Overview of laboratory capacity and lab biosafety to support research of Emerging Infectious Diseases

Dr. Aparna Singh Shah, M.D.

Regional Adviser
Health Laboratory Services and Blood Safety
WHO Regional Office for South-East Asia (SEARO)
Laboratories play an important role in detection, characterization, treatment and containment of diseases.

WHO SEARO provides leadership on health matters, articulates evidence-based policy options, provides technical support to countries and monitors health trends.
Laboratories are crucial for research in communicable diseases caused by existing/emerging/novel pathogens.

We can further expand these activities to provide effective support to research.
Research and labs are Enshrined in WHO Core Functions
Strengthening health lab capacity ……supports in strengthening research capacity

➢ Providing leadership on matters critical to health and engaging in partnerships where joint action is needed;

➢ Shaping the research agenda and stimulating the generation, translation and dissemination of valuable knowledge;

➢ setting norms and standards, and promoting and monitoring their implementation;

➢ articulating ethical and evidence-based policy

➢ providing technical support, catalyzing change, and building sustainable institutional capacity; and

➢ monitoring the health situation and assessing health trends.
Health Laboratories contribute considerably in

- generating reliable, relevant, unbiased and timely information to develop strategies for disease prevention and control,
- developing and updating disease management guidelines,
- evaluating different treatment modalities for a disease,
- improving disease detection and response capacity, and
- Planning of health risk policy
GAPS

Do we have ..............................................

➢ reliable PHLs to safely detect & characterize pathogens?

➢ Safe collection, packaging and shipping of infectious specimens?

➢ Referral mechanism/ Networks of labs/ national/ regional global linkages

➢ LIMS: Data management/ dissemination?

➢ Do we have a national health lab policy to support aforementioned areas of work?
Needs of labs core capacity including quality in countries: 11 Ms and Identified constraints/ Gaps

- Man (Human resource and development process)
- Machinery (Equipment)
- Material (Reagents)
- Methodology (SOP/protocols)
- Management
- Motivation
- Monitoring and evaluation
- Maximum containment (BSL3)
- Matrix (Network)
- Maintenance of expertise
- Money (Resource allocation)

Major lab issues in responding to pathogens in SEA Region:

- Limited public health laboratory capacity
  - Lab policy/ plan/ focal point/ national framework of health labs
  - Access
  - Technology/ inadequately trained staff/ inadequate number of staff
- Continuous supply of Reagents
  - Systematic assessment of lab quality (EQAS)
  - Limited Laboratory capacity to support surveillance and outbreak investigation
  - Biosafety awareness and practices
- Regional/ global linkage for technical support and collaboration
  - Inadequate resources (funds to sustain network)
Laboratory Facilities in SEAR vary from country to country...........................
Role of WHO in Lab capacity building
http://www.searo.who.int/entity/bloodsafety/en/
Role of WHO in Lab capacity building
Laboratory Technical Documents
Trainings- Work-shops/ lab supplies/ referral Services

- Detection of pathogens
  - Hands on training serology/ Virus cell cultures/ Bacterial cultures(regional and national trainings)
  - Molecular technologies(regional/ national trainings)
  - Virus characterization – Sequencing, analysis, and interpretation of genome (ToTs)
  - Virus drug resistance training (ToTs)

- Lab supplies/ reagents/ equipment
  - Non commercial lab supplies for detection of emerging pathogens

- Referral services
  - Regional and global linkages to improve diagnostic capacity
Lab Biosafety/ Quality management system/ packaging & shipping of specimens

- **Biosafety** (to ensure safety of lab personnel and community) and quality
  - Regional and national trainings on biosafety/ quality in laboratories
  - Training of engineers to maintain the facility/ equipment/ infrastructure
  - Situational analysis/ assessments of PHLs
  - Capacity building (PHLs) based on recommendations of assessments
  - Biosafety cabinets assessments: ensure safe working environment
  - Doffing and donning of PPEs

- **Packaging and shipment of the specimens** (to ensure safety and also quality of specimen)
  - Trainings on packaging and shipping of specimens(as per IATA rules and UN norms)

All eleven member states lab staff have been trained in safe packaging and shipping/ CCM (as per IATA rules and UN norms) of dangerous specimens to the referral labs.

Five MSs have functioning BSL-3 and in one reviewing of BSL-3 is ongoing.
Onsite hands on lab trainings
Regional Training of Trainers: Lab capacity building
Laboratory hands-on trainings on AMR and LIMS (Bacteria/ Virus/ Fungus)
Many of SEAR MSs have national health lab policy/ strategy/ national guidelines on Biosafety

All eleven countries have PCR capacity/ most of them have cell culture facility too

All MSs have certified (as per UN norms) shippers for infectious substances.

Regional core group of trainers on sample collection, processing, organism detection, characterization, sequencing, biosafety, lab data management

Improved awareness of biosafety (BSL 3 labs- in five MSs, in one under review),

lab quality – scaling up of implementation of LQSI, LIMs-reliable results/ EQAS

Supply of necessary non-commercial reagents for novel and known pathogens

Scaling up of PoC diagnostics/ list of essential diagnostics needed at various levels of health labs

Improved access to labs/ Regional and global linkages: Global experts, referral mechanism and information sharing
What do we aspire for?

- National capacity in ALL Member countries for establishing initial diagnosis in safe environment
- Regional capacity for characterization of pathogens
- Optimal/rational use of laboratory services
- National commitment to support and sustain laboratory services and research
- International support

Thank you