Report

Workshop on Disease Prioritization for Surveillance
(20th – 21st October 2015)

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Introduction

Resource allocation for every country is highly competitive, the health sector often gets a lower share than desired. These resources then need effective utilization. A major tool for this decision making is a disease surveillance system and its ability to detect outbreaks quickly and respond locally before large populations are affected. However, surveillance and the resulting response have their own costs. They should be reserved for diseases and conditions of importance. Prioritizing diseases for surveillance is an objective, scientific exercise done to best target our control and prevention efforts.

Dr. Farnaz Malik ED, NIH addressing participants along with Dr. Robert Fontaine , CDC and Dr. Rana Jawad Asghar Resident Advisor, FELTP

In Pakistan a disease prioritization workshop with the objective to have a national list of priority diseases for surveillance was conducted in 2005. The report called for another prioritization in five years. Indeed, WHO guidance on surveillance prioritization also recommends periodic updating of surveillance prioritization. However, since this first prioritization the process was not repeated.

Accordingly, a disease prioritization workshop was organized by National Institute of Health (NIH) / Ministry of National Health Services, Regulations & Coordination (NHSR&C) in collaboration with Field Epidemiology and Laboratory Training Program (FELTP) Pakistan from 20th-21st October 2015 at NIH, Islamabad. Director General Health Dr. Assad Hafeez took personal interest and ensured that all stakeholders were invited by the Ministry of National Health Services, Regulations and Coordination (NHSR&C). All key stakeholders were invited including Federal Health / Preventive programs, Provincial Departments of Health, International Donor Agencies, Pakistan Army, Animal Health Sciences and WHO. Dr. Franaz Malik, Executive Director, National Institute of Health and Dr. Muhammad Salman (FELTP/IHR Focal person) facilitated this meeting at NIH. Dr Robert Fontaine, Senior Advisor, US Centers for Diseases Control and Prevention (CDC), led this workshop and Dr. Rana Jawad Asghar, Resident Adviser, FELTP along with FELTP staff facilitated and supported this meeting. Dr. Zakir Hussain (FELTP alumni and Technical Officer Federal Disease Surveillance and Response Unit (FDSRU)) and Dr. Saira Bashir and Dr. Najma Javed (Both FELTP Fellows places at FDSRU) did the background search work and collected diseases statistics. Mr. Jamshed Maqbool (IT and Database Officer, FELTP) did the analyses required. Dr. S. M. Mursalin who was part of 2005 disease prioritization workshop shared the related documents with the group.

Executive summary

Basic approach, Results and conclusions

We used an approach similar to past surveillance prioritizations, to WHO guidance, and to the Pakistan surveillance prioritization of 2005. First a preparation team prepared an initial list of 33 diseases and syndromes. The team then gathered statistics, other information, and factsheets on each disease under consideration. Nineteen representatives from provinces and other administrative areas then used this information and their own experience to rank the diseases using 8 criteria of public health importance. Once ranked the representatives then selected a cut-off point. Diseases above this cut-off were recommended for reporting to the national level.

Recommendations

- The final list of 20 infectious diseases and syndromes is recommended for reporting from the provincial and federally administered zones to the national level.
- Additional resources for developing case definitions, case report forms, and laboratory support should adhere to this prioritization.
- Another prioritization should be done in 3 years.

Guiding Principles and Vision

Surveillance of infectious diseases and for that matter all health related events is under continual evolution. Diseases are eradicated, eliminated, or reduced to inconsequence. These are replaced by emerging diseases and new public health problems. Some threats such as antimicrobial resistance, global warming, changes in food production, rapid urbanization also require careful forethought and anticipation. As countries develop their capacity to control public health problems, improvements in surveillance go hand in hand. Surveillance needs to adapt as diseases evolve and endemic diseases like tuberculosis and malaria become unstable and outbreak prone. When medical practice improves and previously occult diseases can be distinguished from the milieu, those diseases with public health consequence need specific monitoring to take action. Populations become better educated and more incisive in their expectations of public health authorities to identify public health problems and take action. Disease surveillance systems must adapt. The resultant changes and improvements in surveillance should not be ad hoc or haphazard. This surveillance prioritization meeting is the second for Pakistan. It is intended to continue and accelerate the process of developing and adapting surveillance to Pakistan. Above all, the actions that arise from this prioritization will determine its success.

Technical Session led by *Dr. Robert Fontaine, CDC*

Purpose and objectives

The purpose of this surveillance prioritization was to prepare Pakistan for accelerated development of it surveillance system.

Objectives:

Develop a list of reportable infectious diseases ranked according to their public health importance.

Establish a cut point to represent disease reported to the national level versus optional reporting locally.

Prepare this list for distribution of resources to surveillance.

Background

History

Infectious disease surveillance has existed in some form for 250 years. However, the modern era of infectious disease surveillance made its breakout around 1960. Still, the actual selection of diseases for surveillance was not developed at that stage. Placing some infections under surveillance was then obvious because these had always been major epidemic threats to the public health. For emerging diseases such as HIV/AIDS the need for reporting was also obvious. For other diseases the need for surveillance was not so clear.

In 1987, Canada tackled the problem and systematized their selection of infectious diseases for reporting. Thereafter, at least 13 other countries followed suit and undertook surveillance prioritization. Jordan and Egypt also did surveillance prioritization but did not document the process or results. Additional countries that we are not aware of may have also prioritized without disseminating the results. In 2005 Pakistan undertook a surveillance prioritization. In 2006 WHO published guidance on surveillance prioritization. Since then several surveillance prioritizations in different countries have addressed more specialized disease categories including non-communicable diseases and zoonotic diseases. The Pakistan prioritization in 2005 called for a repeat prioritization every 5 years. We are 5 years past that date and a repeat prioritization is now called for.

Methods

We followed the guidance from the 2006 WHO report and the approach of the 2005 surveillance prioritization in Pakistan. Deviations from this general approach are noted later in the methods.

Group work by Participants

Before the beginning of the prioritization workshop epidemiological staff from the Pakistan FELTP prepared a listing of diseases and conditions for consideration. This preparation team began with the original listing of 42 diseases used for 2005 surveillance evaluation. Several modification were made to the list based on changes in national and international interest and importance. Severe Acute Respiratory Infection (SARI) was added to the preliminary list and replaced influenza and influenza-like illness,

pneumococcal pneumonia, other bacterial pneumonia, and atypical pneumonia. Note that laboratory-supported sentinel surveillance of influenza will continue, it will however, not be part of regular notification from the public health units to the national level.

Lumping of other diseases together was also done for tuberculosis and tuberculosis meningitis. Encephalitis was retained as a single category to capture all arboviral encephalitis including Japanese B encephalitis.

Bloody diarrhea would be captured through diarrhea outbreak reporting. Since the laboratory capacity for agents causing bloody diarrhea is essential in surveillance, the group felt that laboratory support would be best reserved for outbreak situations.

Participants during the group work activity

Helminthic diseases and scabies were not considered since they were of low virulence. In the case of helminthic diseases these would be better measured, when necessary, through prevalence surveys. Varicella and rubella were considered to be of low consequence. However, congenital rubella syndrome replaced rubella on the new list. Leprosy and trachoma were considered to be of too low incidence in Pakistan. Two venereal diseases, syphilis and herpes genitalis were removed as surveillance for these infections currently in Pakistan was problematic both in terms of laboratory confirmation and in the propensity of physicians to report.

The preparation team assembled fact sheets and data on incidence, case fatality rates, and other facts concerning the remaining diseases in Pakistan.

After the initial assembly of the 19 participants, we reviewed for them the history of surveillance prioritization, its purpose, and the methodology that we would follow for this particular surveillance evaluation.

We grouped the 19 participants into four working groups (five persons in three groups and four persons in the fourth group). Each group was composed of individuals from different provinces. The intent was that they did not know each other too well and that one member could not overly influence the others in the group.

Participants during the group work activity

During the rest of day one, the groups evaluated the first four criteria. These were: present burden of disease; case fatality rate; epidemic potential; and international regulations or programmes for surveillance, prevention, control, elimination, or eradication (appendix). They used for these the data provided to them on the fact sheets and other materials. If data were not available on a disease, they use their judgment to rank that disease among the others. Each criterion was assessed one at a time. After reviewing the existing data and fact sheets, members of a group first discussed the diseases. When a group was satisfied with the information, review, and

discussions; they began their ranking. Each member of each group independently ranked the diseases for the specific criterion from highest priority to lowest priority. They used individual card decks with each card having one of the diseases under consideration. They sorted their cards according to their priority. Each member gave the top quintile 5 points, the next to the top 4 points, the third 3 points, the next to the bottom 2 points and the bottom one point. Each member of each group then entered this score into an Excel score sheet.

When all the data for a single criterion were entered, the median score for the 19 participants was calculated. These median scores were summed for the eight criteria. The scores for any disease would thus range from a minimum of 8 to a maximum of 40.

During the morning of the second day, the group members evaluated the final four criteria: Potential threat/emergence/changing pattern, Health gain opportunity through public health activities, Social and economic impact, and Public perception. The same process was used except that there was no objective data or information for these criteria. Thus, after initial discussion, each member of each group independently sorted their card deck according to their judgment. Each ranking was then entered into the Excel score sheet. The median score for that criterion was determined.

At this juncture, we differed from the WHO guidance by using this ranking directly. We did not hold a second session to let participants change their initially rankings after seeing and discussing the initial results. We felt that a sufficient body of evidence existed to indicate that the mean of independent determinations by knowledgeable individuals will best approximate the actual value. Moreover, we wanted to avoid the influence of individual participants on others.

During the early afternoon of the second day we gathered together all 19 participants and presented the final ranking to them. We asked the representatives of each province and the national disease surveillance and response unit to recommend where the cutoff should be between nationally reportable (above the cutoff) and optionally reported at the provincial level (below the cutoff). The median cutoff point was selected for the final consensus of the group.

Workshop Participants Receiving certificates from the Chief Guest Dr. Farnaz Malik, ED NIH

Results

The scoring for the 33 infectious diseases or syndromes ranked tuberculosis the highest at 36.5 of the total 40 points available. Ten other diseases or syndromes had scores above 30 (Table 1). The median score was 22 (Anthrax). The minimum score of 12 (visceral leishmaniasis) was 4 points above the absolute minimum of 8 points.

Table 1: Scores and ranking of 32 infectious diseases and syndromes from the 2015 national Pakistan Disease Surveillance Prioritization workshop

Rank	Name of disease or syndrome	Score
1	Tuberculosis	36.5
2	Measles	36.0
3	Hemorrhagic fevers (Including CCHF)	35.5
4	Hepatitis B and C	34.0
5	Malaria	34.0
6	Polio and acute flaccid paralysis (AFP)	34.0
7	Dengue	34.0
8	Severe Acute Respiratory Infections (SARI)	33.0
9	Cholera	32.5
10	Diarrhea outbreaks	31.5
11	HIV/AIDS	31.5
12	Enteric Fever	28.0
13	Neonatal Tetanus	27.0
14	Rabies	26.5
15	Meningococcal Meningitis	24.5
16	Hepatitis A, E, and acute unspecified	22.0
17	Anthrax	22.0
18	Pertussis	21.5
19	Diphtheria	21.0
20	Bacterial Meningitis (unspecified, not meningococcal)	20.0
21	Viral Meningitis	19.5
22	Cutaneous Leishmaniasis	18.5
23	Gonorrhoea	17.5
24	Nosocomial Infections (Surgical site infection, neonatal sepsis)	17.0
25	Encephalitis (Japanese, Unknown etiology, arbovirus)	17.0
26	Plague	16.5
27	Mumps	16.0
28	Botulism	16.0
29	Leprosy	14.5
30	Congenital Rubella Syndrome	14.5
31	Syphilis	13.5
32	Brucellosis	13.5
33	Visceral Leishmaniasis	12.0

Selections of the cutoff point from the different administrative units represented ranged from 12 points (included all 33 diseases or syndromes) to 23 (included 15 diseases or syndromes) (Table 2). The lowest cutoff was a score of 12 and thus included all 33 diseases or syndromes under consideration. The Highest cutoff point was 23 and included 15 diseases or syndromes under consideration. The consensus cut-off point was 20 or higher and included 20 diseases or syndromes. One province (Punjab) and one administrative area (Gilgit-Baltistan) were not able to come to the workshop and are not represented in these findings.

Table 2: Cutoff scores selected by the different administrative units represented at the 2015 Pakistan National Disease Surveillance Workshop.

Administrative area	Cutoff score	Diseases included
Baluchistan Province	23	15
Army	23	15
Sindh Province	22	17
KPK Province	22	17
FATA	20	20
Federal	16	28
WHO	15	28
PMRC	12	33
Gilgit-Baltistan	--	--
Punjab Province	--	--

Priority actions

WHO guidance recommends that this surveillance prioritization be used to initiate work and other actions to strengthen and allocate resources for surveillance.

A first step would be for the working group to report its findings back to the provinces. The provinces would then agree to report these 20 diseases.

Once agreed, a working group should convene to develop case definitions and a list of data to be reported along with the case report. Appropriate forms (paper and electronic) would then be developed for national reporting. Certain forms for diseases that already have national programs with standardized reporting definitions, (e.g. polio, tuberculosis, or malaria), procedures, and forms would need little more than a review before inclusion into the national system.

This prioritization will also serve as a guide to providing laboratory services in support of surveillance. The services could be provided for certain conditions through broad laboratory coverage or through sentinel systems. Other considerations such as cost of specific tests and breadth of the diseases covered by these tests will need to be taken into consideration.

Training, guidelines and standards, and methods to improve surveillance capacity among healthcare workers can also be addressed based on this prioritization.

For priority diseases or syndromes that are not already reported, a complete surveillance system will need to be developed. These would be ideal projects for the new field epidemiologists being trained by the FELTP.

The previous prioritization exercise was 10 years ago. The results of this current, 2015, exercise need to be revisited with another prioritization in about three years. This is especially important in support of the improvements in surveillance intended for Pakistan.

Participants

Sr.#	Name	Designation	Department
1	Dr. Farnaz Malik	Executive Director, NIH	NIH , Islamabad
2	Dr. Robert E. Fontaine	Senior Advisor	CDC, DGHP, Atlanta, USA
3	Dr. Rana Jawad Asghar	Resident Advisor	FELTP-Pakistan, Islamabad
4	Dr. Munir Ahmed Mangrio	Director General	NHEPRN, Islamabad
5	Dr. Sardar Mehmood Ahmed	Director General Health	Health Department, AJK
6	Dr. Khalid Naeem	Chief Scientific Officer	NARC
7	Dr. Khuwaja Masood	National Coordinator	Ministry of NHSR&C
8	Brig. Dr. Naila Azam	Dir. Public Health	AFPGMI
9	Dr. Muhammad Salman	SSO/ IHR Focal Person	National Institute of Health
10	Dr. Dhani Bux	Director Admin/ Finance	Health Department, Sindh
11	Dr. Samra Mazhar	Deputy Director (Technical)	Ministry of NHSR&C
12	Dr. Uzma Bashir	Senior Virologist	National Institute of Health
13	Dr. Ibrar Rafique	Research Officer	PMRC, Islamabad
14	Dr. Naveed Masood Memoon	Provincial Technical Officer	FELTP PDSRU, Hyderabad
15	Dr. Abid Saeed	Provincial Technical Officer	FELTP PDSRU, Quetta
16	Dr. Muhammad Dawood Kasi	Deputy Director	Health Department, Balochistan
17	Dr. Muhammad Saleem	Provincial Technical Officer	FELTP PDSRU, KPK
18	Dr. Muhammad Qasim Khan	FATA NSTOP Officer	Directorate of Health Services FATA
19	Dr. Syed Jamal Akbar	ADPH, DOH KPK	Directorate of Health Services KPK
20	Dr. Muhammad Athar Abbas	Senior Scientist	NARC
21	Dr. Musa Rahim	National Program Officer	WHO
22	Dr. M Suleman Memon	Epidemiologist	Directorate of Malaria Control
23	Dr. Basharat Javed	National Technical Officer	National TB Control Programe
24	Dr. Najama Javed	Senior Medical Officer	PMRC fellow of 6th cohort, FELTP
25	Dr. Faiza Bashir	Medical Officer	PMRC fellow of 7th cohort, FELTP
26	Dr. Qurat-ul-Ain	Medical Officer	AFPGMI fellow of 7th cohort, FELTP
27	Maj. Dr. Balach Baloch	Fellow of 7th cohort FELTP	Pak Army, fellow of 7th cohort, FELTP
28	Dr. Syed Wasif Javed	Provincial Technical Officer	FELTP PDSRU, Punjab
29	Dr. Nadeem-ur-Rehman	Medical Superintendent	THQ, Dhirkot, AJK Health Department
30	Dr. Zakir Hussain	Federal Technical Officer	FELTP FDSRU
31	Dr. Shimizu Takayuki	Expert	JICA, Abbottabad
32	Dr. Shinsaku Sakurada	Expert	JICA, Abbottabad
33	Dr. Abdul Ghaffar Lashari	Planning Officer	Balochistan Health Department, Quetta
34	Dr. Farah Naz	Technical Officer	Federal EPI, Islamabad
35	Mr. Jamshed Maqbool	MIS Manager	FELTP, Pakistan, Islamabad

Appendix:

Criteria for disease prioritization for surveillance, Pakistan, 2015.

For this prioritization workshop we will use the following eight criteria. These are the criteria proposed by WHO for prioritization for surveillance. They were also the same criteria used to prioritize diseases for Pakistan in 2005. The first four criteria can be determined for the most part on existing statistics, other numerical information, or well-defined non-numerical information. The second four criteria are more subjective in nature.

For all criteria except international interest we will rank each disease on a five-point scale. After discussion in small groups each participant will first rank the disease from highest to lowest. They will use the disease cards provided for this. Each participant will then divide the sorted deck into quintiles. The top quintile will get a score of 5, then next from the top 4 and so on down to the bottom quintile which gets a score of 1. Then these scores will be entered into the computer and the median score will be computed for all participants.

Objective Criteria

Present burden of disease

We will consider incidence, prevalence, and mortality rates. For diseases Incidence, prevalence, and mortality for the diseases can be ranked directly using existing data when available.
Where no data are available on incidence or prevalence, diseases need to be scored for these criteria through comparison with other diseases, i.e. does disease X occur more or less than disease Y (for which incidence is known) in the country?

Case fatality rate

The case fatality rate (CFR) can be scored directly ranking the CFRs from highest to lowest and dividing the list into quintiles. The highest quintile would get a score of 5 and the lowest a score of 1.

We have extracted the CFRs from CCDM. When possible these can be modified with country data.

Epidemic potential

This criterion addresses the extent to which the disease poses a potential for epidemics. This question implies understanding the mode of transmission (airborne, vector-borne, person-to-person, and others) the incubation period. Other factors such as the tendency of the disease to spread silently through mild disease, amplifier hosts, commercial products, etc. could be considered. We will use the cards to rank the diseases from highest to lowest epidemic potential. The ranking will be based on potential for spread in time and place. How quickly and how broadly does this spread. At the lowest level one would find diseases that are not expected to spread at all such as neonatal tetanus. At the top would be diseases like pandemic influenza that would spread broadly and rapidly.

International regulations or programmes for surveillance, prevention, control, elimination, or eradication.

Indicators to be considered include the existence of a regional or international elimination or eradication programme, and whether diseases are covered by the International Health Regulations.

Subjective Criteria

Potential threat/emergence/changing pattern

One of the reasons why a disease is put under surveillance is to detect early whether there is a change in pattern and thus to enable rapid intervention. This criterion deals with the risk in relation to the country in which the exercise is being undertaken for the diseases on the list.

The following questions can be considered for this criterion:

- Is this an emerging or re-emerging disease?
- Is there a risk for antimicrobial resistance?
- Has there been a changing pattern in the disease in the last five to ten years; did the disease become more severe; did it affect other groups; did the incidence rise?
- Are there changes in demographics, environment, or vector distribution which could induce changes in the epidemiology of the disease?
- Are there suspected or predicted gaps in vaccine coverage, changes in animal husbandry, and food/water provision?
- Has the disease developed in neighbouring countries?

Examples: BSE is a potential threat for countries that have imported meat or animals from affected countries; malaria and West Nile fever might be high risk for a country where the vector exists but where the diseases are not endemic; SARS and other new diseases may emerge with potential for international spread.

Health gain opportunity through public health activities

This criterion addresses the opportunities to reduce the present and future burden of ill health through prevention or control of a disease. Such opportunities range from little or no available public health measures, through educational programmes or behavior modification, improvement of public to prevention by vaccination. Efficacy, technical and economic feasibility, and acceptability of the measures may be considered.

After discussion in your group as individuals use your card deck to rank the diseases by health gain opportunity. You may roughly estimate the potential available health gain as a percentage preventable. For disease with little information use your judgement and experience to put the cards in the ordered deck. When you are satisfied with the order, divide the card deck into quintiles. The highest quintile will get a score of 5 progressing down to a score of 1 for the lowest quintile.

Social and economic impact

Indicators to be considered include years of potential life lost, physical disability, costs to the organization and individuals, costs resulting from trade and travel restrictions. As examples, pandemic influenza and SARS would score high.

Public perception

The factors which influence people's perception of risk include:

- Immediate versus delayed effects of the infection
- Dreaded versus familiar disease
- Mechanism of disease not known or understood
- When the risk of disease cannot be controlled by the individual
- Children at risk
- Victims known to the individual
- Lack of belief in authority of the information sources
- Media attention.

Indicators to be considered include number of articles published in newspapers concerning the disease, or hits on the Internet relating to the disease in the country. After discussion in your group, use your cards to create a ranking and score as you have done for the previous criteria.

Acronyms

AJK	Azad Jammu and Kashmir
AFPGMI	Armed Forces Post Graduate Medical Institute
CDC	Central Disease and Control and Prevention
FATA	Federal Administrative and Tribal Agency
FELTP	Field Epidemiology and Laboratory Training Program
KPK	Khyber Pakhtunkhwa
NIH	National Institute of Health
NHEPRN	National Health Emergency Preparedness & Response Network
NARC	National Agriculture and Research Center
NHSR&C	Ministry of National Health Services, Regulations and Coordination
PMRC	Pakistan Medical Research Council
PDSRU	Provincial Disease Surveillance and Response Unit
THQ	Tehsil Headquarter Hospital
WHO	World Health Organization