Pandemics, Conflicts, Climate Change: New Roles and Challenges for National Public Health Institutes

Meeting 2

Presentation of the Integrated Disease Surveillance Project

December 1, 08h30-10h00
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<td>Dr. Jean-Claude Desenclos, Santé Publique France, IANPHI</td>
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<td>Deep-Dives Overview</td>
<td>Professor Andrew Lee, University of Sheffield, UKHSA</td>
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<td>Dr. Bjorn Iverson, Norwegian Insitute for Public Health</td>
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<td>Closing</td>
<td>Dr. Quentin Sandifer</td>
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Scoping review and Survey
To identify key priorities that will enable a collaborative approach across sectors for the integration of data, the role of NPHI’s and key actors to analyse and interpret evidence for the purpose of early action and response to epidemics and pandemics

Comprised of three workstreams with individual reports:

**Scoping Review:** To use the 5 core principles of integrated disease surveillance (IDS) set out by Morgan and colleagues, and conduct a rapid scoping review to document current state of knowledge and evidence for definitions and characteristics of Integrated Disease Surveillance and assess how these have evolved over time.

**Survey** IANPHI members on their understanding of IDS and the current status of IDS across the IANPHI network

**Deep Dives:** A focussed study on a limited number of Lower-middle income and High-income countries on the state of IDS including challenges and barriers to implementation as well as identifying opportunities.

In addition, key reflections on the BMGF funded RKI study and Resolve to Save lives project
Questions to consider:

Based on your own experience are there any reflections or views on barriers or challenges to strengthening surveillance that you have not heard mentioned.

Are there other recommendations you think should be made – and who to?

From the project what tools would you find useful that IANPHI can provide.
Workstream 1: Scoping Review

Scoping review working group:
Gerd M Flodgren (Norwegian Institute of Public Health), Norah Alkanhal (Public Health Authority of Saudi Arabia), Simon Brinkwirth (Robert Koch-Institute), James Ross (US Centres for Disease Control and Prevention), Janine E Bezuidenhoudt (National Institute for Communicable Diseases, South Africa), Andrew CK Lee, University of Sheffield/Health Protection, UKHSA
Workstream 1: Scoping Review

Systematic scoping review, a “review of reviews” (8 reviews + 5 primary studies) to understand current state of evidence and approaches to conceptualisation and operationalisation of IDS.

Findings:

- Concept of integration varies in terms of organizational structure, processes and/or personnel, degree of integration, stage of surveillance process when it occurs, and type of data/databases, or sectors.

- Requires: Adequacy of core functions (e.g., improved data quality and timeliness); resource requirements (incl. adequate and sustainable financing); digitization and electronic reporting; data from multiple sources, strong coordination and communication between sectors, two-way information flow; sufficient flexibility, systems integration with good interoperability, semantic consistency, interconnectivity, and convergence; good governance/leadership at all levels, and government commitment

Conclusions:

- Fragmented, incomplete evidence of poor quality, with little information on IDS systems (outside WHO African region), animal sector surveillance, non-communicable diseases or behavioral risk factors.

- Also limited to process outcomes, and operational aspects, and lack of robust evaluations of the effectiveness of IDS on cost savings and disease control.

- Good governance, a functional system and structure, and adequate resourcing needed
Survey Working Group:
Emily Carter, Janine Bezuidenhoudt, Daniel Stewart, Erin Rees, Victoria Ng, Sadaf Lynes, Jean-Claude Desenclos, Andrew Lee, Nancy Nswal, James Ross, and George Odongo
Aim: characterize the understanding and development of integrated surveillance

Online survey of IANPHI members
- 110 members targeted including Caribbean Public Health Agency [CARPHA]
- 65 participated

Both quantitative and qualitative questions

Conceptual model for IDS: “A combination of active and passive systems using a single infrastructure that gathers information about multiple diseases or behaviors’ of interest”*

Respondents self-reported their IDS status as fully developed IDS, partial IDS or no IDS

Case studies of best practices were also reported by respondents

Analysis according to IDS status, country World Bank income group and WHO region

Complete survey responses by World Bank income group (A) and WHO region (B), n=65
Developed IDS: 25%, n = 16; Partially developed IDS: 55%, n=36); No IDS: 20%; n=13

Self reportes IDS status by World Bank income group (A) and WHO region (B), n=65
• Concept of Integrated Disease Surveillance
• Role of National Public Health Institutes/Public health entities
• Data systems integration
• Workforce
• Governance
• Finance
• Key component of an effective surveillance systems (Morgon et al)
The understanding of integrated surveillance differs from country to country.

Lack of a definition of IDS that was universally agreed and understood.

Integration is a complex process that involves multiple stakeholders and sectors that occurs at all levels of the health system and should include non-health sectors. Respondent tended to adopt a whole systems perspective.

The purpose and functions of surveillance, how the system enables better decisions and response to health threats, was a key consideration, for which the system needed to be agile, responsive, and resilient.
Role of NPHIs/Public health entities

- Most surveillance systems involved the MOH
- In many countries with a NPHI, NPHIs had a major part to play either jointly with the MOH or as sole lead agency, particularly for core functions
- This was especially true for countries in higher income groups, and those with more developed IDS systems.
- MOH more involved in preparedness and response
Data systems integration

- Integration issues between organizations, local versus national levels or sectors
- Fragmentation: agriculture/animal, private, NCDs, surveys/research, env/occupational
- Integration of laboratory data mostly from national public health laboratories, followed by subnational public laboratories, than other public laboratories or private
- Genomic testing and sequencing predominantly available for developed or partial IDS systems, but the types of laboratories used varied by country income groups.
- Barriers in HICs related to data ownership, agreement and permission, lack of mandatory enforcement for reporting and lack of funding for IT systems infrastructure
- Enabling role of technology, including greater automation, electronic reporting systems, algorithms, and data platforms
• Gaps in skills related to data science, analytics and information technology followed by epidemiology, administration/data entry, laboratory, and public health.

• Respondents with no IDS more likely to report workforce capacity gaps in IT than respondents with partial or fully developed IDS.

• Respondents with a developed IDS more likely to report workforce capacity gaps in the laboratory compared to respondents with partial IDS and no IDS.

• Surveillance workforce development led by the MOH or NPHI with no difference by IDS status and country income group.

• In-country academic institutions and externally supported/funded initiatives also reported, more often in LICs compared to LMICs, UMICs and HICs.

• Major need to invest in a sustained way in workforce capacity and development.
The MOH and/or NPHI lead public health surveillance in most settings with approximately a quarter having joint leadership shared by MOH and NPHI.

Limitations in governance, with integration barriers at the interfaces between organizations, local versus national levels, or sectors.

Insufficient adherence to legal mandates.

Data protection was recognized to be an issue that needs attention to enhance public trust in public health surveillance.

Better developed IDS systems tended to have better governance/ and protections for citizens.

Lack of ‘evaluation and feedback’ of surveillance.
• Gaps in resourcing requirements reported in all country income groups

• Much more critical for LICs that have less capabilities, less government financing, and are much more heavily dependent on external funding.

• The reliance on international aid is not a sustainable source of funding

• Greater investment and governmental commitment will be necessary to enable countries to develop and optimize the use of a system of integration, with the skills and tools needed to build capabilities.
key components of effective surveillance*

- Corroborates Morgan O et al.* key components for effective surveillance,
- But also identifies other critical factors for IDS
  - governance and need for adequate regulatory frameworks,
  - political engagement and appropriate control,
  - and evaluation, as well as monitoring
- Need for better data management to ensure data integrity and confidentiality, interoperability and multi-sectorality, including interdisciplinary collaboration.
- Equity and guaranteed access to surveillance outputs were also identified as key for supporting strong, well-functioning integrated surveillance systems, as well as flexibility, simplicity, and acceptability.
- Resilience and capacity building were also identified as important factors.

* Morgan O et al. Disease surveillance for the COVID-19 era: time for bold changes. Lancet. 2021 Jun 19;397(10292)
Deep-dives overview
Workstream 3: Deep Dives

- To understand how IDS is conceptualised and operationalised,
- Understand how context has shaped the current provision of IDS,
- Identify the perceived strengths, weaknesses and challenges to future evolution of IDS

<table>
<thead>
<tr>
<th>Deep dive country</th>
<th>Partner country</th>
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<td>Partner country</td>
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<td>Pakistan</td>
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<td>Mozambique</td>
<td>PHA Sweden</td>
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<td>Malawi</td>
<td>PHA Norway</td>
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<td>Uganda</td>
<td>US CDC</td>
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<td>HIC</td>
<td>Partner country</td>
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<td>England</td>
<td>PHA Canada</td>
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<td>Sweden</td>
<td>PHA Norway</td>
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<td>Canada</td>
<td>UKHSA</td>
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30+ focus group discussions
37+ key informant interviews
Integrated Disease Surveillance (IDS) DEEP DIVE in MOZAMBIQUE

Overview, findings and recommendations

Thursday, December 1
## Core Principles of IDS: Mozambique current scenario

<table>
<thead>
<tr>
<th>Population-based</th>
<th>Laboratory confirmation</th>
<th>Digital data</th>
<th>Data transparency</th>
<th>Adequate financing</th>
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<tr>
<td>• Disease surveillance (mostly health facility-based) without a Population Denominators</td>
<td>• Public health laboratories established in 6/10 provinces and headquarters</td>
<td>• HIS, surveys and surveillance migrating from paper to electronic</td>
<td>• Sharing of data from the private sector as a challenge</td>
<td>• Donor driven (few interest on funding surveillance)</td>
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<tr>
<td>• Community-based Mortality Surveillance System (COMSA/ SISCOVE) with a strong Population Denominators</td>
<td>• Research and public health, including genome sequence</td>
<td>• No unique ID</td>
<td>• National Health Observatory as an opportunity for data triangulation</td>
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## Preliminary findings: perceptions on levels of integration

<table>
<thead>
<tr>
<th>Level</th>
<th>Systems level: Interoperability</th>
<th>Data collection level: unique form</th>
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<tbody>
<tr>
<td>National</td>
<td>Interoperability of programmatic, lab, environmental data and triangulation level: different sources</td>
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</tr>
<tr>
<td>Provincial/district</td>
<td></td>
<td>unique form linked to dHIS-2</td>
</tr>
<tr>
<td>Municipality</td>
<td>Interoperability with data from other geographical areas</td>
<td></td>
</tr>
<tr>
<td>Health Facility</td>
<td></td>
<td>unique form</td>
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Preliminary findings: challenges and opportunities

**Opportunities**
- Better interaction between the Gov and NGO’s
- Migration from paper to electronic systems
- National Health Observatory (data repository)

**Challenges**
- Donor driven HIS (multiple systems)
- No unique ID
- Human Resources (work overload)
Integrated Disease Surveillance: preliminary framework

Surveillance

Health Facility
- Laboratory
- Community (health/animal/environment)

Electronic systems

Data center/data warehouse
- Data management
  - Access levels
  - Data visualization
- Interventions (outbreak investigations, etc)

National Health Observatory

Products
- Periodic reports
- Data triangulation (other sources)
- M&E/indicator based monitoring

Goals
- Communication
- Health policies and resource prioritization
- MINISTRY OF HEALTH
- SUSTAINABLE DEVELOPMENT GOALS
Implementing IDS in Mozambique: Recommendations

- Involvement of key stakeholders
- Investment on health care and community workers
- Leveraging existing initiatives
- Using of existing platforms
Integrated Disease Surveillance (IDS) DEEP DIVE in MALAWI

Country NPHI: PUBLIC HEALTH INSTITUTE OF MALAWI (PHIM)
Partner NPHI: NORWEGIAN INSTITUTE OF PUBLIC HEALTH (NIKFI)
Duration: August-September 2022
Factors related to IDS. Legal mandates, governance and reporting requirements.

Life expectancy: 66yrs.
Population: 21 million.
MOH is responsible for health.

OUR STRUCTURE

STRUCTURE OF MOH

Minister of Health
Secretary for Health
Directors (includes Director of PHIM)
Deputy Directors
IDS / IDSR Focal Persons
Country Context

Every site uses multiple registers. Example:
- Patient registers
- Drugs
- Supplies, etc.

Some registers are for specific programs.

A large proportion of IDSR reporting is based on manual OPD registers.
1. Primary level (Health center, Community etc.). 9,000 Community Health Workers. O Level. Document in health passports and registers. Expect a very basic health facility IDS report.

2. Secondary level (District hospitals). Senior nurses, clinicians etc. BSc or higher. Focal Persons for IDS. Expect an enriched district IDS report; data from all health facilities.

3. Tertiary level (central hospitals). Senior nurses, clinicians etc. BSc or higher. Focal Persons for IDS (This site only). Expect an enriched central hospital IDS report.

4. National level (Min of Agriculture / PHIM / MOH HQ). Clinicians, epidemiologists, nurses, etc.... BSc, MSc and PhD holders. Expect a rich national IDS report.

PHIM is part of MOH HQ: It is the central IDS Lead.
Reporting structure: summary

Country Context

Fact:
PHIM is responsible for:
- IDS.</p>
- One Health Surveillance Platform (red).

MOH Planning Department is responsible:
- Health Mgt Information System (HMIS)
- Collects similar as IDS (blue).

National disease control programs are responsible for:
- Separate surveillance systems
- Collects similar to IDS and HMIS (green).

Externally funded programs
- Collect and send reports to partners and donors (purple).
# LIST OF PRIORITY DISEASES (Malawi; For illustration only)

<table>
<thead>
<tr>
<th>IDSR PRIORITY DISEASE</th>
<th>RESPONSIBLE</th>
<th>EXTERNAL RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Polio &amp; Acute flaccid paralysis.</td>
<td>Director, PHIM</td>
<td>No major donors except WHO</td>
</tr>
<tr>
<td>• Cholera &amp; Dysentery.</td>
<td>(IDSR Focal Point; Epidemiology Division)</td>
<td>(New: World Bank supports on COVID 19 only)</td>
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<tr>
<td>• Measles.</td>
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<tr>
<td>• Bacterial meningitis.</td>
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<tr>
<td>• Neonatal tetanus.</td>
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<tr>
<td>• Viral hemorrhagic fever.</td>
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<tr>
<td>• Plague.</td>
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<tr>
<td>• Pneumonia in under 5 children.</td>
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<tr>
<td>• Any emerging or re-emerging diseases (outbreak, epidemic or pandemic)</td>
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<tr>
<td>• New: COVID 19 and Influenza Like Illness.</td>
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<tr>
<td>HIV &amp; AIDS/ STI</td>
<td>Director, HIV &amp; AIDS</td>
<td>Global Fund. PEPFAR.</td>
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<tr>
<td>Malaria</td>
<td>Malaria Control Program Manager</td>
<td>Global Fund. Others.</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>Schistosomiasis Control Program Manager</td>
<td>NTD (WHO)</td>
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</table>
PHIM has low funding support for IDSR and to facilitate integration human vs animal vs environmental health. Data is often poor quality.

**VS**

National disease programmes (SchistosomiasisHIV; TB; Malaria;) which have dedicated funding from donors. Data is often good quality.

The differences are due to these factors etc.
1. Dedicated staff (data clerks) stationed at health facility.
2. Updated data collection tools
3. Regular supervision with updated tools
4. Dedicated reporting structure (Disease control programs prefer to collect and use their own data).

Higher funding should be fed into IDSR and support national systems = Good quality surveillance data.

**Example**

Recent improvement in feedback to sites in form of regular epidemiology bulletin has resulted in immediate improvement in quality of reports: Timeliness and quality of data. (WHO supported)
Key factors related to IDS: Leadership for IDSR data collection, analysis and reporting

1. Primary level (Health center, Community etc.). Expect a very basic health facility IDSR report: Immediate, weekly.


PHIM is part of MOH HQ: It is the central IDSR Lead.

Challenges:
- No proper case definitions
- No guidance: what to report
- No red flag system
- No revised forms
- No resources to guide national implementation
- Insufficient analytical capacity

Some outbreaks are missed; or discovered only during data cleaning exercises.
CHALLENGES

1. Lack of collaboration between vertical systems:
   - IDSR
   - HMIS
   - Disease specific programs

2. IDSR 3rd Edition is large and complex (500 pages?); needs proper adaptation.

3. Use of paper based vs electronic reporting.

4. Data collection tools not adapted to level of service or numbers / skills of providers.

5. Shortage of collection tools leads to improvisation (or no reporting at all).

Opportunities

1. Core infrastructure is in place in Malawi.

2. Main surveillance systems are with two ministries; Animal health vs Human Health.

3. A veterinarian school; Public health schools; Environmental science curriculums.

4. Large network of committed local and international partners, including NGOs & Civil Society.

5. Foreign support through BMJF, WHO, USAID, Africa CDC, East, Central and Southern Africa Health Project (ECSA), NIPH etc.

6. All major stakeholders are open to cooperate better, share data and improve surveillance.
OFFER FROM MALAWI

We have the infrastructure, the experienced personnel at PHIM and, with support from NIPH, BMJF and other partners, we have the drive to do beyond the Deep Dive herein reported.

We need the technical and financial support to do more.
Thank you!

ACKNOWLEDGEMENT

• Malawi Government
• Norwegian Institute of Public Health
• Bill and Melinda Gates Foundation
• IANPHI
• Many others
Integrated Disease Surveillance (IDS) DEEP DIVE in Uganda

Dr. Alex Riolexus Ario, Director, Uganda National Institute of Public Health
• Established structures in place for IDS at national and district levels
• Limited integration of surveillance systems across and within sectors
• Minimal integration of special programs (HIV, Malaria, TB) and outbreaks
• The country has laboratory capacity to confirm priority diseases in human health but limited in other one health sectors (animal health, water and environment)
• Relatively well developed human resource capacities for IDS at the national level but inadequate at the regional and district levels across sectors

• Robust surveillance systems within MoH sector, largely paper based at Ministry of Water and Environment and a combination of systems at the Ministry of Agriculture, Animal Industry and Fisheries

• Limited national government financing for surveillance activities across sectors – over 80% of surveillance & response funding is from external development assistance
• Strengthen IDS data integration across and within One Health sectors
• Accelerate digitization, interconnectivity, and interoperability of surveillance systems
• Focus resources at building resilient sub-national capacities for IDS
• Build laboratory capacity for other One Health sectors
• Advocate for increased national government funding for IDS
Integrated Disease Surveillance (IDS)
DEEP DIVE in Pakistan

Country NPHI: National Institutes of Health Pakistan
Partner NPHI: UKHSA
Fragmented Disease Surveillance Systems in Pakistan
Country Context

National Institutes of Health
- National Focal point of IHR
- Leading Implementation of Integrated Disease Surveillance & Response (IDSR)

National Health Vision (2016-25)
- Federal Government to support Provinces in Universal Health Coverage

IDSR - 2017
- Following JEE 2016
- Technical support of UKHSA

18th Amendment
- Devolution of Health as a Provincial Government Domain
- Plethora of Fragmented Disease Surveillance Systems

NIH Re-Organization Act - 2021
- Corporate institutes for carrying out research, prevention of the spread of infectious diseases & health emergencies in Pakistan

PAKISTAN
<table>
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<tr>
<th>CDC</th>
<th>National Health Laboratory</th>
<th>National Health Data Center</th>
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| • Advisory on epidemics, disease outbreaks, prevention, control, surveillance and response to an outbreak  
  • Declaration of Health Emergency  
  • Surveillance and monitoring of emerging infections  
  • Promotive, preventive and therapeutic aspects for infectious diseases of public health importance in Pakistan | • Establish and operate state of the art Core laboratories  
  • Serve as a reference laboratory for uncommonly available tests including new research tests and collaborate with research investigators to provide tests and analyses | • Establish a central repository for all aspects of health information and data  
• Access from relevant authorities’ information and data and house, collate and analyze all health information and epidemiologic data nationally  
• Provide appropriate data analytics  
• Maintain and update MNCH, Communicable Diseases, and NCDs, demographics, health accounts, health services, and health systems data |
**KPK Health (Surveillance And Response) Act, 2017**

- Implementation and enforcement of the measures to prevent and control of diseases in the Province
- Ensure the reporting, notification, and verification of the events within stipulated time
- Ensure availability of all necessary resources to assist in surveillance, prevention and control of spread of notifiable diseases
- Established an effective Disease Surveillance System, Provincial Disease Surveillance Centers and District Disease Surveillance Centers
- Take appropriate measures to deal with such a health emergency in the province in case of declaration of national health emergency


- Power to Require Local Authorities to take
  Health Measures
- Power to Appoint Additional Health Staff
- Power to Supersede Local Authorities, Make and Modify rules, byelaws
- Power to give Directions & take over Administration of Services

**Sindh Healthcare Commission Act, 2013**

- Improve the quality of Healthcare Services
- Registration and Licensing of Healthcare Service Providers
- Implement the standards developed and approved by Government
- The Commission may make regulations for:
  - The records of patients treated in a healthcare establishment are provided
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NOVEMBER 30 - DECEMBER 2, 2022 | HYBRID

Challenges

1. Governance
   - Political Instability
   - 18th Amendment vs. National Health Vision 2016-25
   - Lesser accountability at Provincial Level

2. Integration
   - Fragmented Disease Surveillance Systems are being supported by Vertical Programs
   - 18th Amendment allowing provinces to take their own initiatives

3. Human Resource
   - Sanctioned posts remain unfilled
   - HR is being bound to enter similar nature of data into multiple systems – Leading to duplication of efforts
   - Technical Capacity

4. Coordination
   - Low coordination among essential stakeholders
   - Minimal coordination with Healthcare Commissions – No or minimal Data Reporting from Private Facilities (few facilities report data in case of National Health Emergency)

5. Public Health Labs
   - PHLD network is established yet it is quite small to cater future threats
   - Private Facilities are not part of network – Patients’ footfall in Private sector is greater than public

6. IT
   - Duplication of efforts
   - IT Infrastructure
   - Networking Facility
   - Too much reliance on Vendors

7. Finance
   - Sustainable funding
   - Financial Activities are leading to duplication – Various Disease Surveillance Systems have been funded in past with similar objectives in different territories
   - Essential Data Reporting Systems like IDSR are not approved as regular schemes
   - The funds haven’t been released for approved PC-1 in multiple provinces
1. Governance
   - Existence of Strategies and Policies at National as well as Provincial Level
   - Policies may be adapted as provisioned
   - Existence of NCOC – Learning from Covid Model

2. Integration
   - National Health Data Center (NHDC) has been established with the Mandate of; Collection, Consolidation, Analysis, and Dissemination of Healthcare Data & Information
   - National Health Decision Support Framework is being devised by NHDC for Integration

3. Human Resource
   - Existence of strong structure
   - HR posts are sanctioned
   - Donor Funded Technical Support

4. Coordination
   - National Health Decision Support Framework Technical Working Group has been functionalized
   - The IT team from NHDC is same which managed Data Flow operations & Analytics of NCOC for COVID
   - Established channels of communication (NCOC, PDSRUs, DDSRUs)

5. Public Health Labs
   - Introduction of Quality Assurance
   - Lab Information Management System is operational in Public Health Reference Labs
   - Significant Capacity Improvement with COVID

6. IT
   - NHDC mandate
   - Dedicated staff at NHDC (TECH)
   - Own Servers and Hosting Mechanism at NHDC
   - Digital Strategy & Innovation

7. Finance
   - Donors Support
   - Provincial PC-1s
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NOVEMBER 30 - DECEMBER 2, 2022 | HYBRID

Key findings

1. Fragmentation of Systems
2. Lack of IT infrastructure at Provincial Level (Hardware & Networking)
3. Delayed Technical Support from Vendors / Partners in Past
4. Sanctioned Posts are required to be filled at Health Facilities & District Level
5. Legislative Framework is available but needs to be strengthened at both levels (National, Provincial)
6. Public Health Labs Network needs strengthening
7. Reporting from Private Facilities can’t be ignored
8. Standard IT systems should be used to avoid duplication of efforts
9. National Health Data Center has taken the lead on IT component of IDSRR
10. Emergency Preparedness strengthening is required

COVID management model at National Level while Dengue Management Model at Provincial Level have been appreciated and may be used to strengthen IDSRR
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<td><strong>06</strong></td>
<td><strong>02</strong></td>
<td><strong>07</strong></td>
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<tr>
<td>Integration of DHIS-2 with Lab Information Management System</td>
<td>Adoption of Machine Learning Algorithms and Artificial Intelligence</td>
<td>Integration of Common Management Unit’s data with DHIS-2 system</td>
<td>GIS Tagging</td>
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<td><strong>08</strong></td>
<td><strong>04</strong></td>
<td><strong>09</strong></td>
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<td>Development of National Health Decision Support System (Important KPIs from Various Data Streams) under NHDSF</td>
<td>Certifications for staff involved in data; Reporting, Quality Assurance, and Analysis</td>
<td>Access to Central Dashboard of NHDSS at different levels</td>
<td>Involvement of District Administration in Strengthening IDS</td>
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<td><strong>10</strong></td>
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<td>Usage of Business Intelligence, Artificial Intelligence Techniques for further Data Analysis</td>
<td>Shift of Point of Entries to Health Facility Level</td>
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Areas Of Priority & Recommendations For Action

1. Governance
   - Strengthening of Strategies and Policies at National as well as Provincial Level
   - Adoption of NCOC Model (COVID)
   - Adoption of Dengue Model (Involvement of District Administration)
   - Strengthening of PDSRU, DDSRUs

2. Integration
   - Strengthening of National Health Decision Support Framework by NHDC
   - Development of National Health Decision Support System

3. Human Resource
   - Sanctioned posts at Facility & District level should be filled
   - NHDC Staff should be shifted to sustainable model
   - Capacity building of staff involved in Data: Reporting, Quality Assurance and Analysis

4. Coordination
   - National Health Decision Support Framework Technical Working Group should be strengthened to play role in Devising / Modifying National Health Action Plan

5. Public Health Labs
   - Private Labs should be made part of reporting network through Healthcare Commissions
   - LIMS should be integrated with DHIS and made part of NHDDS

6. IT
   - NHDC strengthening (Hardware & Staff)
   - Data Quality Assurance exercises
   - Usage of BI, AI & ML
   - Single Dashboard (National Health Decision Support System)
   - Health Information Exchange at NHDC
   - Health Data Lake at NHDC

7. Finance
   - Donors Support needs to be aligned to avoid duplication (NHDSF-TWG)
   - IDSIR should be made part of regular budget at Government level (National & Provincial)
NIH Recognition: NCOC For Covid-19 Response

CERTIFICATE OF RECOGNITION

The IANPHI General Assembly recognizes
National Institute of Health - Pakistan
for its outstanding success establishing and operationalizing a National Command and Operations Center (NCOC) for COVID-19 Emergency Response.

Nov 30, 2022

Prof. Duncan Selbie
President of IANPHI
Integrated Disease Surveillance (IDS) DEEP DIVE in SWEDEN

Country NPHI: Public Health Agency, Sweden
Partner NPHI: FHI, Norway
Folkhälsomyndigheten bidrar till globala målen för hållbar utveckling.

**Levels of responsibilities**

- The municipalities run social services and care of the elderly
- Responsible for environmental investigations

- The regions run independent health care systems
- County Medical Offices: Responsible for contact tracing and outbreak investigations

- The Public Health Agency: National coordination of communicable disease control
- Epidemiological and molecular surveillance
- International focal point
- Statistic Sweden etc
• A network among responsible agencies with
  • well trained and committed staff and
  • a high level of trust and willingness to work
    together
• Unique identifiers that make integration of data from
  different sources possible
• Trust and personal knowledge of key persons gives
  agility to the system
• Automated collection of data from registers can
  compensate for the problems with low participation
  in questionnaires
PIN

- With the PIN, data from different sources can be linked to the very same person.
- PIN enables disaggregation of data into groups – gender, age, country/municipality, income, educational level, country of birth – for further analysis.
Data Sources

- **National health registers** administered by governmental agencies: causes of death, in-patient and specialised out-patient care, vaccinations, amongst others (mandatory reporting)

- Statistics Sweden administers **population-based registers** on education, housing, etc. (mandatory reporting)

- **National health care quality registries** administered by health care regions, covering 110 disease-specific areas (reporting not mandatory)
• A high level of dependence on the legal structure
  • Gives strong mandate to collect data
  • Makes quick adaption difficult
• Extensive use of modelling puts new demands on data collection
• A number of new data sources has been identified during the pandemic
• The pandemic has created new partnerships but also exposed weaknesses in the system
• Include a system for common evaluation and development among the network of actors
• Evaluation of the legal structure to make it more agile
• Evaluate the usefulness of the new data sources found
• Identifiers can compensate for the data residing in different structures
• Data from the health system needs to be made more easily available at national level
  • Clinic
  • Laboratory
Deep-dives overview
• COMMON UNDERSTANDING OF INTEGRATION:
  • Varied understanding of IDS & also different aspects of integration
  • Agreed definitions, better standardisation, SOPs, etc may be helpful
  • Framework (“building blocks”) developed for understanding IDS system in different countries is useful
  • But, there is no single model of IDS that can be universally applied.

• GOVERNANCE
  • Governance issues frequently reported.
  • Need supportive governance, leadership, commitment (“all of government approach), and accountability
  • Key role of NPHI

• OUTCOMES
  • The link with response / outcomes not prioritised enough.
  • Focus should therefore be on purpose-driven integration.
  • Targeted investment and integration in different elements of the surveillance system may be more likely to achieve greater impact.
• Affirms the building blocks required
• Complexity of implementing IDS must not be underestimated, especially infrastructure needed
• Context, needs, challenges, and systems differ. Hence, need for context specific design. Not starting from scratch but improving what is there.
• Consider developing ‘Maturity Models’ of IDS
• Are multiple collaborative structures that communicate well better and more feasible choice than the use of a single infrastructure?
Strong professional relationships, networks & trust enhance effectiveness of systems.

- **SKILLS/WORKFORCE:**
  - *Significant workforce resourcing with technical skills required* at all levels

- **POLICYMAKERS:**
  - Need *advocacy & policy support*; Ownership; Accountability; Leadership

- **STAKEHOLDERS:**
  - Greater *public participation*; Consider *diversity of users and differing needs*

- **COMMUNITIES OF PRACTICE:**
  - Value of relationships, networks, *Communities of Practice*
  - Interprofessional practice linkages
  - Cross-disciplinary & cross-sectoral approaches
  - Invest in good *partnerships* & building *trust*
• RESEARCH:
  • More research & evaluation is valuable – to know what works, what is the utility of IDS, cost-benefit of measures, Context-Mechanism-Outcomes, etc…
  • Need to foster multi-sectoral collaborative research and innovation

• EVALUATION & LEARNING:
  • International peer-peer learning – learning & developing together
  • Create common evaluation & development system
  • Knowledge exchange with other countries for best practices
  • Interprofessional & intersectoral learning

• QUALITY IMPROVEMENT
  • Data quality
  • Resilience & preparedness
• Recommendation 1: Clarify the definition, scope and purpose of IDS
• Recommendation 2: Adopt a strategic planning approach to the implementation of IDS
• Recommendation 3: Implementation plans should factor in key enablers

Other opportunities
- Bridge gaps in evidence for the areas of **governance** in IDS and **evaluation** of IDS systems.
- Embed a **health economics** approach to decision making should be considered to build into processes regarding support for building and sustaining IDS.
- Generate evidence for the effects of IDS on costs and lives saved, gains in efficiencies in decision making and **sharing of best practice**
- Develop **evidence** and clarity to understand the multi-sectoral workforce needed to optimize the design, development, and implementation of IDS

*Next challenge then is “how” to realize this vision ➔ CALL FOR ACTION*
ANNUAL MEETING
NOVEMBER 30 - DECEMBER 2, 2022 | HYBRID
Questions to consider:

Based on your own experience are there any reflections or views on barriers or challenges to strengthening surveillance that you have not heard mentioned.

Are there other recommendations you think should be made – and who to?

From the project what tools would you find useful that IANPHI can provide.