PLANNING AND DELIVERING TRAINING

A conceptual model for a modern surveillance system

and A one-day training session to train health workers

who is supposed to work with such a system

By:

GROUP B

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Key points in the report:

Who is the target audience?

- *Health workers at local, intermediate (provincial) and national levels*

What is the training session (overall) objective?

- *To enhance health staffs' competencies to use an integrated surveillance computerized tool for to meet IHR implementation requirements*

What are the learning objectives/expected outcomes (what participants will gain upon completion of your training session)

- *To describe the national computerized system for data collection for suspected and sampled patients*
- *To enter the data for suspected and sampled patients*
- *To acquire the automatic reports for the suspected and sampled patients*
- *To interpret the automatic reports for the suspected and sampled patients*
- *To advise the most appropriate public health mesures according to the reports*

In order to develop a modern surveillance system in accordance with the core capacity No.3 reflected in the IHR monitoring checklist, we should first take into consideration some of the requirement of a good surveillance system.

Background and introduction: to explain existing problems/unmet needs

The International Health Regulations require that all countries be able to detect public health events, such as outbreaks, in a timely manner; and they should be able to respond quickly. Many existing national disease surveillance systems are complex, with the result that they do not have sufficient early

warning functionality. Syndromic surveillance (SS) can be much faster and simpler because it is based on reporting of clinical symptoms and does not require laboratory confirmation. This paper discusses a concept on SS that a country can consider to augment its ability to have an early warning system based on syndromes. While this SS approach advocates for the KISS (**k**eep **i**t **s**imple and **s**tupid) principle, it should be understood that it does not discourage countries who have working automated surveillance system, based on laboratory confirmations, to further strengthen their system.

1- **What is the objective of the SS (Surveillance System):**

If we include a lot of diseases in the SS, it doesn't have any effect besides overburdening the health system of the country, thus we should keep it simple by confining it to some important conditions. As well, gathering a lot of information for each condition would kill the SS. So the first principle is keeping SS as simple as possible.

2- **What is the type of surveillance model?**

In the literature there are a variety of surveillance models mentioned e.g. active, passive, hospital-based, epidemiological, absenteeism, death-based, event-based, and so on. However these are a bit confusing and here we try to mention just 2 types of surveillance models. One of the models is Syndromic Surveillance and the second one is patient-centric surveillance model. These 2 models are implemented in different places like hospital, sentinel health centers, crowded places. So it is better to say that in a modern surveillance we just have 2 models with different centers for their application. In the following we will give more details of these 2 surveillance models.

3- **What are the data and indicators to be collected and calculated?**

In every country, the public health authorities should revisit their surveillance system to check which indicators they need. However, we can classify the indicators into two broad categories: Syndromic-based indicators and patient-centric (case-based) indicators.

4- What are the definitions of cases?

The case definitions should be simple and clear preferably Syndromic (based on a few key symptoms for suspected cases). There should not be lots of symptoms and signs for people in the periphery who do not have lots of time for authorities in the headquarters. On another aspect, we can never confirm a case without lab but in outbreaks/epidemics, to send an alarm (risk assessment), we do not need to confirm every case but in elimination (outbreak investigation), and we need to confirm every case. Thus Syndromic surveillance is mainly of use for risk assessment and patient-centric surveillance is of use for outbreak investigation. And in Syndromic model, the case definitions are mainly focused around some clinical syndromes based on key symptoms, which is further elaborated later. Those syndromes can capture diseases of national/international concern.

One of the problems in the developing countries is lacking the public health laboratories in the periphery. Thus there might be a weak relationship between the data-collection environment and the labs.

5- What is the route of data transmission?

In the modern world with requirements set by IHR2005, the paper-based surveillance models with the aid of telephone and fax is not a appropriate option, instead the data flow should be computer-based otherwise there would be discrepancies between the peripheral levels and central levels of the SS, e.g. the central level may claim that there are 18,000 cases while the peripheral level may disagree that there are just 10,000 cases! Another drawback of the traditional paper-based

surveillance models is the slow flow of data from the periphery to the central level. This feature is inconsistent with the IHR2005 mandates to detect and assess a PHEIC within 48 hours and report to WHO 24 hours after the assessment.

6- Interpretation of data at different levels of the health system

We should not just collect data. The gathered data must be analyzable and interpretable simply at different levels of the health system. Interpretation of data should be facilitated at different levels, and to do this, public health workers should be trained at peripheral and central levels. Unfortunately, at the present time, in many countries, the interpretation of surveillance data are not performed at the peripheral level, and at the central level it is done late.

7- Proper feedback to the lower levels

If the central level of SS does not provide feedback to more peripheral levels, it induces an impression that it is not interested in the peripheral level, thus the peripheral level also would make uninterested in the central level, and such a relationship causes that the peripheral health workers fill out the surveillance sheets reluctantly and carelessly. A surveillance newsletter/bulletin from the central to intermediate level is useful and from the intermediate to peripheral level would be helpful to strengthen the relationships between people at different levels by providing feedback. Incentives and rewards for the more peripheral people who take pains, is another strategy for fostering a SS.

8- Clear statement of actions to be taken

In the bulletin, the actions should be informed, thus the peripheral health workers will know what actions to do as for the gathered and interpreted data, and otherwise they would ask “Why are we collecting those data? Just to report them at the end of the year!

9- **Sentinel sites** – In countries with vast geography, implementing SS can be challenging. As an inclusive approach to SS will be much more beneficial, due consideration should be given to having more than just one site submitting their SS reports. Again, one should be mindful of keeping the reporting system as simple as possible.

10-Appropriate training of staff at all levels

Training of the health system staff in regard to the SS is a mandate. One of the reasons behind this necessity is rapid turnover of the staff. Another reason is to value more peripheral personnel and help them to feel that they are important for us. Another advantage of training personnel on SS is to monitor the human resources and find out their knowledge and skills gap, thus we would be able to remove their weaknesses and foster their strengths.

Current situation of the health system

There is a specific structure in the Primary Health Care System (PHC). Without considering that structure, it is impossible to implement a modern Syndromic Surveillance integrated with the conventional surveillance model. The following factors should be considered in order to develop and maintain the mentioned SS in long term:

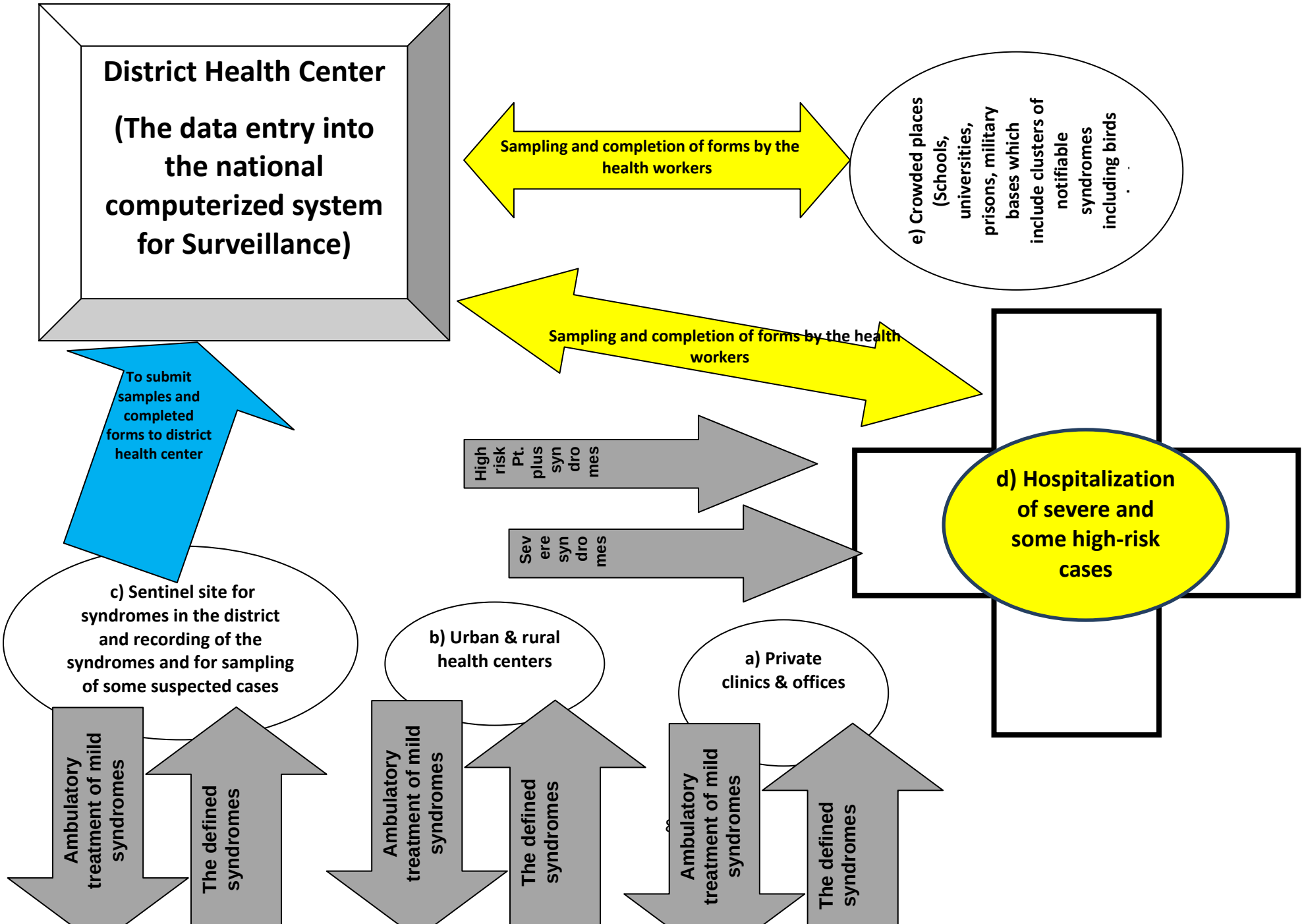
- The structure of the current PHC system from the lowest to the highest level
- The data flow and sampling form patients in the PHC system
- The tools and equipment currently exist in the PHC system especially the hardware or software

The PHC system and thus the surveillance system usually have four layers:

1- The central level (headquarter) which in Iran is the Center for Disease Control (CDC)
2- The intermediate level (the provincial health center)
3- The peripheral level (the ***district*** health center which is administrative)
4- The local community level which is the unit offering public health or therapeutic services at the community level under the supervision of the district level. These units are usually five types:

    a. Private offices/ clinics
    b. Public Health & therapeutic centers (or health centers in brief that can be rural or urban)
    c. District sentinel site/s which are usually urban health centers in nature but are bigger than urban health centers, of more resources, thus are able to get samples and monitor the epidemiological situation of the notifiable conditions e.g. syndromes in the district
    d. The district hospital which hospitalizes the cases suspected of having severe conditions (syndromes like SARI, Severe Acute Respiratory Infection) or mild cases who concurrently have high-risk conditions for that syndrome
    e. The crowded places in the district level like schools, universities, prisons, military bases, where are valuable sources to implement event-based surveillance

In the next page, the service units at the district level of importance in the Syndromic and conventional surveillance are demonstrated. In the diagram, the data collection process is also demonstrated:


District Health Center
(The data entry into the national computerized system for Surveillance)
Sampling and completion of forms by the health workers
e) Crowded places (Schools, universities, prisons, military bases which include clusters of notifiable syndromes including birds
Sampling and completion of forms by the health workers
To submit samples and completed forms to district health center
High risk Pt. plus syn dro mes
Sev ere syn dro mes
d) Hospitalization of severe and some high-risk cases
c) Sentinel site for syndromes in the district and recording of the syndromes and for sampling of some suspected cases
b) Urban & rural health centers
a) Private clinics & offices
Ambulatory treatment of mild syndromes
The defined syndromes
Ambulatory treatment of mild syndromes
The defined syndromes
Ambulatory treatment of mild syndromes
The defined syndromes

Rational for proposed project/programme: why we think this method can address the issues were raised/explained before

A very important point is that the syndromic surveillance should be integrated with the conventional surveillance model and cannot be an alternative to that. Simply, the syndromic surveillance is the surveillance for clinically suspected cases. Some of the important syndromes that can capture the notifiable diseases of the conventional surveillance system are:

1- ***Fever plus sore throat and/or cough***
2- ***Fever and jaundice***
3- ***Fever and bleeding***
4- ***Fever and cutaneous lesions***
5- ***Bloody diarrhea***
6- ***Frequent watery diarrhea without fever***
7- ***Fever plus headache and vomiting***

The conventional surveillance system which is dependent on sampling and definite diagnosis of diseases and during which a lot of fields (variables) are gathered for each case in addition to laboratory sample, is called patient-centric surveillance system.

The surveillance system for suspected cases or the syndromic surveillance system is performed in the service units of a,b,c and d while the conventional (patient-centric) surveillance system is performed in the service units of c,d and e.

In Iran, the data entry point of both surveillance models is the district health center as there is no internet line or and sometimes computer facilities in the lower levels than the district health center so preferably the service units like sentinel sites fill out the hard-copy forms of the surveillance system and do the samples and then the forms are entered into the computerized surveillance interfaces in the district health center and the submission of lab samples to the lab is taken care of.

Proposed program and clear objectives

The program for developing such an integrated surveillance system in each WHO member state has 4 main steps:

1- To develop the national computerized system for data collection
2- To add the reporting facilities to the system, alarming algorithms and thresholds and sms submission facility for submission of alarms to key stakeholders in case of trespassing the data above the thresholds
3- To develop the GIS facility for the automated (computerized) surveillance system
4- To instruct all the health workers at national, provincial and district levels to get the necessary knowledge and skills to work with the automated syndromic and patient-centric surveillance models

At the first step, after the phase 1, i.e. the establishment of a national computerized surveillance system, a one-day training session is recommended to train health workers at the national, intermediate and local levels in order to enable them to enter the data to the system and get reports.

The tentative schedule (timetable) is offered on the next page with the details:

The workshop of computerized surveillance system for suspected (syndromic) cases and patient-centric surveillance)		
Organizer: Center for Disease Control, Ministry of Health & Medical Education		
Morning session		
Time	Title	Presenter
8:00 – 8:15	**Welcoming and the introduction of audience**	*CDC Director General*
8:15 – 8:30	**The objectives of workshop (covering the incorporation of the system in the national IHR implementation program)**	*CDC Director General*
8:30 – 9:30	**The features of a good surveillance system**	*Dr. Bin-Shenq Ho*
9:30 – 10:30	**An overview of data sources, data flow and modern surveillance models (covering the link with IHR-NFP)**	*Dr. P. Hemmati*
10:30 – 11:00	**Coffee Break**	
11:00 – 13:00	**An orientation to data-collection forms in a modern surveillance system/ Question & Answers**	*Small group discussion*
13:00 – 14:00	**Coffee Break (Lunch)**	
Afternoon session		
14:00 – 15:00	**How to create the structure of the district PHC system in the web-based interface for suspected cases e.g. ILI cases**	*Practical computer-based session*
15:00 – 16:00	**How to enter the data from a form of suspected cases into web-based interface by the district health center/ providing feedback**	*Practical computer-based session*
16:00 – 16:30	**Coffee Break**	
16:30 – 17:00	**To demonstrate some reports of the web-based application**	Dr. Thierry Paux
16:30 – 17:00	**An orientation to the asynchronized (offline)**	Dr. Marcus Samo

	application for recording the sampled patients (Patient-centric model)	
17:30 – 18:30	**How to enter the data from a form of a sampled case into offline application and get the reports on the web-based / feedback**	*Practical computer-based session*
18:30 – 19:00	**Participants' views about the one-day workshop and compendium**	

As Rory Downham stressed on a one-day training session, we put the program as a one-day session, however, it would be better to consider such a workshop as a two-day workshop to be able to finish the program up to lunch time every day. That way the training would be less boring for the participants.