Community RApid Response for Infectious Disease Outbreaks

Business Objective

Compact, modular, reconfigurable, and optional mobile rapid response hub (node) and the resulting network of many such nodes across the USA and worldwide, for gathering and analyzing biological samples with a focus upon cases of likely infectious diseases of critical interest to public health, food supplies and wildlife. Onboard technologies include mutation early warning and alerts, collecting and dispersing public (social, educational) information, coordinating dispersal and re-routing of medicines, vaccines, and emergency personnel. Community-oriented (town, local/regional health dept,, university, large-employee-base plant, airport, transit hub, food processing center, other). Open-ended assay/testing capacity enables handling other new pathogens.

Stakeholders

◆ Local, regional, federal and international public health management and epidemiological response organizations, the smallest level being small towns. ◆ University campuses and large-employment-base private or public facilities (e.g., automotive plant, SSA hqdtrs, bank processing hqdtrs., petrochem refinery, high-risk and high-impact district such as @ Silicon Valley, New York City).
◆ DHHS (CDC, FDA, USDA, NIH), DHS (NBIC, also others including ICE), EPA, DOC (business and economy continuity), DOD (base and naval fleet integrity and deployment readiness), and international counterparts (e.g., WHO, HPA). ◆ All healthcare provider agencies and groups including private-practice physicians. ◆ All levels of public safety and security for management of crowds, neighborhoods, and instances of social unrest and conflict driven by health-centric public problems including food and medicine/vaccine shortages.

Solution

CRAIDO (Community Rapid response for Infectious Disease Outbreaks) is a comprehensive and full-function integration of early warning, sensing, facility bioprotection, diagnostics including mutation observation and tracking, and SANER (situation awareness, notification and emergency response). It fully integrates into one operating environment analytics and informatics, with two-way information collection and data flow, accommodating communication with other public and private information networks, both open-source, proprietary and secure. The "outbound" (but interactive) web portal architecture is platform independent and architecturally open. One portal (AwareIntel) is primarily technical and oriented to medical and healthcare professionals and providers including ad hoc emergency responder teams, but also with a public-access version. It is based upon advanced intelligence analysis tools developed for ARDA, DARPA and other program offices. Another (CCPP – CUBIT-CRAIDO Public Portal) is focused upon serving the general public. A third (FutureGate) is focused upon activating, encouraging, and gathering data from social networks in the context of expectations, forecasts, and predictions made by portal users.

The technologies, instruments, assays, and software employed and incorporated within CRAIDO all derive from a careful evaluation, selection, and integration of both COTS and extensive prior-tested research components. Any assays or diagnostics procedures relating to human or animal sample testing have been previously tested in hospitals and have appropriate FDA, USDA, and/or EPA approvals.

Value

CRAIDO offers a very economical, robust, fault-tolerant set of realtime-analytic-informatic tools and resources that are easy to learn, easy to use and easy to supply and maintain. The ability to rapidly reconfigure either a stationary (room-based) or mobile (trailer/truck-based) unit upon demand, or upon need for switching equipment, or moving from stationary to mobile setup or vice versa, and to have this system be easily usable by non-specialists operating under variable but often extreme "residence program" level stress, is a superb value for the entire national and global initiative to attain resilience and sustainability, including social stability and economic continuity, during and after a period of a viral pandemic or other type of pandemic, natural disaster, or terrorist attack. Once a network is operational, the value for mutation identification and tracking rises rapidly.

Timeframe

CRAIDO LabStations (both stationary and mobile versions) are presently being assembled by the CUBIT Working Group (CWG) which is a consortium of private and public entities and staff. The PilotLabstation may be scheduled for demo/visit in different cities amd Q4/2009 is the target for first available for deployment in the USA. The primary coordinator, facilitator and project manager is TETRADYN Corporation, based in Charlotte, NC and with CRAIDO lab facilities set up also at Vanderbilt University Medical Center in Nashville, TN.

Estimated Cost

Costs vary depending upon (stationary or mobile; PilotLabStation or PodLabStation variants for mobile) and precise configuration of instrumentation onboard. The variances in biomedical testing and diagnostic equipment as well as in the optional use of environmental testing equipment are significant. The base configuration will nominally have PCR, immunoassay and related biomedical instrumentation plus computing facilities and software as well as a suite of supplies for assay preparation & sample processing. Costs will range from $100K upwards for a given CRAIDO node. Training and maintenance will be nominal. Cost for the public user is zero.