



Bioterrorism Preparedness

Executive Summary September 2006

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Five years have passed since the national disaster known as “9/11” killed thousands of Americans. In the wake of the September 11, 2001 attack came the subsequent outbreak of anthrax that was caused when weaponized spores were mailed through the U.S. postal system. These events provided notice that all levels of government needed to focus on improving public health preparedness and response capabilities to effectively respond to the next manmade or natural disaster. Within days of 9/11, even before federal financial resources became available, the County of San Diego allocated \$15 million to begin developing a comprehensive strategy to protect its citizens against the threat of additional terrorism attacks. In collaboration with our committed community partners, important strides have been accomplished to help assure the readiness of the local healthcare system.

This report summarizes the progress that has been made in the last five years.

Mission

The mission of the County of San Diego Health and Human Services Agency (HHSA), Public Health Services work on emergency preparedness is:

“To ensure local readiness of health and emergency medical resources to minimize the impact on human lives from a natural or man-made disaster.”

The County is taking an “all hazards” planning approach to comprehensively fulfill this mission. The all hazards approach encompasses biological threats and other potential threats such as chemical, radiological and explosive weapons, as well as natural disasters. County Public Health Services, under the direction of Public Health Officer Nancy Bowen, M.D., is the lead agency within the County charged with developing medical and health strategies to protect County citizens. The County Board of Supervisors oversees the on-going preparedness activities and establishes priorities to make sure the County is ready for potential threats and contingencies. Recently, the Board directed staff to develop a comprehensive pandemic flu plan in response to worldwide concerns about the “bird flu” and other outbreaks of infectious disease.

Public Health Preparedness Programs

Public Health Services has organized its preparedness initiatives around four major federal funding programs:

- Health Resources and Services Administration (HRSA)
- Centers for Disease Control and Prevention (CDC)
- Cities Readiness Initiative (CRI)
- Metropolitan Medical Response System (MMRS)

The funding from these programs supports on-going local priorities. For instance, CDC funding supplemented HRSA funding to support local hospitals and clinics in developing infrastructure for treating additional patients above normal patient levels (“surge capacity”), trauma/burn capacity and communications/IT equipment. The CRI funding was utilized, along with CDC funding, to develop a Medical Operations Center to better coordinate medical resources and communications during an emergency. Other key program successes are discussed below.

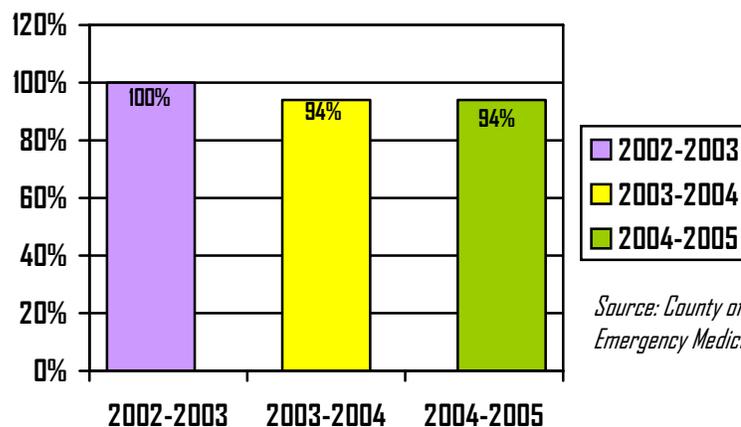
HRSA Program

The mission of the HRSA national bioterrorism (BT) preparedness program is to:

“Ready hospitals and supporting healthcare systems to deliver coordinated and effective care to victims of terrorism and other health emergencies.”

The HRSA program has been funded for several years, with the current San Diego County base allocation of \$1.8 million annually. Consistent with the mission of the national program, most of the County’s HRSA money has gone directly to local hospitals and community clinics. The hospitals and clinics are using this resource to purchase needed equipment and supplies for surge capacity, trauma/burn capacity, communication/IT enhancements and education/training for staff.

Chart 1. Percentage of HRSA funding going to the community, 2002-2003, 2003-2004, and 2004-2005.



Source: County of San Diego, Emergency Medical Services.

The local HRSA planning group comprised of representatives from County Public Health Services, local hospitals, community clinics and the San Diego County Medical Society, has identified surge capacity as the top priority for HRSA funds. The goal for local surge capacity is to develop additional capacity to triage and treat at least 1,500 adult and pediatric patients with acute illness. Hospital equipment and supplies have been stockpiled for immediate use in an emergency. The hospitals have also developed plans to utilize registered healthcare personnel and/or clinical disaster service workers to supplement existing staff. Drills and disaster training have been ongoing since 9/11.

Important progress has also been achieved in meeting HRSA's critical benchmark to purchase adequate personal protective equipment (PPE) to protect 750 healthcare personnel during a biological, chemical or radiological incident. This threshold of 750 PPE has now been met, with the equipment stored primarily at local acute care hospitals to protect hospital workers following an attack. In addition, HRSA funds have been utilized to ensure that every acute care hospital in the County has decontamination capability for chemical or radiological material.

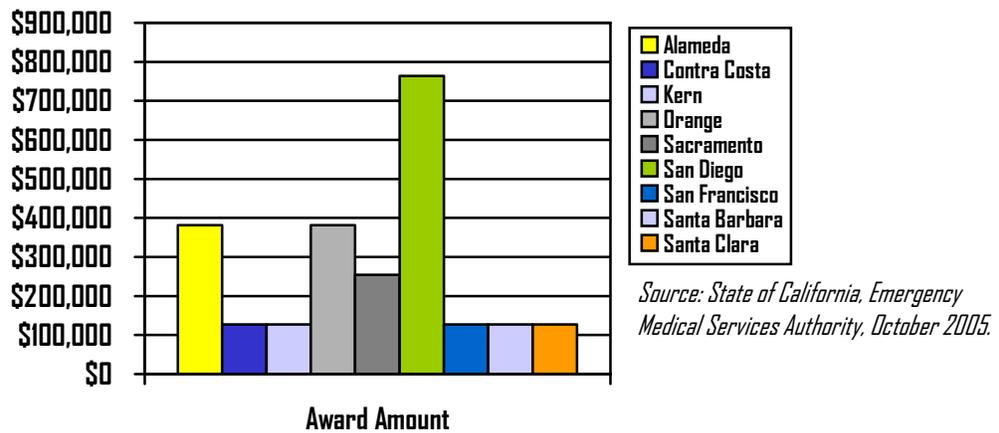
The 2003 Trauma System Assessment Study authorized by the County Board of Supervisors recommended implementation of a single trauma registry, which was deemed critical to disaster planning. HRSA funds were utilized to complete the purchase of San Diego's trauma registry. The new trauma registry will provide an efficient trauma information system for capturing system-wide trauma utilization data and treatment practices. Following any event, the trauma registry provides accurate information about the number of injuries, severity and best treatment practices.

With all the recent news about SARS and pandemic flu, safely isolating infected patients to prevent the spread of disease has become an increasingly important priority. To address the need for added isolation capacity, the State of California recently awarded the County an additional \$1 million for isolation bed capacity. Within weeks of the award, 17 local hospitals entered into purchase agreements for isolation tents and negative airflow systems to enable the hospitals to safely isolate infectious patients.

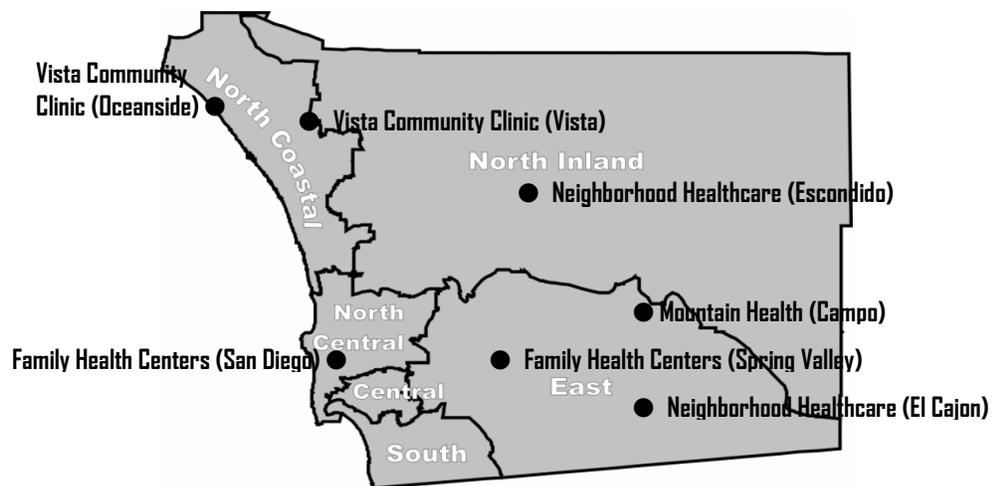
County Public Health Services and the Hospital Association of San Diego and Imperial Counties played an active role in securing the \$1 million for additional isolation capacity within the County. In addition to this project, the County successfully applied for and received a \$763,632 grant allowing all six local trauma hospitals to purchase large quantities of airway, diagnostic, burn, surgical, and obstretical equipment/supplies and medications. Known as the trauma/burn cache project, this funding enhanced hospital capacity to respond to emergency situations. San Diego County aggressively pursued this

funding opportunity as demonstrated in the chart below, resulting in funding for all six of the local trauma centers.

Chart 2. Trauma and Burn Cache Key Awardees, California Counties.



The County has also partnered with community clinics to enhance the clinics' capacity to treat patients in an emergency. The firestorm experience showed us that in some parts of the County the clinics became the community's only viable option to access primary healthcare. With this in mind, several geographically dispersed clinics have been retrofitted with emergency electrical power backup systems to ensure power in a disaster. Emergency communications and disaster training have also been priorities for clinics with the HRSA funding.



Over the last four years, the County has collaborated with our community partners to address hospital/clinic priorities. As a result, the local healthcare system is better prepared to triage, isolate, diagnose, and treat multiple victims.

CDC Bioterrorism Preparedness Program

The CDC Bioterrorism Preparedness Program was implemented in response to 9/11 and the anthrax attack. The purpose of the CDC national bioterrorism preparedness program is to:

“Ensure immediate and adequate response to any acts or threats of bioterrorism, infectious disease outbreaks, and other public health threats or emergencies.”

The County has participated in the CDC program each year, with the current San Diego County base allocation of approximately \$3.8 million annually. From program inception, the CDC has prioritized the following initiatives for local health departments:

- Build upon existing communicable disease surveillance and epidemiologic activities;
- Enhance lab capabilities; and
- Implement a rapid health alert system.

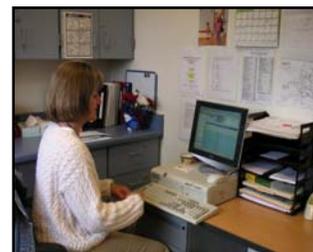
County Public Health Services has excelled in each of these areas.

Disease Surveillance and Epidemiology

Early detection of a disease outbreak will be essential to limiting the number of people that will become infected. The Public Health Services Community Epidemiology Branch monitors the health of the community and investigates reportable diseases to identify the source of infectious diseases. This disease surveillance mission has become increasingly important with the threat of bioterrorism and new virulent strains of influenza. Bioterrorism preparedness funding has enabled Public Health Services to significantly expand the reach of its surveillance activities to more effectively monitor the community’s health. Several key projects are discussed below.

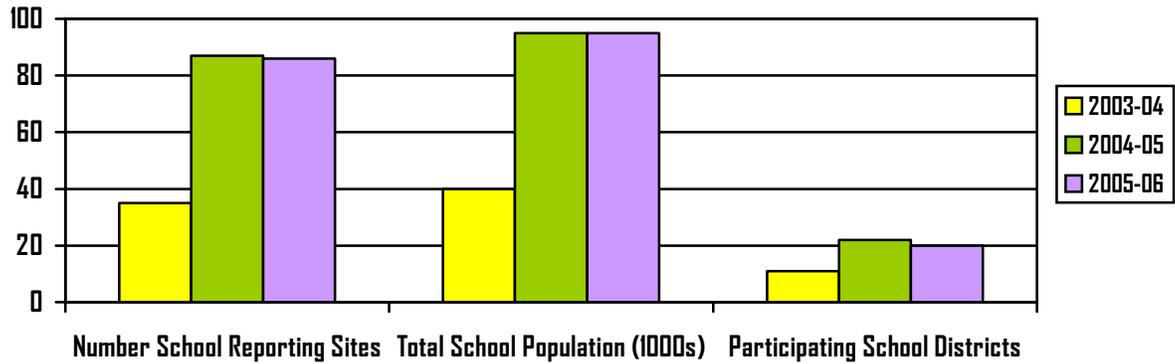
Project SHARE

On June 17, 2003, the County Board of Supervisors authorized the expenditure of funds to begin Project SHARE (School Health and Absenteeism Reporting Exchange) as a pilot project at selected school sites throughout the County. Three years later, the program has been expanded to include over 80 schools from 20 school districts that represent nearly 95,000 students Countywide. The goal is to maintain a robust syndromic surveillance system among schools. Schools throughout the County provide daily information about absenteeism and types of health office visits. These data are available for early detection analysis, with the results available to all system users and the schools. This successful project is the result of close collaboration between County Public Health Services, the local County Office of Education and school districts throughout San Diego County.



Project SHARE received the 2005 National Association of Counties Achievement Award in recognition of the program’s success and importance as an early warning system for health surveillance.

Chart 3. Participating Project SHARE Sites by Year, 2003-2006.

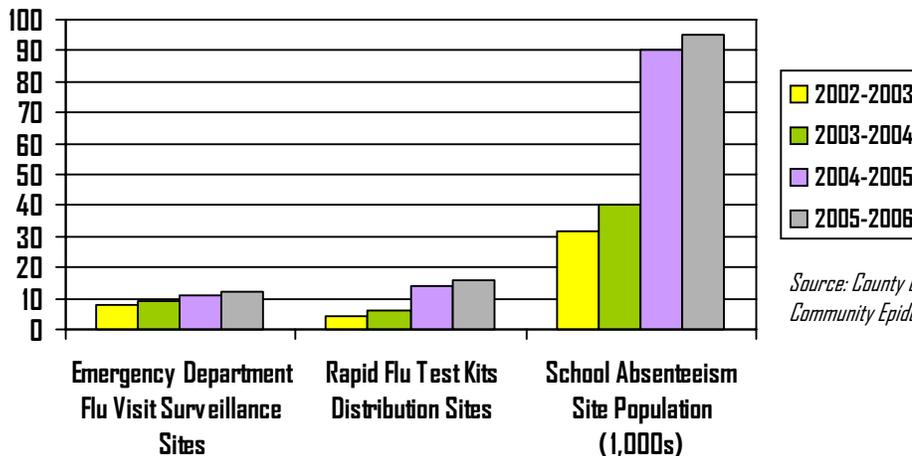


Source: County of San Diego, Community Epidemiology.

Enhanced Surveillance for Influenza

Through BT funding, the County of San Diego has been able to enhance and expand its surveillance for influenza. This was accomplished by expanding surveillance for influenza-like-illness at selected medical facilities by distributing rapid flu test kits to geographically-dispersed medical providers as well as distribution of surveillance information to community clinics, university health centers and hospitals. This enhanced influenza surveillance has enabled the County to establish expanded capacity for SARS rule-out testing and selected preparedness for avian influenza testing. Any positive influenza cases are reported to Public Health Services for follow-up. Due to the impressive success of our local program, the State has subsequently modeled its statewide influenza surveillance efforts after San Diego County’s approach.

Chart 4. Participating Sentinel Influenza Surveillance Sites by Year, 2003-2006.

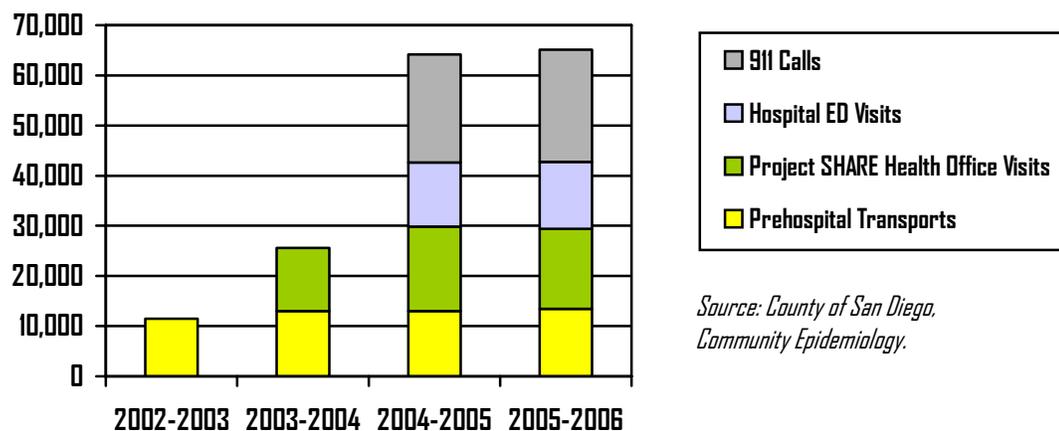


Source: County of San Diego, Community Epidemiology.

Syndromic Surveillance

Following 9/11 and the subsequent anthrax attacks, Public Health Services Community Epidemiology began formally establishing its ability to monitor selected syndromes from a variety of data sources. On a daily basis, Community Epidemiology has developed the capacity to acquire selected data, perform state-of-the-art detection and analysis algorithms, and summarize surveillance results for interpretation, notification and epidemiological investigation. The prototype system uses data sources from hospitals, paramedic transports, medical 911 calls, over-the-counter medication sales and the medical examiner. These data have proven useful in detecting several small events including an increase in respiratory conditions due to the 2003 fires and the heavy impact of the 2003/2004 influenza season. Currently, efforts are underway to include additional hospital sites, develop analysis sensitive to geographical location and publish results on a secure web site. As noted in numerous State and national meetings, San Diego County continues to be a leader in its approach to syndromic surveillance.

Chart 5. Bioterrorism Syndromic Surveillance, Growth in Average Monthly Volume Collected and Analyzed.



Source: County of San Diego, Community Epidemiology.

Methodology for Early Detection of Unusual Patterns of Disease

Staff researched and tested various illness detection software packages and technical references before selecting the County's current system that analyzes multiple data streams in a reliable and highly automated way. The automation of this process permits near real time analysis to determine if an unusual pattern exists and facilitates daily distribution of a summary document with results. Community Epidemiology has provided training to public health staff from other counties in California on the methodologies employed in San Diego County.

Visual Confidential Morbidity Report (VCMR)

The County Board of Supervisors authorized the purchase of the Visual Confidential Morbidity Report (VCMR) on January 28, 2003. The VCMR system is designed to automate disease reporting and surveillance for public health. The system was customized for communicable disease reporting in California and is being used by three counties in California. The system includes case management features, customizable workflows and processes with integrated modules for electronic lab reporting and web-based provider reporting. The County also utilizes the alerting module that provides a mechanism for disease or group specific alerts to be generated for users upon entry of a case in the system.

VCMR benefits the County by:

- Expediting the process of communicable disease reporting to include the CDC classified bioterrorism agents, investigation, and control by automating the reporting process from both providers and laboratories;
- Integrating data from case investigations into a single system to facilitate access by staff;
- Providing an internal alerting mechanism to notify key staff of disease reports that require urgent public health action; and
- Enhancing surveillance efforts by more accessible data and better integration of data for generating reports.

These projects clearly demonstrate the increased capabilities of the Public Health Services Community Epidemiology Branch to perform disease surveillance. With the help of technology, electronic reporting has been established and systems are in place to rapidly analyze data and disseminate vital information to the medical community.

Enhance Lab Capabilities

In any bioterrorism event, rapid identification of the biological material will dictate how best to treat sick people and protect others from getting ill. As a result of BT funding used to purchase state-of-the-art laboratory equipment, the County of San Diego has greatly enhanced the capability of the Public Health Laboratory to rapidly analyze samples. The lab currently has the capability to identify or rule out many potential bioterrorism agents within three hours of the time the specimens arrive at the laboratory. Five years ago, the lab lacked the ability to identify many of these agents, or required several days to identify or rule out dangerous biological agents. For instance, recently the



lab was able to determine within three hours that a patient was infected with varicella (chickenpox virus) and not smallpox. Previously, this would have required sending specimens to the CDC in Atlanta and waiting several days for the results.

The lab also utilizes STARLIMS software for web-based reporting, which allows the lab to send results electronically to submitters. The software generates reports needed to identify, track and control the spread of communicable diseases.

Laboratory microbiologists have participated in numerous trainings to become proficient in performing analysis of suspected BT agents. The County lab has been stellar in sharing information and has worked to implement a laboratory response network with labs in Imperial County and has trained public health officials in Mexico. The laboratory response network streamlines sharing of information and testing resources to prevent the spread of communicable diseases in the region.

Laboratory expansion efforts to be completed in 2007 include additional square feet of new lab space, allowing workers to safely work with avian influenza viruses and many bioterrorism agents. A new heating, ventilating and air conditioning system will be installed, as well as a new drywall ceiling to improve biosafety.

Implement a Rapid Health Alert Network

The County's Emergency Medical Alert Network (EMAN) is a local public health emergency communication system. It is a key component of preparedness and response to potential public health threats in San Diego County. In April 2003, with CDC funding, the County of San Diego utilizes the EMAN Bioterrorism Readiness Suite (BTRS), a web-based software application. This software enables secure "real-time" alerting and communication between Public Health Services and community partners including healthcare professionals, safety officials, local and neighboring jurisdictions, and animal health professionals.

The mission of EMAN is to enhance confidential communication between public health, safety and medical professionals in order to expedite rapid identification of, and response to, potential threats to local public health. EMAN alerts are sent to assist local medical, health and safety professionals in identifying, assessing, preventing and/or controlling public health threats with the ultimate goal of protecting the health and safety of County residents and visitors. This communication network provides low, medium, and high level alerting capabilities. Low-level alerting is used for ongoing disease surveillance and control purposes. Medium to high-level alerting may be used to notify participants who are likely to respond during potential public health threats to ensure a rapid and coordinated response.

There are over 1,600 local medical, safety and public health participants on EMAN. Participants determine the method by which they are alerted: telephone, e-mail, pager, and/or cell phone. EMAN staff work closely with the San Diego County Medical Society to encourage and facilitate EMAN enrollment of local healthcare providers throughout the County.

Chart 6. EMAN Participants.

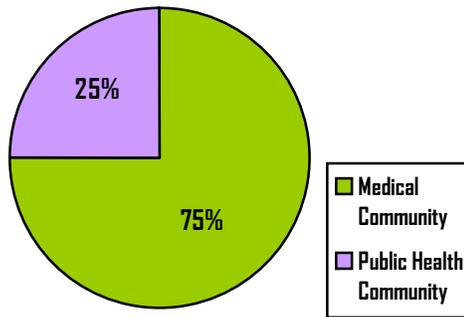
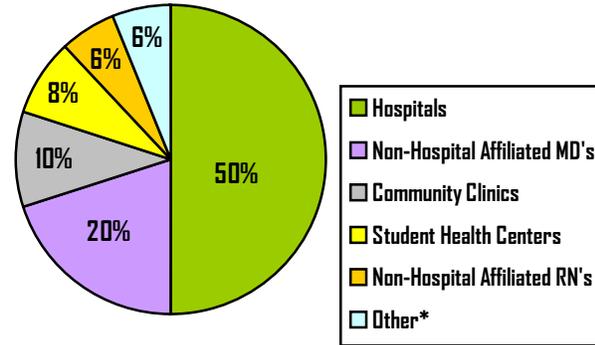


Chart 7. Medical Community EMAN Participants.



Source (Chart 6 and 7): County of San Diego, Community Epidemiology, June 2006.

* Other on Chart 7 includes regional health officials, animal health programs, urgent care centers, and miscellaneous affiliations.

Redundant Communications

In addition, through the 800 MHz Regional Communication System (RCS), pre-hospital providers such as paramedics and first responders can communicate by radio with hospitals and County facilities. Over 300 users are on the 800 MHz radio system including strategically located community clinics.

The new Medical Operations Center (MOC) was constructed as a command center to coordinate medical resources in an emergency. From the MOC, both County staff and representatives from local hospitals and community clinics will monitor the availability of medical assets and determine how to deploy them in response to the community's needs.



Completion of the MOC was a major milestone in the County's efforts to prepare and effectively respond to a public health emergency.

The County's new Medical Operations Center (MOC).

Hurricane Katrina taught important lessons about the importance of good communications and having back up systems to communicate needs. As a result of BT funding, redundant communication systems and the MOC are now in place within San Diego County to assure that vital information is disseminated to governmental entities and community partners during a disaster.

Other Major Activities Through CDC

As further discussed below, County Public Health Services has developed a mass prophylaxis plan that would supply needed medication to the entire population of the County within 48 hours. The term “prophylaxis” refers to medications or vaccines that will protect the population against possible biological or chemical threats. The federal government maintains numerous supplies known as the Strategic National Stockpile (SNS) containing pharmaceuticals, vaccines and medical supplies in locations throughout the United States so that the medications will be available within 12 hours. A comprehensive plan has been established to request, receive and distribute the SNS in time of need. However, this response time is inadequate for a nerve agent event, where treatment must be accomplished quickly in order to save as many lives as possible. As a result, the County has facilitated a local CHEMPACK program for the forward placement of nerve agent antidotes in numerous locations throughout the County. The County partnered with healthcare organizations, first responders and other governmental entities to meet the federal requirements to accept the CHEMPACKs. This program will soon be fully implemented, resulting in a significant safeguard should a nerve agent event occur within the County.

On-going training of Public Health staff, first responders, and the medical community has been a high priority since 9/11. All 6,000 HHS employees have received Work Force Readiness and Preparedness (WRAP) training to prepare the workforce for a disaster and to reinforce their responsibilities as disaster service workers. Since the initial WRAP training, advanced WRAP training has been implemented to train Public Health Nurses and other key HHS workers on topics such as the Standardized Emergency Management System (SEMS), National Incident Management System (NIMS) and Mass Care and Shelter. SEMS training emphasizes procedures to follow in a disaster and how to allocate resources based upon the circumstances. NIMS provides a consistent nationwide template to enable all government, private-sector, and non-governmental organizations to work together during domestic incidents. Public Health staff expected to report for duty during an emergency are in the process of completing online introductory NIMS training. The Mass Care and Shelter training simulates procedures utilized by the Red Cross at shelters set up during an evacuation. Unfortunately, Hurricane Katrina provided a real life event for Public Health staff to employ the skills gained from these trainings as local staff members were involved in planning for the arrival of evacuees and performing health assessments for arriving evacuees.

In the community, the County has facilitated training and provided materials to educate members in the healthcare community about what to look for and how to respond to potential threats. Public education and risk communication have also been addressed with the development of public information messages and training for public information officers.

Cities Readiness Initiative (CRI)

In the wake of a bioterrorism event for which antibiotics are an appropriate countermeasure, the Cities Readiness Initiative (CRI) requires participating areas to:

“Provide such prophylaxis to the known and potentially affected population within 48 hours of the time of the decision to do so.”

The Centers for Disease Control and Prevention (CDC) provided approximately \$1.2 million in funding for San Diego County's CRI program. Much has been accomplished.

Building on the County's existing Strategic National Stockpile (SNS) and Mass Prophylaxis Plan, San Diego was selected along with 20 other major metropolitan areas to participate in the CRI. The CRI raised the bar for deploying the SNS, requiring the County to distribute antibiotics to the entire County population within 48 hours. The local model involves utilizing the U.S. Postal Service to distribute medications to every residential mailing address in the County. Beyond that methodology, the County is planning redundant distribution systems. For instance, the City of San Diego, through CRI funding, has developed its own mass prophylaxis plan to ensure that city fire fighters, law enforcement and other essential city personnel and their households receive the antibiotics as quickly as possible so they can respond to a bioterrorism event. Recently, National City, San Marcos and Carlsbad were selected by the CDC to develop their own plans for protecting their first responders and other essential personnel to ensure they can respond to the emergency and maintain essential services. It is anticipated that CRI funding will continue so that all the cities within the County will be given the opportunity to develop their own internal distribution plans over the next several years. Additionally, the County of San Diego is planning to utilize funding dedicated to SNS to stockpile local pharmaceutical supplies to ensure first responders, and health and safety personnel are available to implement the mass distribution models. Funding is also set aside for local hospitals to maintain pharmaceutical supplies and the Pharmacy Association has developed a



template for hospitals to access additional pharmaceuticals to protect essential personnel and their families during the initial hours following an event.

Any event that activates the SNS will require a great deal of communications with the public. The public must be kept informed, given instructions and be confident that the emergency is being handled competently. To the extent practicable prior to the event, the County has prepared sample instructions and medication information that will accompany any mass prophylaxis event. Public information announcements and talking points templates for the media have been developed. Exercises are planned to fine-tune the communication strategies.



The County has also used first year CRI funding to equip six portable points of dispensing units (POD's) that will be deployed to augment other distribution methods. The portable sites will be used to dispense medications and instructions.

In the first year of CRI funding, San Diego County's POD program was assessed and rated among the best in the nation by the CDC. Work is on-going to develop and test the CRI transportation plan.

The County's portable points of dispensing units (POD's).

Metropolitan Medical Response System (MMRS)

The Metropolitan Medical Response System (MMRS) program was initiated in 1997 by the federal government to prepare local responders in metropolitan areas to respond to an incident involving a weapon of mass destruction. Its primary goal is to:

“Develop a rapid response, multi-disciplinary, multi-jurisdictional team designed to provide support for a terrorist event involving a weapon of mass destruction.”

This includes bringing together non-routine responders, agencies, and various disciplines to plan, purchase equipment, train, exercise and prepare to respond to a mass casualty resulting from a weapon of mass destruction.

The local MMRS program involves the participation of many agencies, including HHS (lead agency), Department of Environmental Health, Sheriff's Department, police and fire departments, the FBI, military and local hospitals. Locally, the funding has been utilized for the following priority purposes:

- Purchasing specialized analytical and detection equipment;

- Purchasing specialized response equipment such as mass decontamination equipment, first responder Personal Protective Equipment (PPE) and supplies;
- Purchasing communication equipment; and
- Purchasing pharmaceuticals and medical supplies.

Since the inception of the MMRS program, participants have prepared themselves to respond to a large-scale disaster. The Metropolitan Medical Strike Team (MMST) has been formed to assist first responders at the disaster scene. Drills and exercises have led to greater coordination among the MMST members. In November 2005, the MMST participated in a County-wide exercise that tested the Team's skills in mitigating the effects of a simulated weapon of mass destruction.

Going forward, future priorities for the MMRS program are to:

- Enhance community support for the MMST;
- Enhance the MMST's capabilities and expertise through training; and
- Develop an Incident Management Team to be used to coordinate assets during a disaster or weapon of mass destruction event.



The County's MMST participating in an emergency exercise.



Conclusion

Over the last five years, dedicated professionals within the County have been working on the mission:

“To ensure local readiness of health and emergency medical resources to minimize the impact on human lives from a natural or manmade disaster.”

This report summarizes some of the achievements and programs that have been put in place with the help of the County’s committed community partners, to make the County safer and better prepared. The achievements include the following:

- County Emergency Medical Services (EMS)/Disaster Medical and Health Emergency Preparedness is working with the County Office of Emergency Services (OES) and the City of San Diego Office of Homeland Security (OHS) in developing six Mass Casualty Incident (MCI) response units (truck and trailer) to respond to MCI’s within the operational area. These units will be available 7/24/365 for response with the capabilities to treat up to 100 patients per unit when placed in service. Units will be placed with local fire first responder agencies.
- By utilizing HRSA funding, local hospitals and clinics have purchased essential equipment and supplies to prepare themselves to handle a surge in patients.
- An additional \$1 million has been allocated to hospitals with the sole purpose of increasing isolation bed capacity, which will be needed to control an infectious disease outbreak.
- Geographically dispersed community clinics have been retrofitted to ensure that the clinics will remain operational, even if local electrical power is disrupted.
- PPE has been procured to protect hospital workers and first responders against harmful agents or infection.
- To detect and limit the impacts of a possible bioterrorism attack or naturally occurring epidemic, CDC funding has been utilized to dramatically improve the County’s laboratory and disease surveillance capabilities. The Public Health Laboratory now has the capability to identify or rule out a potential biological threat within hours, instead of days. The Public Health Services Community Epidemiology Branch has systems in place to monitor the community’s health and has the capability to quickly alert the medical community and local officials if abnormal health conditions are detected.
- The CRI is quickly developing plans to provide prophylaxis to the entire County population, if necessary.
- Education, drills and exercises will remain ongoing to assure that first responders and the healthcare community are prepared for any event.

- The County has created DDC's to assure that essential County services are not disrupted.
- The MOC has been developed to coordinate medical resources countywide.
- Among the resources available is the highly trained and equipped MMST that is available to assist first responders in any disaster.
- In response to concerns over a pandemic flu outbreak, the County has developed its own comprehensive pandemic flu plan.

Building on these successes, the County and its community partners remain committed to the mission of ensuring local readiness.