

**National
Biosurveillance
Strategy
Summary of
Comments & Suggestions**

**Courtesy of
Northrop Grumman
June, 2008**

TABLE OF CONTENTS

National Biosurveillance Strategy	3
Strategic Concept Recommendations	3
Scope of Biosurveillance	4
Principles of Biosurveillance	4
Biosurveillance Current Capabilities	6
Stakeholders, Roles, & Responsibilities	7
Requirements	8
Enhancing Biosurveillance	9
Communication & Collaboration	10
Workforce	10
Additional Assistance Available.....	11

National Biosurveillance Strategy

CDC recently requested comments on its National Biosurveillance Strategy draft document, dated June 2008. Northrop Grumman Corporation was pleased to have the opportunity to respond. Comments from the Northrop Grumman Corporation public health practitioner community were posted to the National Biosurveillance web site on June 27, 2008, in the format requested by the CDC. As this was a first draft strategy document, Northrop Grumman Corporation comments were targeted to key strategic discussions. An executive version of these comments is summarized below.

The purpose of the National Biosurveillance Strategy is to clearly set forth where the nation is; where the nation needs to be; how the nation will get there; how the nation will know when it has arrived; and, how the nation will objectively recognize areas which need further development.

The National Biosurveillance Strategy positions the following points:

- The mandate for the earliest possible detection of disease outbreaks has become a crucial issue in the face of bioterrorism, emerging infectious diseases, and other potential hazards that can widely impact human health.
- The articulation of a national strategy will better prepare the United States to respond quickly to an emerging health-related event.
 - A modern approach to health situational awareness for day-to-day operations as well as emergency events is essential and has not yet been achieved.
 - Shared leadership is pivotal for sustaining public and private health capacity at the national, state, and community levels.
- The shortage of appropriately trained public health practitioners is an inhibitor to the development of biosurveillance and overall public health practice.
- Strategic concept development will be an iterative, interactive process requiring frequent stakeholder review and input.

The National Biosurveillance Strategy draft document represents an important step towards the capabilities required by Homeland Security Presidential Directive -21 (HSPD-21)—it is being well-received.

Strategic Concept Recommendations

The below topics outline areas which require additional development in the National Biosurveillance Strategy. The discussion of each topical area includes observations, recommendations, and/or specific suggestions to assist strategy development, as appropriate.

Scope of Biosurveillance

- The National Biosurveillance Strategy Executive Summary should be able to stand-on-its own as a concise summary of the mission, vision, strategy, and road map for national preparation as derived from HSPD-21.
- The strategic planning process should refine, clarify and standardize its strategic and operational definition of biosurveillance (epidemiologic surveillance) through the contents of National Biosurveillance Strategy.
 - There seems to be no single, generally accepted, definition of the term “biosurveillance”. The definitions set forth in HSPD-21 are what they are; however, an enhanced discussion *interpreting the stated, known, and implied components of biosurveillance* will further strategic and operational clarifications of the mission of biosurveillance.
 - Discussions of biosurveillance have embedded technical and operational subtleties. An explicit recognition/discussion of the following elements of biosurveillance will further support national strategic concept development:
 - *systematic* processes—the current definition of biosurveillance does not use the word systematic. Specifically, computer systems, in addition to formalized public health procedures, are needed to actively gather and analyze data related to hazardous events, human health and disease in a population to obtain early warning of human health events;
 - *rapid characterization of human disease events*—the national strategy should specifically set forth the specific operational goals of rapid characterization;
 - *common situational awareness of disease activity to allow shared-sense making*—the national strategy should identify the elements which are expected to constitute common operational situational awareness so that plans for attainment can be put in place; and,
 - *prevention and mitigation of disease activity consequences*—the national strategy should reinforce the role of biosurveillance in the public health activity lifecycle.
- The critical role of development, adoption, and improvement of processes is missing from the strategy. The National Strategy draft address the scope of the solution as data (more, better, faster), system (move, aggregate and analyze data, and people). The critical role of processes and workflows needs conceptual development.

Principles of Biosurveillance

- The National Strategy calls for increased contextual information for making effective decisions but provides no insights regarding how this is to be accomplished on a day-to-day basis. A philosophy is needed regarding how events-based and indicator-based surveillance can be combined and operationalized.

- In order to achieve earlier detection, public health needs to discover infection and exposure much quicker. This is illustrated in Figure 1, below.
- Previously unrecognized threats to public health--first occurrences of a “new” emerged infection--are a major challenge due lack of precedent for surveillance, unknown data pattern(s) for analysis, and a lack of tradition and protocols.

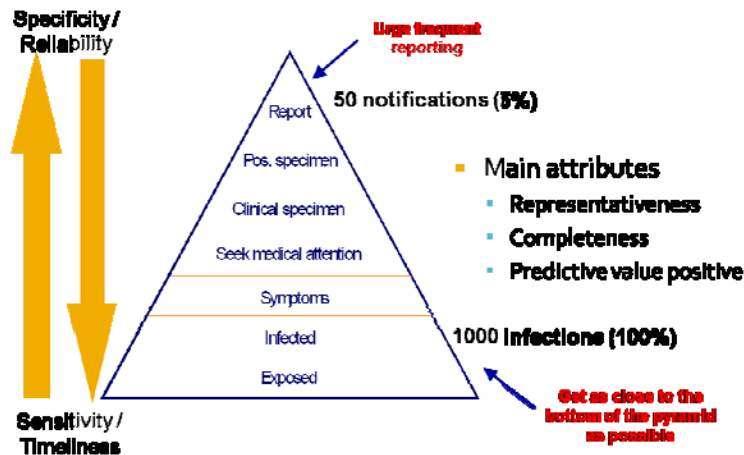


Figure 1

Source: Kass-Hout and Zhang. Biosurveillance, 2008. Chapman & Hal/CRC

- Figure 2, illustrates that a continuum exists regarding the source and timeliness of information.

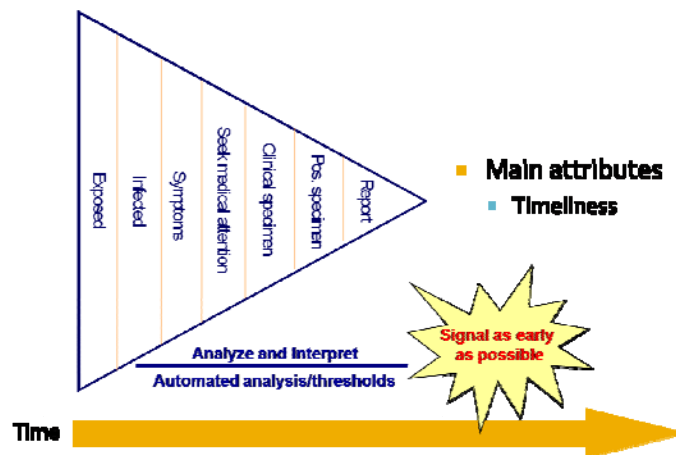


Figure 2

Source: Kass-Hout and Zhang. Biosurveillance, 2008. Chapman & Hal/CRC

- Additionally, there may be a potentially fallacious conclusion in the National Strategy's general discussion of biosurveillance scope. The strategy implies that designing systems against worst-case scenarios ensures that less demanding, smaller scope incidents are successfully addressed. Smaller scope events might be harder to see initially and might require a more fine-grained—the total capacity required for recognition might actually be greater.
- There needs to be an explicit recognition of the nature of the real-time data which supports or could support biosurveillance activities to allow greater timeliness. Data sources are addressed primarily from a technical perspective—the strategy should take a broader view in this area, i.e., infectious, toxic, metabolic, or other meaningful classifications, and relate to events which are intentional, unintentional, or of a natural origin, which may present themselves in structured, or unstructured.
- To meet the need of earlier detection, public health should be open to new and novel sources of information. These sources should include online news, chat rooms, blogs, articles, multimedia, social networking groups (e.g., “*Facebook 'more effective than emergency services in a disaster'*” Source: <http://www.telegraph.co.uk/news/1914750/Facebook--'more-effective-than-emergency-services-in-a-disaster'.html>)
- The principles for biosurveillance should also include innovative thinking around methods, cultural interventions, and social networking, and technologies which provide politically neutral solutions. These concepts should also include the need to recognize and bring existing professional, Ad Hoc professional networks, business and non-business organizations into the strategy—at the local levels.
- The six step functional description of biosurveillance presented in the Nation Strategy implied that biosurveillance is linear process. As discovery and learning happens, real-time adjustments to roles and operating processes can be important—the strategy should acknowledge the importance of dynamic adaptation.
- Challenges remain for local public health regarding how to obtain representative, complete, and predictive information. Not all localities have the same capabilities. The maturity of these capabilities can be defined and classified.
- Mechanisms need to be identified to enable transparency of the evolving data and situational awareness across global, public health and private organizations—the organizations that have shared concerns and contribute to the total operating picture.

Biosurveillance Current Capabilities

- Biosurveillance activities should not be viewed as uniquely different from ongoing health surveillance efforts, but as an integrated component and extended enhancement of existing and current surveillance strategies and infrastructure.
- Local, state, and regional biosurveillance strategies and operational capabilities are key additive contributors to overall national public health preparedness. Going into the future,

biosurveillance activities should be viewed as daily, value added, responsibilities that allow public health practitioners to monitor important (automated) indicators of population health and safety, and help professionals execute their daily responsibilities more successfully.

- Fellow public health stakeholders should be persuaded to examine and clarify the means to incorporate and leverage biosurveillance data in day-to-day public health activities through such technologies as information dashboards, mobile and cellular computing, as well as other means.

Stakeholders, Roles, & Responsibilities

- The National Biosurveillance Strategy should provide a concise interpretation of the scope of operating responsibilities contained in HSPD-21 to define the scope of operational planning.
- The interpretation of responsibilities should provide the foundation for a clear vision of future operating concepts including stakeholder interactions.
- The list of specific organizational stakeholders which need to be inclusively considered within the national biosurveillance strategy is large. The national strategy should provide greater elaboration of major stakeholder categories, how they participate, what they are expected to contribute, and what they will receive in exchange for participation.
 - Stakeholders could be examined and categorized from a variety of approaches, but should incorporate representation from governmental agencies (local/county, city, state, regional, territorial, national, international), non-profit (ASTHO, CSTE), the private sector (for profit corporations, foundations, member-based organizations), health care industries (AMIA, AMA, APHL, HIMSS), standards organizations (HL7, ISO, HITSP, PHIN, AHIMA, NAHDO), consumer agencies (Consumers Union, Consumer League, BBB, USPIRG), and more.
 - Specifically needed are the strategic guidance statements addressed to the various stakeholder groups which will insure integration with preferred local methods, and incenting rapid wide-spread adoption common methods—both are a key considerations.
 - Add special emphasis on non-traditional stakeholders as a challenge to public health to initiate and lead the engagement with health organizations, health policy and practice leaders, and private industry.
- The subject of motivation for data providers is missing--especially when national cost pressures are diving greater patient throughput in the health system.
- The stakeholder strategy should stimulate a common understanding of collaborative federal, state, and local planning; and, advance the scientific underpinnings of biosurveillance.

Requirements

- Biosurveillance is about early detection, early information sharing, and the ability to make early, informed decisions. Categories for capabilities assessment should recognize both public health operating capabilities as well the underlying technology capabilities required to support data processing. At a high level every biosurveillance system will have four fundamental capabilities:
 - Data ingest
 - Data analysis
 - Data presentation
 - Data and information sharing
- In each of the capability areas listed above, there are a number of sub-capabilities that a system might have (e.g., time series plots, regression analyses, geospatial analyses, and predictive modeling). Standardizing the discussion of requirements and capabilities should be done in such a manner as to enable the construction of a capabilities maturity model. Non-system based capabilities—including workforce levels and analyst capabilities—could be a part of this model.
- Given this strategic orientation—that of a capability model—the operational plan could include specific activities to form a comprehensive “capability framework” based upon the future desired state of biosurveillance. (Note: Northrop Grumman has additional thoughts, insights, and suggestions to develop a more comprehensive “capability framework” based upon the future desired state of biosurveillance. This framework would not only better assess the current capability of those involved in biosurveillance, it would also help communicate the future capabilities that are required by the varying participants in national biosurveillance and provide a logical path for SLTT and federal agencies to progress from current to future state.)
- National Strategy discussion groups should review the AIRA and the immunization community experience. AIRA and the immunization community created a similar framework, the PROW “Standards of Excellence” which successfully provides a framework of specific ways in which immunization systems effectively and integrally support the core components of an immunization program.
- This framework would not only better assess the current capability of those involved in biosurveillance, it would also help communicate the future capabilities that are required by the varying participants in national biosurveillance and provide a logical path for SLTT and federal agencies to progress from current to future state.
- The yet to be developed Operational Plan should include activities to form a comprehensive “capability framework” based upon the future desired state of biosurveillance that can be used to communicate desired capabilities to partners, to help assess the current state, and to provide a logical path for progression.

Enhancing Biosurveillance

- The National Biosurveillance Strategy requires more specific vision statements surrounding “system of systems” capabilities and acknowledgement of the practical challenges of variable levels of infrastructure capacity – especially under emergency conditions.
- The National Strategy suggests that a portal-based system may be needed.
 - A portal based information system that could ease the integration of day to day operations information with the emergency (surge) related functions for local public health. It could provide a common workspace allowing the “roll-up” of information to state, regional, and national levels.
 - A portal could also help local public health organize and integrate the normal day to day forms, content, and operational artifacts, allowing local public health practitioners to recall and reuse information for future projects.
 - A portal could enable local public health communications with other key local community stakeholders.
 - A portal could be the (mandatory) foundation used to conduct CDC exercises—providing a repository for the Common Operating Procedures, tailored to specific locality uses and user needs.
- A specific IT technology strategy should be provided in enough detail that multi-domain, time-phased planning can be enabled.
 - Strategy statements should be crafted to insure that initial deployment plans incorporate the use of portals, wiki webs, and collaboration spaces.
 - The deployed technology should allow local independent functioning congruence with policy, preparation, intervention strategy, resource allocation, strategic management, information technology, validation, and evaluation of use and capability.
- As one of its roles, CDC should act as the developer and disseminator of a collaboration-space that would allow biosurveillance experts, stakeholders, researchers, and policy makers a forum for sharing ideas, evolving policies and public health practices.
- The discussion of NBIS (National Biosurveillance Integration System) is confusing—the missions appear highly overlapping. If NBIS and this approach are not tightly coordinated with understood boundaries and clear, non-redundant interfaces, there will be a perceived burden on information/data providers/sources who might see that they will have multiple touchpoints to service. Striving for a single touchpoint for data providers to reduce their future burden in providing data should be a strategic goal.

Communication & Collaboration

- Coordination of a national biosurveillance strategy requires effective and efficient communication among all key stakeholders within a collaborative framework.
 - Given that such a group is widely dispersed across the nation, efforts must be made to improve interconnectivity, and technology enabled collaboration.
 - The National Biosurveillance Strategy should indicate the need for a comprehensive communication plan.
 - The Strategy should provide strategic guidance on the direction of the technical infrastructure supporting communications.
- The Strategy should identify communication needs, the goals and agenda for communication activities, the need for mechanisms to maintain an updated and comprehensive list of participants, the roles that participants play in communication, the multiple channels for use by participants, assuring quality in communication efforts, and more.

Workforce

- Public health practice and resulting activities are only as strong as the level of expertise and depth of experience practitioners bring with them.
- Creating a more skilled workforce trained in the range of biosurveillance proficiencies (using both traditional and IT-facilitated training strategies) is just one component of a comprehensive approach.
- In this time of a shrinking public health workforce due to retirements, transitions to other fields, and a lack of resources to attract and retain staff, the overall importance of public health workforce education needs reinforcement.
- The need for public health informaticians to help from the local/county level all the way up to the international arena is also evident. Training/continuing education efforts like AMIA 10x10 (with public health/population informatics as one of the major domains) should continue to be supported and expanded.
- CDC has been instrumental in calling attention to the lack of personnel and appropriately trained resources to carry out the local, state, and nation biosurveillance mission. A comprehensive strategy and plan to recruit and prepare professionals that can function at the local, state, national, and international levels is needed and may need to constitute a separate strategy, plan, and effort. (Note: Northrop Grumman recommends a comprehensive strategy and plan to recruit and prepare public health and national biosurveillance professionals that can function at the local, state, national, and international levels. This program can be conducted in conjunction with the Association of Schools of Public Health (ASPH) as well as interagency and intra-agency training opportunities, e.g., internships, fellowships, training programs, web-based independent training.)

Northrop Grumman Corporation
Response to the National Biosurveillance Strategy Draft

- Recruiting more young scientists from disciplines outside the public health profession must also be considered.
- The continued training of public health professionals must be tied to Healthiest Nation concepts.

Additional Assistance Available

Northrop Grumman Corporation is committed to making CDC successful in its strategic mission.

In its web form submittal to the CDC, Northrop Grumman Corporation indicated a desire to support the on-going discussions and working group committee of the National Biosurveillance Strategy.

Northrop Grumman believes that it can play a role to further assist CDC strategy development efforts, and can complement CDC efforts in workforce development, university, internship programs, “system of systems” engineering, capacities framework development, as well as other areas.

As noted, herein, Northrop Grumman Corporation has additional thoughts, insights, and suggestions to develop a comprehensive “capability framework” based upon the future desired state of biosurveillance. This framework is needed to better assess the current capabilities of those involved in biosurveillance; and, it would also help quantify and communicate the future capabilities that are required by the varying participants in national biosurveillance. A biosurveillance capabilities framework or model would also provide a logical path to guide progression.

Upon request, Northrop Grumman Corporation will make available selected members of its executive staff from its Advanced Science & Technology Practice Community to assist with strategy and document development.

Tim Baker, MPH, Strategic Relationships Director, (770-891-1079, Timothy.Baker@ngc.com)

Or

Fred Grant, PhD, MBA, PMP, Chief Scientist, (678-530-3568, Fred.Grant@ngc.com)