



HealthAlert[®]
REACT · REPORT · RESPOND

HealthAlert

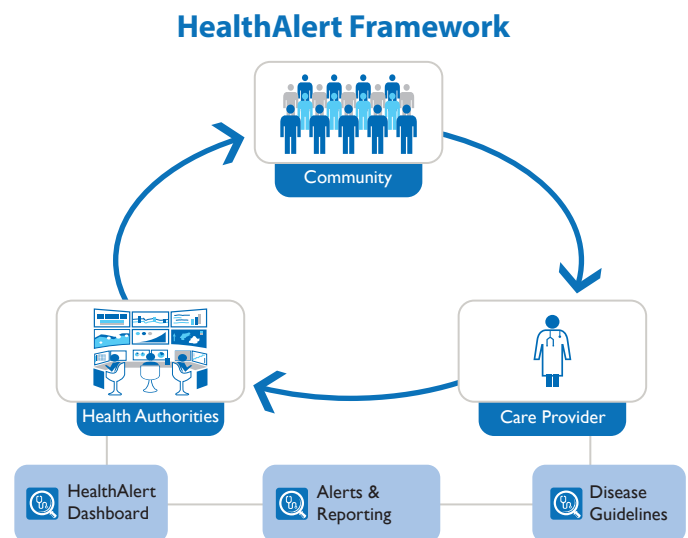
A digital platform for disease surveillance & response

Today's interconnected world is confronted with increasing threat of communicable diseases that have exponential potential to spread into outbreaks, epidemics and even pandemics. This call for building a system that can detect, report and respond to public health events within quickest possible time. Pakistan, like rest of the developing world, mainly relies on a fragmented disease surveillance and response system, facing difficulty in detection of emerging infectious disease threats. Use of appropriate surveillance tools is a basic requirement for timely detection of disease outbreaks and control of epidemics. With increasing 3G/4G users across the world, using a smartphone application for disease surveillance seemed very promising—leading to the development of HealthAlert in 2017 by a team of public health and IT professionals at Contech International.

HealthAlert Conceptualization & Development

HealthAlert is a smartphone application that provides a digital platform for disease surveillance and response. It is primarily designed for frontline healthcare providers for generating alerts to relay information on suspected patients and contacts to health authorities in real time. Community members can also register and use this App. Prior to large-scale deployment, dry run was conducted and the App was pilot tested in Larkana district (Population: 1,524,391) of Pakistan. During the COVID-19 emergency, the App was offered to federal and provincial governments under USAID's Integrated Health Systems Strengthening & Service Delivery (IHSS-SD) Activity to strengthen the surveillance capacity. The App framework has the following three components:

- Under the React component, when a patients from community comes to a health facility, the care provider can first use the HealthAlert to access national guidelines on case definition and clinical management of priority notifiable diseases.
- Under the Report component, healthcare providers can generate real-time alerts on priority notifiable diseases, including COVID-19, with essential patient information for the health authorities.
- Under the Respond component, the information shared by healthcare providers is consolidated at the web-based dashboard for health authorities to make informed decisions and initiating response.

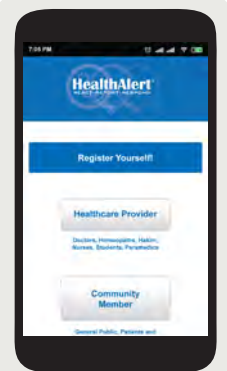
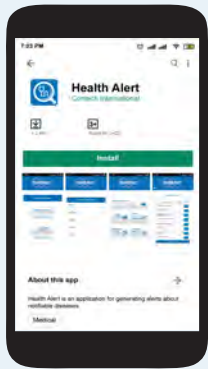


App Hosting	A registered mobile application available at both AppStore and Google Play, with physical server at National Institute of Health Pakistan and virtual hosting on Google server
Platform	Php and MySQL
Integration & Compatibility	Integration with existing information systems through sharing of APIs and providing data in multiple formats like JSON, CSV and XML
Data Access	'Secure' web panel through designated access codes for rights and permissions
Privacy and Confidentiality	<ul style="list-style-type: none"> • Restricted user-based access and data security layers at national and sub-national levels • Regulations regarding privacy, like voluntary code of conduct on privacy of mHealth app
Security	Web application uses SSL and the App is tested for penetration using Netsparker

HealthAlert: Application & Dashboard Interface

Install

- Downloadable from AppStore (iOS version 9.0 and later) and PlayStore (Android version 4.4 and later)
- Free of cost to maximize uptake among healthcare providers
- Ad-free interface to enhance the user experience

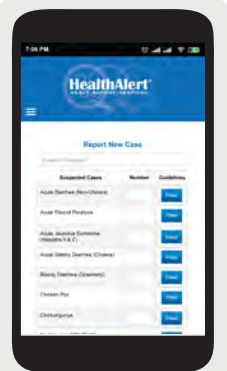
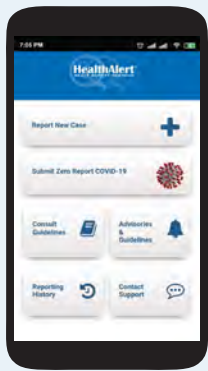


User Profile

- Distinct registration for healthcare providers (doctors, nurses and allied health professional) and community members
- Profile development of healthcare providers including professional credentials, facility information, and locality and contact details

Application Functions

- Alert generation on notifiable diseases and health hazards in real time
- Expandability through configuring the list of priority diseases catering to government's priorities and emerging public health threats like COVID-19
- Access to user's reporting history

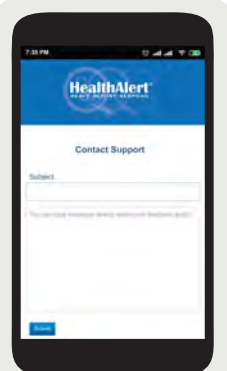


Alert Generation

- Secure data transmission of alerts (suspected cases and contacts of notifiable diseases) and zero reports from healthcare providers
- Capability to record the alert information (Name, age, gender, ID number, contact number, address, city and district) for tracking and response

Technical Guidelines

- Quick-access to standardized guidelines on enlisted diseases
 - ◊ Case definitions of suspected, probable, confirmed cases and contacts
 - ◊ Management and treatment protocols
- Dissemination of government's advisories and notifications to user network



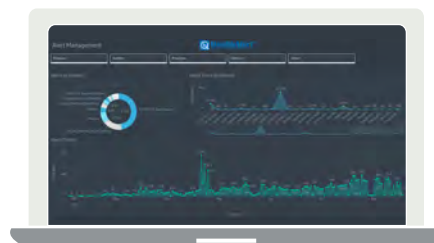
Two-way Communication

- App interface supports communication between user and HealthAlert
 - ◊ 'Contact Support' to provide feedback and to reach out the virtual backstopping team for trouble-shooting and professional support
 - ◊ Reminder notification for compliance of App users

HealthAlert Dashboard

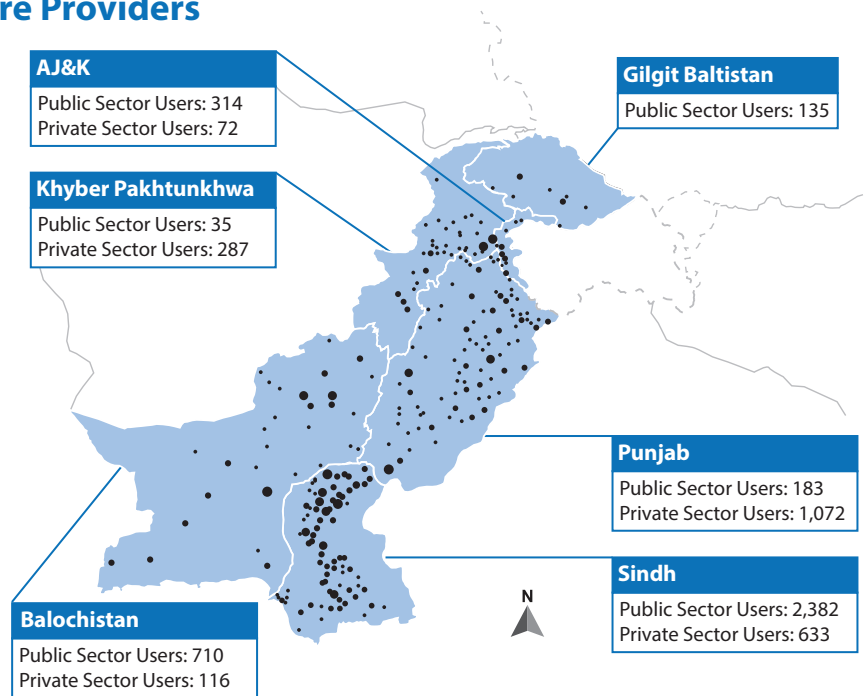
A web-based, SSL encrypted Dashboard gives login-specific access to the health authorities at district, province/territory and national levels.

- Access to alert's information
- Registered user information
- Tracking and recording of response
- Advanced analytics (QlikSense)
- Evidence-based decision making



Network of Registered Healthcare Providers

HealthAlert has a network of more than 5,900 registered healthcare providers from all provinces, regions and territories of Pakistan (See figure for geo-spatial mapping of HealthAlert users). Historically, there has been no system in Pakistan to gather disease information from the private sector, which is catering to ~70% of healthcare needs of the population. This leaves a huge gap in coverage of disease surveillance activities. Through 2,183 registered private sector healthcare providers, HealthAlert provides an all-inclusive platform for both public and private sectors providers.



Orientation of App Users (Healthcare Providers) and Health Managers

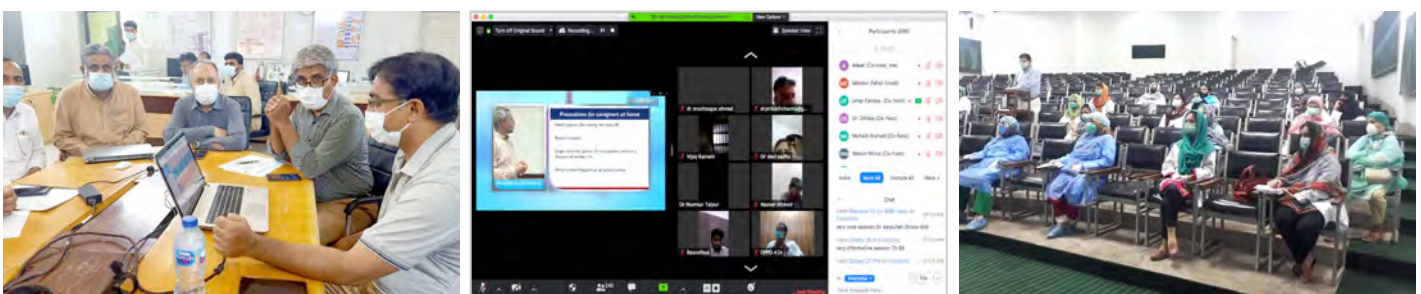
Launch of HealthAlert is supplemented with capacity building and orientation of healthcare providers on installation and usage of the App. During the COVID-19 response activities, the users have also been oriented on COVID-19 case definition, management protocols and infection prevention and control practices. Following approaches were identified and implemented to reach the targeted users amid administrative restrictions.

- Inter-personnel orientation sessions within health facilities
- Virtual orientation sessions through Zoom (~110 sessions conducted during COVID-19 response in Pakistan)
- Learning and engagement through social media platforms

Health Managers at provincial and district levels have been trained on using the HealthAlert Dashboard. A Dashboard User Manual is developed and a combination of virtual sessions and physical visits of newly established District Disease Surveillance & Response Units have been conducted for orientation and hands-on assistance to manage and coordinate the response. Through these activities, staff capacity has been built to mobilize Rapid Response Teams, mapping of disease clusters/hotspots, and predictive analytics to detect emerging health hazards.

Virtual Backstopping Support

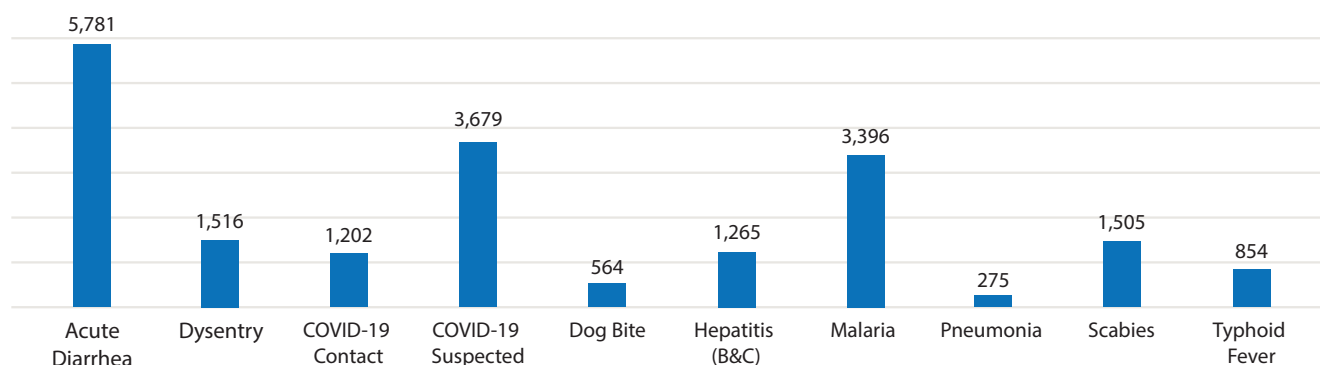
Involving and motivating healthcare providers and health managers for being part of such initiative is always challenging. Therefore, the steward organization constituted a dedicated virtual backstopping team (VBT) to ensure regular and continuous support in terms of trouble-shooting, compliance and follow up. Using multiple telecommunication channels, the VBT has provided regular and continuous support to the healthcare providers and further augmented the capacities of Disease Surveillance and Response Units.



Implementation Outcomes

Taking a systems' approach, HealthAlert has been implemented in close coordination with National Institute of Health and provincial governments of Pakistan as an adjunct to the prevailing surveillance system. Using this digital platform for surveillance and response of notifiable diseases, including COVID-19, registered healthcare providers are using the App for generating alerts, which are being consolidated on the Dashboard to facilitate and coordinate the response. This has led to strengthening of existing disease surveillance and response system through timely generation of alerts on suspected cases of priority notifiable diseases. Disease reporting from both public and private sectors has further allowed regular monitoring of disease patterns and trends for informed decision making.

Disease-wise Numbers of Generated Alert (Top 10 Diseases)



Total Alerts Generated: 33,396 (Including 32 notifiable diseases & COVID-19)

COVID-19 Alerts: 4,881 (Suspected Cases: 3,679; Contacts: 1,202)

RRT Mobilized & Testing Conducted on COVID-19 Alerts: 792

HealthAlert has supported the collection and transmission of alerts in real-time to designated public health authorities for initiating response, which otherwise could have taken up to 30 days to get reported through traditional information systems. This timely reporting has facilitated response actions from concerned entities like laboratory sampling of suspected cases and contacts of COVID-19 and suspected AFP cases, intimation to local government on increased cases of dog bites, location sharing of vaccine preventable diseases (for cases of Pertussis, Diphtheria and Mumps) with EPI vaccinators for improved micro planning, and relaying with vertical programs of HIV/AIDS and TB.

Way Forward

Success of HealthAlert relies on building synergies with existing health systems and broad user base for comprehensive coverage. HealthAlert has proven its potential to detect and address emerging public health threats. It has the capability for extendibility and replication to other geographic areas/countries on their specific disease surveillance and response needs.



JSI Research & Training Institute, Inc.



Contech International is a healthcare consulting, research and management organization established in the private sector in 2001 with the mission to improve lives and make a difference.

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