveillance system, and the global influenza surveillance system (including FluNet).

4.1 Term of Reference

The NICC which will be located in the Disease Control Division, Ministry of Health Malaysia. It is responsible for:

i. coordinating the surveillance and response of influenza incidents / outbreaks in the country.
ii. preparing the national influenza pandemic plan.
iii. preparing and monitoring the medical response.
iv. preparing and monitoring public health response.
v. assessment for disease burden of influenza in Malaysia.
vi. monitoring antiviral, vaccines and critical materials i.e. protective personnel equipment (PPE) stockpiling.
vii. training, research and development on influenza.
viii. coordinating capacity building for the laboratories.
ix. networking with other agencies including animal surveillance.

This center will act as a linkage between the national surveillance system, and the global influenza surveillance system (including FluNet). The information should be sent every 3 months to WHO using format in appendix 6.

Networking with the Department of Veterinary Services has been established since the Nipah outbreak in 1998. The inter ministerial committee has a regular biannum meeting to exchange information. However whenever there is a crisis involving zoonotic diseases, the communication and cooperation is immediately enhanced.

With the establishment of NICC, the sharing of information will be done formally and regularly. The strain of influenza virus circulating among the poultry and wild birds will be monitored and compared with human strain.

5.0 ANALYSIS OF DATA

Data are analysed at each level. As for now, with the very limited data (as the system just started in September 2003), the consultation rate of ILI is compared to the moving average of the previous five weeks (appendix 1). The moving average is taken as alert threshold. It is meant for enhanced surveillance at local level.

However the action threshold is taken as 1 per 100,000 population. It is meant for starting investigation for the increase number of case.

When we have enough data after monitoring for sufficient period of time, the calculation of mean will be reviewed.

6.0 EVALUATION PLAN

6.1 Evaluation of system

After collecting data of ILI and with the laboratory surveillance data for half a year, an evaluation needs to be done. The influenza surveillance is expected to provide answer to the following questions:

i. What is the ILI burden in Malaysia?
ii. Is there a seasonal trend, whether following the winter of the north and south hemisphere or related to local environment?
iii. What vaccine strains to give?
iv. Matching of the vaccine given with the circulating influenza virus in the country.
v. The pattern of distribution of influenza virus strain in the nation and the association with the global circulating virus.
vi. Sensitivity of case definition in relation to clinical surveillance and laboratory surveillance.
vii. Evaluate the yield of virus isolation in relation to case definition and type of clinical specimens.
viii. The morbidity and mortality secondary to influenza infection.
ix. Can the laboratories cope with the number of specimens send?
x. Is the dissemination of information process efficient and useful?
xi. Is the guidelines (including case definition) is easily followed and helpful?

The evaluation is proposed to be done by the Epidemic Intelligence Program Fellows as one of their assignment. The attributes to be assessed are as in appendix 6.

6.2 Indicators

1. To estimate the incidence of influenza in Malaysia.
   Rate per 100,000 population.
2. To determine the circulating influenza virus strain in Malaysia.
   Per locality / region.
3. To provide the virological surveillance information to FluNet regularly.
   Once / month.
4. To produce and disseminate information on influenza surveillance to relevant parties.
   Once in 3 months.

5. To evaluate system.

Twice a year at the beginning of the program, then once a year.

7.0 TRAINING

The turnover of health staff may cause breaches in the surveillance system. To ensure the influenza surveillance system works and provides beneficial and meaningful information, training from time to time should be in the agenda. Training should include both old and new staff that are involved in the surveillance system. The identified training needed are as below:

TOPIC	TARGET GROUP	TIME FRAME
Management of ILI including diagnosis, laboratory investigation and treatment	Medical Officers Pathologist Scientists Epidemiologists	1 x a year
Procedure of taking specimen, storage and transporting it to the NIL	Medical Officers Pathologist Scientists	2 x a year
Analysis of influenza data and interpretation of the information	Epidemiologist	1 x a year
Laboratory procedures in diagnosing influenza and isolating the virus (attachment) Laboratory biosecurity	Pathologist (updates) Scientists (2 – 3 persons per session)	5 x a year
Quality Control (QC) training	Pathologists	1 x a year

All the training will be conducted locally. Consultation will be given by local influenza experts. An external consultant might be invited. It will be worked out through WHO collaboration.

8.0 FOCAL POINT

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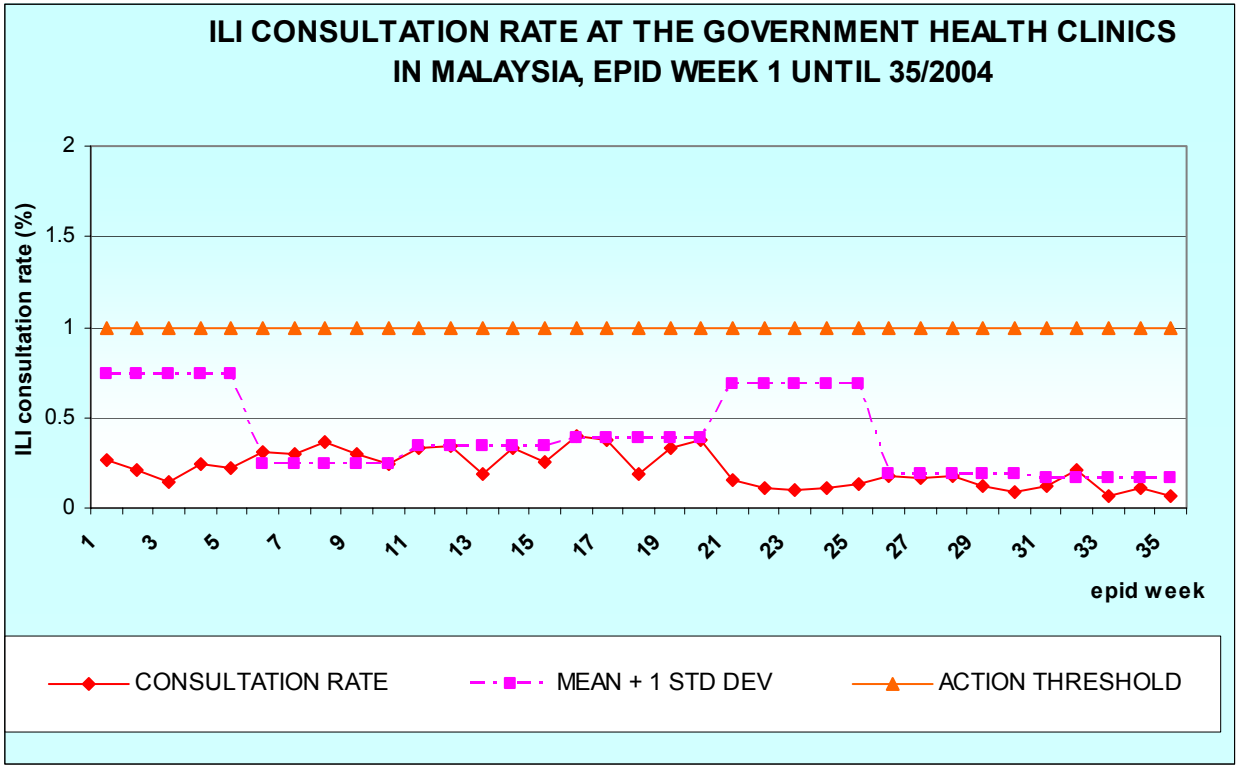
Appendix 1

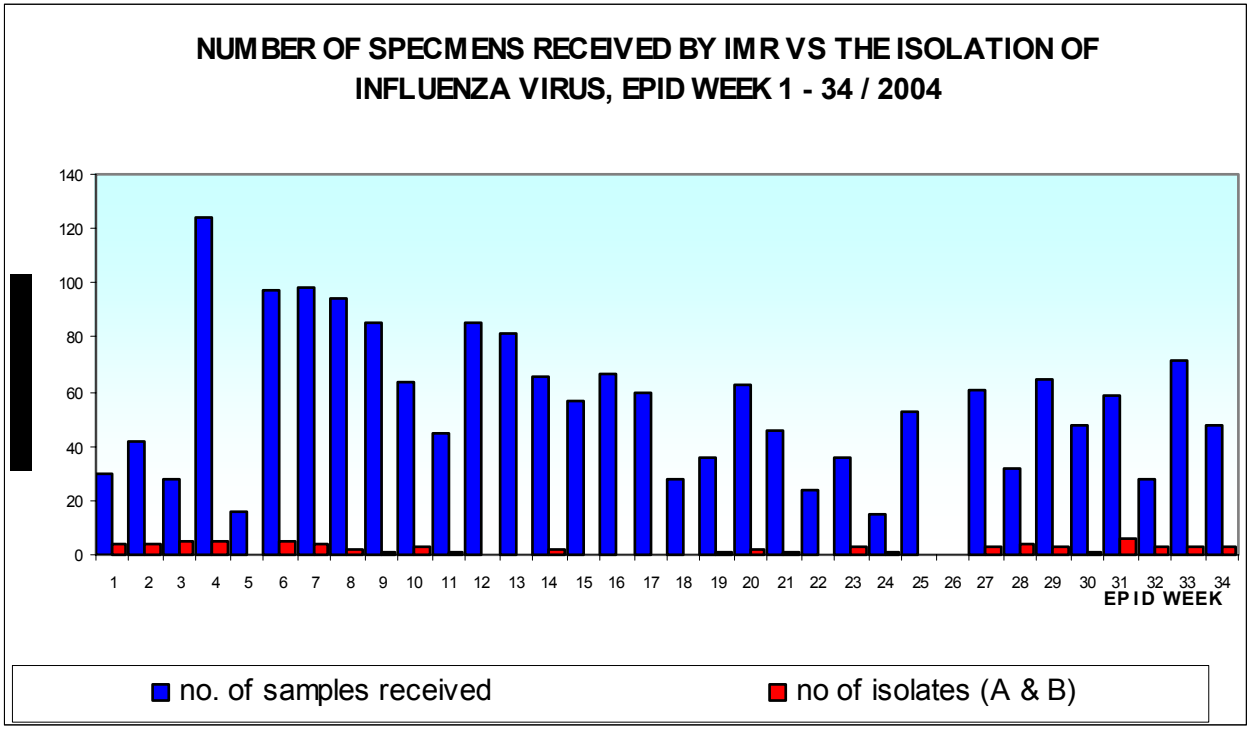
Example of monitoring data on the consultation rate for influenza (ILI) in Malaysia, 2004.

EPID WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CONS. RATE (%)	0.266	0.213	0.148	0.248	0.222	0.307	0.301	0.361	0.293	0.245	0.329	0.345	0.186	0.334	0.249	0.394	0.377	0.192	0.332	0.374
Mean + 1SD	0.745	0.745	0.745	0.745	0.745	0.243	0.243	0.243	0.243	0.243	0.343	0.343	0.343	0.343	0.343	0.39	0.39	0.39	0.39	0.39



There is no obvious increase in the consultation rate of ILI in relation to the mean + 1SD .

The limited information that we get from Institute for Medical Research, which focused on only the limited sentinel sites in Federal Territory of Kuala Lumpur only.



Appendix 2

FORMAT A

(For use by Health Clinic)

Influenza-Like-Illness Surveillance

Clinic :_____

Date : _____

Total number of OPD attendances: _____

Diagnosis	Age						Total
	0 – 6 Yrs	7 - 12 Yrs	13 - 17 Yrs	18 - 24 Yrs	25 - 59 Yrs	60 and above	
Influenza-Like-Illness (ILI)							

* data can be collected using the tally method **(~~IIII~~) = 5**

_____
Signature and Official Seal
M&HO / MA

Attention:

All report must reach District Health Office daily before 10.00 am the next day (except public holiday)

FORMAT B

Influenza-Like-Illness Surveillance

(District Level)

District : _____

Date : _____ (Epid week _____)

Total number of OPD attendances: _____ / week

Diagnosis	Age						Total
	0 – 6 Yrs	7 - 12 Yrs	13 - 17 Yrs	18 - 24 Yrs	25 - 59 Yrs	60 and above	
Influenza-Like-Illness (ILI)							

_____
Signature and Official Seal
M&HO / MA

Attention:

All report must reach State Health Department Tuesday of the next epid week week (except public holiday)

FORMAT C

Influenza-Like-Illness Surveillance

(State Level)

State : _____

Date : _____ (Epid week _____)

Total number of OPD attendances: _____ / week

Diagnosis	Age						Total
	0 – 6 Yrs	7 - 12 Yrs	13 - 17 Yrs	18 - 24 Yrs	25 - 59 Yrs	60 and above	
Influenza-Like-Illness (ILI)							

_____
Signature and Official Seal
State Epid Officer

Attention:

All report must be sent to Surveillance Section, Disease Control Division, Ministry of Health by Friday of the next epid week. Fax No. : 03-88886271.

Appendix 3

No. Rujukan Makmal	

NATIONAL INFLUENZA–SURVEILLANCE

DIAGNOSTIC REQUEST FORM

A. MAKLUMAT PESAKIT		
Negeri:	Daerah:	
Hospital / Klinik Kesihatan:		
Nama Pesakit:		
No. K/P:	Umur:	Jantina: L / P

B. MAKLUMAT KLINIKAL		
Gejala (Simptom)	**Ada / Tiada (Tandakan √ diruang berkenaan)**	**Tarikh mula**
Demam tinggi secara tiba-tiba (*Sudden onset of high grade fever*)		
Batuk tidak berkahak (*Dry cough*)		
Hidung tersumbat (*Nasal congestion / blockage*)		
Sakit tekak (*Sore throat*)		
Sakit otot (Myalgia)		
Kejang (*Convulsion / fits*) (bayi / *infants*)		
Muntah (bayi / *infants*)		

C. SPESIMEN KLINIKAL			
Spesimen (* potong mana yang tidak berkennan dan tandakan √ diruang berkenaan)		**Tarikh diambil**	**Tarikh penghantaran**
*Nasopharyngal aspirate / swab**		/ /	/ /
*Nostril swab / throat swab**		/ /	/ /
Tracheal aspirate			
Darah / Serum*		/ /	/ /

D. MAKLUMAT PEMOHON	
Nama dan Cop Pegawai: Tandatangan:	No telefon: No. fax: e-mail:

E. MAKMAL (Untuk Kegunaan Makmal)			
Keadaan spesimen:			Tarikh terima spesimen:
Spesimen	**Jenis ujian**	**Keputusan ujian**	**Komen**
*Nasopharyngal aspirate / swab**			
*Nostril swab / throat swab**			
Tracheal aspirate			
Darah / Serum*			
Nama dan tandatangan Pegawai Makmal:			
Jawatan Pegawai Makmal dan Cop Makmal:			Tarikh:

* Note: All samples **except blood / serum and nasopharyngeal aspirate (NPA)** must be in the viral transport media (VTM) and send immediately in ice pack to Influenza designated laboratories

Appendix 4

GENERAL GUIDELINES FOR RESPIRATORY TRACT SPECIMEN COLLECTION, HANDLING AND TRANSPORTATION

Specimens are collected from the upper or lower respiratory tract, depending on the site of infection. Upper respiratory tract pathogens (viral and bacterial) are found in throat and nasopharyngeal secretions. Lower respiratory tract pathogens are found in sputum specimens.

In patients with stridor or when acute epiglottitis is suspected, no attempt should be made to take throat or pharyngeal specimens and neck X rays, since these procedures may precipitate respiratory obstruction. However the aetiological agent may be isolated from blood culture

Protection for Health Care Workers

While taking specimen, HCW should exercise droplet and contact protection. HCW should wear a surgical or N95 mask as appropriate. If the procedure involves a high risk of splashing of contamination by the clinical specimens, the HCW should wear appropriate eye protection.

Materials for collection

- Transport media – bacterial and viral
- Cotton swabs
- Tongue depressor
- Flexible wire calcium alginate tipped swab (for suspected pertussis)
- Nasal speculum (for suspected pertussis – not essential)
- Suction apparatus or 20-50 ml syringe
- Sterile screw-cap tubes, and wide-mouthed clean sterile jars (minimum volume 25 ml).

i Upper respiratory tract specimens

A. <u>Method of collecting pernasal and post-nasal swabs (for suspected pertussis and influenza)</u>

1. Seat the patient comfortably, tilt the head back and insert the nasal speculum.

2. Insert a flexible calcium alginate swab through the speculum parallel to the floor of nose without pointing upwards. Alternately, bend the wire and insert it into the throat and move the swab upwards into the nasopharyngeal space.

3. Rotate the swab on the nasopharyngeal membrane a few times, remove it carefully and insert it into a screw-cap tube containing transport medium.

4. Label the specimen tube.

B. <u>Method of collecting nasopharyngeal aspirate (NPA)</u>

1. Seat the patient comfortably, tilt the head back and insert the nasal speculum.

2. Insert a.

3. Aspirate the secretion and put it in a container without VTM.

4. Label the specimen tube.

C. Method of collecting a throat swab

1. Hold the tongue down with the depressor. Use a strong light source to locate areas of inflammation and exudate in the posterior pharynx and the tonsillar region of the throat behind the uvula.

2. Rub the area back and forth with a cotton swab. Withdraw the swab without touching cheeks, teeth or gums and insert into a screw-cap tube containing transport medium.

3. Break off the top part of the stick without touching the tube and tighten the screw cap firmly.

4. Label the specimen containers.

5. Complete the laboratory request form.

ii. Lower respiratory tract specimens

Method of collecting sputum

1. Instruct patient to take a deep breath and cough up sputum directly into a wide-mouthed sterile container. Avoid saliva or post-nasal discharge. Minimum volume should be about 1 ml.

2. If no sputum, induce cough by hypertonic saline nebulisation.

3. Label the specimen containers.

4. Complete the laboratory request form.

iii. Bronchoalveolar / tracheal lavage

Method is not documented here as these procedures are only performed by experienced personnel.

Handling and transport

- All respiratory specimens except sputum are transported in appropriate bacterial / viral media.
- Transport as quickly as possible to the laboratory to reduce overgrowth by commensal oral flora.
- For transit periods up to 24 hours, transport **bacterial** specimens at ambient temperature and **viruses** at 4 to 8 °C in appropriate media.

Appendix 5

Influenza Virus Surveillance

Institution : IMR / UMMC / HUSM / HUKM / NPHL
Date : _____

DATE RANGE OR EPID WEEK	Diagnosis	Age						Total
		0 – 6 Yrs	7 - 12 Yrs	13 - 17 Yrs	18 - 24 Yrs	25 - 59 Yrs	60 and above	
	A / H3N2							
	A / H1N1							
	A / untypable/ pending							
	Type B							
	A / H3N2							
	A / H1N1							
	A / untypable/ pending							
	Type B							

_____

Signature and Official Seal of Reporting Pathologist

Influenza Virus Surveillance

Institution : IMR / UMMC
Date : _____

DATE RANGE OR EPID WEEK	Diagnosis	WPKL	S'ngor	Perak	PP	Perlis	Kedah	NSemb	Melaka	Johor	K'tan	T'ganu	Phg	Sabah	S'wak
	A / H3N2														
	A / H1N1														
	A / untypable/ pending														
	Type B														
	A / H3N2														
	A / H1N1														
	A / untypable/ pending														
	Type B														

_____
Signature and Official Seal of Reporting Pathologist