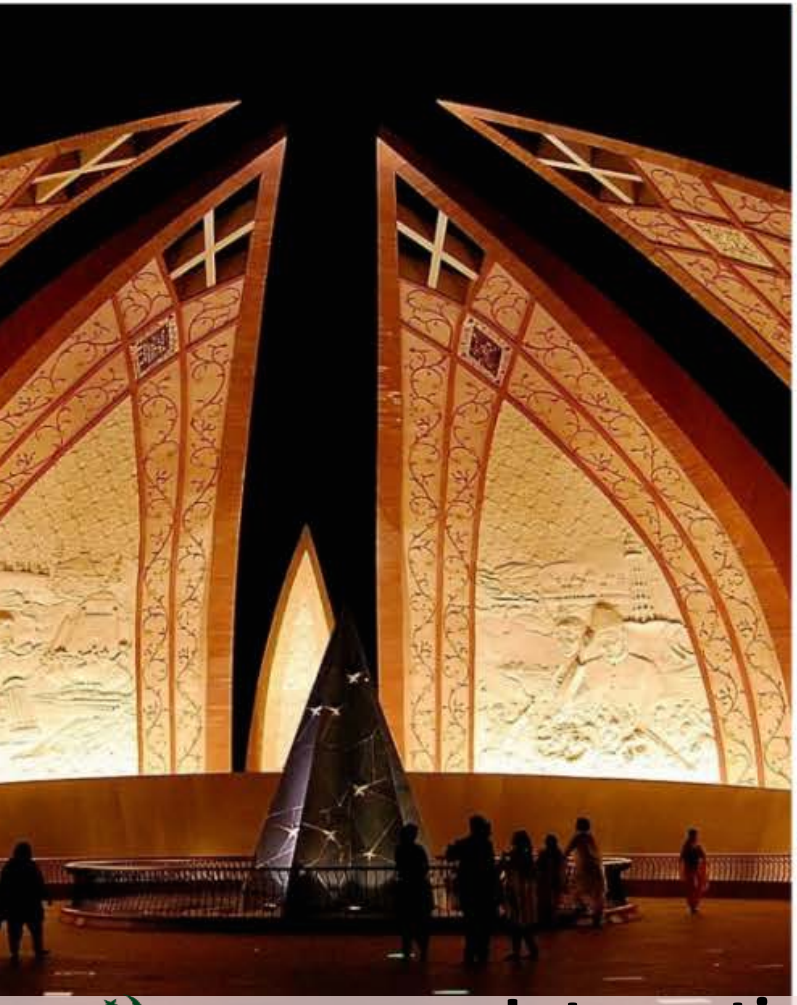




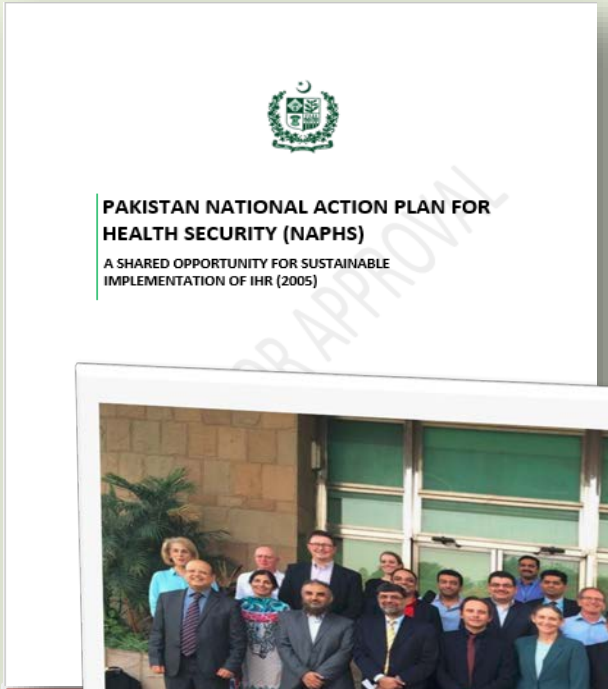


International Health Regulation-GHSA

National Action Planning Experience & Implementation Status

Ministry of National Health Services, Regulations & Coordination

5 Year IHR National Action Plan Pakistan (2017-21)



Objective Planning for Health Security

Questions to be Addressed

1. What are the **priority areas** of implementation and **basis** of prioritization?
2. Government allocating **domestic resources** to implement the priorities ?
3. **Areas** needing **external** support?
4. If already begun implementation, what **specific areas have you focused on** and what's the **status of implementation** activities?

5 Year IHR National Action Plan for Pakistan (2017-21)

PAKISTAN NATIONAL ACTION PLAN FOR HEALTH SECURITY (NAPHS)

A SHARED OPPORTUNITY FOR SUSTAINABLE IMPLEMENTATION OF IHR (2005)

DRAFT FOR APPROVAL

Ministry of National Health Services Regulations & Coordination

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Development of a Costed National Action Plan for Health Security in Pakistan: Lessons Learned

Malik Safi, Kashef Ijaz, Dalia Samhouri, Mamun Malik, Farah Sabih, Nirmal Kandel, Mohammad Salman, Lady Suryantoro, Ahmad Liban, Hamid Jafari, Assad Hafeez and Provincial Partners

In order to assess progress toward achieving compliance with the International Health Regulations (2005), member states may voluntarily request a Joint External Evaluation (JEE). Pakistan was the first country in the WHO Eastern Mediterranean Region to volunteer for and complete a JEE to establish the baseline of the country's public health capacity across multiple sectors covering 19 technical areas. It subsequently developed a post-JEE costed National Action Plan for Health Security (NAPHS). The process for developing the costed NAPHS was based on objectives and activities related to the 3 to 5 priority actions for each of the 19 JEE technical areas. Four key lessons were learned during the process of developing the NAPHS. First, multisectoral coordination at both federal and provincial levels is important in a devolved health system, where provinces are autonomous from a public health sector standpoint. Second, the development of a costed NAPHS requires engagement and investment of the country's own resources for sustainability as well as donor coordination among national and international donors and partners. Engagement from the ministries of Finance, Planning and Development, and Foreign Affairs and from WHO was also important. Third, development of predefined goals, targets, and indicators aligned with the JEE as part of the NAPHS process proved to be critical, as they can be used to monitor progress toward implementation of the NAPHS and provide data for repeat JEEs. Lastly, several challenges were identified related to the NAPHS process and costing tool, which need to be addressed by WHO and partners to help countries develop their plans.

Keywords: Joint External Evaluation, International Health Regulations, Pakistan, Public health preparedness and response

In February 2016, the World Health Organization (WHO) launched a Joint External Evaluation (JEE) tool with inputs from WHO regions, incorporating various regional and partner initiatives like the Global Health Security Agenda (GHSA). Using the JEE tool, countries conduct a self-assessment that is followed by an external evaluation by a WHO-led multidisciplinary team of experts. After the completion of external evaluation, the JEE report is shared with the country for review and published online, and the country is encouraged to lead the development

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Development of NAP for Health Security

- 2nd country in EMRO to develop 5 years IHR NAP
- TWG outlined NAP priority areas- comprehensive consultative process from Sept till Nov 2016 (6 fed & prov. workshops)
- IHR NAP endorsed on 1 Dec 2016
- Costing exercise completed by May/June 2017
- Presentation to IHR Task Force & Donors Coordination Forum to align support
- PC1s developed to secure domestic funding
- Implementation of NAPHS in process…..

1-What are the **priority areas** of implementation and **basis** of prioritization?

Key Recommendations of JEE

1. Critical need for continued and **expanded multi-sectoral communication and coordination**.
2. Critical need for a **sufficiently funded, widely supported country 5-year plan** to strengthen IHR capabilities.
3. Need to establish a strong, visible, **active surveillance & tiered public health laboratory** system
4. Need to develop and enhance **regulations, standards, and coordination** mechanisms for **food safety**
5. Need for a national **cross-sectoral** approach for **Anti Microbial Resistance**

2-Government allocating **domestic resources** to implement the priorities?

	Institutions	Areas	Cost of PC 1
1	**National Institute of Health - NPHI**	PHL Network IDSR Workforce development	**PKR 6,718.10 m** **($ 50.89 m)**
2	**Port of Entries**	Core Capacities Public Health Emergency Response Equipment and Infrastructure Human Resources (New Positions) Operational and Logistics Support	**PKR 1,644.67 m** **($ 11.9 m)**
3	**AMR**	7 Strategic priorities	PC 1 under development (based on AMR NAP)
4	AMR Surveillance (**Veterinary sector**)		PKR 62.00 m

3- Areas needing External support ?

	Partners	Areas of Existing Support
1	**World Health Organization**	AMR & IPC; PH Labs; Zoonosis; Emergency preparedness & response (RRT on all hazard approach); Surveillance system; immunization; PoE (IHR compliant rules & regulations); Capacity building for IHR
2	**CDC**	PHL network, EPI, WFD through FETP Program; EOC
3	**PHE**	Real Time Disease Surveillance and response with capacity building
4	**European Union**	Bio-safety & Bio-security
5	**Fleming Fund**	AMR surveillance
6	**GAVI Alliance**	Routine Immunization
7	**China**	Strengthen core capacities at selected PoEs
8	***Additional External Support Requirements***	**Implementation of IDSR Pilot** (Phase 1) IHR compliant **PoE** rules and regulation **Functionality of EOC (**develop/establish operational **mechanism and coordination linkages** (all hazards approach)

4. Implementation Status

IHR Technical Area	Progress Update
National legislation policy and financing	KPK enacted public health surveillance Act 2017 National public health Act under drafting process Technical review of existing PoE legislation (for compliance with IHR) Food Safety legislation assessment conducted
Coordination and NFP Communications	Designation of focal points (IHR/GHSA NFP; Provincial IHR FP; IHR FP in Ministries of NFS & Climate Change) National multi-sectoral IHR taskforce notified
Surveillance and Response	Disease prioritization for surveillance IDSRS framework developed (phase-1 to be launched in 2019) Ongoing capacity building on IDSR (reporting, information, DHIS-2, RRT and Labs)

4. Implementation Status

IHR Technical Area	Progress Update
Preparedness	All hazards mapping completed at national level Draft of costed pandemic preparedness plan National Public Health EOC established (capacity building of NIH staff)
Health Workforce Development	National HRH strategy developed & endorsed Ongoing capacity building on disease surveillance and response (FELTP, RRT. IMS) FELTP transition to NIH (sustainability) Vet lab staffs trained in AMR diagnostics
Laboratory Biosafety & Biosecurity	National lab and biosfatey policy & strategic plan developed & endorsed PHL network establishment at provincial level National Lab standards defined Lab networking through LIMS including linkages with vet sector Continuous capacity building (BRM, LQMS,LIMS) Lab simulation exercise planned (30-31 Jan 2019)

4. Implementation Status

IHR Technical Area	Progress Update
AMR	Focal AMR focal points in health & veterinary sectors National multi-sectoral AMR Steering Committee National AMR Strategic Framework & National Action Plan developed & endorsed (Translated into Provincial Action Plan) Ongoing sentinel surveillance (WHO GLASS protocol) Integrated AMR surveillance in OH approach (ESBL Tricyclic project) National Action Plan for XDR Typhoid being developed
Immunization	Secure domestic allocation and donor funding New vaccines (Rota, MR, TCV planned) introduced into RI
Zoonotic Diseases	Enhanced collaboration & inclusion of animal/ livestock, environment sector on different forum (AMR; labs; biosafety & biosecurity; surveillance) Zoonotic disease prioritization completed One Hub established at NIH One Health strategic framework developed

4. Implementation Status

IHR Technical Area	Progress Update
Others	PoE assessment and existing legislation review Training and capacity building of PoE staff
The key success ; Costed IHR NAPHS has been now made an integral part of Government s 12th 5 Year Plan (2019-23) - MoPD&R, which approves allocation for all new projects within the Government Sector.	

Linking NAPHS to GPW 13

To save Pakistan from health emergencies and disease outbreaks we need to aaddress health emergencies

***Goal 2**: **40 million** more people protected from health emergencies*

- Real time disease surveillance & response
- Public health lab network
- Skilled health workforce
- Functional health establishments at 19 Points of Entry (POEs) with quarantine facilities
- Anti microbial resistance
- National all hazard multi-sectoral emergency preparedness & response plan
- Linkages with other line ministries and WHO

Summary of total Cost of 5 Year Health Security Plan

S No.	Province / Federating Unit	Year I	Year II	Year III	Year IV	Year V	Total In PKR (In Million)	Total In Dollar (In Million)
1	**Federal**	**2860.904**	**785.950**	**583.318**	**554.712**	**447.649**	**5231.383**	**112.5278**
2	**KPK**	10613.290	1511.139	1536.871	1100.395	1382.770	16144.467	**166.9628**
3	**Punjab**	8989.028	1491.867	1649.408	1291.608	1411.198	14833.110	**133.0549**
4	**Sindh**	7786.723	1376.091	1547.312	1110.233	1406.833	13227.193	**50.3017**
5	**Baluchistan**	11903.652	1520.946	1474.133	1168.232	1297.172	17364.136	**132.4162**
6	**Fata**	9645.741	1098.957	1171.160	916.930	1004.925	13837.714	**155.2353**
7	**AJK**	9499.416	599.875	676.862	421.574	505.164	11702.890	**142.6261**
8	**GB**	9583.169	1085.310	1175.777	918.547	1008.482	13771.284	**127.1845**
	Total Cost	70881.923	9470.136	9814.842	7482.232	8464.194	**106112.177**	**1020.30**

Federal Funding Required – Costed NAP

Area	Technical Support Required	USD in millions
National Public Health Institute	IHR Coordination	4.02
	Antimicrobial Resistance (AMR)*	10.66
	Biosafety& Biosecurity	61.83
	National Laboratory System	71.27
	Surveillance	71.96
	Reporting	17.02
Central Health Establishment (PoE)	Cross border Collaboration MIS Development Capacity Development Updating Legislation	43.19
MoNFS&R (One Health)	Zoonotic Diseases	102.34
	Food safety	46.65
	Immunization (mostly -Veterinary Sector)	290.24
Mo CC	Chemical Events (Environmental monitoring, lab strengthening, capacity building, waste/spills management, poison control centres)	8798.166 (Based-provincial shares only)

Gap Analysis of Costing

National/ Provinces/ Areas	Year 1 Est. Cost	Year 2 Est. Cost	Year 3 Est. Cost	Year 4 Est. Cost	Year 5 Est. Cost	Total Cost PKR (Million)	Total Cost USD (Million)
Govt. of Pakistan	18339.943	4891.600	5608.892	4769.460	4712.470	38322.365	**368.484**
Funding Gap	52541.980	4578.536	4205.950	2712.772	3751.724	67789.812	**651.825**
Total Cost	70881.923	9470.136	9814.842	7482.232	8464.194	106112.177	**1020.309**

Costing Methodology

- Working sheet of each activity requiring costing has been reflected separately
- **Costing** based on following **categories**:
  - **Technical Assistance**
  - **Equipment Cost**
  - **Workshops, Trainings, Meetings & Seminar costs**
  - **Hiring of Staff**
  - **Civil Work / infrastructure**
  - **M&E related travel cost**

Costing Methodology

Costing Tools were based on **customized** excel spread sheets;

- All **19 Technical** Areas are **summarized** in one summary sheet
- Each **Technical** Area is a **separate** excel sheet
- Each **activity** is also **costed separately** according to the needs of relevant departments
- **Working sheets** are linked with each **activity** based on costing requirement of the activities
- **Each activity** of all technical areas discussed and **costing requirement** filled in as per their needs

Challenges

- Getting attention of Policy makers for domestic resources
- Skilled human resource
- Inter-sectoral coordination
- Pace of implementation in other sectors!
- Sustained commitment
- Donor coordination, duplication and funding

THANK YOU

Components of PC 1 for NIH strengthening

Component	Estimated Cost in Millions of PKR	Estimated Cost in Millions of US$
I. Integrated Disease Surveillance & Response System	**2,640.00**	**20.00**
II. Public Health Laboratories Network	**3,073.32**	**23.28**
III. FELTP Transition to FEDSD	**1,004.78**	**7.61**
Grand Total:	**6,718.10**	**50.89**

PoE-PC-1 Components with Cost

S.No.	Component	Estimated Cost in PKR Millions	Estimated Cost in USD Millions
1.	Strengthening Core Capacities	41.33	0.3
2.	Public Health Emergency Response	51.15	0.4
3.	Equipment and Infrastructure	512.03	3.7
4.	Human Resources	953.98	6.9
5.	Operational Support	86.18	0.6
Total PC-1 Cost for Five Years		1,644.67	11.9

JEE Score (Pakistan)

Capacities	Indicators	Score[1]
National legislation, policy and financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR	2
	P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005)	3
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR.	3
Antimicrobial resistance	P.3.1 Antimicrobial resistance (AMR) detection	1
	P.3.2 Surveillance of infections caused by AMR pathogens	1
	P.3.3 Healthcare associated infection (HCAI) prevention and control programs	1
	P.3.4 Antimicrobial stewardship activities	1
Zoonotic diseases	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	3
	P.4.2 Veterinary or Animal Health Workforce	3
	P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional	2
Food safety	P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination.	2
Biosafety and biosecurity	P.6.1 Whole-of-Government biosafety and biosecurity system is in place for human, animal, and agriculture facilities	2
	P.6.2 Biosafety and biosecurity training and practices	2
Immunization	P.7.1 Vaccine coverage (measles) as part of national program	2
	P.7.2 National vaccine access and delivery	4
National laboratory system	D.1.1 Laboratory testing for detection of priority diseases	4
	D.1.2 Specimen referral and transport system	3
	D.1.3 Effective modern point of care and laboratory based diagnostics	2
	D.1.4 Laboratory Quality System	2
Real-time surveillance	D.2.1 Indicator and event based surveillance systems	3
	D.2.2 Inter-operable, interconnected, electronic real-time reporting system	2
	D.2.3 Analysis of surveillance data	2
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to WHO, FAO and OIE	2
	D.3.2 Reporting network and protocols in country	2
Workforce development	D.4.1 Human resources are available to implement IHR core capacity requirements	3
	D.4.2 Field epidemiology training programme or other applied epidemiology training programme in place	3
	D.4.3 Workforce strategy	2
Preparedness	R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented	1
	R.1.2 Priority public health risks and resources are mapped and utilized	1
Emergency response operations	R.2.1 Capacity to activate emergency operations	2
	R.2.2 Emergency Operations Centre operating procedures and plans	2
	R.2.3 Emergency operations programme	3
	R.2.4 Case management procedures are implemented for IHR relevant hazards	2
Linking public health and security Authorities	R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspect or confirmed biological event	3
Medical countermeasures and personnel deployment	R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency	4
	R.4.2 System is in place for sending and receiving health personnel during a public health emergency	4
Risk communication	R.5.1 Risk communication systems (plans, mechanisms etc.)	1
	R.5.2 Internal and partner communication and coordination	2
	R.5.3 Public communication	2
	R.5.4 Communication engagement with affected communities	2
	R.5.5 Dynamic listening and rumour management	3
Points of entry (PoE)	PoE.1 Routine capacities are established at PoE.	2
	PoE.2 Effective public health response at Points of Entry	2
Chemical events	CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies	2
	CE.2 Enabling environment is in place for management of chemical events	2
Radiation emergencies	RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies	5
	RE.2 Enabling environment is in place for management of radiation emergencies	5

Strategic Goals (2019-23) aligned to GPW 13

1: Advancing universal health coverage

Goal: 42 million more people benefitting from UHC

2: Addressing health emergencies

Goal: 40 million more people protected from health emergencies

3: Promoting healthier populations

Goal: 40 million more people enjoying better health and well-being

4: Corporate Goal: More effective & efficient public health sector in Pakistan

Requirements for Implementation of NAPHS

National:

- **Endorsement** of NAPHS by National IHR Taskforce
- **Secure funding** for **NIH :GHSA-NFP** and POEs strengthening through PC 1's
- Secure funding by Line Ministries : FS&R and Climate change
- Draft **Public Health Act (s)** submitted
- Securing Technical Assistance and Coordination with donors /partners for resource mobilization
- Consensus building, implementation and monitoring of NAPHS to meet core capacities

Provincial:

- Prioritization of technical areas for strengthening
- Resource mobilization through PC 1
- Utilization / Linkages between EOC(s)/DSRU for IHR implementation

Partners:

- Technical and Financial assistance

Role of MoFS&R & Climate Change

MoFS&R ;

- One health Hub – MOU susaintanability
- Domestic funding for Laboratories , Surveillance Reporting and AMR
- Coordination with Provincial Line Departments
- Laws / Acts

MoClimate ;

- **Focal Points** to be nominated for IHR &AMR
- **Domestic Funding** for Lab & Surveillance
- Coordination with Provincial EPA s for resource mobilization
- Laws /Acts

NIH - Key Areas of Strengthening

- Establishment of IDSR Coordination Unit with
  - Computers and servers,
  - Technical staff,
  - Trainings,
  - Reporting linkage with provincial DSRUs
- Strengthening of PHLD to BSL III level lab for PHLN
  - Upgradation of laboratory,
  - Technical support to 10 regional/provincial labs,
  - Staff capacity building,
  - Linkage with FEDSD for Disease Surveillance related lab testing support)
- FELTP transition
  - Infrastructure (Hostel),
  - HR workforce development (first 2 years in collaboration with HSA),
  - Equipment

Components of PC 1 for NIH strengthening

Component	Estimated Cost in Millions of PKR	Estimated Cost in Millions of US$
I. Integrated Disease Surveillance & Response System	**2,640.00**	**20.00**
II. Public Health Laboratories Network	**3,073.32**	**23.28**
III. FELTP Transition to FEDSD	**1,004.78**	**7.61**
Grand Total:	**6,718**	**50.89**

AMR Progress

- Tricycle Project for AMR Surveillance (ESBL *E. coli*) ongoing and expanding
- Fleming Fund supporting AMR surveillance, RFPs posted and awaiting award after technical evaluation
- AMR reflected in ongoing XDR Typhoid Response plan developed by NIH with WHO/CDC support
- However, additional support required to fully implement NAPHS activities

AMR – Requirement vs Pledged Technical Support

- CDC Atlanta – USD 1M/year, funding activities for identified gaps
- Fleming Fund – GBP 3.2M in phased disbursement linked to deliverables
- Public Health England – TAs for establishing IDSR-AMR links, amount allocated for TAs not known
- European Union CoE CBRN – TAs for relevant areas, amount allocated for TAs not known

	Provinces & Regions								
	Federal	AJK	GB	FATA	Punjab	Sindh	B'stan	KP	TOTAL
AMR	155.725	89.0358	80.7808	114.6358	265.5958	85.7908	99.2308	218.5458	**1109.3406**

PoE Progress

- WHO mission for reviewing legislation
- JSI support for developing PC-1 in light of JEE gaps and NAPHS activities
- Infrastructure, HR, planning and operational requirements addressed in PC-1
- PC-1 awaiting submission to planning

PoE - Key Areas for Strengthening

- Improved coordination among health & other partners
- Develop package of rules for all types of PoEs
- Additional HR for PoEs, address existing gaps in monitoring and supervision & capacity building of PoEs staff
- Develop and implement SoPs for one health response, provide operational support for implementation
- Review and update public health contingency plan
- Establish e-reporting system
- Equipment including thermal scanners
- Construction of quarantine hospitals and PoEs

IDSR Progress

- Consensus based IDSR mechanism defined and approved with support of PHE
- Provinces where an existing IDSR system was in place, mechanism supplements or modifies as per local need
- Engagement mechanism to include private laboratory networks and para-statals being evolved
- KPK IDSR system in advanced stage of development, Sindh work to be initiated shortly (latter will have a tentative budget of PKR 110 Million

Cost of 3 major components of IDSRS pilot in KPK

Capital cost of project

DESCRIPTION	Year 1	Year 2	Year 3	Total
Develop and strengthen the institutional mechanism for disease surveillance and response by establishing robust, networked coordination arrangements across provincial and district level.	132.79 Million	109.25 Million	113.99 Million	356.03 Million
Coordinated and timely collection, collation, reporting, analysis and interpretation of disease notification data for effective communicable disease control	76.17 Million	13.95 Million	13.35 Million	103.47 Million
Strengthening system for appropriate and timely response to outbreaks of epidemic prone diseases by ensuring all support functions of surveillance and response are undertaken	106.64 Million	41.06 Million	41.06 Million	188.76 Million
TOTAL	315.6 Million	164.26 Million	168.4 Million	648.26 Million

Challenges & Lessons Learned

- Donor Coordination is difficult, incomplete information about activities causes duplication
- JPRM should be developed in coordination with Health Ministry to better allocate scarce resources
- Alignment of country priorities and requirements should be reflected in partner / donor plans
- Coordination mechanism between implementing ministries and line departments has to be clearly elucidated and followed
- Advocacy with national planning authorities to be initiated early to include financial requirements in overall national plans

5 year IHR/GHSA Costed Action Plan (in USD)

		Provinces & Regions								
		Federal	AJK	GB	FATA	Punjab	Sindh	B'stan	KP	TOTAL
Technical Areas	National Legislation	71.98	41.7	41.7	44.02	37.135	77.84	50.34	40.325	**405.04**
	IHR Coordination	37.23	28.28	30.185	26.99	65.475	89.775	71.895	68.5	**418.33**
	AMR	155.725	89.0358	80.7808	114.6358	265.5958	85.7908	99.2308	218.5458	**1109.3406**
	Zoonotic Disease	276.03126	1345.58908	1108.13908	1417.53632	1789.24708	1299.58876	1821.14484	1584.59476	**10641.87118**
	Food Safety	353.3007	276.646	276.646	281.646	150.216	405.9224	1553.79686	1553.79686	**4851.97082**
	Biosafety & Biosecurity	96.88	557.945	352.115	555.295	1349.295	2087.699	1255.295	175.91	**6430.434**
	Immunization	215.305	2747.315	5247.315	5247.315	3437.315	2796.68	5247.315	5247.315	**30185.875**
	NLS	99.845	499.45284	517.47684	216.987	2052.32424	803.2218	1287.71	1935.275	**7412.29272**
	Surveillance	230.29964	947.47368	947.47368	972.99632	1257.54668	1000.95632	1208.6906	918.72904	**7484.16596**
	Reporting	33.86	199.41638	199.41638	200.57638	246.22138	316.57188	204.32138	370.62688	**1771.01066**
	Workforce Development	56.021	2210.74874	2210.74874	2210.74874	410.74874	1181.18012	2210.74874	1181.18012	**11672.12494**
	Preparedness	577.2652	1122.075	1122.075	1122.075	829.425	1455.455	829.425	1325.505	**8383.3002**
	Emergency Response	148.49	30	30	21	360	170.6552	105	65	**930.1452**
	Linking PH & Sec Agencies	50.7136	11.352	11.352	11.352	9.78	13.332	11.352	11.352	**130.5856**
	Med CM & Prsnnl Deplyt	118.3	14.75	14.75	14.75	78.74	64.465	15.97	15.97	**337.695**
	Risk Communication	57.16632	54.90616	54.90616	54.90616	80.80616	57.40616	80.80616	120.80616	**561.70944**
	PoE	2652.978	251.02	251.02	49.7	1044.7	36.513	103.395	103.395	**4492.721**
	Chem Events	0	1275.1841	1275.1841	1275.1841	1273.0641	1284.15	1207.7	1207.7	**8798.1664**
	Radiation Events	0	0	0	0	95.475	0	0	0	**95.475**
	TOTAL	**5231.39072**	**11702.88978**	**13771.28378**	**13837.71382**	**14833.11018**	**13227.20244**	**17364.13638**	**16144.5266**	**106112.2537**