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Global consultation on strengthening national capacities for surveillance and control of communicable diseases

Geneva, Switzerland
22–24 November 2003

World Health Organization

Communicable Disease Surveillance and Response
Lyon Office for National Epidemic Preparedness and Response

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Abbreviations

AFP	Acute flaccid paralysis
AFRO	WHO Regional Office for Africa
CBOs	Community-based organizations
CDC	Centers for Disease Control and Prevention Atlanta, GA, USA
CFR	Case fatality rate
CSR	Communicable disease surveillance and response
DEWS	Disease early warning system
EMRO	WHO Regional Office for the Eastern Mediterranean
EPI	Expanded Programme on Immunization
EPINET	European Programme for Institutional Network in Epidemiology Training
EPR	Epidemic preparedness and response
EU	European Union
EURO	World Health Office for European Region
EWARN	Early Warning, Alert and Response Network
EWS	early warning systems
FETP	Field Epidemiology Training Programme
GAVI	Global Alliance for Vaccines and Immunization
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOARN	Global Outbreak Alert and Response Network
HIV	Human immunodeficiency virus
HQ	Headquarters
ICMR	Indian Council for Medical Research
ICC	Inter-country Coordination Committee
ICT	Inter-country team
IDPs	Internally displaced populations
IDS	Integrated disease surveillance
IDSP	Integrated disease surveillance programme
IDSR	Integrated disease surveillance and response
IHR	International Health Regulations
IMCI	Integrated management of childhood illness
IT	Information technology
LQA	Laboratory quality assurance
NICD	National Institute of Communicable Diseases
NGOs	Nongovernmental Organizations
NSPCD	National Surveillance Programme for Communicable Diseases
PAHO	Pan-American Health Organization
PHR plus	Partners in Health Research
PMTCT	Prevention of mother-to-child transmission
PPHSN	Pacific Public Health Surveillance Network
RBM	Roll Back Malaria (Programme)
SARA	Support for Analysis and Research in Africa (project)
SARS	Severe acute respiratory syndrome
SEARO	WHO Regional Office for South-East Asia
STDs	Sexually transmitted diseases
TB	Tuberculosis
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
WPRO	WHO Regional Office for the Western Pacific
WHO	World Health Organization

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Executive summary

Old, emerging and re-emerging communicable diseases constantly threaten global health security. Coping with these threats relies heavily upon effective and efficient surveillance, preparedness and response systems. A strong national surveillance system provides the backbone for early detection of and prompt response to health emergencies. Strengthening national capacities for surveillance, in line with the requirements of the revised International Health Regulations (IHR), is a priority as stated in the resolution on global health security of the Fifty-fourth World Health Assembly.

Countries increasingly look upon the integration of disease surveillance activities as an effective, efficient and sustainable approach to improving national capacities. An integrated approach to surveillance aims at improving efficiency, increasing effective and sustainable capacity building and improving use of data at the national and subnational levels, while taking into account programme-specific needs. However, in adopting an integrated approach to surveillance, it is essential to continuously review the existing strategies and models of disease surveillance in each country. Moreover, the assessment of existing national surveillance and response systems is important in identifying strengths, weaknesses, constraints and opportunities so that the information obtained can be used to develop feasible strategies. Likewise, lessons from different models and approaches to surveillance need to be documented for use in further strengthening surveillance systems.

Based on these premises, a Global Consultation to review current strategies and identify lessons for further strengthening national surveillance and response systems was convened in Geneva, Switzerland, from 22–24 November 2003. The main objectives of this meeting were:

- to share experiences, lessons learnt, challenges and constraints in applying different models and approaches for strengthening national surveillance, response and control systems; and
- to define elements of a common framework for strengthening national capacity for surveillance, response and control of communicable diseases, and recommend steps for its implementation.

This Global Consultation reviewed the various approaches that have been adopted to strengthen national surveillance systems. It was emphasized that simple and practical tools, adaptation to local contexts, focus on capacity building, feedback and regular monitoring were strong attributes of functional surveillance systems. On the other hand, absence of a legal framework, weak coordination, a shortage of critical resources and undefined expectations were identified as features of weak surveillance systems.

The necessity for the following was stressed: to strengthen district-focused surveillance systems; to promote competency-based training of health workers; to improve services and build partnerships with vertical programmes, networks and the media. Similarly, it was noted that coordination of surveillance across programmes needs leadership at the highest levels. Pre-service, in-service and longer-term specialized training were identified as important prerequisites for the successful development of human resources for surveillance and response. It was emphasized that there is a need for advocacy, standardization of procedures, provision of tools and supplies, and trained personnel to strengthen the role of laboratories in disease surveillance and response.

I. Background

1.1 Global challenges: infectious diseases — emerging threats, evolving challenges and needs

Infectious diseases continue to be the major challenge for global health security, often causing outbreaks that have impacts beyond geographical boundaries. With the continuing growth in international trade and travel, the potential for the spread of infectious diseases is greater than ever before. The emergence of new pathogens and the re-emergence of old ones, poses a growing threat to global public health[1]. Threats of deliberate and malicious use of infectious diseases as weapons of bioterrorism further reinforce the urgency for strengthening our preparedness and response capacity.

Recent experiences with cholera, plague, and acute viral haemorrhagic fevers, including Ebola and rift valley fever, all attest to the growing threat from infectious diseases and the urgency for further strengthening disease surveillance and response systems. The emergence of new threats such as severe acute respiratory syndrome (SARS), a disease that has traveled more widely, swiftly and lethally than any other recent new disease, has proved that infectious diseases are real threats. However, the recent experiences with SARS have also shown that with improved surveillance, public health threats can be contained[2]. These experiences underline the need for global partnership in the fight against such threats[3].

In general, strengthening the national surveillance and response capacity of Member States to allow early recognition, investigation and timely provision of quality information is essential for the early containment of disease outbreaks to prevent international spread. Likewise, strengthening monitoring and evaluation is essential to track outcomes and impact of disease prevention and control programmes.

The development of norms, standards, guidelines and tools provides the basis for improvements in performance of surveillance systems and public health laboratories. Ideally, countries should conduct a standardized comprehensive assessment of their national systems[4], which is then used to develop a plan of action outlining activities, such as reinforcing communication networks, and implementing early warning or disease-specific surveillance systems[5]. Besides the national surveillance systems, international disease surveillance networks, such as the Global Outbreak Alert and Response Network (GOARN), have proven their relevance by allowing timely exchange of information, resulting in better country preparedness and response to emerging threats such as SARS.

During the past few years, countries have increasingly looked at the integration of disease surveillance activities as an effective, efficient and sustainable approach to improving national capacities. This has translated into regional surveillance strategies in the African, Eastern Mediterranean and South-East Asia Regions. Implementation of the integrated strategy aims at maintaining an appropriate balance between the benefits of integration and the need for disease-specific control programmes[6].

Increasingly, the World Health Organization (WHO) is being requested to provide assistance to countries in strengthening their national surveillance, response and control activities. In order for WHO to provide the required guidance to Member States, appropriate and effective models for strengthening national disease surveillance systems need to be reviewed and further developed, taking into account country-specific needs.

[1] Emerging and epidemic-prone infectious diseases. In: Global defence against the threat of infectious diseases. Geneva, World Health Organization, 2003.

[2] How SARS changed the world in six months. Bulletin of the World Health Organization, 2003, 81:625–626.

[3] Weekly Epidemiological Records, 2003:13–19.

[4] Weekly Epidemiological Records, 2000, 76:9–16.

[5] Weekly Epidemiological Records, 2003, 78:232–240.

[6] Weekly Epidemiological Records, 2000, 75:1–8.

1.2 Purpose of the Consultation

This purpose of this Global Consultation was to review existing surveillance models and implementation strategies, to identify their strengths and weaknesses, and to identify areas for synergy, and based on the results of this review, to suggest ways in which efficient and sustainable national communicable disease surveillance and response systems can be developed.

1.3 Objectives

- To share experiences, lessons learnt, knowledge of challenges and constraints to be overcome in applying different models and approaches to the strengthening of national surveillance, response and control systems.
- To define elements of a common framework for strengthening national capacity for surveillance, response and control, and recommend steps for its implementation.

1.4 Expected outcomes

The expected outcomes of the Consultation were:

- a better understanding of different models and approaches to building national capacity for surveillance; and
- consensus on elements of a framework and next steps for a coordinated approach to effectively support Member States in building national capacity for surveillance, response and control.

1.5 Expected outputs

The expected outputs of the Consultation were:

- a consensus on a framework for a coordinated approach to strengthening national capacity for surveillance, response and control;
- a set of recommendations on strengthening national surveillance and response capacity; and
- a summary report of the proceedings.

1.6 Process

The 3-day global workshop on strengthening national capacities for surveillance and control of communicable diseases, was attended by more than 80 participants from all WHO Regional Offices, representatives of World Health Organization country offices, and national ministries of health, Centers for Disease Prevention and Control, Atlanta, USA (CDC, Atlanta), United States Agency for International Development (USAID) and other partner institutions (annex 1).

At the various sessions, experiences and lessons on implementation of integrated disease surveillance and response (IDSR), disease early warning systems (EWS), field epidemiology training, and laboratory strengthening were presented and discussed[7] (see annex 2 (agenda) and annex 3 (discussion paper).

[7] Case-studies based on IDSR documentation in six WHO African Region and WHO Eastern Mediterranean Region countries were distributed.

Overall, the process involved:

- presentations on country, inter-country, regional and global experiences and lessons[8];
- group discussions on presentations;
- group (thematic) work and recommendations; and
- workshop deliberations.

II. Introduction: global challenges and strategies to combat threats from infectious diseases

Opening remarks

***A. Asamoa-Baah**, Assistant Director General, Communicable Diseases, WHO Headquarters*

There are no dichotomies between national and global health security but rather the two are closely linked. A strong national surveillance and response system is the cornerstone for the implementation of the revised International Health Regulations (IHR), the legal framework for ensuring global health security.

Communicable diseases remain the major cause of morbidity and mortality, particularly in developing countries. Increased globalization, and the resulting growth in travel and trade, have contributed to the spread of infectious diseases. In 2002 alone, it was estimated that travellers made 2 billion international journeys, in addition to other population movements, e.g. due to displacement and conflict. These movements, although offering opportunities for improved integration of the world's population, also contribute to the rapid spread of infectious disease outbreaks, the latest of which was SARS.

Following the development and wide use of vaccines, there were high expectations and a widely held belief that infectious diseases would be things of the past. Unfortunately, the emergence of new infections, development of antimicrobial resistance and difficulties in ensuring universal delivery of vaccines have dashed these hopes. Moreover, changing lifestyles, conflicts and population displacements, floods and famine have contributed to the resurgence of infectious diseases.

Coping with these threats relies on effective and efficient communicable disease surveillance, preparedness and response systems. A strong national surveillance system provides the backbone for early detection of health emergencies and prompt responses, which contribute to reducing excess morbidity and mortality.

Global health security will be achieved by supporting countries to strengthen their national health security. In recognition of this need, the fifty-fourth World Health Assembly endorsed a resolution to strengthen national surveillance capacities. Based on this knowledge, it is important to focus not just on the successes so far achieved, but also on the gaps. Building on surveillance experiences and the existing legal framework, this Global Consultation was expected to deliberate on and identify a feasible framework, and recommend ways to strengthen national surveillance and response systems.

[8] All presentations were made at general sessions.

An overview of communicable disease surveillance and response strategy and objectives of the meeting

Guénaël Rodier, *Director, Communicable Disease Surveillance and Response, WHO Headquarters*

Global health security relies on strong national surveillance systems with district focus. Although there are different approaches to surveillance, IDSR envisages integration of the common functions of the different surveillance systems, while at the same time addressing programme-specific data needs.

Several strategies to strengthen national surveillance systems have been adopted in the different WHO Regions. Currently, various approaches are being used to strengthen national capacities, and there is often duplication of approaches and efforts. In recent years, new approaches considering local contexts have been field-tested. The lessons learnt so far indicate that there is no single recipe to improve communicable disease surveillance and response, but there are common principles. Although countries need to adapt their approaches to their local context and needs, the main principles of surveillance are the same. These include partnerships with other programmes (at Headquarters and Regional levels), epidemiology and laboratory strengthening, and functions of surveillance.

At the district level, a single group or a few groups of people handle almost all the surveillance and response functions related to various surveillance and control programmes. Although there are specific information needs, i.e. for response to epidemics, health policy, resource allocation and control activities, common or support functions of surveillance can generally be jointly implemented. An integrated approach to surveillance envisages that surveillance functions such as supervision, training, resources and standards can be integrated to improve the efficiency of the system. This would facilitate timeliness and availability of good-quality information on a public health event as well as information sharing and analysis, and this should ensure evidence-based action. Recent developments, particularly the outbreak of SARS, gave surveillance an unprecedented momentum and support, and there has been an increased interest in surveillance; senior leadership and commitment have increased; know-how has improved, and more funds have been made available.

The proposed global communicable disease surveillance and response (CSR) strategy has four components: global partnership; containment of known risks; response to unexpected risks; and improved preparedness. Most efforts and investments will need to focus on improving national capacity for preparedness, and it will be a genuine duty of WHO Regional Offices and World Health Representatives of the country offices to provide support, assisted by CSR Headquarters. Moreover, Article 4 of the revised IHR provides a legal framework for strengthening surveillance, notification and response systems. To achieve these goals it will be necessary to improve national capacities, with a district focus, for disease surveillance, epidemic preparedness and response.

III. Country perspectives: approaches, opportunities, challenges, lessons and needs

The chairperson of the session emphasized that sharing experiences from the field and lessons on implementation of various approaches to surveillance is important for strengthening national systems. In this session, country perspectives on surveillance approaches and strategies for disease surveillance and response were presented and discussed.

3.1 Strengthening national capacity for surveillance and response in Uganda

Ambrose Talisuna

Uganda was one of the early implementers of IDSR in Africa. Currently, Uganda has a national IDSR coordinating body, a strong capacity-building programme, and a network of laboratory and training institutions. Lessons from Uganda show that success in IDSR requires high-level commitment, regular feedback, local capacity-building, networking and partnership. The programme has demonstrated progressive improvement in surveillance indicators.

The Integrated Disease Surveillance (IDS) strategy was adopted by Member countries of the African Region in 1998. In line with this strategy, Uganda conducted a comprehensive assessment of its national disease surveillance system in 2000. The assessment indicated a high-level commitment as evidenced by the development of the National Health Sector Strategic Plan and the National Health Policy, of which surveillance and epidemic preparedness were major components. Based on the findings of the assessment, Uganda developed a 5-year strategic plan of action for implementation of an IDSR programme. Focused detailed annual plans for districts and subdistricts were developed and resources for implementation were mobilized. Prioritization of diseases for surveillance identified epidemic-prone diseases to be included in the national disease surveillance system.

The coordinated of implementation of the national plan of action was ensured through a national committee involving all stakeholders which meets monthly. Likewise, provincial liaison offices (epidemiology units) were assigned for each province. Implementation in districts and subdistricts was coordinated through designated focal persons at all levels.

The IDSR implementation strategy is aimed at strengthening case-detection and registration, reporting and data management, including weekly analysis and interpretation and action as required. Similarly, regular feedback, through weekly newsletters, quarterly bulletins (PDF and printed versions for peripheral health workers) and a WHO quarterly bulletin is produced. A 6-monthly meeting of focal persons engaged in surveillance is organized. To improve the role of the laboratory services in epidemiological surveillance, emphasis has been placed on strengthening laboratory capacity and establishing referral networks. To coordinate these, a national laboratory committee with representatives of public and private laboratory facilities and nongovernmental organizations (NGOs) was established.

Training, social mobilization, monitoring and evaluation are integral parts of the implementation plan. Monitoring of programme implementation uses indicators that have been identified as appropriate (see Box 1). An assessment of progress has documented that timeliness of reporting weekly data has steadily increased, and more than 90% of the districts reported in 2004 compared to 60% in 2002. The completeness of data was 100% and analysis has been routinely used to identify trends and monitor for occurrence of disease outbreaks. However, analysis at lower levels is still a challenge. The use of thresholds has improved timeliness of detection and reporting of disease outbreaks. Moreover, the proportion of laboratory-confirmed outbreaks has increased.

In meeting the need for further strengthening of the national surveillance system, and to consolidate the achievements made so far, support from all stakeholders remains essential. The challenges for the implementation of IDSR in Uganda are to further improve the quality of data and their use for public health action. Moreover, strengthening of community-based surveillance including vital registration requires further effort.

Box 1. **Indicators for monitoring programme implementation**

- Percentage of epidemics with laboratory-confirmed diagnosis
- Percentage of districts with outbreak thresholds
- Percentage of epidemics with case-based records
- Percentage of epidemics reported within 2 days surpassing the threshold
- Percentage with quaterly IDSR bulletins
- Percentage with weekly newsletters to districts
- Percentage of outbreaks with recommended response
- Percentage of districts with weekly/monthly reports
- Percentage case fatality rate (CFR) of cholera, measles, meningitis and plague
- Percentage of cases of cholera, measles, plague in epidemics laboratory confirmed, and acute flaccid paralysis (AFP) surveillance indicators

3.2 Integrated disease surveillance and response in India

Domodor Bachani and Sampath Krishnan

In 1997, India started implementation of the national surveillance programme for control of communicable disease (NSPCD) in selected districts. Since then, the NSPCD has been expanded and is currently implemented in 101 districts in all states. Building on the experiences and lessons from the NSPCD, India has initiated an integrated disease surveillance programme (IDSP). There is a national commitment to the IDSP which has been expressed through the establishment of an IDSP cell within the Ministry of Health and the allocation of the resources required for its implementation. A national IDSP coordination mechanism, representing all states has been established.

In 1997, the National Apical Advisory Committee for National Disease Surveillance and Response System, established by the Ministry of Health and Family Welfare, prepared a concept plan for strengthening the disease surveillance system in India. The NSPCD and the associated specific activities were developed and approved by the Government. and implementation of these activities was initiated. The overall focus of the programme was to enhance and expand the existing activities of the National Institute of Communicable Diseases (NICD), Indian Council for Medical Research (ICMR) and the state governments to establish networks for communicable disease surveillance and response.

The NSPCD includes activities such as development of human resources through training of surveillance officers and laboratory personnel and upgrading and modernization of laboratories. It also includes strengthening of the links from peripheral to central levels, networking between state, regional and national institutions, and the development of standard formats, operation and training manuals, and improving monitoring and evaluation. The programme was first pilot tested in 101 districts of the country and has now been introduced into all the states.

Building on the lessons learnt from implementation of the NSPCD, India has embarked upon an IDSP. This programme aims to integrate existing surveillance information collected at the district level, and to use it for public health action. The IDSP will integrate surveillance and control programmes covering communicable diseases, accidents, water quality, outdoor air quality, surveillance of risk factors for noncommunicable diseases, and state-specific priority diseases. It will be implemented using a phased approach and all districts will be covered within a 5-year period.

Because the system of administration and health care delivery in India is decentralized, the IDSP focuses on strengthening the implementation capacity at state and district levels as this is the best practical approach.

As part of the implementation of the IDSP, a central IDSP cell and a national coordination committee have been established. Resources to strengthen the national IDSP cell have also been identified. Additionally, state- and district-level surveillance committees have been established. An innovative approach being used in India is the participation of the private sector in public health surveillance. Currently this initiative is being piloted in the state of Maharashtra which has established a functional district-focused surveillance system. Lessons from this pilot project will contribute to the development of a model for involving the growing private sector in disease surveillance and response.

3.3 Strengthening national surveillance through partnership in Romania

Alexandru Rafila

Romania, a country in socioeconomic and political transition, has initiated a national disease surveillance programme. However, to meet expected the surveillance standards set by EURO, it needs to invest further in time, legal framework and resources. To this end, Romania has finalized a comprehensive assessment of its national disease surveillance and response system. This assessment has identified a network of public health institutions which can contribute to further strengthening of the national disease surveillance system. It also identified that filling gaps in coordination and establishing a legal framework for surveillance are priorities for strengthening the national disease surveillance and response system.

Socioeconomic and demographic indicators for Romania are far less than European standards. The main causes of death include cardiovascular diseases, tumours and injuries. Of the infectious diseases, diarrhoea, chickenpox, mumps, tuberculosis (TB) and hepatitis A are common.

Romania has embarked on a programme for strengthening its national surveillance network through better partnership with stakeholders from the central to the peripheral levels. The goal of the national communicable disease surveillance system is to strengthen the core functions of the surveillance system and to develop an integrated system. The surveillance network system consists of a national coordinator, national reference laboratory, four regional institutes of public health (with epidemiology and laboratory units), and 42 district public health directorates. Reporting is mandatory for 95 conditions; this includes immediate reporting for relapsing fever, cholera, yellow fever, plague and haemorrhagic fever, and weekly, monthly and quarterly reporting for other conditions. Vertical reporting is in place for TB, human immunodeficiency virus (HIV), and sexually transmitted diseases (STDs).

Romania's decision to join the European Union, which requires certain surveillance standards from its members, is a driving force for high-level commitment to strengthening the national disease surveillance system. The comprehensive assessment of the national disease surveillance system identified that the presence of a national network of communicable diseases and public health institutions offers an opportunity to strengthen the system. On the other hand, lack of a well-defined national coordination body, absence of a legal framework for national disease surveillance (legislation), and lack of accreditation and laboratory quality assurance (LQA) mechanism are identified gaps. The findings of the national assessment underline the need for strengthening the system including through establishing a legal framework and mechanisms for coordination.

3.4. Computerized Early Warning, Alert and Response Network for epidemic-prone and vaccine-preventable diseases in Lebanon

Nada Ghosn

Lebanon has established a national disease surveillance system, which includes both routine surveillance and an Early Warning and Response Network (EWARN). Whereas the routine disease surveillance system provides data for the planning and monitoring of health programmes, the EWARN is primarily geared to early recognition, investigation and response to disease outbreaks. Experiences and lessons from Lebanon show that national commitment and a legal framework are necessary for effective coordination, integration and sustainability of national disease surveillance systems.

In Lebanon, as in many developing countries, communicable diseases are the leading causes of morbidity and mortality. Of the communicable diseases, foodborne and waterborne diseases account for 83% and often cause outbreaks. The Government is the main provider of public health care. But the private sector has a large role in curative services particularly in urban centres.

The national disease surveillance system benefits from the legislation regulating universal passive disease reporting. The system aims at strengthening networking, development of human resources, integration of surveillance activities and provision of regular feedback. A national committee for communicable disease control coordinates activities. A network consisting of surveillance focal points in 150 hospitals, 900 dispensaries, laboratories and blood banks has been established. Technical guidelines and manuals have been produced and training on surveillance tools and guidelines (including for the private sector) has been provided. The national system is also working towards integration with AFP surveillance to extend zero reporting to all diseases under immediate notification. Feedback is a strong component of the system and health professionals are regularly informed through bulletins, web site updates, press releases and field investigation reports.

In addition to the routine disease surveillance system, Lebanon has also introduced a computerized EWS for epidemic-prone and vaccine-preventable diseases. This system focuses on improving use of analysis of surveillance data to prompt timely action. The system has generated maps, graphs, and an automated alert table and has contributed to early recognition of and response to outbreaks.

The main issues to be addressed in further strengthening the national disease surveillance system include updating the current surveillance legislation and standardization of thresholds for detecting outbreaks. There is also a need to raise the awareness of health professionals about disease surveillance and to maximize the use of information technology in surveillance activities. External assessment of the existing disease surveillance system, prioritization of laboratory surveillance and networking, and strengthening intersectoral cooperation and networking are other areas for follow-up.

3.5 Disease surveillance in Cambodia

Sok Touch

Cambodia has been challenged by years of conflict, internal displacement and disease outbreaks. Recently, a national assessment of the existing surveillance system was finalized and areas for improvement were identified, including the desirability for involvement of the private sector and establishment of a legal framework and mechanisms for coordination of activities.

Cambodia has a low socioeconomic and demographic profile with the second-highest infant mortality rate of the Member countries of the WHO Western Pacific Region. Years of conflict and internal displacement have contributed to this profile. Most of the disease burden in Cambodia is due to communicable diseases including acute respiratory infections, malaria, TB, diarrhoeal diseases and HIV/AIDS. Cholera is endemic and more than 10 epidemics have occurred in the last two decades alone.

Cambodia has established a national communicable disease surveillance system which was started in 1993. The system includes a daily sentinel data reporting to detect early warning signals of disease outbreaks, and weekly zero reporting for dengue, AFP, measles and cholera. It also has HIS with monthly reporting and quarterly reporting for TB and leprosy. The information collected from health facilities is reported to the district and provincial levels, and then to the Ministry of Health.

A comprehensive assessment of the national surveillance system was conducted with support from WHO. The recommendations from this assessment and lessons learnt from the response to SARS were used to further strengthen the system and to explore opportunities for integration with vertical surveillance systems (for malaria, TB and HIV). It also recommended strengthening weekly reporting, producing regular updates and improving data management at the central level. The assessment has also identified the need for improving the capacity of public health laboratories and recommended the definition of core capacities required to achieve this goal. In recognition of the growing role of the private sector in health care delivery, it is imperative to involve this sector in disease surveillance activities. This will require a reform of the current legislation on communicable disease control to encourage private–public partnerships.

Based on the experiences from the national communicable disease surveillance programme, recommendations for prioritizing and updating the list of diseases for surveillance and for reviewing the legal framework for surveillance were made. In addition, a comprehensive review of the laboratory capacity, improving the database with Healthmapper, and developing a plan of action will further improve the system. The experiences gained from SARS underscore the need for improving coordination and strengthening disease surveillance.

3.6 Strengthening surveillance through behavioural change: experiences from Ghana and the United Republic of Tanzania

Rebecca Fields and Lynne Franco

Ghana and the United Republic of Tanzania have adopted the IDSR strategy. Documentation and review of the process of implementation of this strategy noted that encouraging progress has been made in both countries. As part of this implementation, both Ghana and the United Republic of Tanzania have adapted surveillance training manuals and training of health workers. To assess the application of the acquired skills, a rapid assessment of the surveillance behaviour of health workers was undertaken. The assessment concluded that although training and acquiring new skills are important, behavioural change is critical for application of these skills.

Ghana and the United Republic of Tanzania were among the first Member countries of the African Region to adopt the IDSR strategy to strengthen their national disease surveillance and response system. As part of the process of implementation of this strategy, both countries have made an assessment of their national disease surveillance systems. Based on the assessment findings and the resulting recommendations, both countries have developed a national plan of action. Currently, implementation of activities is in progress. These include the adaptation of surveillance training manuals and training of health workers.

Building on these experiences, Partners in Health Research (PHR) plus and Tanzanian partners, with support from USAID, conducted a rapid assessment of the context in which health workers performed integrated disease surveillance activities. The objective of the assessment was to identify status and factors for performance and recommend strategies for strengthening surveillance practices through behavioural change. The assessment variables included views about surveillance, operating constraints such as facility and extent of supervision, as well as perceptions of the community. The assessment identified obstacles related to surveillance being perceived as meaning “clinical diagnosis and treatment of cases”: recording and reporting were not mentioned as components of surveillance. The study indicated that although the acquisition of technical skills through training is essential, it is not sufficient to ensure good performance which largely depends upon changing the attitudes and behaviour of the individual health workers.

Based on the above findings, it is recommended that not only knowledge and skills be addressed, but also attitudes, perceived consequences, accountability, social norms, and self-efficacy. It is also important to clearly communicate expectations of performance. Moreover, for training to be effective it is necessary to provide appropriate guidelines, job aids and tools.

Discussion on country presentations

The discussions focused on the challenges and issues in prioritization of diseases for surveillance, on improving motivation of health workers and addressing resource constraints. The design of surveillance strategies in decentralized health systems and participation of the private sector in surveillance activities were also discussed.

It was pointed out that political commitment is critical for establishing and sustaining national disease surveillance and response systems, including strengthening the capacity of public health laboratories and epidemic preparedness. In this regard, emphasis was placed on the need for developing an effective advocacy strategy including the use of functional surveillance models, demonstrating cost-effectiveness and regular update on the performance of surveillance.

Motivation of health workers was another important issue that was discussed in depth. It was emphasized that although training is essential for acquiring skills, the motivation of health workers through behavioural change and incentives, as well as clearly defined expectations are required.

The participants pointed out that the administrative arrangements and local contexts in each country should be considered when designing surveillance strategies. Thus, in a decentralized system, a district-focused decentralized approach would be more feasible and sustainable. Moreover, as well as taking into account the local context, the design of the surveillance strategy should be flexible enough to address identified needs.

The role of the private sector in health care delivery, particularly in curative care and diagnostics, is growing in many Member countries. Thus, national surveillance programmes should adopt strategies to involve the private sector in surveillance activities. Similarly, the role of NGOs and academic and training institutions in surveillance needs to be further explored and expanded. To enhance this process, it was suggested that coordination should be clearly defined, and should involve major stakeholders including the public and private sectors, the community and NGOs.

IV. Inter-country perspectives on approaches to surveillance — opportunities, challenges, lessons learnt and needs

The session started with a brief keynote speech from the chairperson who underscored that although globalization has enhanced communication (and exchange of experiences and skills), it has at the same time facilitated the rapid spread of epidemics. In this context, sharing of inter-country and cross-border experiences would provide an opportunity to improve the coordination mechanism for surveillance and response systems and contribute to global health security.

4.1 Strengthening national communicable disease surveillance through networking — the Mekong Basin Disease Surveillance experience

Gulam Rasul

The Mekong Basin Communicable Disease Surveillance Initiative has created a forum for rapid information sharing, inter-country cooperation in training, strengthening of laboratory networks,

and for promoting cross-border surveillance and response activities. The initiative is the result of collaboration between 11 countries, two regional offices, and CSR Headquarters and donor agencies. The experiences from this partnership offer important lessons for inter-country collaboration to strengthen national and cross-border surveillance networks.

Globalization, through increased international travel and trade, has created opportunities for the rapid trans-boundary spread of infectious diseases. Thus, it is of paramount importance to strengthen information sharing and coordination between countries to enable them to be prepared and ready to respond to infectious disease threats. Recognizing this need, the Mekong Basin Communicable Diseases Surveillance Initiative was launched by six countries (Cambodia, Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam and Yunnan, Province of China.) which participated in the project. These countries have common borders and much cross-border population movement and trade, facilitating the rapid spread of infectious diseases. This project is the result of a growing understanding of subregional collaboration and communication among the Mekong Basin countries which was endorsed through the signing of a memorandum of understanding. This initiative is a product of the collaboration between the Western Pacific and South-East Asia Regional offices of WHO, and donors' support for strengthening national and subregional surveillance and response systems.

The goal of the project is to contribute to early detection and communication of disease outbreaks in participating countries through subregional information exchange. Its objectives are to contribute to the development of national capacity for surveillance and to establish mechanisms for the reporting of important infectious disease events. It also serves as a platform for discussion and for standardization of case definitions and tools among the Mekong Basin countries. Other important areas include promoting training on surveillance based on experiences from Thailand, improving communication on priority diseases through formal and informal reporting of disease outbreaks, and improving subregional capacity for laboratory diagnostics, mobilization of resources for investigation and response, and coordination between the Mekong Basin countries.

The main achievements of phase 1 (from 2000–2003), were the establishment of a surveillance network and a mechanism for sharing of information on disease outbreaks, training in field epidemiology through fellowships to China and Thailand, and conducting technical reviews on surveillance.

The second phase of the project, scheduled for 2004–2006, will include a more practical approach to data sharing and response activities in five cross-border sites bordering the Lao People's Democratic Republic. Additionally, the project envisions initiating a cross-border project for epidemic surveillance and response in Nepal.

4.2 Strengthening surveillance and laboratory networks in Brazil

Jarbas Barbosa

Brazil has had encouraging experiences in establishing a disease surveillance system. An extensive laboratory network, an emphasis on strengthening epidemic preparedness and response (EPR), and field epidemiology training constitute the essential elements of this system. The experiences from Brazil indicate that establishing a functional laboratory network is a critical component of effective disease surveillance and response systems. The laboratory network can benefit greatly from identifying participating laboratories in strategic locations, including border sites to facilitate the collection and transport of specimens to referral centres.

Brazil has an estimated population of 175 million and shares common borders with almost all the countries in South America. It has a decentralized federal administration with 27 states and 5600 municipalities. In line with this decentralized system, the states and municipalities are responsible for implementation of health activities including surveillance and response. The Ministry of Health is responsible for setting policies and standards, development of guidelines, planning, budgeting and

coordination of service delivery. The public sector is responsible for 80% of the health care delivery while the private sector covers the remaining 20%.

Brazil has taken the initiative to strengthen its national surveillance system through training of health workers, networking and decentralization of health-related activities. As part of this effort, it has established an extensive laboratory network in each state. Moreover, 15 laboratories have been established at border sites and participate in the laboratory network. As part of the process of strengthening this network, a pilot scheme for information sharing on yellow fever and AFP is being implemented. A laboratory network for dengue and influenza sentinel surveillance at municipal, state and federal health facilities is also in operation.

The national health information system uses computerized data reporting software to report on 55 infectious diseases. This system generates and disseminates surveillance information on disease trends and outbreak events through bulletins and web site reports.

Training is an important component of the national programme for strengthening disease surveillance and response. To effectively coordinate these training activities, a network of 10 training institutions has been organized. So far, 4300 health workers have participated in short-term and refresher courses, 130 people have been trained in outbreak investigation, and 80 hospital personnel have received training in infection control. In addition to the short- and tailor-made courses, Brazil has initiated a 2-year field epidemiology training programme (FETP) and 21 people have so far been trained.

Improving epidemic preparedness and response to emergencies is an important element of the national surveillance system. To this end, special attention has been given to anthrax, SARS and influenza. As part of this effort, a national influenza pandemic preparedness plan has been developed and an annual influenza immunization campaign for people older than 60 years of age has achieved target coverage of approximately 70%.

As a result of this extensive laboratory and epidemiology surveillance network, during the last 2 years alone, 42 outbreaks have been reported and investigated. In an effort to sustain and expand these activities and consolidate gains, Brazil is strengthening its cooperation with neighbouring countries and the international community, including participation in disease-specific surveillance networks.

4.3 Training networks — the example of the European Programme for Institutional Network in Epidemiology Training

Alain Moren

The European Programme for Institutional Network in Epidemiology Training (EPINET) has contributed to the strengthening of surveillance systems through its FETP. Improvements have included human resources development and outbreak investigation and response at the national, regional and international levels. This network is a key component of a European Union (EU) centre for prevention and control of communicable diseases.

Although 18 disease-specific surveillance networks were established with the same purpose of information sharing and supporting response to infectious disease threats within EU borders, many of these had no common training opportunities or approaches. Recognizing these gaps, the European Programme for Institutional Network in Epidemiology Training (EPINET) was established in 1995 with sponsorship from individual countries, WHO and the EU. The objective of EPINET is to build skills in planning, implementation, and evaluation of surveillance programmes, and develop technical skills in outbreak investigation and research. It aims at strengthening communicable disease surveillance and response in the European community through regular sharing of surveillance data and provision of technical support.

As part of its activities, EPINET developed an FETP with both theoretical and practical components. The course includes lectures by field epidemiologists using interactive cases. After an introductory course, participants work in host institutes of public health in 15 European countries, thus providing opportunities for sharing international experience. By using real case-studies the host institutes are actively involved in training and this gives visibility to the participating public health institutes. Developing effective communication skills using oral and written exercises is part of the course. So far 103 fellows, 400 external participants and 70 trainers have participated in the FETP. Almost 70% of the trainees are employed by national governments while the rest are employed by NGOs and international agencies. The programme has contributed to strengthening national surveillance systems, improved participation in cross-border outbreak investigation and enhanced coordination. To maintain a functional and up-to-date professional network, a yearly scientific seminar is organized where fellows, alumni, colleagues and trainers meet to exchange information on current developments.

4.4 African Region epidemiological Bloc: experiences, lessons learnt and challenges in integrated disease surveillance and response, and epidemic preparedness and response

Naphtali Agata

In 1993, the Member States of the WHO African Region adopted a resolution to strengthen national communicable disease surveillance and response systems for the early detection and control of epidemics through the adoption of an epidemiological bloc approach. This approach provides a mechanism for the provision of technical and logistical support to Member States through inter-country teams (ICT) based in five strategic locations. This approach has proven useful in rallying political support and in mobilizing resources for surveillance and response. It has also contributed to cross-border collaboration in outbreak detection, reporting, and investigation and control.

In 1993, the WHO Regional Committee for Africa adopted a resolution (RC 43/7) which recognized that many epidemics are common problems and called for a strengthening of the capacity for epidemic preparedness and response. The resolution recognized that an epidemiological-bloc approach constituting establishment of an inter-country team to support a number of bordering countries was an appropriate strategic direction to address this need. Accordingly, the Horn of Africa was divided into five epidemiological blocs: western, central, the Great Lakes Region, and Southern African regions. To provide a legal framework, a protocol that emphasized the commitment to strengthening inter-country collaboration was signed by bloc countries and the WHO Regional Director. Based on this framework, each bloc has established an ICT. The major activities for ICTs include strengthening epidemiological surveillance, improving EPR and promoting inter-country collaboration in surveillance and response. To facilitate these activities, training manuals were adapted and inter-country response teams were organized.

The epidemiological-bloc approach has been instrumental in making available much-needed technical support for national capacity, produced and disseminated epidemiological bulletins, and played a direct and important role in cross-border surveillance, regular information exchange, and investigation of and response to outbreaks. The ICT has promoted implementation of the IDSR strategy, and contributed to the improvement of national EPR capacity. The ICT members participated in the investigation of and response to outbreaks of Ebola, meningitis, yellow fever, cholera and measles.

As part of this approach, a network of public health laboratories has been established. Special laboratories, accredited by WHO, have been identified and strengthened to support Member countries in verification of epidemics. For example, the multi-disease surveillance centre in Ouagadougou, Burkina Faso, and the Institute of Virology in Johannesburg, South Africa, serve as centres for referral and testing, research, training, surveillance and forecasting.

In summary, a number of lessons can be drawn from implementation of the ICT/epidemiological-bloc approach. It is an approach that has proved to be practical and has improved national capacity for surveillance of priority diseases. It has contributed to strengthening laboratory capacity and networking. It offers flexibility in use of an ICT for reinforcing outbreak response measures. As a result, there has been steady progress in the timely detection, notification and response to disease outbreaks. It has also facilitated information sharing among Member countries through the production of bulletins. Last, but not least, it has increased political support for the shared approaches to disease control.

The main challenges for the ICT approach include sustaining ongoing efforts and commitment of partners, limited resource availability including the shortage of funds, drugs and laboratory supplies and other EPR supplies.

Discussion on inter-country experiences

The discussions highlighted the importance of cross-border initiatives in promoting mutual understanding and trust among partners from different countries that share similar infectious disease threats. The experience of the Mekong Basin Disease Surveillance initiative, the EPINET and the epidemiological bloc approach from the African Region show that networking and collaboration in surveillance and response are critical for strengthening national capacities and information exchange, and ensuring global health security. Such inter-country and inter-regional collaboration offers opportunities for sharing experiences, mobilization of resources and promoting joint surveillance and response activities. It was underscored that these flexible approaches have facilitated increased cross-border mobility of technical personnel to respond to outbreaks.

The participants emphasized the need for exploring opportunities for integration of surveillance courses into existing training programmes. The opportunities discussed included the integration of surveillance with the current Association of South-East Asian Nations (ASEAN) Collaboration Training Network for Malaria (ACT Malaria) and with the Greater Mekong Sub-Region's Roll Back Malaria Mekong Initiative. Furthermore, it was suggested that pre-service training curricula should be revised to incorporate surveillance.

The experiences from Brazil in the strengthening of surveillance through a decentralized approach, integrated use of resources, laboratory networking and health information systems were discussed as examples of successful attempts to eradicate or eliminate a number of infectious diseases.

Concerns were raised by the WHO Regional Office for the Eastern Mediterranean (EMRO) regarding the high cost and problems of sustainability of international FETP participation and it was suggested that such training could be more sustainable if it could be offered at country level. It was suggested that epidemiology training should be part of the curricula at medical and nursing graduate level and should also address the integrated disease surveillance approaches. The main cross-cutting issue identified in discussing the various approaches related to the funding of activities.

V. WHO Regions and partners' perspectives on approaches to surveillance, opportunities, challenges, lessons learnt and needs

5.1 A description of the target audience for implementation of the integrated disease surveillance and response strategy in the African Region: implications for relevant training

Helen Perry

A study to describe current surveillance practices and the relevance of IDS guidelines indicated that tasks are mainly focused on data collection with minimal analysis and use, and lacking feedback on expected performance. The study underscored that although the development of guidelines and tools is important, their relevance for specific groups and their ease of application need to be assessed. The findings suggest that guidelines and training should aim at developing those skills required to achieve desired goals. It also recommended that surveillance programmes need to set clear objectives and communicate expected goals to health staff.

The process of development of surveillance guidelines and tools should address the target audience and aim at improving the performance of health workers in accomplishing the desired surveillance goals. Basically, organizations produce outputs because people perform the necessary tasks to a desired standard. Likewise, a surveillance system produces results because the designated personnel in the public health system perform to the desired standards and apply basic principles and skills in the process. Matrix skills and activities in IDS need to be defined in relation to the different implementers at the various levels (i.e. community, health facility, district, national and WHO). Simple, user-friendly guidelines and tools can ease workload and motivate timely collection, collation and analysis of data. Training in the use of surveillance tools is critical for better performance. Nevertheless, it is vital to think "beyond training" and consider issues such as supportive monitoring and evaluation, and the allocation of adequate resources.

In 2000, a target audience study to describe the current surveillance task and to determine whether the IDS guidelines were used and helpful at the district and health facility levels was conducted in Burkina Faso and Ghana. The study included some demographic variables, attitudes of health workers, needs and relevance of training, and application of newly acquired skills.

A total of 54 participants from both countries took part in the study. Interestingly, there were marked differences in the gender and age distribution of the workforce between the two countries. In Ghana, 59% of the workforce were women, and 86% were over 35 years of age. In contrast, in Burkina Faso 24% of the workforce were women and 36% were over 35 years of age. Participants showed a good understanding of public health actions, and good collection and reporting of data. However, there was limited analysis and use of data for public health action. Participants felt they needed a general analysis tool to assist them. In answer to the questions on training on surveillance, 63% of the participants reported that they had received training through workshops or seminars and 64% of the participants reported that they would prefer more hands-on training or supervisory training using audiovisual methods. A high turnover of staff was noted.

The above observations show that although training is important for acquiring skills, it is not sufficient to achieve surveillance goals. In other words, the training may not lead to achievement of the desired results. Thus, training plans need to consider the relevance of training to acquiring or enhancing the skills required to perform desired task. The study highlighted the need for recruiting younger staff and retaining them long enough in their positions to ensure continuity of surveillance activities. It also recommended the development of more transparent job descriptions for specified positions.

5.2 Using surveillance to drive a programme: integrating surveillance for Expanded Programme on Immunization, Roll Back Malaria and Integrated Management of Childhood Illness within the integrated disease surveillance framework

Mac Otten

Successful surveillance systems have inbuilt capacity-building, standard and simple formats, and data analysis tools. In such responsive systems, surveillance information prompts public health action. The experiences of programmes have shown that surveillance data could lead to the investigation of disease outbreaks, improved coverage and quality of the system, or redesign of programme interventions. Integration of common surveillance functions and tools can maximize the benefits gained from lessons, expertise and resources.

Disease surveillance programmes contribute to decreasing the morbidity and mortality from infectious disease outbreaks through improving case detection and reporting, and supporting programmes for elimination and eradication, such as those for AFP and measles. At the same time, good surveillance systems provide useful information for monitoring the progress of programme interventions and contribute to the process of review and/or redesign of appropriate interventions. Experiences from EPI show that setting realistic targets, and identifying simple and measurable indicators for monitoring progress need to be part of the programme design. Similarly, a strong referral and testing network for laboratory specimens is a cornerstone of eradication and elimination programmes.

Experiences from EPI show that identifying gaps in coverage at the district level can guide prioritization of programme intervention to ensure geographical equity. This is essential for elimination and eradication programmes where access to and coverage of immunization and surveillance for active cases are essential components. Based on an emphasis on coverage, EPI/Global Alliance for Vaccine and Immunization (GAVI) uses a model to reach every district. The strategy is characterized by supportive supervision from district to health facility, review, reestablishment of outreach services, and developing a district micro-plan. This district focus is primarily designed to identify gaps in coverage and ensure geographical equity. The next step will be for EPI to implement district-level revaluation, and apply a "reaching every district" strategy. The district-focus approach can also be adapted to meet the needs of other programmes including Integrated Management of Childhood Illness (IMCI), Roll Back Malaria (RBM) and HIV.

One important area for integration between programmes is the use of HealthMapper and data analysis tools. Recognizing the potential and need for integration in this area, CDC and the WHO Regional Office for Africa are jointly developing tools that can be used for different programmes. Overall, although specific programme needs may vary, there are a number of areas in which integration is feasible and beneficial. Similarly, application of best practices and lessons from EPI surveillance can contribute to improving the performance of other programmes.

5.3 Implementation and documentation of integrated disease surveillance and response in the African Region — lessons learnt

Wondim Alemu

In December 2002, WHO with support from USAID, CDC and Support for Analysis and Research in Africa (SARA) project, carried out documentation of the implementation of the IDSR strategy in five Member countries of the WHO African Region and one member country of the WHO Eastern Mediterranean Region. As part of the process, an IDSR documentation tool was developed and field tested. Country reports, policy briefs, and a synthesis report were produced. IDSR has made a significant contribution towards improving early recognition, reporting, and investigation and response to disease outbreaks. The findings from the documentation show that IDSR is feasible, adaptable to local situations and flexible enough to address specific surveillance needs. It recommended that advocacy, sensitization, resources, capacity building, coordination and feedback are important factors for successful implementation.

The WHO Regional Office for Africa (AFRO) initiated the concept of integrated disease surveillance in 1995. This concept was further developed and was adopted as a regional strategy through a resolution by Member countries in 1999. Based on this legal framework, implementation of IDSR strategy was started with advocacy and sensitization of stakeholders, including key policy-decision makers. To facilitate the process of implementation AFRO has developed generic IDSR technical guidelines and training modules. It has also adapted a protocol for national surveillance systems and plan of action development guide. Moreover, the core indicators for monitoring the progress of implementation have been identified.

Documentation of the process and of progress made in implementation of the IDSR strategy was undertaken in Burkina Faso, Ethiopia, Ghana, Mali and Uganda (African Region) and Sudan (Eastern Mediterranean Region). The main objective of the documentation process was to identify lessons, experiences and opportunities for further enhancing the implementation of the IDSR strategy. The findings of the review indicated that the IDSR process including assessments, sensitization, planning, resource mobilization, adaptation of technical guidelines and modules were on track. Nevertheless, in some of the countries, dissemination of surveillance tools and guidelines had been delayed. The documentation also noted a growing participation of laboratories in surveillance and outbreak response activities — a network of public health laboratories has been established. WHO collaborative laboratories are part of this network and participate in referral testing, external quality control, training and research activities. However, it was noted that there is a need to strengthen laboratory capacity and networking at the regional, subregional and epidemiological bloc levels.

As a result of the implementation of the IDSR strategy, timeliness and completeness of reporting have improved, and outbreak detection and response are more prompt. Although data analysis has improved at the central and state levels, improvement is still required at the district and facility levels. Feedback bulletins are being increasingly used for sharing surveillance information. Monitoring and supervision have so far been limited due to communication problems. Overall, although there is interest in and commitment to the implementation of the IDSR strategy, the review also identified a need to establish IDSR units, allocate specific surveillance budgets, to strengthen communication and to train more health workers at the various levels.

The documentation produced included six country reports and country policy briefs, a synthesis report and a revised documentation protocol.

In summary, lessons learnt from the implementation process show that the IDSR strategy is flexible and that different approaches can be used to fit the context of each country.

5.4 Support for Analysis and Research in Africa Project: dissemination strategies for integrated disease surveillance and response

Antonia Wolff

As part of monitoring the progress of the process for implementation of the IDSR strategy, documentation was carried out in six countries. Based on the findings of the documentation, six country policy briefs were developed for use in advocacy. It is recommended that advocacy tools and packaging techniques with a target audience need to be developed as part of the dissemination strategy.

At its November 2003 meeting in Harare, the IDSR Working Group developed a documentation tool, identified priority audiences, and defined formats and channels for information dissemination. The group identified dissemination strategies and developed a dissemination workplan. It also outlined the products expected from the documentation process including protocol, synthesis report, country policy briefs and multimedia briefs.

Dissemination provides useful information essential for policy-decision making and for programme design. It also serves as a forum to share experiences and lessons, and to adopt new initiatives where required. Based on this understanding, country reports, a synthesis report, and six two-page policy briefs were produced. The documentation process showed that best practices, success stories and lessons from implementation of surveillance programmes in countries can be repackaged for use in IDSR advocacy. It also underlined the need for including advocacy and dissemination strategies in the IDSR implementation plan. With this in mind, programmes for disease surveillance, prevention and control need to develop materials that help to acquire the skills necessary for repackaging, analysis, and dissemination of lessons and best practices.

5.5 Perspective and strategy on strengthening national communicable disease surveillance in the Western Pacific Region: lessons from the outbreak of severe acute respiratory disease

Hitoshi Oshitani

The outbreak of SARS has provided important lessons for the global community, namely that emergence of infectious pathogens is a real threat to global health security and that strengthening national surveillance and response systems is a national priority. Likewise, it also underscored that transparency of national authorities is crucial for rapid containment of global threats. The experience shows that partnerships and surveillance and laboratory networks play a critical role in combating the threat of emerging infectious diseases.

The WHO Western Pacific Region has 37 Member countries, which are widely spread geographically and are home to a huge population. Member countries are at different stages of socioeconomic development. Although there are some common priority health problems among the Member countries, there are also diseases that are priorities only in specific countries. For example, dengue is widespread throughout the Region but brucellosis is a problem only in and parts of China and in Mongolia.

The outbreak of SARS revealed the vulnerability of the Region to infectious disease threats. It also demonstrated the need for improving preparedness and strengthening global networking. Following the report of an outbreak, a regional task force on SARS was established to coordinate the surveillance and response operation. This operation was the largest so far for the WHO Regional Office for the Eastern Mediterranean with more than 200 consultants participating. A number of important lessons were learnt from the SARS outbreak. First it underscored the need for strengthening surveillance and improving epidemic preparedness and response to enable early recognition, investigation and containment of emerging infectious disease threats. It also highlighted the value of global and regional partnerships as no single country or region could have all the capacity required to confirm and contain new infectious diseases. The experiences with SARS show that transparency is critical for the prompt investigation and containment of public health emergencies of international concern. It is also interesting to note that SARS has led to an increased commitment to strengthening national ministries of health and WHO country offices and collaboration in research activities.

To further strengthen national surveillance and response systems, WPRO has developed a communicable disease surveillance and response strategy that includes country assessments, training, and strengthening of laboratory and surveillance networks. A review of surveillance systems noted that countries have different health priorities, different capacities, systems and infrastructure. Hence, there is a need for a country-specific approach to strengthening national surveillance and response capacities.

5.6 Implementing Surveillance and the Early Warning, Alert and Response Network in the WHO Eastern Mediterranean Region

Hassan El Bushara

The WHO Regional Office for the Eastern Mediterranean (EMRO) has adopted two approaches to support Member countries in strengthening national disease surveillance and response systems. In stable countries with functional health systems, a multi-disease surveillance system has been adopted. In complex emergencies and where the health system is weak, EMRO has initiated an Early Warning System targeting few epidemic-prone priority conditions. Lessons from these approaches show that surveillance systems are feasible when applied in the local context. The experiences have shown that adequate resources, effective coordination, flexibility and adaptability to address priority needs, and promoting the participation of partners are essential for successful implementation of surveillance programmes.

EMRO has adopted two approaches to support countries in strengthening their national disease surveillance systems. The first is the strengthening of multi-disease surveillance in countries with viable health systems and a capacity for the routine generation of health service data. The second approach is an early warning system (EWS/EWARN) adopted primarily in countries with weak routine surveillance systems and complex emergencies. The disease EWS focuses on improving preparedness and response to epidemic-prone diseases. Strengthening communication, networking, laboratory systems and feedback are also essential elements of EWARN systems. The system generates weekly surveillance data on selected priority epidemic-prone diseases and unusual syndromes to prompt appropriate action. In the last few years, EMRO has adopted EWS in countries that lack a functioning surveillance system, have difficult geographical terrain and complex emergencies, including in Pakistan, Somalia and Sudan.

In southern Sudan where there is a complex emergency associated with two decades of conflict, EWARN was initiated in 1999. This initiative was based on lessons and recommendations from response to outbreaks of relapsing fever and acute respiratory syndrome. Based on the observations from these and other outbreaks, it was recommended that local capacity and networking should be strengthened for early detection and response. Accordingly, a task force composed of WHO, United Nations Children's Fund (UNICEF)/OLS and nongovernmental organizations developed draft operational guidelines. WHO was designated to coordinate implementation of the programme which is implemented through a network of more than 50 nongovernmental organizations, UN agencies, community-based organizations (CBOs) and local partners. In 2000, WHO developed a proposal for a 3-year period of project implementation which was supported through a grant from the United Nations Fund for International Partnership (UNFIP). In May 2000, the 3-year project became operational. Since then, training manuals and community sensitization guidelines have been developed and used. Rumour reporting formats and syndromic case definitions have been adapted and distributed. Rumours of outbreaks and unusual events are reported to WHO through a network of more than 100 high-frequency radios and the extensive polio AFP surveillance network. A laboratory network has been established for specimen referral and testing. EWARN teams have been trained and organized to provide support for detection, investigation and response efforts. As a result of this effort, EWARN has been able to early detect, promptly verify and effectively respond to a number of outbreaks which might previously have taken several weeks or months, albeit at huge costs for mobilization of external teams.

Lessons from EWARN in southern Sudan have indicated that outbreaks can also provide opportunities to review and strengthen capacity for surveillance and response. EWARN has also demonstrated that surveillance designs need to be flexible and adaptable to the local context. It has also emphasized that local capacity building, networking and coordination can be achieved even in complex situations. Moreover, EWARN has maximized use of scarce resources including through doubling skills of vertical programme staff.

In Pakistan, a disease early warning system (DEWS) to detect and immediately report selected diseases within 24 hours using a one-page data collection, analysis and reporting format was

established. To enable this system to be implemented, surveillance and training manuals and guidelines were developed and health workers received appropriate training. Epidemic investigation cells were also organized. As a result, the system has been able to detect and investigate a number of disease outbreaks.

In the Kingdom of Saudi Arabia, a special surveillance programme for yellow fever, meningitis and cholera has been instituted. This approach is based on the specific needs and risk of disease transmission during Hijera, when millions of people from around the world make a pilgrimage to Mecca.

Building on these practical approaches and experiences, EMRO plans to expand EWARN to other Member countries and to strengthen national disease surveillance systems.

5.7 The approach of the WHO Regional Office for Europe to surveillance for human immunodeficiency virus

Lali Khotenashvili

Most Member countries of the WHO European Region have well-developed socioeconomic and disease surveillance systems. Nevertheless, HIV surveillance is still weak, and prevalence data are limited. A number of countries have as yet no national HIV policies and strategies. Current efforts by EURO to strengthen sentinel surveillance are invaluable in bridging this gap.

The European Region includes both countries with high levels of economic development and those in transition and conflict that has led to population displacement (countries of the former Soviet Union). These countries have a weak HIV surveillance system and prevalence data are limited. Risk factors for HIV infection such as displacement, conflict and drug use are on the rise. The quality of the available data is poor and not representative. Data on AIDS cases and STIs (mainly syphilis and gonorrhoea) are complied at Regional level. The EURO HIV centre collects data on new infections and the Lisbon Centre on Drug Addiction compiles data on drug use patterns. However, the lack of national HIV/AIDS policies and strategies, and weak laboratory capacity in some Member countries make it difficult to establish a strong national HIV surveillance system.

To address these challenges, there is a need to scale up advocacy and capacity-building activities. The integration of HIV surveillance with health reforms is one alternative to ensure that the system is sustained. Currently, second-generation HIV surveillance is being initiated. EURO is engaged in the promotion of sentinel surveillance systems. To further this effort, regional, subregional, and inter-country workshops and training as well as support for project development and implementation, and regional surveillance networks are essential. The support of national governments and partners, as expressed through the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), and initiatives from GTZ-WHO will offer opportunities to further strengthen HIV surveillance in the Region.

5.8 Challenges and opportunities for integrated systems for the surveillance of communicable and noncommunicable diseases in the South-East Asia Region

Methsiri Gunaratne

The South-East Asia Region, which is home to a quarter of the global population, is in epidemiological transition. Although communicable diseases are still common, mortality and disease burden from noncommunicable diseases is on the rise. The Regional disease surveillance strategy underlines the need for enhancing surveillance for communicable and noncommunicable diseases using an integrated approach.

The South-East Asia Region has 11 Member countries with diverse socioeconomic and population

dynamics. The Region is home to a quarter of the global population, and includes countries with populations ranging from a few hundred thousands to more than one billion. The Regional disease pattern is characterized by emerging and re-emerging infectious diseases, and chronic and noncommunicable diseases. Although communicable diseases are still an important problem, noncommunicable diseases are also on the increase. Outbreaks of diseases including cholera, dysentery, malaria, dengue, Japanese encephalitis and plague have been reported by Member countries.

The WHO Regional Office for South-East Asia (SEARO) developed a regional IDS strategic plan in 2003 which incorporated an integrated approach to communicable and noncommunicable diseases. Based on this strategic plan, SEARO has supported a comprehensive assessment of the national surveillance and response systems in Member countries. Myanmar and Sri Lanka have finalized the assessment of their surveillance systems and will soon develop national plans of action. The findings from the assessments show that there is a need to address surveillance of both communicable and noncommunicable diseases in the plan of action. India has initiated an IDSP, which includes surveillance of both communicable and noncommunicable diseases.

Overall, mechanisms for the surveillance of noncommunicable diseases are scarce. The recognition of the increasing burden of noncommunicable diseases, will, however, improve commitment of national governments to greater efforts in noncommunicable disease surveillance. Although there are different surveillance data needs for communicable and noncommunicable diseases, a functional integration in selected areas would provide opportunities to maximize the use of surveillance resources and reduce the workload of the peripheral health workers. A major challenge for this approach would be to identify these potential areas for integration and to define data requirements.

5.9 Framework for scaling up implementation of integrated disease surveillance and response in the African Region

P. Lusamba-Dikassa

The Member countries of the WHO African Region are currently implementing the IDSR strategy using two approaches: selective or comprehensive (in terms of their functions). Monitoring and review of the implementation of the IDSR strategy using the two approaches show that detection, investigation and response have steadily improved. Laboratory networking and involvement of the laboratory in outbreak confirmation have also increased. The challenge for AFRO is how best to scale up implementation of the strategy. It is recommended that partners agree on a framework for scaling up that includes defining the essential elements, tools and procedures.

The IDSR strategy was adopted by Member countries of the African Region in 1998. Implementation of this strategy has required policy changes and the setting up of coordination mechanisms at the national and district levels. To ensure that the required changes are instituted, sensitization and advocacy were conducted at various levels of the health system. Support was provided for national assessment, adaptation of surveillance tools and guidelines, and production of training manuals. Currently 40 countries are implementing the IDSR strategy.

AFRO provides guidance on effective implementation of the IDSR strategy in the African Region. To this end, it has outlined an implementation framework which identifies the various elements including the required inputs, the implementation process and the expected outputs of the strategy as listed in Table 1.

Table 1. Inputs, implementation process and expected outputs of the integrated disease surveillance and response strategy in the WHO African Region

Inputs	Implementation process	Expected outputs
Human resources	Sensitize	Early detection
IDSR technical guidelines	Assess	Timely reporting
Training modules	Plan	Prompt verification
Communication facilities	Adapt	Timely response
Recording and reporting tools	Implement	Increased capacity
Data analysis supplies	Monitor/evaluate	Good feedback

Member countries have adopted two approaches to implementation of the IDSR strategy: selective and comprehensive. When the first approach was used, only selected elements of IDSR guidelines were introduced nationwide in a relatively short time. Emphasis was placed on the performance of the system through supervisory visits, review meetings and regular feedback. Several countries have applied this approach after consideration of their priorities and potentials for integration. For example, Mozambique, Uganda and several West African countries started with surveillance for epidemic-prone diseases. The comprehensive approach introduced all the recommended components of the IDSR generic technical guidelines either nationwide (e.g. in Ethiopia, Eritrea and Gambia,) or using a phased approach starting with a few districts (e.g. in Ghana, Mali and the United Republic of Tanzania).

Most countries started with the implementation of a pilot scheme and then scaled up to cover more locations. The steps for scaling up were as follows: agreement by partners on the essential elements, tools and procedures; preparation of a plan; orientation and training of staff; and support for implementation of IDSR. It is also very important to monitor and evaluate the progress of IDSR, and when necessary to adjust the plan to enable performance to be improved.

Several partners play key strategic roles in the implementation of IDSR in the African Region. These are USAID, CDC, SARA, UNFIP, ministries of health, PHRplus, MSF, PASE, EPIC, AMP, ARIVA and WHO. The role of these partners in the development of generic guidelines and tools, national assessments and development of the plan of action, has been a major determinant of the success of the strategy. WHO/ICP officers, in close collaboration with representatives of the WHO country offices support the national government in the implementation of activities, including data management and preparation and distribution of feedback bulletins. The ministry of health coordinates, assigns focal persons and mobilizes resources for IDSR. The ministry of health monitors the progress of implementation and evaluates the system using IDSR core indicators.

Although the overall goal of IDSR is to establish an effective national disease surveillance system and build national capacity for responding to outbreaks or epidemics (focusing on districts), countries are encouraged to choose suitable approaches to implement and scale up IDSR.

Core surveillance indicators have been developed to monitor progress. To date, progress has been encouraging and many countries have shown commitment and interest in further consolidation and scale up of implementation. The strategic issue for AFRO is how to scale up implementation in order to achieve the outputs and outcomes stipulated at the outset.

Discussions

The main issues raised during this discussion include integration of communicable and noncommunicable diseases, the value of national surveillance assessments, implementation of EWARN, and laboratories in surveillance, training and capacity building.

It was emphasized that although noncommunicable diseases and communicable diseases do share common surveillance needs, and many of the resources can be shared, there is a need to define the extent of integration. Improving the capacity of laboratories is critical in confirmation of outbreaks, in research on antimicrobial resistance and in detection of emerging strains of pathogens (W135). The need for strengthening integration of epidemiological surveillance and public health laboratories was stressed. In view of the need for early recognition of potential disease outbreaks, the need to strengthen disease EWSs was emphasized. Regarding indicators for IDSR implementation, it was suggested that measuring timeliness and completeness of data reporting with subsequent emphasis on data quality is a practical approach. Inadequate transparency in sharing outbreak data was raised as an issue on which more work is required to bridge gaps in immediate notification. The revised IHR are expected to address these issues.

VI. WHO Headquarters strategies for strengthening country capacity in surveillance

6.1 Surveillance of malaria, human immunodeficiency virus and tuberculosis

Thierry Mertens

Surveillance systems share common functions and offer many potential areas for integration. Experiences and lessons from one programme can benefit others by indicated adjustments required to address specific needs and goals. Defining these common areas, identifying specific needs and programme challenges provide direction on the choice of data collection methods.

Changes in disease patterns and control strategies justify the need for adaptation of surveillance approaches to meet to existing and emerging situations. For example, not all infection with TB necessarily results in illness. Thus follow-up and care are easier and programme coverage can be assessed using the same case information. On the other hand, HIV surveillance had been limited due to stigma and lack of effective treatment. However, the availability of antiretroviral (ARV) drugs has led to the adoption of a different strategy and approach for HIV surveillance, with a shift towards voluntary counselling and testing, and behavioural studies, and second-generation data. The main concern relating to surveillance data is how to ensure that the information collected through the system is representative and satisfies the needs of the programme. Thus, it is essential to develop a methodology that generates relevant data. For example, sentinel surveillance data among attendees at antenatal clinics is fairly representative of the general population. Similarly, behavioural surveillance can be used to monitor the impact of HIV interventions as was observed in Thailand where a relationship between STI rates and increased condom use has been documented.

Data for the malaria programme regarding service coverage, distribution and use of ITN and treatment can be generated through surveys. Data on sex, age and trends can be collected through surveillance that is integrated with other ongoing programmes, such as AFP surveillance.

Functional surveillance systems require competent and qualified front-line health workers, well-defined areas of collaboration, and a focus on strengthening laboratory capacity. The surveillance system should also be flexible enough to adapt to the design of district HMIS and networks. Data management and simple GIS, outreach and advocacy, and service delivery are components of a

functioning surveillance system. Surveillance should provide appropriate information to initiate appropriate public health action.

6.2 Types of surveillance for vaccine-preventable diseases and lessons learnt on vaccine safety and investigation

Maureen Birmingham and Philip Duclos

Disease surveillance and control programmes need to consider the local context, set realistic objectives and targets that can be met with the available resources. Experiences from vaccine-preventable disease programmes show that flexibility of the system, synergy with ongoing programme activities, adequate resources, building local capacity, good logistics and strong monitoring are essential for success.

The natural history of the disease in question and the objectives of the programme determine the design of a disease surveillance system for vaccine-preventable diseases. A disease control programme targeting eradication and elimination would have a different design from one for epidemic control. Similarly, changes in epidemiology of VPDs and the dynamics of risk populations, for example after high vaccine coverage, would have an effect on the design of surveillance programmes. However, all programme designs need to be adapted to the local context. Although, in principle, programme-specific surveillance systems should adapt to ongoing national surveillance systems, it is also essential to consider programme-specific needs. A practical approach would be to map core functions for each VPD and identify opportunities for integration.

Immunization programmes have been adapted to local needs and have contributed to strengthening of the national surveillance and response efforts. In addition to the general surveillance functions, immunization programmes also need to meet specific needs such as surveillance for vaccine safety and monitoring for any adverse effects, which may be due to the vaccine, its mode or site of administration, storage, or occur by chance. This type of monitoring is important to enable the detection and correction of any genuine side-effects, and redesign strategies and operations if required. Moreover, surveillance for vaccine safety is also important to defend against and avoid unsubstantiated blame and build community confidence in the vaccination programme.

In general, lessons from VPD/EPI and polio eradication show that successful surveillance designs have reliable field operations and logistics, good laboratory support and a sound data management system. Essential inputs include prototype tools and formats for data entry, analysis, mapping and feedback, and reporting guidelines. Moreover, setting expected standards and expected targets provides focus and motivation for carrying out programmes. Investment in human resources development, training and advocacy, delegation of authority and tasks, and supportive supervision are equally important.

6.3 Polio surveillance and strengthening national capacity

Rudi Tangermann

The certification process for polio relies heavily on surveillance. So far, three regions have been certified polio-free and global certification by 2008 is a realistic goal. To ensure that this is achieved and sustained, however, countries will need high-quality AFP surveillance for many years to come. Lessons learnt from building a high-quality AFP surveillance system can benefit efforts to strengthen national disease surveillance systems.

AFP surveillance is an important strategy of the global polio eradication initiative. Over the years, this strategy has remarkably improved and was the cornerstone for the eradication of polio in many countries. Experiences and lessons from AFP surveillance can be applied to strengthening national capacity, including surveillance systems. In the areas of laboratory and surveillance networking areas

for strengthening include, community mobilization, training of health workers, regular supervision, monitoring and evaluation.

The main factors in the success of polio eradication programme were the identification of clear objectives and needs, development of standards, training and mobilization of human resources, and the involvement of clinicians in advocacy and sensitization. Moreover, reliable logistics including a functioning reverse cold chain, provision of vaccines and supplies had significant role in the success of the polio eradication programme. Expert review committees, efficient case-tracing and investigation, timely reporting and stool specimen collection and transport contributed to the high quality of active AFP surveillance. Regular monitoring, supervision and feedback are built in to the programme.

Other approaches that are part of the AFP surveillance programme include sensitization of clinicians to report cases, zero reporting, involvement of traditional healers, a system of laboratory accreditation, and the linkage of surveillance to programme actions. Elaboration of performance indicators, including surveillance, in strategic plans and monitoring of performance at the national and subnational levels together with regular reviews were key elements for success.

6.4 An integrated approach to noncommunicable disease surveillance

Tim Armstrong

The surveillance of communicable and noncommunicable diseases shares a number of common functions, and information on morbidity and mortality is often generated from the same sources. Experiences from a pilot programme to integrate surveillance of communicable and noncommunicable diseases in Mozambique indicate that integration is more feasible at the facility level where data are generated.

The rationale for an integrated approach to noncommunicable disease surveillance is the growing burden of noncommunicable diseases in low- and middle-income countries (which threatens to overwhelm health services), and the need for a better global understanding of major risk factors using standard, simple and affordable methodology. Identification, analysis and understanding of major risk factors is the basis for policy formulation, and for designing prevention strategies. WHO has adopted a STEPwise framework for surveillance of noncommunicable diseases. This framework has three components for assessing risk factors: core, expanded core and optional. This approach is based on the concept that surveillance systems require standardized data collection for comparison over time and across locations. The approach can be adapted to fit country situations and settings. A number of countries in the African and European Regions have already adopted and started implementation of the STEPwise approach. Other regions are at various stages of adoption and implementation.

A pilot project looking at the integration of surveillance for communicable and noncommunicable diseases is under way in Mozambique. This pilot scheme builds on existing strengths and resources for surveillance of communicable diseases. Data are collected on stroke, hypertension, diabetes and injuries from different levels of health care delivery. This pilot project indicates that integration of surveillance systems for communicable and noncommunicable diseases can contribute to the development of a sustainable system. Some of the issues being addressed in the pilot project are defining data sources, harmonization of formats, sharing responsibilities for data collection and analysis, and defining coordination of roles and reporting mechanisms.

Discussion

The main issues covered in this session were the harmonization of programmes and surveillance objectives, monitoring of vaccine safety, and integration of surveillance functions common to national disease surveillance systems among different elimination, eradication and control programmes.

The group emphasized the need for defining common areas of work in vertical and integrated disease surveillance programmes. Harmonization of tools, guidelines, indicators, supervisory tools, training, monitoring and evaluation are some of the common areas of work.

Lessons learnt from EPI and AFP in social mobilization, improving networking between laboratories, and supervision and monitoring can be used to strengthen the implementation of IDSR strategy. It is therefore essential to document and share some of these lessons and best practices.

6.5 Strategy for strengthening national capacity for communicable disease surveillance and response for public health laboratories

Brad Kay

The WHO CSR health security capacity strengthening programme aims at strengthening public health laboratories for disease surveillance. This programme offers access to training, information, and external quality control for national laboratories. Currently, 22 countries from three Regions are participating in the programme. This programme has proved valuable in strengthening laboratory networks and external quality control and building local capacity.

Building diagnostic capabilities, integration of epidemiological principles, development of local resources and support for public health laboratories are indispensable in ensuring an effective response to disease outbreaks. However, in many countries strengthening of national public health laboratories is given low priority, and laboratories often have little involvement in surveillance activities. These findings highlight the need for advocacy at national levels to ensure that adequate resources are allocated for strengthening public health laboratories.

To bridge this gap, WHO has designed a programme to support the strengthening of national public health laboratories as part of its broader goal to improve biosafety and to contribute to global health security. The operational plan of this programme includes identification of countries, obtaining the commitment of trainees to serve in their country of origin on completion of the training course, and evaluating epidemiology-laboratory status of disease control programmes. Based on these assessments, national laboratory plans of actions are developed and training programmes are conducted. The training consists not only of coursework; the trainee must also return to work in a job environment supported by supervision, equipment, supplies and resources to apply the skills he or she has learnt. Monitoring and follow-up of progress in training and capacity building are part of the implementation plan.

This programme offers access to training, information means, and regular communication as part of the programme for improving laboratory services coordinated by the WHO office in Lyon. It also provides electronic training and reference materials. External quality assurance for selected diseases identified by the national laboratories is another important component of this programme. Currently the WHO office in Lyon is working with 22 countries in the African, Eastern Mediterranean and European Regions on a programme to strengthen public health laboratories.

6.6 Communicable disease surveillance and response: national capacity-strengthening strategy for epidemiology

Denis Coulombier

The strengthening of national capacity for surveillance and response is critical to contain known risks, respond to unexpected events and improve epidemic preparedness. The mission of the Lyon office Epidemiology Strengthening Programme is to strengthen national capacities for surveillance and response by developing norms, standards, tools and models which are promoted and implemented through WHO Regional and country offices.

The WHO office in Lyon has adopted three approaches for the support of Member countries in strengthening their national surveillance and response systems. These approaches focus on systems building, the implementers and information.

The systems component comprises revision of the protocol for assessment of surveillance systems, development of generic surveillance standards, and supporting members to undertake assessment of their surveillance systems and to develop a plan of action based on prioritization. It also supports national capacity for laboratory-based surveillance, develops alternative surveillance models, such as an EWS (EWARN), develops generic technical guidelines, and monitors and evaluates different surveillance systems. The programme provides technical and logistical support for the investigation and control of disease outbreaks. In the last 2 years alone, the WHO office in Lyon has provided support for the investigation of and response to outbreaks of cholera, yellow fever, Ebola virus, CCHF and SARS. Furthermore, it has supported the setting up of early warning, surveillance and control systems for dealing with the complex emergencies in Iraq, Macedonia and Sudan.

The second component focuses on the implementer. This is aimed at supporting Member States in the development of human resources with a particular emphasis being given to epidemiology and laboratory training. The approach uses development and adaptation of models, training curricula, case-studies, training of trainers and participation of fellows in investigation and response to disease outbreaks. Support for field epidemiology training programmes is implemented through networks and programmes including FETP, PHSWOW, EPINET and schools of public health. The strategic direction of the programme is to support Member States in incorporating epidemiology training into pre-service and in-service courses and distance learning. It also plans to develop models for regional training and to assess quality of FETP.

The third approach being taken by the WHO office in Lyon, is strengthening information sharing through surveillance networks, cross-border surveillance and partnership among programme-specific surveillance activities and collaborators. To this end, the WHO office in Lyon has been working closely with inter-country and cross-border projects, and has supported projects to strengthen surveillance and information networks.

6.7 National capacities for surveillance and response in the proposed revision of the International Health Regulations

Max Hardiman

Based on articles 2 (k), 21 (a) and 22 of the Constitution of WHO which provide the policy and legal framework for the revision and implementation of the International Health Regulations (IHR), WHO has undertaken an initiative to revise the existing IHR. The proposed changes include notification of all public health emergences of international concern, delegation of national IHR focal points, definition of core capacities, and a link between notification and recommended measures based on assessed risk. The revised draft underscores the need for strengthening core capacities for disease surveillance, early warning and response.

The best way to prevent the international spread of diseases is not to have lots of checks and balances at ports, but to detect outbreaks early and act promptly to contain them at the local level. This requires an effective national disease surveillance and response system which can detect the early warning signals of an impending disease outbreak and prompt the initiation of an appropriate response. Building core capacities for surveillance and response is, thus, an integral part of ensuring global health security.

The current IHR, adopted in 1969, require Member States to notify WHO of outbreaks of only three diseases, namely cholera, plague and yellow fever. However, the global threat of infectious diseases is changing and is not limited to these three diseases. In fact, with the changing global dynamics, including the emergence of infectious disease pathogens, increasing international travel and trade,

and ecological changes, outbreaks of infectious diseases of global significance are on the rise. The recent experiences with SARS clearly demonstrated the growing challenges and the threats to global health security. As a consequence of the changing situation, the need to revise the current IHR to cope with the increasing threats to public health has been recognized and a draft is ready for further review and consultation.

The proposed draft incorporates four major changes.

- The first change is that notification will be expanded to include all public health emergencies of international concern.
- Secondly, there will be a national IHR focal point to liaise with WHO and the national authorities for better operational links, official inputs on the revision process and notification and information sharing.
- The third area of change is that the revised IHR define core capacities required for surveillance and response at various levels (facility, intermediate and national levels), and at points of entry or exit, including border-crossing points.
- The fourth main area of change concerns the recommended measures for responding to public health emergencies and acknowledged risks.

As described above, the revised draft IHR define the technical requirements from Member States, including core capacities for surveillance and response. At the primary level, emphasis is placed on building capacity to early detect and report disease outbreaks. At the public health facility level, the required core capacities are for verification, institution of control measures and reporting. Establishing national capacities, including the skills and facilities necessary to institute control measures, operational links, and an emergency plan are key components. Similarly, the IHR underscore the need to improve global understanding and coordination at the international level to avoid unnecessary restriction on international travel and trade. They also recommend measures for assessed risks, including mechanisms for seeking international assistance when required. This will encourage transparency in the notification of public health emergencies of international importance. Overall, the IHR are a legal platform of high-level commitment that will provide leverage for strengthening national surveillance and response systems.

The draft has been prepared with inputs from relevant international institutions. It will be reviewed by Member States who will be asked for their inputs, and be presented to the Intergovernmental Working Group in November 2004 for review. Finally, it will be submitted to the World Health Assembly for adoption in 2005. As part of this process, national and regional consultations on the revised IHR will be held with Member countries. The revised version is available at ***http://www.who.int/csr/ihr/revision.***

6.8 Alternatives and options for matching surveillance needs

Stefano Lazzari

As a new concept, the integrated disease surveillance and response strategy requires more understanding by all stakeholders. At present there are misconceptions on the principles of IDSR. Thus, there is a need to develop a more effective advocacy tool and to pilot practical models that show integration at work. By identifying common areas for integration, IDSR can bridge some of the gaps in national surveillance and response systems.

There is a need for a common understanding on the concept of the IDSR strategy, as different groups have defined "integration" in different ways. It is essential to clearly understand that IDSR contributes to the national system and also to acknowledge that vertical systems are not sustainable in the long term. At the same time it should be realized that no system can be fully integrated or fully vertical. However, integration should increase efficiency, build capacities and benefit both multi-disease and vertical surveillance systems. It is also important to have consensus on the concepts of integration.

Equally, it is important to identify common areas to bridge gaps, provide common tools, build capacities and define coordination mechanisms. Accordingly, IDSR should bridge some of the elements without negatively affecting others, and lead to better information collation, analysis and sharing among various programmes. To this end, it is necessary to jointly identify potential areas for integration; build consensus; share resources, including common tools, such as Public Health Mapping; and focus on building local capacities. Training is one area for integration where input is essential to build local capacity. Different training programmes can identify and build the skills required to achieve surveillance needs.

Discussion

The participants discussed issues of integration with special reference to programme design, funding, flexibility and coordination of programmes. It was emphasized that WHO needs to take the lead in mobilizing resources from donors and promoting funding of surveillance from vertical programmes because surveillance benefits all stakeholders.

It was highlighted that one of the challenges for integration of surveillance is the design of the various programmes which previously has often used a vertical approach. Such designs usually make it difficult to integrate programmes at the national and subnational levels although activities are generally integrated at district and facility levels. This approach does not provide opportunities for flexibility in the utilization of programme resources and hinders integration as each vertical programme at a higher level sets its own targets and insists on the performance of programme-specific activities. In some instances, this approach even reaches to the periphery where each programme creates its own system and its own laboratory network. Thus, it was recommended that programme designs explore ways to provide opportunities for flexibility and coordination, identify common areas for integration and promote synergy to strengthen surveillance systems as a cross-cutting need. To this end, it was suggested that the process should start at WHO Headquarters, as Regions and countries cannot achieve integration without leadership from WHO Headquarters.

Another concern raised by the discussants related to verticality of funding. It was noted that although local partners and Member countries are in favour of integration, resources are allocated in a vertical way. Thus, it was requested that WHO take the lead in the promotion of donors' funding mechanisms such as the Global Fund and GAVI to support broader funding aimed at surveillance which will benefits all stakeholders.

6.9 Health metrics

Carla Abou Zahr

Although health information is vital tool for improving surveillance and response, it requires the development of national capacities, the building of skills for generating timely and relevant information, and its sound analysis and effective use. Surveillance and control programmes need to identify mechanisms for coordination of information generation, analysis and sharing. The Health Matrix is a mechanism for addressing this need.

Information is vital for the planning of programmes, monitoring and evaluation of interventions, identifying new health challenges, and for initiating evidence-based decisions. The Health Matrix aims at strengthening global and country health information systems using a coordinated approach with different information sources and systems. These sources and tools of information range from outbreak surveillance, census and surveys, to vital registration of events, to modelling and estimates.

At present, there is growing commitment, willingness, technological know-how and demand for better quality data. Building on these opportunities, the Metrics Network has been established with an interim secretariat mandated to strengthen health information systems.

The major issues that hinder the building of a sound public health information system are related to inadequate capacity and poor coordination and its application to improve access, use and quality.

VII. Group work to define elements of a framework and next steps for a coordinated approach to strengthening national capacity for surveillance, response and control

7.1 Process

Four working groups deliberated on strengthening national systems, human resources development, strengthening laboratory capacity, and encouraging networking and partnership.
The objectives of the working groups were:

- to outline the elements of a framework for a coordinated approach to strengthening national disease surveillance, human resources development and laboratory capacity;
- to propose roles and responsibilities of WHO and partners to better support Member States; and
- to recommend strategies and steps for implementation of the IDSR framework.

Following deliberations on the four thematic areas, each group presented its findings and recommendations to the plenary session which formulated general recommendations.

7.2 Group presentations

7.2.1 Strengthening national systems

The working group discussed the strengths and weaknesses of the different surveillance systems (vertical, disease-specific and integrated systems) and the potential areas for integration offered by these systems. They made the following observations:

- Vertical systems are target-specific, and more likely to generate funding from donors, but are very expensive and difficult to sustain.
- Integrated programmes require a long time to convince and win the support of vertical programme and donor partners because building integrated systems takes a longer time. But, these systems have the advantage of being focused on national capacity building and are more cost-effective and sustainable. Selected programme indicators that measure short-term outputs and outcomes, including success stories can help to promote advocacy.
- It is important to devise a progressive (step-by-step) plan for transition from a vertical to an integrated approach and to outline common surveillance elements for integration. The initial phase of integration can start with sensitization, training and adaptation of case definitions. Others can build upon these.
- The IDSR framework includes a process of advocacy and sensitization, assessment of surveillance systems, development of national plans, adaptation of guidelines and tools, implementation, monitoring and evaluation. This systematic process provides opportunities for integration.
- High-level commitment, policy environment and adequate inputs, supervision and monitoring, regular review and adaptability to the local context were identified as the key factors for success.
- IDSR implementation is flexible enough to adapt to existing surveillance systems and takes into account the existing resources in each country. It aims at maximizing the use of available resources to build a sustainable national surveillance and response system.

Based on the above discussion points and observations, the following group recommendations were made:

- To promote advocacy for integration through developing policy briefs, documentation of success stories from experiences in the field and development and piloting of district-focused surveillance and early warning models which show results.
- To establish mechanisms for integration and coordination at the global and regional levels, interagency coordinating committee, and establishing inter-country teams (such as that of AFRO), and regular meeting with vertical programmes.
- To define common elements indicating where programmes can be integrated through a step-by-step approach and to define programme-specific needs and elements.
- To document the economic cost of integration and the added value of coordination and integration of programmes to provide evidence that integration saves resources.
- To monitor the progress made through implementation of the IDSR strategy in building local capacity to strengthen national disease surveillance systems using identified indicators which are comparable over time, including indicators for output, outcome and impact.
- To evaluate the success and document and share lessons and experiences gained from the IDSR process of implementation that can be applied to further strengthen national surveillance systems.

7.2.2 Human resources development and training

The working group which discussed current strategies and approaches to human resources development made the following observations:

- Training is essential for human resources development, but should be targeted towards acquiring the skills required to perform defined tasks. Training programmes need to apply appropriate methods and focus on competency building.
- Training of health workers should be aimed at those who perform the relevant tasks: health workers at mid-level and workers in the peripheral health system.
- The different training strategies, including MPH/AETP, international opportunities, modular programmes (group/distance learning), elective (short courses) and opportunistic training are all important in building capacity for surveillance and response. However, these training strategies also need to be tailored to the needs of the individual countries so that more health workers can be enrolled to develop a broader human resources base close to where it is most needed.
- Although tailor-made courses and in-service training are essential, it has also been observed that these alone cannot satisfy training needs. Thus, it is essential that pre-service curricula incorporate epidemiology training into undergraduate classes and fieldwork programmes.
- WHO can assist countries to develop role models for capacity building including in FETP courses. This would offer an opportunity to learn from field activities and promote transfer of skills.
- Support from international partners in resource mobilization, formulation of training policy, and development of standards and guidelines is essential for human resources development.

The group made the following recommendations to strengthen human resources development:

- to focus epidemiology training to reach health workers at the district and peripheral levels including clinicians and faculty members;
- to adopt a sustainable strategy for human resources development and to this end to incorporate training into the pre-service, continuing and post-service training curricula;

- to review current curricula; work with training institutions; and involve trainers from medical and nursing schools in the process to ensure high standards for the curriculum;
- to ensure that training needs are identified and to tailor competency-based training to address the limitations of the current courses;
- to establish a follow-up mechanism to assess the impact of training on performance including through field supervision and experience sharing; and
- to link training to the needs of beneficiaries and programmes and establish mechanism.

7.2.3 Networking and partnerships

The working group on networking and partnerships discussed the strengths and gaps in the existing networks and made the following observations:

- Surveillance, training and laboratory networks do contribute to improving capacities for surveillance, response and control of communicable diseases, and for disease elimination and eradication programmes. Hence, there is a need to strengthen such networks at the local, national, regional and global levels.
- There are certain prerequisites for the success of formal and informal networks such as appropriate skills, resources and value for networking. The key factors for success include confidentiality, trust among members, animation/moderation, shared objectives and perception of added value for members.
- Additionally, networks need to establish good coordination, a mechanism for conflict resolution (e.g. publication of data), two-way feedback (e.g. provision and analysis of data), a suitable code of conduct (e.g. participants representing national systems) and good technical backup.
- The challenges for networking are the fact that it requires cooperation but can also generate competition; sharing and retaining data; the need for seed funding to get a network started and for financial sustainability; and the question of how to evaluate structure, process, outcome and impact.
- Partnerships with relevant national, regional and global stakeholders in disease surveillance, epidemic preparedness and response are critical for global health security as was demonstrated during the response to the SARS outbreak. Such partnerships are critical for the effective implementation of IDSR strategy as demonstrated by the progress made in Member countries of the African Region.

After group discussions, the following recommendations were made:

- to undertake an inventory of existing surveillance, training, and laboratory networks, including geographical and thematic areas, expertise, objectives and opportunities for networking;
- consultation of networks with a clear agenda to exchange resources and develop a firm network for capacity building;
- to define tasks of network partners in surveillance and response functions;
- to promote meetings of surveillance networks at the regional and global levels to foster the exchange of experiences, raise resources, and develop a forum for capacity strengthening;
- to develop guidelines for building, operating and evaluating surveillance networks;
- to build skills in using information technology to promote information sharing between programme partners and networks, including scientific information;
- to encourage partners to embark partners and donors to promote integration and partnerships, including the existing global funding mechanisms, to address broader surveillance issues; and
- to broaden the scope of partnerships to include training and capacity-building through the promotion of north–south and south–south collaboration between universities.

7.2.4 Laboratory strengthening

Following intensive discussions on the current status of laboratories at the national and regional levels, the following observations were made:

- establishing a strong public health laboratory system is critical for the confirmation of disease outbreaks; for monitoring antimicrobial resistance; and for research and development of vaccines.
- strengthening of public health laboratories has not been given the attention that it deserves at the national level. As a result the allocation of resources for this purpose has been limited.
- the private sector is expanding and can collaborate with the public sector in ensuring technical competency and quality of tests, and promote biosafety.
- WHO collaborating centres are currently providing invaluable support for referral and testing, and for external quality control activities.
- research and development of rapid diagnostic tests is essential to reduce the time required for specimen referral and testing as these tests can easily be adapted to field use for the confirmation of infectious diseases.
- integration of the laboratory with epidemiology is feasible and beneficial for IDSR. Such integration could include joint training of health workers, field investigations and development of guidelines.

The group recommended that provision be made for the following:

- strengthening laboratory networking by building upon existing networks at the national level and also strengthening regional and subregional laboratory networks;
- periodic assessment of existing capacities and needs, to accredit and update the list of WHO collaborating laboratory centres;
- advocacy for the adoption of a legal framework by national governments to give priority to public health laboratories, including the establishment of a regulatory framework and a national focal body;
- promotion of public–private partnerships and networking among public health and clinical laboratories as part of the surveillance system and to provide the required support;
- improvement of laboratory quality control both internal and external;
- allocation of more resources including reagents and supplies, and rapid diagnostic kits;
- identification of opportunities for integration among multi-disease and vertical programme laboratories leading to expansion and sustainability of public health laboratory systems;
- improvement of biosecurity and biosafety standards through provision of necessary supplies and skills for the safe collection and transport of infectious specimens; and
- establishment of mechanisms to speed up safe referral of specimens from national public health laboratories to WHO collaborating centres.

VIII. General recommendations

The observations and recommendations of the working groups were discussed at the plenary session and the following general recommendations were made:

- WHO should provide leadership in the application of an integrated approach to surveillance in programme design and implementation at global and regional levels, in order to reinforce this approach at national and subnational levels, and should promote technical consultations at all levels.
- WHO and partners should ensure coordination of technical, financial and other support for surveillance, ensuring that broader national surveillance capacities are built up through ongoing disease-specific programmes and initiatives such as GFATM and GAVI.
- WHO should advocate awarding the highest priority to surveillance and response at policy levels. Regions should include strategies for the strengthening of surveillance, response and disease control on the agenda of their respective Regional Committee meetings.
- WHO and Member States should expand the documentation of country experiences, and use this to set a research agenda, including analysis of the cost, cost-benefits and cost-effectiveness of different surveillance models, thus allowing countries to guide the process of improving national capacity for surveillance, response and control.
- Member States should review the existing legal frameworks to further support strengthening of surveillance including the participation of the private sector and nongovernmental organizations.
- WHO and Member States should integrate surveillance into existing pre-service curricula, other in-service training and long-term specialized public health training.
- WHO and Member States should promote adult, competency-based training methods such as those currently employed by applied epidemiology training programmes, and that include a service component, to support and expand participation of fellows in multinational epidemic response teams.
- Member States should strengthen links between national ministries of health and training institutions to ensure collaborative development of curricula and training materials.
- WHO should ensure national commitment to strengthening public health laboratory services.
- WHO should develop regional and subregional centres and networks for continuing support in national capacity building.
- WHO and partners should study the use of rapid diagnostic tests and other technologies that can contribute to strengthening national capacity for laboratory confirmation of priority health events.
- WHO should compile an inventory of existing surveillance networks and document their strengths and weaknesses in order to develop guidelines for improving these networks.
- WHO should develop mechanisms for improving communication with capacity strengthening networks and work in line with GOARN.
- WHO and partners should define standards and mechanisms for partnership at the country level to promote global efforts that contribute to national capacity strengthening, and to broaden the scope of these partnerships.

IX. Closing remarks

Diego Buriot

For an integrated system of disease surveillance to succeed, strong political support such as that demonstrated in the African Region is a key prerequisite. This is essential because structural changes in national systems, such as setting up a national coordination body and a legal framework, require policy changes. At the operational level, investments in strengthening national systems need to focus on building capacity at district level and at peripheral health facilities. Emphasis on training, incentives, supervision, and documentation of successful models is vital for IDSR. Furthermore, the participation of the private sector and communities is critical.

The Global Consultation identified a number of critical areas and has recommended strategies and follow-up actions. WHO will continue its commitment to support Member States in the strengthening of their national communicable disease surveillance and response systems.

X. Conclusion and summary

Global health security can be ensured when national surveillance systems are able to early recognize, investigate and respond to — and where required, notify — potential public health emergencies of international concern. Recognizing this critical link, the draft IHR have identified the need to build core capacities required for surveillance and response which also contribute to the strengthening of early warning systems, and to improve epidemic preparedness and response capacity.

This Consultation has deliberated on the different approaches to, and country experiences of, surveillance. It has recommended follow-up actions for further strengthening of national communicable disease surveillance and response systems. A number of subgroups discussed and identified needs for strengthening in four important areas: national surveillance systems, laboratory capacity, human resources development and networking and partnerships. The recommendations from each group and the general recommendations reiterate the need for the investment in and identification of strategies for strengthening surveillance and response systems.

Annex 1: Agenda

22 October 2003

08:30–09:00	Registration
09:00–09:10	Opening — *A. Asamoa-Baah*

Session 1

Country perspectives on approaches to surveillance, opportunities, challenges, lessons learnt and needs

09:10–09:30	Overview on communicable disease surveillance and response (CSR) strategy Objectives of the meeting — *Guénaël Rodier*
09:30–09:45	Strengthening national capacity for surveillance and response in Uganda — *Ambrose Talisuna*
09:45–10:00	Integrated disease surveillance and response in India — *Domodor Bachani*
10:00–10:30	Discussions
10:30–11:00	Coffee break
11:00–11:15	Strengthening national surveillance through partnership in Romania — *Alexandru Rafila*
11:15–11:30	Computerized Early Warning, Alert and Response Network (EWARN) for epidemic prone and vaccine preventable diseases in Lebanon — *Nada Ghosn*
11:30–11:45	Disease surveillance in Cambodia — *Sok Touch*
11:45–12:05	Strengthening surveillance through behavioural change: experiences from Ghana and the United Republic of Tanzania — *Rebecca Fields and Stephanie Posner*
12:05–12:30	Discussions
12:30–14:00	Lunch

Session 2

Inter-country perspectives on approaches to surveillance, opportunities, challenges, lessons learnt and needs

14:00–14:15	Strengthening national communicable disease surveillance through networking – the Mekong Basin experience — *Gulam Rasul*
14:15–14:30	Strengthening surveillance and laboratory networks in Brazil — *Jarbas Barbosa*

14:30–14:45	Training networks — the example of the European Programme for Institutional Network in Epidemiology Training (EPINET) — *Alain Moren*
14:45–15:00	AFRO epidemiological bloc: experiences, lessons learnt and challenges in IDSR and EPR — *Naphtali Agata*
15:00–15:30	Discussion
15:30–16:00	Coffee break

Session 3

WHO Regions and partners' perspectives on approaches to surveillance, opportunities, challenges, lessons learnt and needs

16:00–16:20	A description of the target audience for implementation of the integrated disease surveillance strategy in the African region: implications for relevant training — *Helen Perry, CDC-NCID*
	Using surveillance to drive programme: integrating surveillance for Expanded Programme on Immunization, Roll Back Malaria and Integrated Management of Childhood Illnesses within the integrated disease surveillance framework — *Mac Otten, CDC-NCID*
16:20–16:40	Implementation and documentation of integrated disease surveillance and response in the African Region – lessons learnt — *Wondi Alemu*
	Support for Analysis and Research in Africa Project**:** dissemination strategies for integrated disease surveillance and response — *Antonia Wolff*
16:40–16:55	WPRO perspective and strategy on national communicable disease surveillance strengthening: lessons from severe acute respiratory syndrome surveillance and response — *Hitoshi Oshitani*
16:55–17:10	Implementing Surveillance/Early Warning, Alert and Response Network in the WHO Eastern Mediterranean Region — *Hassan El Bushara*
17:10–17:30	Discussion

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Session 3 *(continued)*

09:00–09:10	WHO European Region approach to human immunodeficiency virus surveillance — *Lali Khotenashvili*
09:10–09:20	Challenges and opportunities for integration of communicable and noncommunicable disease surveillance systems in the WHO South-East Asia Region — *Methsiri Gunaratne*

09:20–09:30	Framework for scaling up implementation of integrated disease surveillance and response in the African Region — *Paul Lusamba-Dikassa*
09:30–09:45	Discussions

Session 4

WHO Headquarters strategies for strengthening country capacity in surveillance

09:45–10:10	Surveillance of malaria, human immunodeficiency virus and tuberculosis — *Thierry Mertens*
10:10–10:30	Types of surveillance for vaccine-preventable diseases and lessons learnt, vaccine safety and investigation — *Maureen Birmingham and Philip Duclos*
10:30 – 11:00	Coffee break
11:00–11:15	Polio surveillance and national capacity strengthening — *Rudi Tangermann*
11:15–11.30	Noncommunicable disease surveillance — *Tim Armstrong*
11:30–11.45	Discussion
11:45–12.00	Communicable disease surveillance and response: national capacity-strengthening strategy for public health laboratories — *Brad Kay*
12:00–12:10	Communicable disease surveillance and response: national capacity-strengthening strategy for epidemiology — *Denis Coulombier*
12:10–12:20	National capacities for surveillance / response in the proposed revision of the International Health Regulations — *Max Hardiman*
12:20–12:30	Alternatives and options for matching surveillance needs — *Stefano Lazzari*
12:30–12:45	Discussion
12.45–12:55	Health Metrics — *Carla Abou Zahr*
12:55–13:00	Introduction to working group sessions — *Stella Chungong*
13:00–14:00	Lunch break

Session 5

Group work to define elements of a framework and next steps for a coordinated approach to strengthening national capacity for surveillance, response and control

14:00–15:30	Group work session
15:30 –16:00	Coffee break
16:00–17:00	Group work session (continued)

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09:00–10:30	Presentation of group work and discussion
10:30–11:00	Coffee break
11:00–11:50	Presentation of group work and discussion
11:50–12:20	Recommendations and next steps
12:20–12:30	Closing remarks— *Diego Buriot*

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Annex 3: Discussion paper

Strengthening National Capacities for Surveillance, Response and Control

Background

Existing, emerging and re-emerging diseases pose a constant threat to global health security. Communicable diseases are a major cause of morbidity and mortality, particularly in developing countries. Coping with these threats relies on effective and efficient communicable disease surveillance, response and control systems. Strengthening the capacity of Member States to provide quality information in a timely manner is essential for early detection of outbreaks, monitoring of disease trends and disease burden, and for the monitoring and evaluation of the impact of disease prevention and control programmes. A strong national surveillance system provides the backbone of a system for the early detection of health emergencies and a prompt response as required by the revised International Health Regulations (IHR). This, in turn, reduces morbidity and mortality, and limits the disruption of other disease control activities. However, many countries do not have fully functional disease surveillance systems.

Various Resolutions passed by the World Health Assembly and the WHO Regional Committee meetings have reiterated the need for strengthening national capacities for the effective surveillance of both communicable and noncommunicable diseases. Over the past few years, different key players and stakeholders, coordinated by WHO, have attempted to translate these resolutions into frameworks and actions for building sustainable and strong national surveillance systems. The WHO Regions are implementing similar activities, sometimes using different models and strategies, to address specific needs. To strengthen national capacities for surveillance, response and control of communicable diseases, it is essential to constantly review these strategies and models, identify challenges, constraints, and lessons learnt, and consolidate the achievements.

This Global Consultation therefore aims to review the different strategies and models, and to broadly define the elements for a global framework that would effectively and efficiently support Member States in building strong and sustainable national disease surveillance systems.

Strategies for strengthening national disease surveillance systems

Strengthening national disease surveillance, response and control systems has usually involved improving the performance of the systems, building the knowledge, skills and competencies of the implementers, improving the exchange and dissemination of relevant goodquality information, and ensuring accessibility to the information derived from the system(s). Improving networking and partnership is a key concept in strengthening national surveillance, response and control.

Strengthening the performance of the systems

Ensuring an appropriate structural and organizational framework for surveillance; the availability and use of relevant standards, guidelines and tools; motivated human resources, adequate financial and material resources; functional communication systems, and appropriate laboratory capacity, will allow for more effective surveillance. Operationalizing surveillance and response/control processes (data collection, transmission, analysis, feedback and supervision, investigations and preparedness) provides the basis for improvements in system performance. Strengthening the overall national surveillance system could be accomplished through disease-specific or more generic approaches.

Disease-specific strategies

Disease specific strategies have often evolved from the need to control specific communicable diseases or groups of diseases, that cause a significant health burden on the population, or are a threat to national, regional and global health status (such diseases include cholera, malaria, polio, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), meningitis and influenza).

Disease-specific surveillance systems are widely implemented, but the procedures used often differ according to the type of data collected, the frequency of data collection and the intended use of the information. Most of the disease-specific surveillance programmes (e.g. Expanded Programme on Immunization (EPI), polio, HIV/AIDS, Roll Back Malaria (RBM), tuberculosis (TB) and guinea-worm disease) have been designed to address specific programme needs and goals with good documentation of the challenges and lessons learnt that could guide the development of a framework for strengthening overall national capacities for surveillance. Examples of specific issues include the differing information needs for disease control and the sources and quality of information. Certain diseases may have complex information needs that can be met only through specialized surveillance systems such as the sero-prevalence surveys for HIV/AIDS, antimicrobial sensitivity studies, and detailed case reporting for diseases targeted for eradication and elimination.

Multi-disease surveillance strategy / integrated disease surveillance and response strategy

A multi-disease surveillance strategy has been developed in an attempt to remedy the identified weaknesses in existing systems, increase efficiency, cost effectiveness, and sustainability of national surveillance and response systems, without compromising the needs of the disease-specific programmes. It builds on existing systems and promotes the integration of common processes, structures, personnel and other resources as deemed appropriate. The multi-disease surveillance strategy involves:

- assessment of existing systems to identify strengths, weaknesses, gaps and opportunities for strengthening national surveillance systems using standardized procedures and methods;
- prioritization of the diseases for surveillance using a scoring system with agreed criteria to arrive at a limited list of diseases for public health surveillance;
- development of plans of action with key stakeholders and partners to strengthen national surveillance systems based on the findings of the assessments. The plan of action aims at improving the performance of the surveillance functions, and building the broad epidemiological and laboratory skills, while taking into consideration opportunities for synergy with existing programmes, developing necessary linkages and networking at country level. It sets targets and defines the roles and responsibilities of all key players contributing to the achievements; and
- implementing the plan of action while monitoring the improvements in the overall surveillance systems.

The strategy views various surveillance systems in a country as a common public service, whose activities involve similar functions and often use the same structures. Integration of surveillance activities includes identification of a coordinating surveillance unit/body at the national level. It involves utilization of joint surveillance tools and guidelines, joint assessments and reviews, coordinated technical and logistical support for both epidemiology and laboratory strengthening, joint publications and bulletins for information sharing and dissemination. This strategy, if appropriately applied, provides opportunities to coordinate surveillance activities and to share and maximize utilization of available resources, thus increasing efficiency.

The multi-disease surveillance strategy is currently being implemented by most of the countries in the African Region, and, together with the Eastern Mediterranean Region, has documented successes in

improving the national surveillance systems. The South-East Asia Region has developed a regional strategy for integration. Other WHO Regions are currently implementing various aspects of the strategy. Although integration at country level has so far proved feasible, it is necessary to review and assess possible areas for improved coordination of activities and provision of technical support at the Regional and global levels.

This Consultation will explore the challenges, lessons learnt from implementing disease-specific and integrated surveillance systems, and the opportunities for further reinforcing and building sustainable and effective national surveillance systems in a coordinated manner. It will highlight the different models of integration of surveillance activities, and discuss the advantages and disadvantages, achievements and lessons learnt, and opportunities for improvement.

Strengthening human resources for surveillance, response and control through training and training institutions

The successful implementation of surveillance strategies and models depends to a certain extent on the knowledge, skills and competencies of the implementers and their development represents an integral part of strengthening national capacity for surveillance and response. In many countries public health training institutions have worked closely with the ministry of health to build national capacity for surveillance. Although training is usually considered as an important support function of surveillance, it can be viewed as a strategy to build national capacity for surveillance. Several models and strategies for building human resource capacity through training have been implemented, some of which include:

- the review of existing training curricula to ensure the promotion of an integrated strategy;
- development of specific 1–2 year residential training programmes (e.g. field epidemiology training programmes and public health schools without walls), and other programmes (e.g. Lyon cohort strategy);
- development of regional training programmes;
- development of short courses tailored to address specific strategic needs and reinforce specific skills; and
- development of in-service training programmes for “on-the-job” training.

Many countries have developed short-term courses to strengthen their capacity in surveillance and response. Fifty countries are participating in longer-term training programmes for field epidemiologists (FETP), thus, using training as a real long-term strengthening strategy. Although most of these countries have recorded successes in implementation of these programmes, their experiences have highlighted a number of needs:

- to achieve a balance between long-term and short-term training curricula;
- to closely involve training institutions in the implementation of the plan of action;
- to ensure high-quality technical supervision of trainees embarking on long-term training programmes;
- to address the issue of sustainability before embarking on long-term programmes; and
- to develop regional and subregional strategies to meet the needs of those countries that cannot meet the requirements for long-term programmes.

This process will review these experiences and further define a strategy for increasing the role of training in strengthening communicable disease surveillance and response.

Strengthening access to information through networking and partnerships

Many countries, regions and subregions have begun developing communicable disease surveillance networks, that facilitate the exchange, dissemination and analysis of information for appropriate action,

among other benefits. Several surveillance networks exist often comprising countries that face similar health challenges, and have similar surveillance and response objectives, strategies or activities. The rapid exchange of information for control is often important, and some networks rely heavily on the added value of pooling data, expertise and resources. The requirements for standardization within the networks often lead to the improvement of surveillance at the national level.

Examples of existing networks include the East African Surveillance Network (EAIDSnet), the Mekong Basin Disease Surveillance (MBDS) network, the Pacific Public Health Surveillance Network (PPHSN) including PacNet, the Baltic Network, Networks of Epidemiology, the Caribbean network (CAREC), subregional networks in the Americas for emerging and re-emerging diseases, public health training institutions, the European Network for Imported Viral Diseases (ENIVD), the European Working Group for Legionella Infections (EWGLI), WHO Collaborating Centres, Polio, Influenza and other laboratory networks.

Communicable diseases respect no boundaries, especially in the present era of increased international travel and trade. Global health security cannot be achieved in the absence of strong national surveillance and response systems. Few ministries of health have the capacity to deal with all communicable disease threats. There is a need to strengthen cross-border surveillance, response and control activities, and to develop strong partnerships with collaborating institutions and other partners, to ensure global health security. Global investments for strengthening surveillance and response should likewise envisage and facilitate linkages between national, regional and international networks.

This consultation will explore national, regional and global strategies to promote networking for strengthening national capacity for surveillance.