

PROTECTING HEALTH THROUGH  
GLOBAL EPIDEMIC CONTROL

**Developing laboratory  
partnerships to  
detect infections and  
prevent epidemics**



**World Health  
Organization**

**Communicable Disease Surveillance and Response**

**WHO Lyon Office for National Epidemic  
Preparedness and Response**



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# Executive summary

The world is changing. New microbes have appeared and old diseases have re-emerged. Coupled with increases in global traffic and trade, public health risks frequently traverse national boundaries. Effective national surveillance systems are essential to prevent international spread of epidemic diseases. Within these systems, public health laboratories play a critical role. Sadly, these structures and the staff who work in them have long been considered in many countries to be unimportant and consequently are poorly resourced.

Partnerships are now widely considered to be crucial to the efforts to improve health conditions in developing countries. Bringing together different organizations from different sectors has been shown to be an effective means of leveraging more resources and expertise to tackle public health problems.

As part of its contribution towards WHO's work on global health security, the Integrated Capacity Development Programme for Laboratory Specialists, managed by the WHO Lyon Office for National Epidemic Preparedness and Response assists countries to improve the knowledge and skills of laboratory staff and to provide resources to enable the detection of, and response to, epidemics which threaten public health.

The proposed project, based on partnership, is designed to complement and extend the Integrated Capacity Development Programme for Laboratory Specialists and promote the improvement of public health laboratory capacity in developing countries in a sustainable manner.

The project is based on twinning public health laboratories in developing countries with specialized public health or research institutions (usually but not only) in developed countries to undertake specific collaborative projects. A partnership network of laboratories engaged in such twinning projects will permit the participants to exchange information, share experiences, avoid gaps and duplications, highlight successes and best practices, and coordinate shared activities.

Supporting twinning projects can lead to sustainable improvement in public health laboratory capacities and have a positive impact on public health systems.

# The challenge

## The growing threat of epidemics

**E**pidemics and newly-emerging infections are threatening the health of people globally and impacting on travel and trade in our increasingly interconnected world. Many epidemic threats, such as cholera, meningitis, yellow fever and dengue, recurrently challenge health systems in countries with very limited resources. Others, such as influenza and severe acute respiratory syndrome (SARS), have demonstrated their potential to create new pandemics.

Natural disasters may result in epidemics in affected populations and the risk of accidental or intentional release of biological agents is an additional threat to global health security. Epidemics, recurrent or unanticipated, add to the heavy burden borne by health services struggling to cope with the major diseases of poverty such as AIDS, tuberculosis and malaria, and the growing impact of non-communicable diseases.

## Limited capacity for response

For more than 50 years, scientific and technological advances have created tremendous opportunities for progress in combating infectious diseases, but developing countries cannot find solutions to their public health problems merely by acquiring equipment and medicines. Today, the need for skills and aptitude to apply new knowledge and devise solutions to local problems is paramount. The latest technological advances are not required in every centre, but every country needs the capacity to identify and respond rapidly to epidemic threats.

The appropriate response to epidemics depends on precise identification of the pathogenic agent(s) involved. Thus national public health laboratories (or other laboratory services with public health responsibilities at country level) have a crucial role to play in the rapid provision of accurate information on the causes of epidemics. However, among developing countries laboratory capacity varies widely from advanced to almost non-existent. This lack of capacity often reflects a poor understanding of the role of this critical component of the health service. Consequently, laboratory services are frequently underfunded and their staff poorly trained and undervalued.

A meeting of laboratory experts, organized in 2003 by WHO and the United States of America Centers for Disease Control and Prevention, identified the main reasons why public health laboratories are on the margin of public health services in many developing countries.

### **Why public health laboratories are on the margin of public health in many developing countries**

- lack of public awareness of the role of public health laboratories
- lack of confidence in laboratory results
- lack of training and leadership among laboratory staff
- laboratory staff do not recognize their own value
- poorly-funded and not income-generating
- lack of optimization of resources
- lack of tangible outcomes

## Expanding capacity by partnership

Partnerships, i.e. respectful relationships established between two or more organizations to address specific and mutually-agreed goals and objectives over a specific period of time, are now widely considered crucial to efforts to improve health conditions in developing countries. Bringing together different organizations from different sectors has been shown to be an effective means of leveraging more resources and expertise to tackle public health problems. Partnerships strengthen the practice of public health, stimulate new forms of integration among organizations, and contribute to ensuring better access to health services and better health outcomes.

A partnership often builds on the strengths of partners from different sectors. Partners tend to share their resources, be they technical, organizational, geographic, human or financial, with each partner having specified rights and responsibilities related to the partnership.

A study undertaken by McKinsey & Company for the Bill and Melinda Gates Foundation concluded that more than 80% of the public health alliances (partnerships) analysed appeared to be successful (when success was defined as an acceleration, improvement, or reduction in cost of initiatives aimed at reducing disease burdens in comparison to what could be accomplished on a solitary basis).

Establishing good communication between sectors and organizations is the first step in developing a partnership. Partnerships are gradual and incremental processes that require time to gain pace, build momentum and bear fruit.

### **Keys to effective partnership**

- **Communication** – when organizations begin to talk to each other about their interest in creating a partnership.
- **Cooperation** – when two or more communicating organizations reach an understanding to assist each other.
- **Coordination** – when organizations combine their resources and strengthen their individual roles.
- **Collaboration** – when two or more groups already communicating work together to develop an activity, programme, or policy that did not exist previously.

# The essential role of laboratories

**Vision** The earliest possible detection of epidemic threats through a network of effective diagnostic laboratories

Every country should have in place, using national resources and outside collaborative support if required, a system to detect, identify and appropriately characterize in a timely manner, the pathogens which pose the greatest epidemic risks to its population. This minimum national capability is essential to enable national health authorities to:

- trigger alerts at peripheral, national or international level, according to agreed guidelines;
- have enhanced capability to detect pathogens which may be accidentally or deliberately released;
- implement adequate response measures to contain possible risks of epidemics due to the pathogens under surveillance;
- comply with the revised *International Health Regulations*, whose guiding principle is to prevent international spread of disease by early detection at national level of disease events that threaten public health.

To achieve this vision, every country needs, in addition to clinical and epidemiological capabilities, a laboratory infrastructure with services, reagents, and skilled knowledgeable staff, capable of fulfilling essential functions on a permanent basis. These essential functions have recently been defined in a WHO document<sup>1</sup> and are summarized below.

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<sup>1</sup> *Essential laboratory functions for epidemic alert and response at national level*. Geneva, World Health Organization, 2005.

### **Essential laboratory functions at national level**

Delivery of assured laboratory services with respect to:

1. Communicable disease surveillance, including epidemic alert, response and prevention
2. Microbiological safety of food and water
3. Quality assurance
4. Information management and communication
5. Training and continuing education
6. Policy development, networking, partnership and advocacy.

Only very few laboratories in the world offer a global capability, especially when it comes to newly-emerging agents, such as the SARS virus. Thus partnership and collaboration between laboratories is a key to expanding capability. This is particularly crucial for poorly functioning laboratories in developing countries which are barely able to ensure the laboratory diagnosis of a small number of the most prevalent pathogens affecting their populations.

# From vision to action

**T**he WHO Lyon Office for National Epidemic Preparedness and Response (LYO) focuses on developing the core competencies of public health laboratories and epidemiology units in order to improve national preparedness to detect and respond to epidemics and contain known risks.

## Training laboratory specialists

To begin to address some of the deficits in public health laboratory services, LYO initiated the Integrated Capacity Development Programme for Laboratory Specialists (the ICDLS Programme). This two-year training programme for specialists from public health laboratories in developing countries is aimed at updating their knowledge and skills through mentoring by experts and through distance-learning. Since the ICDLS Programme was launched in 2001, a total of 64 participants from four groups of countries have taken part.

### Countries engaged in the ICDLS Programme since 2001

**Group 1:** Cape Verde, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the Congo, Equatorial Guinea

**Group 2:** Iran, Iraq, Jordan, Lebanon, Sudan, Syrian Arab Republic, Yemen

**Group 3:** Belarus, Bulgaria, Georgia, Republic of Moldova, Romania, Russian Federation, Turkey, Ukraine

**Group 4:** Benin, Burkina Faso, Djibouti, Mali, Mauritania, Niger, Senegal.

## **Strengthening laboratory capacity**

In addition, LYO assists countries to improve their public health laboratory capacity through:

- implementing a model external quality assessment programme;
- strengthening biosafety measures to avoid the spread of communicable diseases caused by accidents or mishandling of infectious substances in laboratories or during transport;
- developing advocacy messages to assist WHO Member States to gain support for their public health laboratories;
- providing a framework for WHO assistance to Member States for preparedness for the deliberate use of biological agents.

# Developing laboratory partnerships – a new project

The ICDLS Programme is proving to be effective in assisting laboratory specialists to update their skills and knowledge and to plan and execute improvements in their countries' public health laboratories. However, it has also generated a considerable demand for technical input and expert assistance to bring the laboratories in developing countries to an appropriate level. Thus it is clear that additional action is needed to ensure sustainable improvements in public health laboratory services.

To address this challenge, WHO seeks to promote the establishment of **twinning projects** between developing country laboratories and specialized institutions, and to build a **partnership network** to complement and extend the ICDLS Programme.

The partnership network will be open to laboratories and institutions engaged in twinning projects to strengthen the capabilities and expertise of public health laboratories in developing countries. The aim is to facilitate collaboration, provide a forum for discussion and information exchange, and promote the sharing of knowledge and resources.

## Twinning

The objective of a twinning project is to contribute to the improvement of the capabilities and expertise of less-developed laboratories so they can fulfill essential functions and participate more efficiently in the detection of epidemic-prone diseases.

The twinning project is expected to address the competencies needed to achieve this objective, based on an assessment of needs and mutually-agreed priorities. These are likely to include:

- diagnostic methods and reagents e.g. introduction of new diagnostic methods in bacteriology, virology, parasitology; use of molecular tools; development of rapid diagnostic tests, etc.;
- training on, and support in, the development of standard operating procedures;

- assistance in establishing and managing quality assurance and biosafety programmes;
- development of laboratory management skills;
- joint research programmes enabling capacity strengthening;
- development of in-country laboratory networks.

A twinning project is conceived as a joint commitment between two laboratories working together in a voluntary peer-to-peer partnership on issues of common concern. Each partner must contribute human and/or in-kind resources to the project. Twinning should be more than collaboration on focused issues; it must lead to the sustainable strengthening of the less-developed laboratories. The duration of a twinning project should be not less than three years. In addition:

- The agreement of the national government is a prerequisite for a twinning project. These partnerships need to fit in with government priorities and national plans for building a functional public health laboratory system.
- The less-developed laboratory must be acknowledged by the government as its national public health laboratory or a component of its public health laboratory structure.
- The work of the laboratories participating in twinning projects must be relevant to national and regional plans for the organization of an epidemic alert and response network.
- The objectives and expected outcomes, evaluation process, conditions of collaboration, and roles and responsibilities of each partner must be clearly defined.
- Where possible and appropriate, the development of commonly-defined research projects should be encouraged as these often provide good opportunities to strengthen capabilities and attract donor support.

## **Partnership network**

It is proposed that the individual twinned laboratories should be linked into a partnership network. Networking is a crucial process to promote the sharing of resources, knowledge and information; it will enhance the sharing of lessons learnt and facilitate the implementation of twinning projects. The partnership network will extend the benefits of twinning projects by multiplying the possibility of exchanges and facilitating the implementation of shared activities (e.g. the organization of workshops, multicentre research programmes, etc).

Many laboratories or institutions are already involved in collaborative projects or in networking. The partnership network will capitalize on relevant ongoing projects and create new opportunities where necessary. In the future the partnership network could be integrated into a global laboratory network for the detection of epidemic threats.

# Launching the project

Following a consultation involving a number of laboratory experts from developing countries and WHO Regional Offices, the following plan was developed to launch the laboratory partnership project.

## The partners

A twinning project should recognize the value of a true partnership. The partners, i.e. the developing country partner (the public health laboratory in a developing country) and the specialized institution (which may be situated in a developed or developing country), should agree on roles and responsibilities.

### Partners must be prepared to:

- build peer-to-peer relationships based on trust
- establish and maintain effective communication
- gain trust and support at all levels of the governmental authority of the developing country laboratory
- be sensitive to political and cultural dynamics faced by both partners

**Developing country partners** — should meet a number of requirements prior to engaging in a twinning project. These include:

- willingness and demonstrable capability to participate; evidence of clear needs and wishes
- political commitment at national level (ministry of health)
- support of parent institution
- good organization at country level to avoid risks of destabilization of the national laboratory system

- evidence that the laboratory is responsible for supporting the improvement of the national public health laboratory system
- relevance regarding the development of regional plans for public health programmes related to epidemic-prone diseases.

It is proposed to initiate the programme with those public health laboratories already engaged in the ICDLS Programme ongoing in LYO (see above). However the model will be extended progressively to include other countries according to the plans for laboratory strengthening in the WHO Regions.

**Specialized institution partners** — may be public health laboratories, research organizations, universities, or other “reference” institutions, located in developed or developing countries.

Criteria for the selection of a specialized institution as twinning partner include:

- international recognition
- willingness to participate
- relevant and sustainable scientific and technical expertise
- ability to contribute to strengthening national and regional public health laboratory capacity
- proven public health credentials.

More than 40 institutions worldwide which meet the above criteria have already agreed to engage in twinning projects.

**Matching the partners** — will require consideration of various factors including:

- shared vision and goals; both partners must have a mutual understanding of the purpose and expected outcomes of the project;
- concordance of needs and skills;
- geography; it seems logical to encourage projects between laboratories and institutions located in the same region, for reasons of logistics and cost, and also because they are likely to share priorities and problems in terms of common pathogens;

- the possibility to communicate in a common language.

Once the ground rules have been laid down and the prerequisites met, it is important for the partners to have a good understanding of each other and of the national context within which they operate and to implement the project with flexibility and pragmatism. Mutual understanding and a commitment at personal level, and shared objectives, are critical for the success of such programmes, especially at the start.

## **Partnership network**

A partnership network of public health laboratories and specialized institutions engaged in twinning projects will enable the participants to exchange information, share experiences, avoid gaps and duplications, highlight successes and best practices, facilitate the implementation of twinning projects, and permit coordinated action.

The participants in the network will meet annually to discuss matters within the network's purview. WHO will provide the secretariat for the network.

## **Selection and evaluation of twinning projects**

To further enhance the improvement of the capabilities and expertise of less-developed laboratories, WHO will seek to provide financial support to twinning projects which are of relevance to the overall objective of the ICDLS Programme. In this connection, a Steering Committee will be set up to provide advice and recommendations to WHO on twinning projects which merit financial support.

Members of the Steering Committee will be drawn from both developed and developing countries representative of resources and opportunities, and with an adequate international and technical distribution of expertise. The Committee should have no more than 12 members serving three-year staggered terms. WHO will provide the secretariat for the Committee, which will meet once or twice a year. The Steering Committee will include experts from laboratories which have no current involvement in a twinning project. Should this situation change, the expert should either be asked to step down and be replaced by a new member, or at least be asked not to participate in the review of the application of the laboratory to which he/she is affiliated.

The role of the Steering Committee will be to assist WHO by:

- providing advice on priorities
- making recommendations on standards for proposals, review process, standards for the evaluation process, performance indicators, etc.
- providing advice on the content and expected outcomes of project proposals
- checking the relevance of individual partnerships to the overall objective of the ICDLS Programme
- assessing the outcomes of the projects funded by WHO.

### **A stepwise approach**

The complete process of establishing twinning projects and the partnership network is summarized in the flowchart opposite which shows the different steps and who implements them.



|   | PARTNERS IN DEVELOPING COUNTRIES & SPECIALIZED LABORATORIES | STEERING COMMITTEE | WHO | PARTNERSHIP NETWORK |
|---|---|--------------------|-----|---------------------|
| Determination of priorities, development of standards for proposals, review process and performance indicators            |   | ●                  | ●   |                     |
| Request for advice on the establishment of twinning projects, proposals for twinning                                      | ●   |                    |     |                     |
| Advice, review and selection of relevant proposals  |   |                    | ●   |                     |
| Visit to the developing country laboratories to finalize the projects contents and get political support at country level | ●   |                    | ●   |                     |
| Detailed applications for funding of twinning projects  | ●   |                    |     |                     |
| Review of the funding applications, decision on projects to be funded   |   | ●                  | ●   |                     |
| Conclusion of Memorandum of Understanding between partners  | ●   |                    |     |                     |
| Implementation of the twinning projects   | ●   |                    |     |                     |
| Review of progress and assessment of the outcomes of the twinning project   |   | ●                  | ●   |                     |
| Network activities  | ●   |                    | ●   | ●                   |

# Financial support

External scientific, technical and financial resources (i.e. external to the developing-country institution) should be used principally to provide additional resources to enable a project to be completed successfully. External inputs and skills should add to, rather than replace, local ones.

WHO, with the aid of significant donor funding, currently supports the ICDLS Programme in LYO and will contribute to the functioning of the Steering Committee in this new proposal. Additional financial resources will be sought from external sources:

- to support the individual twinning projects themselves
- to support the meetings and other activities of the partnership network.

Funding partnerships and networking through WHO provides a number of key advantages and assurance to donors:

- ensured monitoring
- independent peer assessment of success in meeting objectives
- common quality standards
- accountability
- added value by access to larger support networks
- independent oversight and progress reports
- improved potential for sustainability.

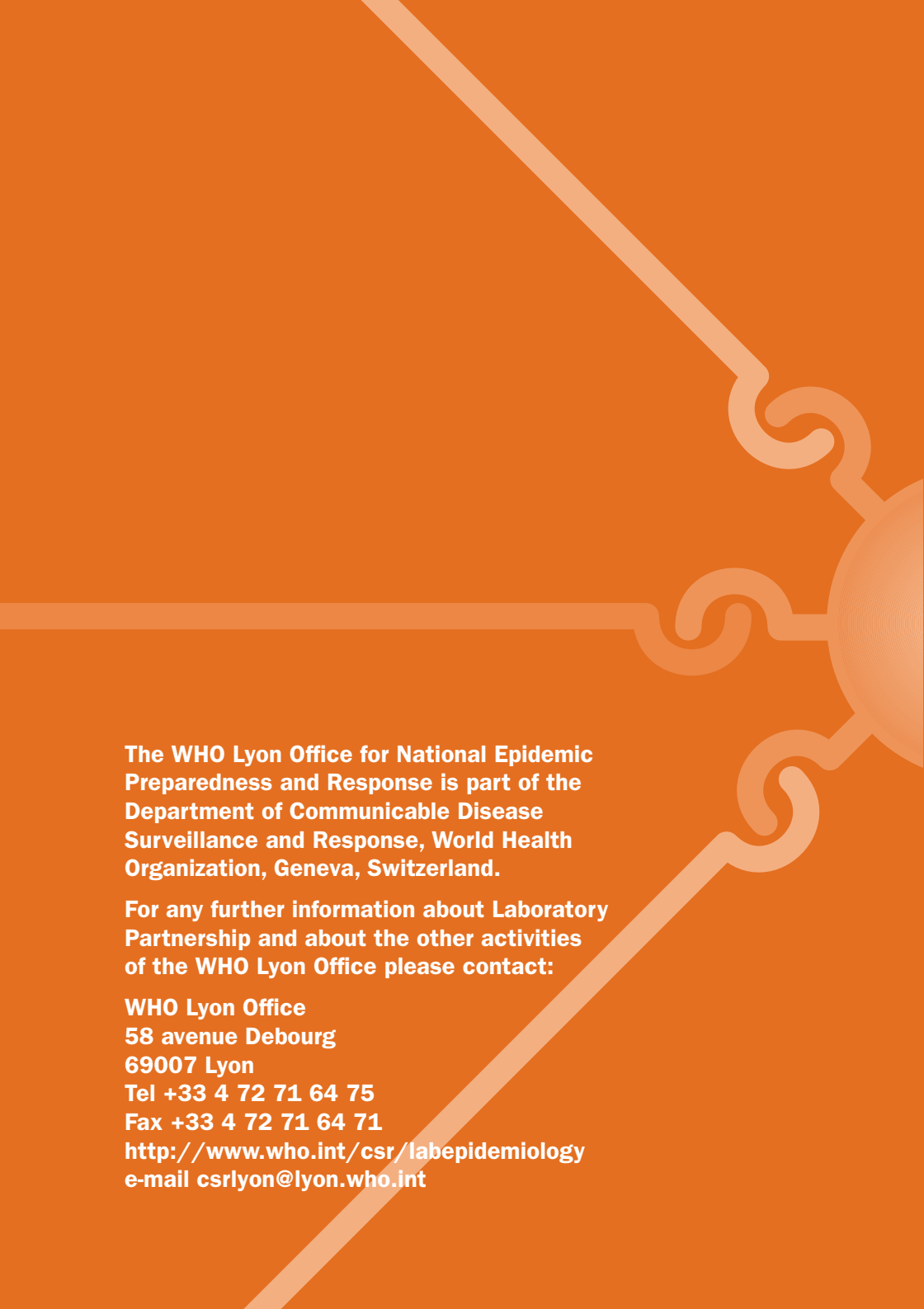
# Information resources

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