A Model for Adapting Community Health Call Centers to Support Outpatient Healthcare and Monitoring in a Major Healthcare Crisis

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Background

- The current lack of surge capacity in the healthcare system will be a major challenge in events resulting in large numbers of ill or injured.
- In CBRNE events, the "worried well" or those potentially exposed (but at low risk for injury or illness) may paralyze healthcare systems with their demands for information and triage.
- Quarantine of exposed but healthy individuals and even isolation of those with illness may be required to halt the spread of disease.
- Communities are developing plans for prophylaxis or immunization of their citizens within 48 to 72 hours, possibly leading to complications and adverse drug events.

Public Risk Perception
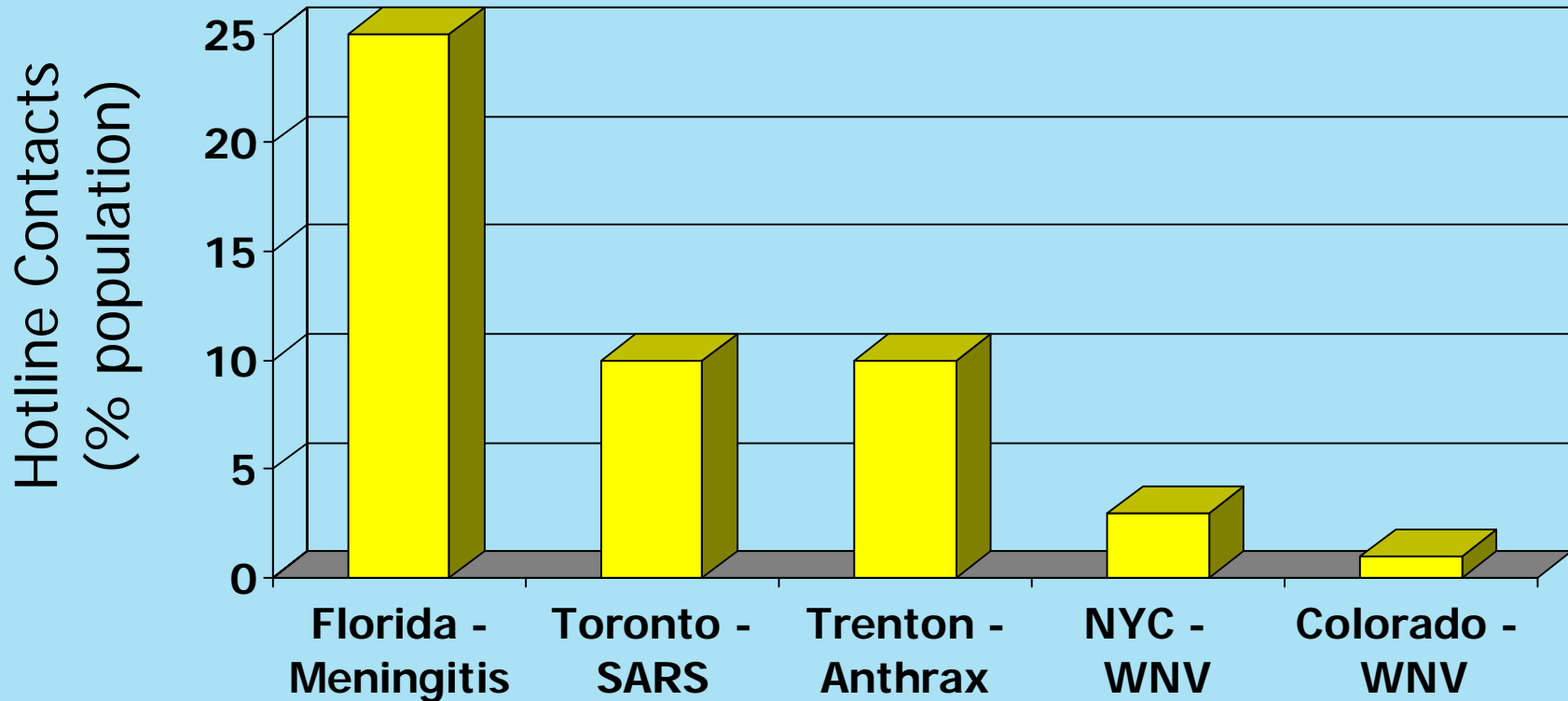
Certain events (bioterrorism, child-targeted, new emerging disease) will effect the amount of public concern and numbers of people having information or others needs.

Challenges for Preparedness

- 2004 Redefining Readiness Project*
  - 60% of public would not heed official instructions to get vaccinated during smallpox outbreak
  - 40% of public would not heed official instructions to shelter in place during a dirty bomb incident

  * R. Lasker, Center for the Advancement of Collaborative Strategies in Health (www. cacsh.org)

Public Needs Information on…..

- General topic/event information
- Public health messages
  - Personal and family protection
  - State/local health dept guidelines
  - Points of contact for referral agencies
- Health decision-support and evaluation

Helping the public make informed decisions and to care for themselves can alleviate their demands on healthcare delivery systems

Health Call Centers

- Community poison centers, nurse call lines, drug info centers, hotlines and others can assist in response efforts by:
  - providing health information
  - disease surveillance
  - triage/decision support
  - quarantine/isolation monitoring & support
  - drug information & adverse drug event reporting

Reducing Hospital Surges

- United States Poison Control Centers
  - Of 2.4 million contacts about potential toxic exposures in 2004, 1.8 million (75%) were managed outside of health care facilities

- Denver Health Nurse Line
  - Manages 40% of callers at home
  - 70% callers changed plans after calling
  - 16% planned home care but 47% chose it after calling

Task Order Goal

- Develop, implement and test a model to adapt call centers (such as poison control centers, nurse call lines, hotlines, etc) to support home management and shelter-in-place approaches in certain mass casualty or health emergency events.

  - Using protocols and algorithms developed for specific scenarios to advise the community on how to self-triage, identify symptoms and call for help or advice.

  - Developing models for home management such as visiting professionals, diagnostic testing, and mental health intervention.

Task Order Tasks

1. Establish an Advisory Panel

   – Convene a panel of subject matter experts to supplement the expertise of the contractor and to provide assistance and guidance on the tasks and deliverables

   – Panel will meet 3 times in DC over the 1-yr period:
     - 1st month: For overview & input to task plans
     - 5th month: For preliminary results of model development
     - 10th month: For preliminary results of model testing and evaluation

Task Order Tasks

2. Develop Scenarios

   – Examine mass health emergency scenarios for CBRNE events and decide which provide the best opportunity for home management/shelter-in-place strategies to reduce burden on the healthcare delivery system.

   – When examining scenarios, consider:

     • Available surge capacity

     • Infrastructure to support protocols in existing call centers

     • Range of necessary technology

Task Order Tasks

3. Model Development

    –   Research existing models, protocols and algorithms and develop and implement a scenario-based model using community health call centers that specify:

        - Who should be advised to self triage or shelter-in-place
        - Under what circumstances a home care/shelter-in-place plan should be implemented
        - Health and medical response requirements
        - Public communication protocols and strategies
        - Risk management requirements and strategies for call centers
        - Generation of patient records for subsequent care or registries
        - Timely mechanisms for call centers to get patient data and info

Task Order Tasks

4. Test and Evaluate Model

   – Develop a mechanism to test and evaluate the model with a local exercise

      • Rural community exercise

      • Urban community exercise

Task Order Tasks

5. Final Report & Recommendations
   - Final report should address these areas:
     - CBRNE or natural scenarios where medical consequence management could realistically and effectively include use of health call centers to support care outside of hospital
     - Description of model addressing the critical planning elements needed for operating such a health call center
     - Comparison of model to other existing models, protocols or algorithms (incorporating strengths and avoiding weaknesses)
     - Identification of medical risk management and legal obstacles to the call center management concept (challenges in communication and public perception)
     - Recommendations for model applicability at various levels (local, state or national) in communities
     - Discussion of risk management issues and means of dealing with them

Task Order Timeline

Period: August 24, 2005 to August 23, 2006

1. Meet with AHRQ to discuss goals, objectives & work plan - Aug 30'05

2. Submit work plan – Sep 13'05

3. Submit monthly progress reports – 15th of each month

4. 1st expert panel meeting – Oct 13'05

5. Review existing CBRNE scenarios for sheltering-in-place – Oct '05

6. Review existing models, protocols and algorithms for this – Oct '05

7. Submit review of finding on existing models – Nov '05

8. Develop model with parameters and requirements specified – Dec '05

Task Order Timeline

Period: August 24, 2005 to August 23, 2006

9. 2nd expert panel meeting – Jan '06

10. Submit plan for small scale test of model – Jan/Feb '06

11. Conduct and evaluate test of the model – May '06

12. 3rd expert panel meeting – Jun '06

13. Submit draft final report – Jul '06

14. Presentation to AHRQ/DHHS staff – Aug '06

15. Submit final report – Aug '06

Health Emergency Assistance Line & Triage Hub (HEALTH) Model:
Review of Initial AHRQ Task Order

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Background

- Our call centers experienced a 10% increase in call volume related to 9-11-01 and anthrax letters.
- Our expertise in answering calls about medical concerns from the public prevents unnecessary visits to healthcare facilities
  - US poison centers
  - Nurse call lines
- Expanding the capability of health call centers to assist the public with clinical decision support, especially the "worried well" or those at low risk for injury or illness, can benefit healthcare systems during emergency events.

Community Response Challenges

- What would you do to handle a surge in public contacts during a public health emergency?

- Could you adequately predict the potential volume of contacts?

- How would you identify staff, facilities and other resources for this need?

- If you couldn't handle this need, who in your community could?

Anthrax by the numbers

There have been four deaths from the 17 confirmed cases of anthrax in the United States. Here is a breakdown of numbers associated with the disease.

32,000 People prescribed antibiotics.

5,000 People told to take the antibiotic for 60 days.

300 Buildings tested

Inhaled
- ● Confirmed
- ⊗ Died

Cutaneous (skin)
- ▲ Confirmed
- ▲ Suspected

Florida
● ⊗

New Jersey
● ● ▲ ▲ ▲ ▲ ▲

New York City
⊗ ▲ ▲ ▲ ▲ ▲ ▲ ▲

Washington, D.C.
⊗ ⊗ ● ● ●

8,860 Calls about possible bio-terrorism threats or anthrax symptoms received by the Centers for Disease Control and Prevention from the United States and 22 foreign countries during October.

590 Calls deemed a potential threat and investigated by the CDC.

SOURCE: Centers for Disease Control and Prevention
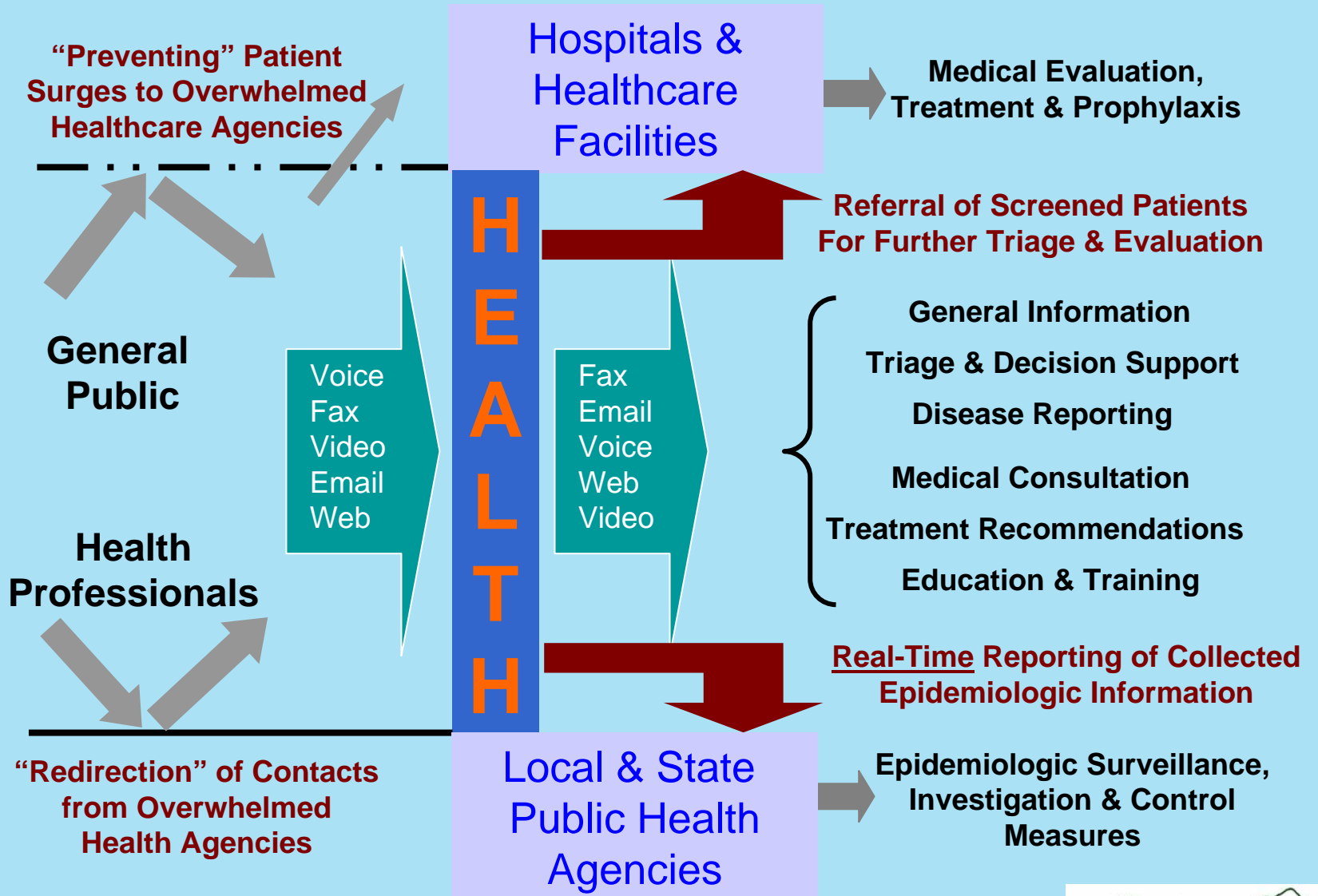
AP

HEALTH Model Overview

Purpose

- Determine the requirements, specifications and resources needed for developing *HEALTH,* a highly integrated public health emergency contact center that can minimize patient surges to the healthcare delivery system during bioterrorism or health emergencies.

Methodology

- Using these steps, produce a model that could be implemented at project completion for our medical contact center and that could be exportable:
  - Incorporate lessons learned in bioterrorism preparedness and emergency response
  - Determine requirements for surge capacity: facilities, equipment and personnel
  - Determine linkages with public health and emergency preparedness infrastructure

HEALTH EMERGENCY ASSISTANCE LINE & TRIAGE HUB
(HEALTH)

"Preventing" Patient Surges to Overwhelmed Healthcare Agencies

Hospitals & Healthcare Facilities

→ **Medical Evaluation, Treatment & Prophylaxis**

General Public

H E A L T H

Voice
Fax
Video
Email
Web

Referral of Screened Patients For Further Triage & Evaluation

Fax
Email
Voice
Web
Video

General Information

Triage & Decision Support

Disease Reporting

Medical Consultation

Treatment Recommendations

Education & Training

Health Professionals

"Redirection" of Contacts from Overwhelmed Health Agencies

Real-Time Reporting of Collected Epidemiologic Information

Local & State Public Health Agencies

→ **Epidemiologic Surveillance, Investigation & Control Measures**

Lessons from Health Emergencies

- Web sites, press releases and brochures used for many events, though <u>high public concern usually required ad hoc hotlines</u>

- <u>Perceptions of information were not addressed</u>, though trustworthiness and reliability of sources has been studied

- <u>Public needed general assistance and information</u> during events though no assessments of meeting those needs were done

- <u>Special populations limited</u> to children, victims, "worried well" and those with emotional trauma, while elderly, tourists, homeless, disabled, minorities including non-English speakers weren't addressed.

Lessons from Health Emergencies

- <u>Demand for 1-on-1 communication</u> was evident with call volume surges surpassing capacity without technical failures though there were <u>system failures</u>

- Ability to call in <u>additional personnel were hampered by communication system problems</u> and <u>no pre-planning</u> on where and when to report, further compounding staff shortages

- <u>Sustained responses also strained agencies and staff</u>

- <u>No comprehensive assessment of facility limitations</u> though inadequate equipment, space and services to support staff and volunteers were mentioned

HEALTH Contact Center Assessment Tool Set

- Contact Surge Calculator – Helps predict contacts expected from a health emergency

- Staffing/Resource Calculator – Determines staffing and other resources requirements

- Capital & Technology Expense Calculators – Determines potential capital costs

- Surge Options Matrix – Assesses capabilities for a contact center and suggests options

(Tool set available at www.ahrq.gov/research/health)

SARS Outbreak 2003

- Mar 13: WHO international health alert issued
- Mar 14: Toronto (pop. 4.6 million) confirms cluster related to WHO alert
- Mar 15: Hotline established, 0800-1100 daily
- SARS Hotline receives >300,000 calls from Mar 15 to Jun 24; peak daily volume of 47,567 calls
- Primarily staffed by public health nurses, 46 on day and 34 on evening shifts (>200 over period)
- Aug 30: 44 deaths and 438 SARS cases

Colorado WNV 2003

- CO population = 4.4 million
- 2nd year of WNV
- Jul 22: 1st human WNV case confirmed
- Oct 30: 2,543 confirmed cases with 47 deaths
- CDPHE funded Health Emergency Line for the Public (COHELP) to provide information on WNV, its symptoms and prevention measures
- CO HELP collected dead bird reports
- Hotline received 12,150 calls Jul 22 to Oct 11

Background

- January 2003: CDPHE & RMPDC began a partnership to establish a standardized public preparedness and response system for Colorado
- Originally for Smallpox Vaccination program
  - Toll-free telephone lines
    - CO HELP - Colorado Health Emergency Line for the Public (using information providers)
    - CO PHIL - Colorado Provider & Hospital Information Line (using information providers and nurses)
    - Primarily an inbound call center
  - Website - www.cohelp.us

CO HELP Service Users

Public →

Healthcare Providers →

Clinics →

**CO HELP
877-462-2911**

← Schools

Health Agencies →

Hospitals & EDs →
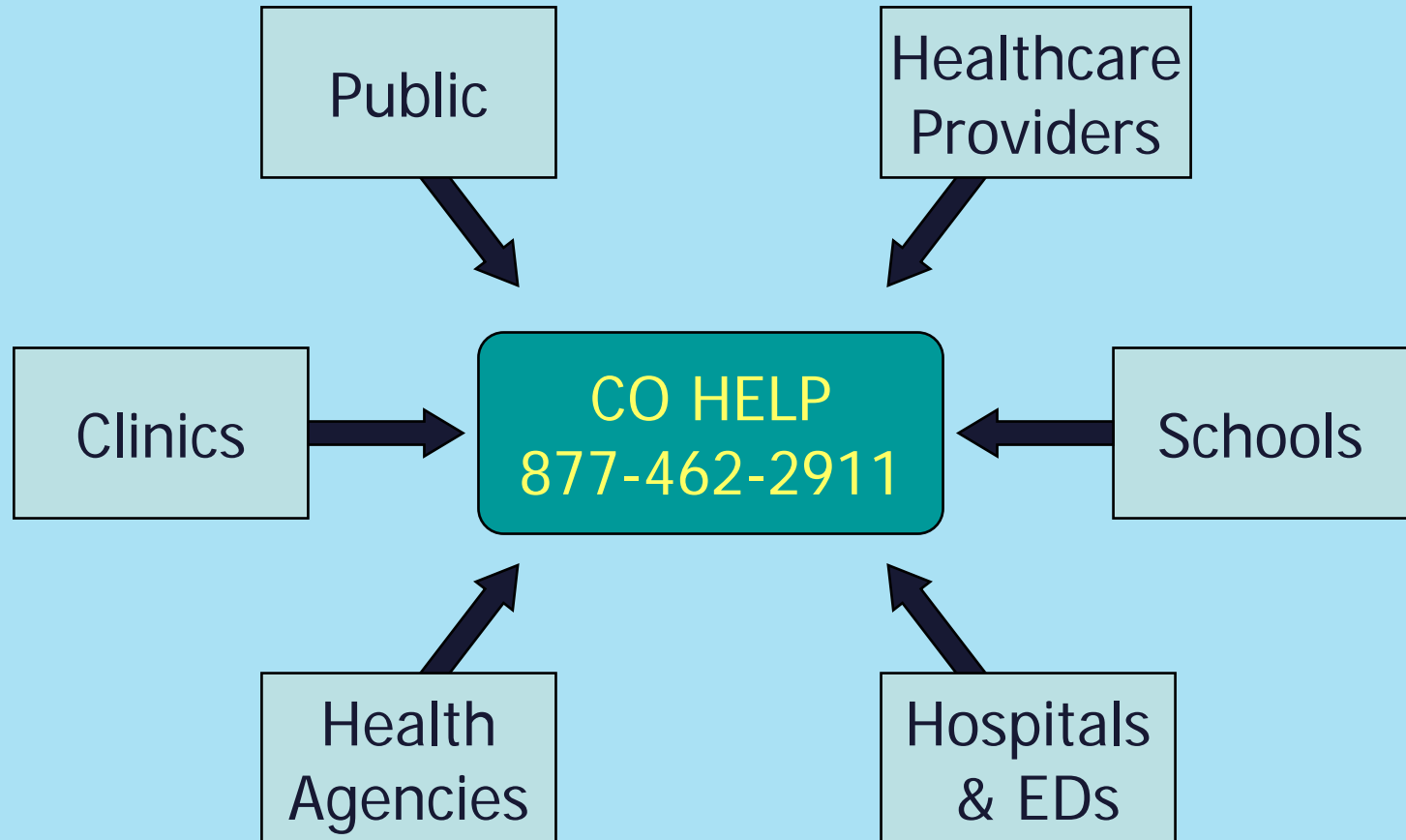
CO HELP Objectives

- Develop a standardized and prepared response to public health events
- Provide consistent, accurate information
- Collect and maintain structured data to better characterize events and responses
- Develop capability and capacity to adapt to other public health emergencies

Standardized Response

- Call handling procedures
- Call center infrastructure/technology
- Toll-free lines with up-to-date recordings
- Integrated website (www.cohelp.us)
- Trained information providers
- Defined referral procedures
- Consistent, accurate information delivery
- Structured data collection and reporting

CO HELP - WNV Call Handling
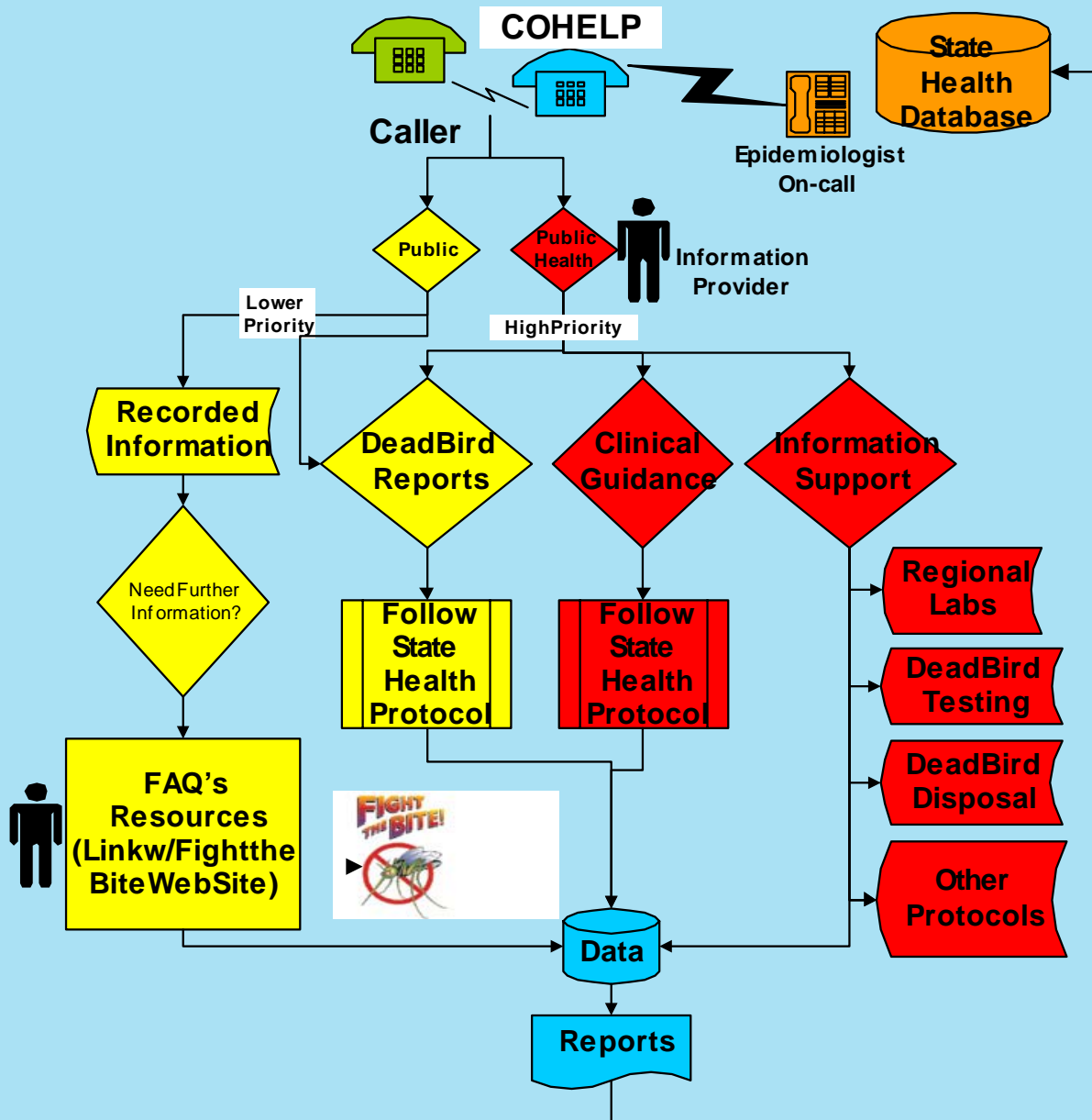
Updated Recordings

- Consistent, accurate information delivery

- Delivers the most urgent public health message

- Customized to address most frequent concerns and issues
  - WNV – symptoms ⟶ protective measures
  - Influenza – symptoms ⟶ immunizations

- Reduces need to speak with person

- Assists with call volume surges

- Directs callers to internet for additional information (via www.cohelp.us)

Integrated Website

ROCKY MOUNTAIN POISON AND DRUG CENTER

Colorado Health Emergency Line for Public Information - Web Links

The Colorado Health Emergency Line for Public Information (COHELP) is a public support service sponsored by the Colorado Department of Public Health and Environment to keep you informed on current public health or bioterrorism issues. The COHELP toll free line (1-877-462-2911) is staffed by trained information providers who give information on the following topics: Smallpox, West Nile Virus, MOLD, Influenza and Pneumonia. For more information about these topics, Please click on the links below.
To schedule a flu or pneumonia shot go to **www.immunizecolorado.com**

TOPIC	LINK
Bioterrorism	**www.bt.cdc.gov**
Smallpox	**www.cdphe.state.co.us/bt/smallpox/smallpox.html**
West Nile Virus Prevention and Education	**www.fightthebitecolorado.com**
West Nile Virus Surveillance	**www.cdphe.state.co.us/dc/zoonosis/wnv/wnvhom.html**
MOLD	**www.cdphe.state.co.us/dc////////envtox/MoldInfoSheetweb.pdf**
MOLD (EPA mold remediation guide)	**www.epa.gov/iaq/molds/mold_remediation.html**
Influenza/Pneumonia	**www.immunizecolorado.com**
Influenza/Pneumonia Surveillance	**www.cdphe.state.co.us/dc/Influenza/main.htm**

Information Topics

- – Smallpox information/vaccination support
- – West Nile Virus (WNV)
- – Mold
- – Influenza/Pneumonia
- – Hantavirus
- – White Powder
- – Tuberculosis
- – Anthrax
- – SARS
- – Avian Flu
- – Ricin

Information Types

- General topic information
- Public health messages
  - Personal/family protection
  - State/local health department specifics
  - Point of contact information for local health depts.
- Provider guidelines and information
- Clinical decision support

Trained Staff

- Standardized training program
  - Customer service/communication skills
  - Technology skills
  - Content education

- Quality Assurance/Quality Control (QA/QC)
  - Recorded call reviews
  - Case review
  - Staff feedback/improvement review

Referral Procedures
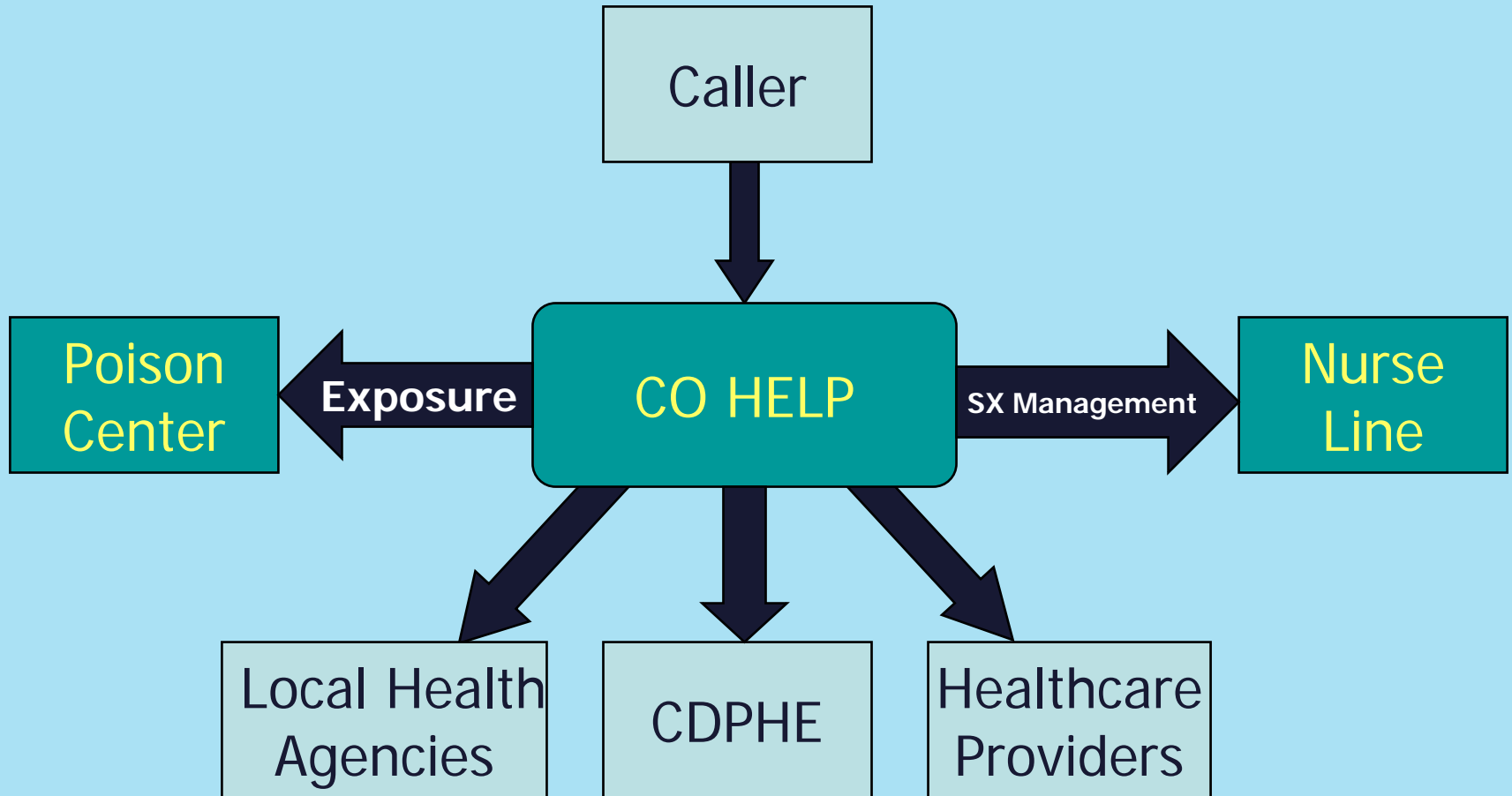
Information Delivery

- All content approved by CDPHE
- Structured as Frequently Asked Questions (FAQs) and their answers
- "Information Not Available" procedures
- Consistency assured through training and QA/QC reviews

FAQ Example

How can I protect myself from West Nile virus?

- ✓ The best way to protect you and your family is to limit mosquito exposure.
- ✓ Limit outside activity around dawn and dusk when mosquitoes feed.
- ✓ Wear protective clothing such as lightweight long pants and long sleeve shirts when outside.
- ✓ Apply insect repellant to exposed skin when outside. Repellents with DEET are effective, but should be applied sparingly.
- ✓ Make sure that doors and windows have tight- fitting screens. Repair or replace screens that have tears or holes in them.
- ✓ Drain and prevent formation of all standing water. Stock permanent ponds or fountains with fish that eat mosquito larvae.
- ✓ Change water in birdbaths or wading pools and empty flowerpot saucers of standing water at least once a week.
- ✓ Remove items that could collect water such as old tires, buckets, empty cans, and food and beverage containers.

Data Collection

- Structured commercial software
  - Caller demographics (zip code, county, city)
  - Call type (WNV, Influenza, Smallpox, etc)
  - Call reason (info, report case, provider info, etc)
  - Surveys (dead bird reports, VAERS)
- Information management and documentation (FAQ libraries)
- CDPHE notifications & referrals (per protocols)

Structured Software

Data Reporting

- Reporting
  - Call metrics (volume, disposition)
  - Caller demographics
  - Call types
  - Information delivered
  - Customized for recipient needs
  - Surveillance signals
    - Sentinel alerts
    - Trends in public concerns

Reporting Examples

- CDPHE
  - Weekly
    - Call volumes
    - WNV calls total, reasons for calls, counties calling
    - Dead Bird Reports (geo coded)
    - Mold calls by county and reason for call
  - Monthly
    - All call types, FAQ's given, Caller zip codes & counties
- Local Health Departments
  - Weekly
    - Dead Bird Reports (includes qualification for testing and address of find)
  - Ad Hoc Reports
    - Call stats by specific counties—Number of calls, FAQ's given
    - Top ten counties calling
    - Number of out-of-state calls
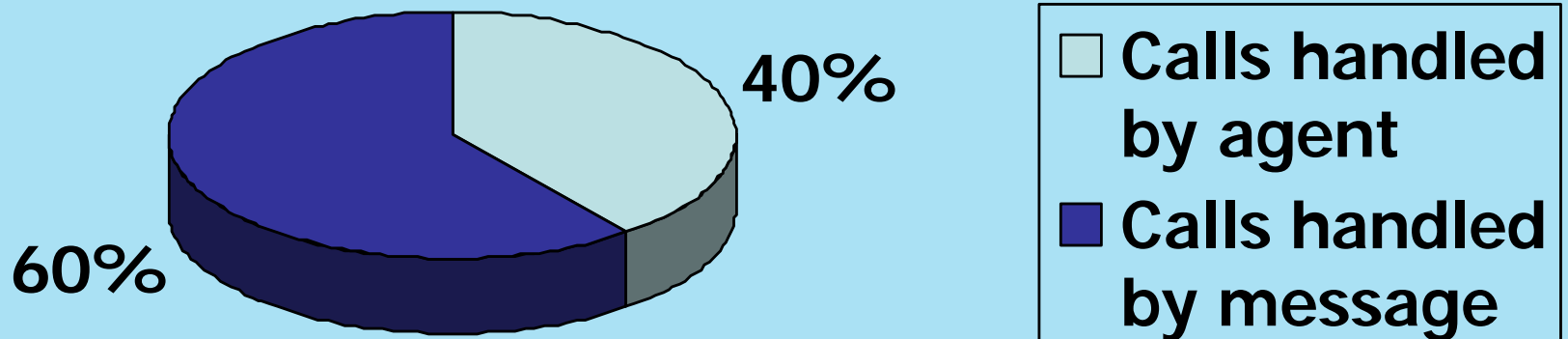   - Top ten reasons for call

Call Volume & Disposition

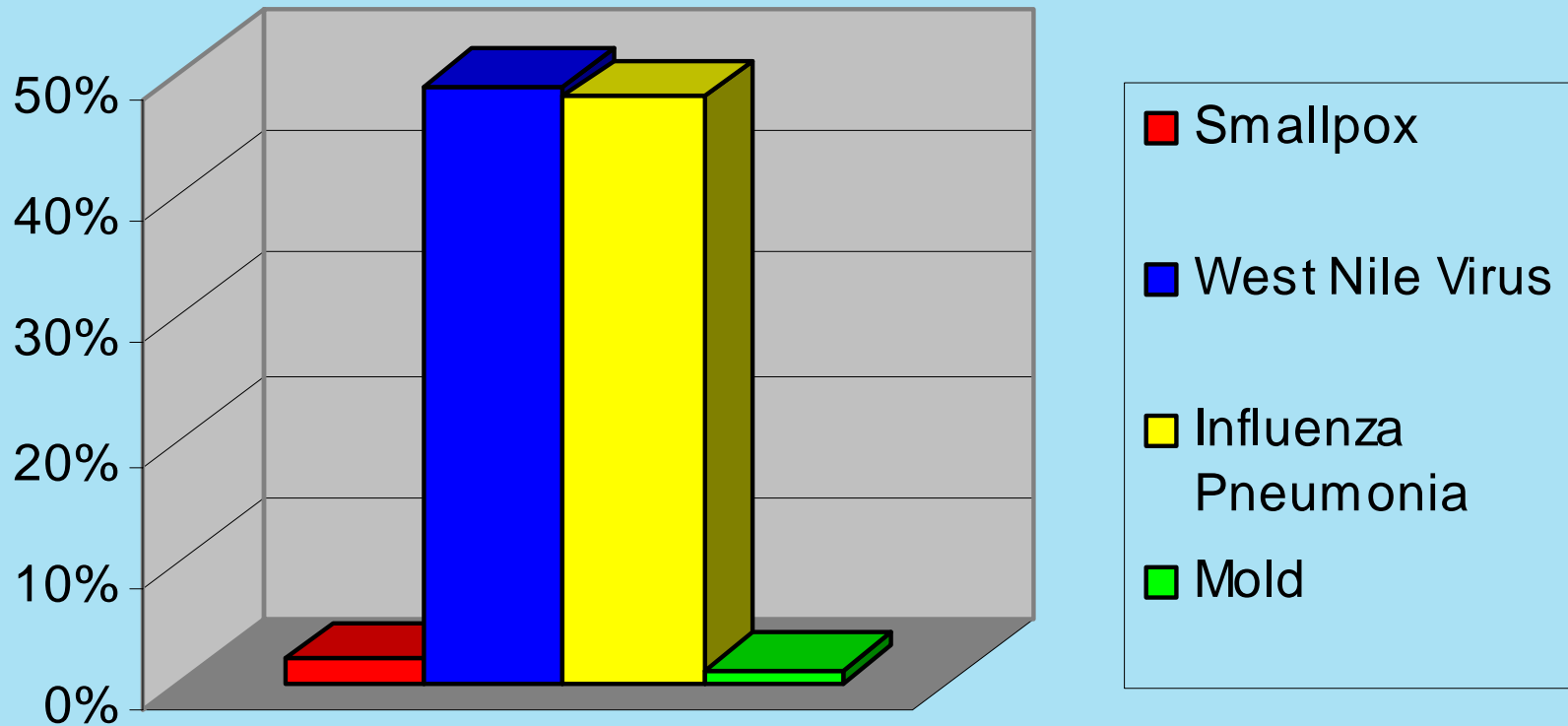2003 Total Calls = 36,361
  Smallpox = 193
  WNV = 12,555 (2,850 Dead Bird Reports)
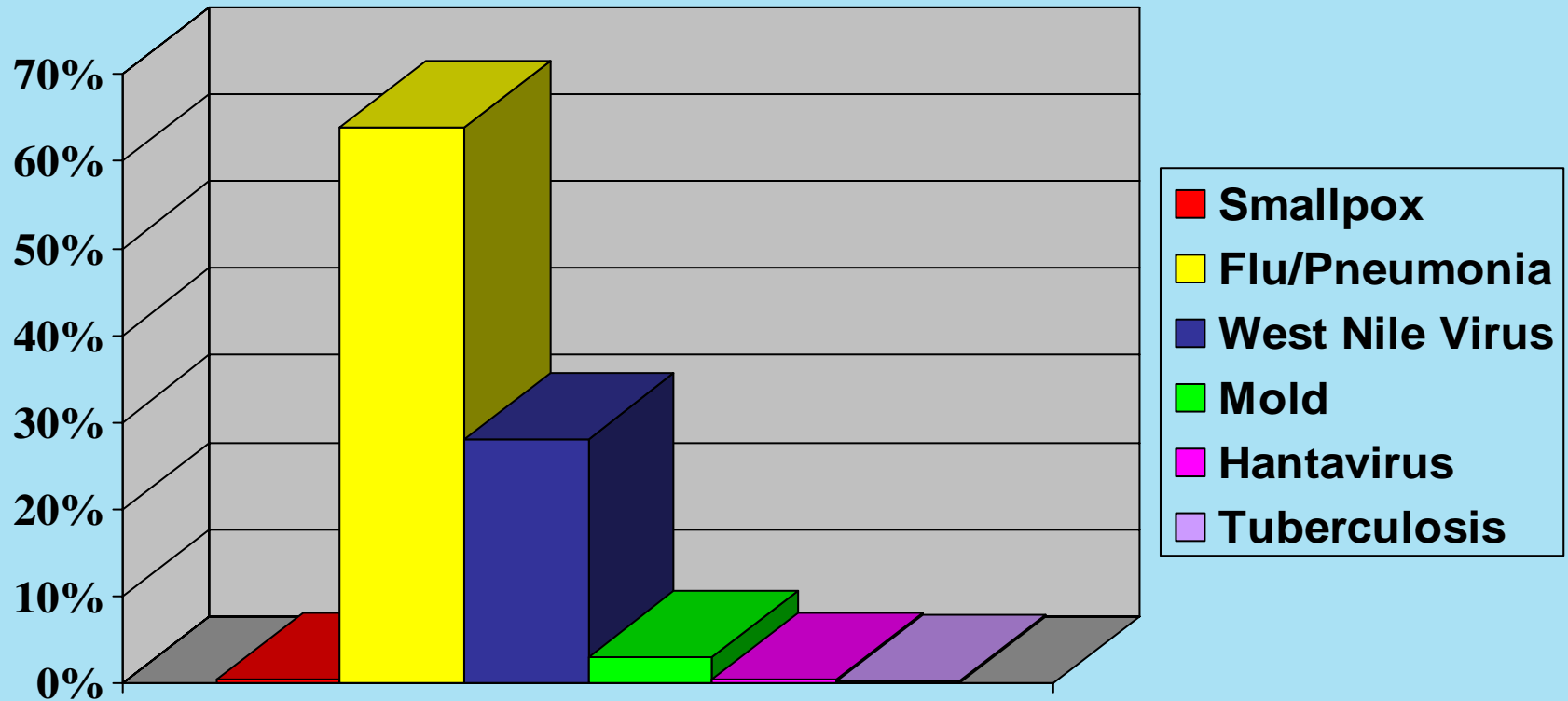 Influenza/Pneumonia/Mold = 23,613

40%

60%

☐ **Calls handled by agent**
■ **Calls handled by message**

Call Types: Agent Handled

CO HELP - 2004

Legend:
- Smallpox
- Flu/Pneumonia
- West Nile Virus
- Mold
- Hantavirus
- Tuberculosis

WNV Call Types & Issues

	2003 (07-22-03 to 10-14-03)	**2004** (06-01-04 to 09-27-04)
Calls:	6971	2993
DBR:	2850	817
Top 3 Types:	Dead Bird Reports Information Human WNV	Information Dead Bird Reports Human WNV
Top 3 FAQs:	WNV symptoms Handling dead birds Duration of symptoms	WNV symptoms Medical decision support Child/community protection
New FAQs:		[Support groups] [Ongoing WNV effects] [Herbal repellents]

INFLUENZA
Call Types & Issues

	2003	2004
	(10-01-03 to 02-28-04)	(10-01-04 to 02-28-05)

Calls: 7110 7385

Top 3 Information Call Information Call

Types: Possible Flu Health Professional

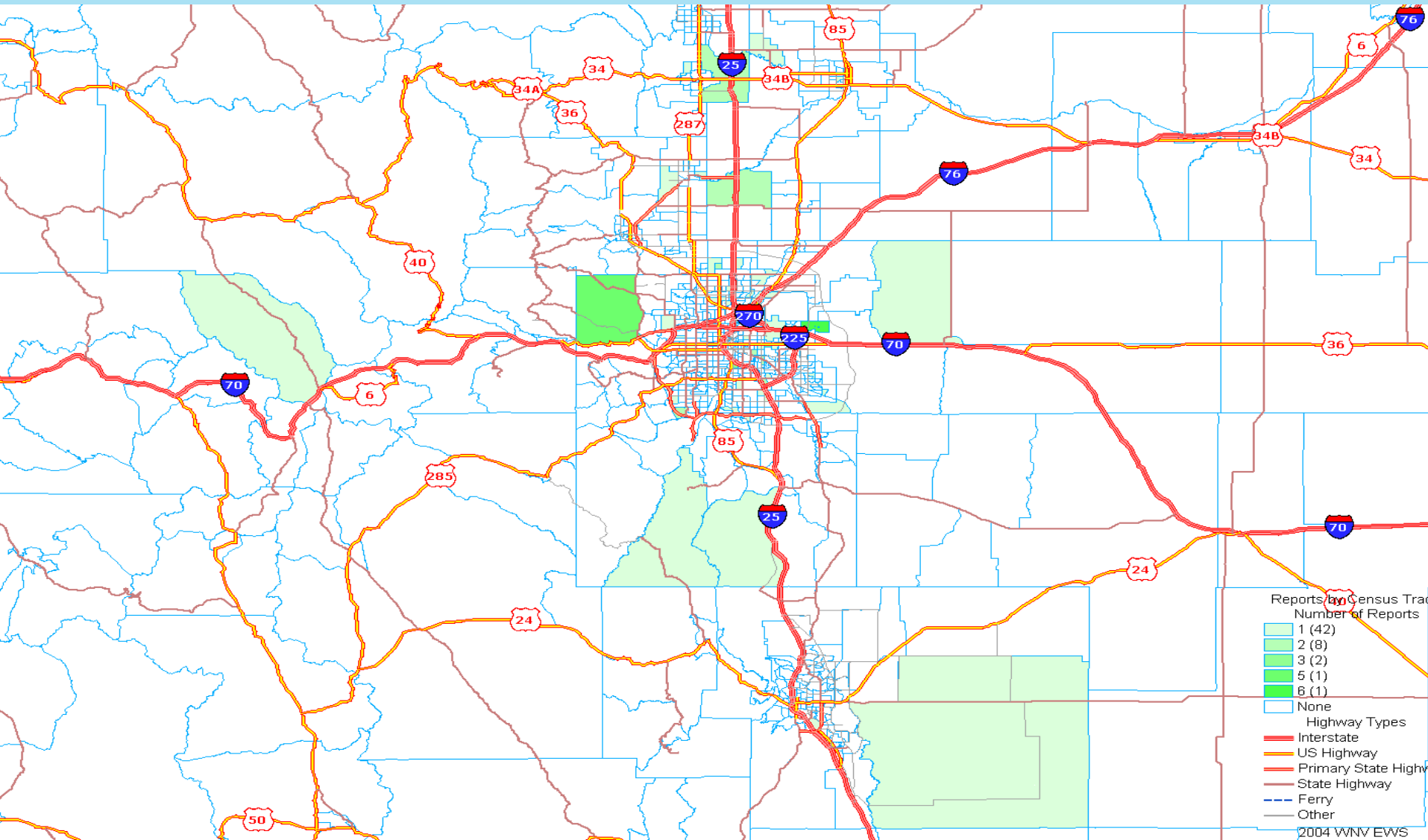Health Professional CDPHE Alert

Top 3 FAQs:
1. Where can my child get a flu shot?
2. Where can I get a flu shot?
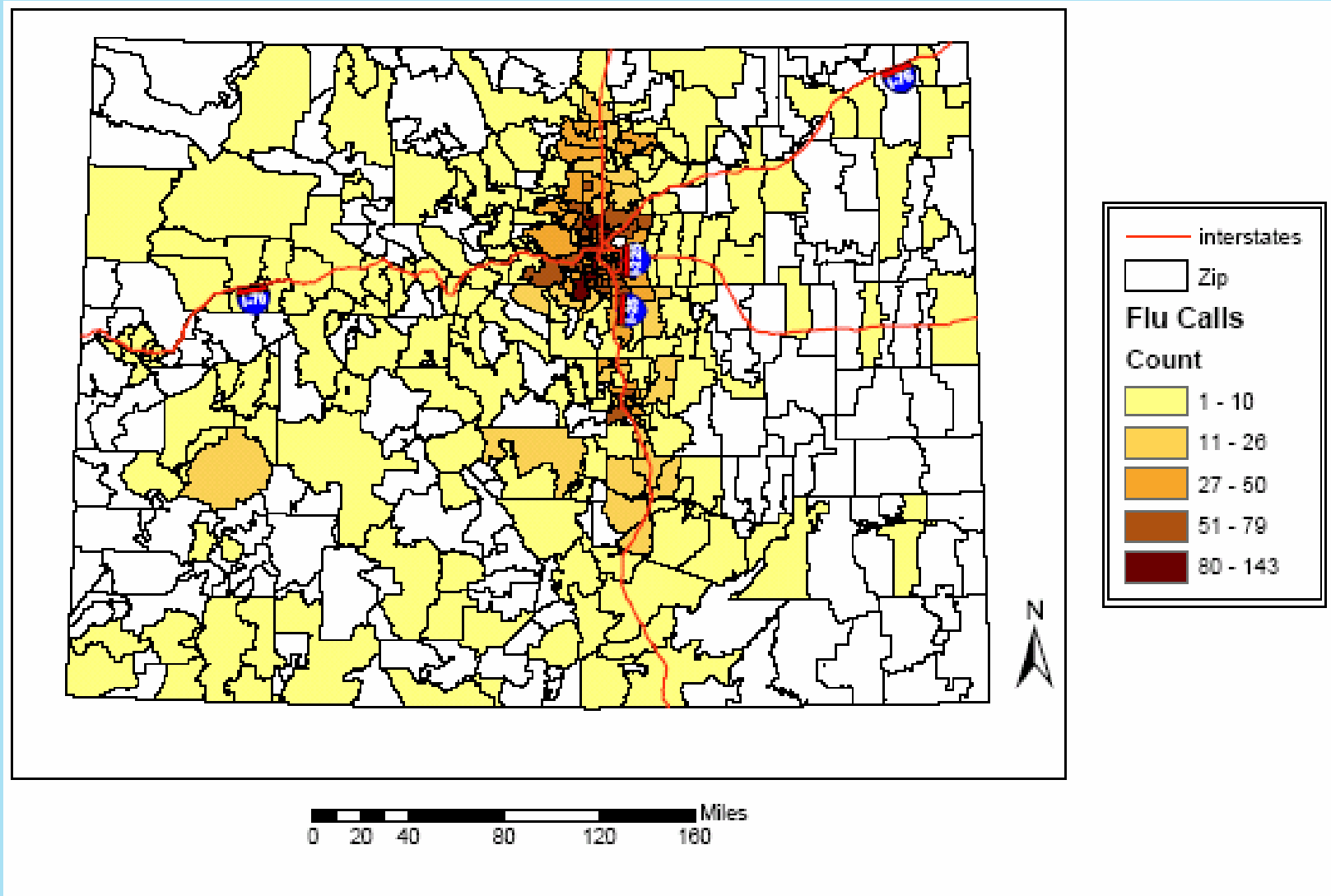3. What are the symptoms of the flu?

1. Where can I get a flu shot?
2. Vaccine Shortage Statement
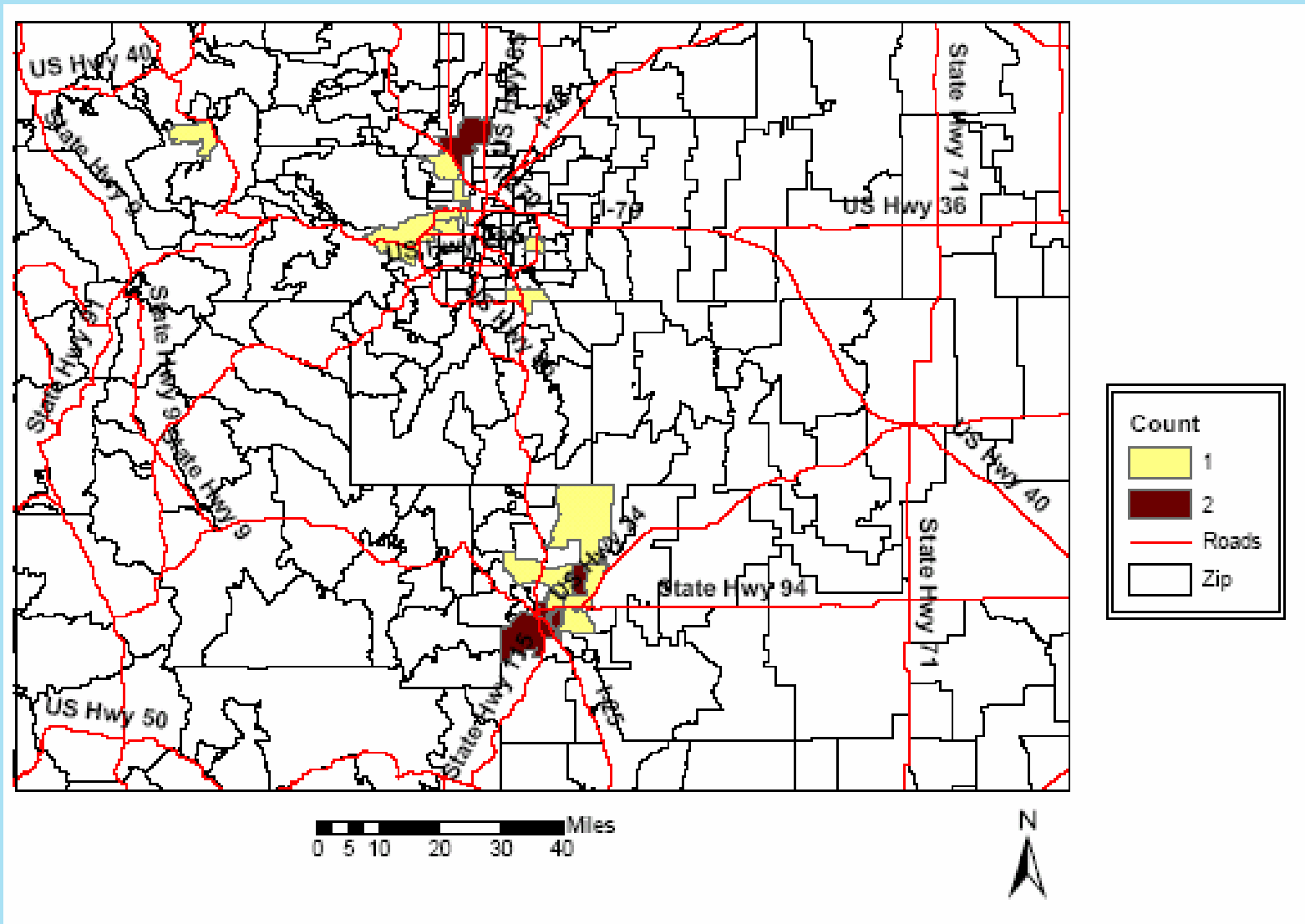3. What is FluMist?

Surveillance – Dead Bird Reports

Reports by Census Tract
Number of Reports
1 (42)
2 (8)
3 (2)
5 (1)
6 (1)
None

Highway Types
Interstate
US Highway
Primary State Highway
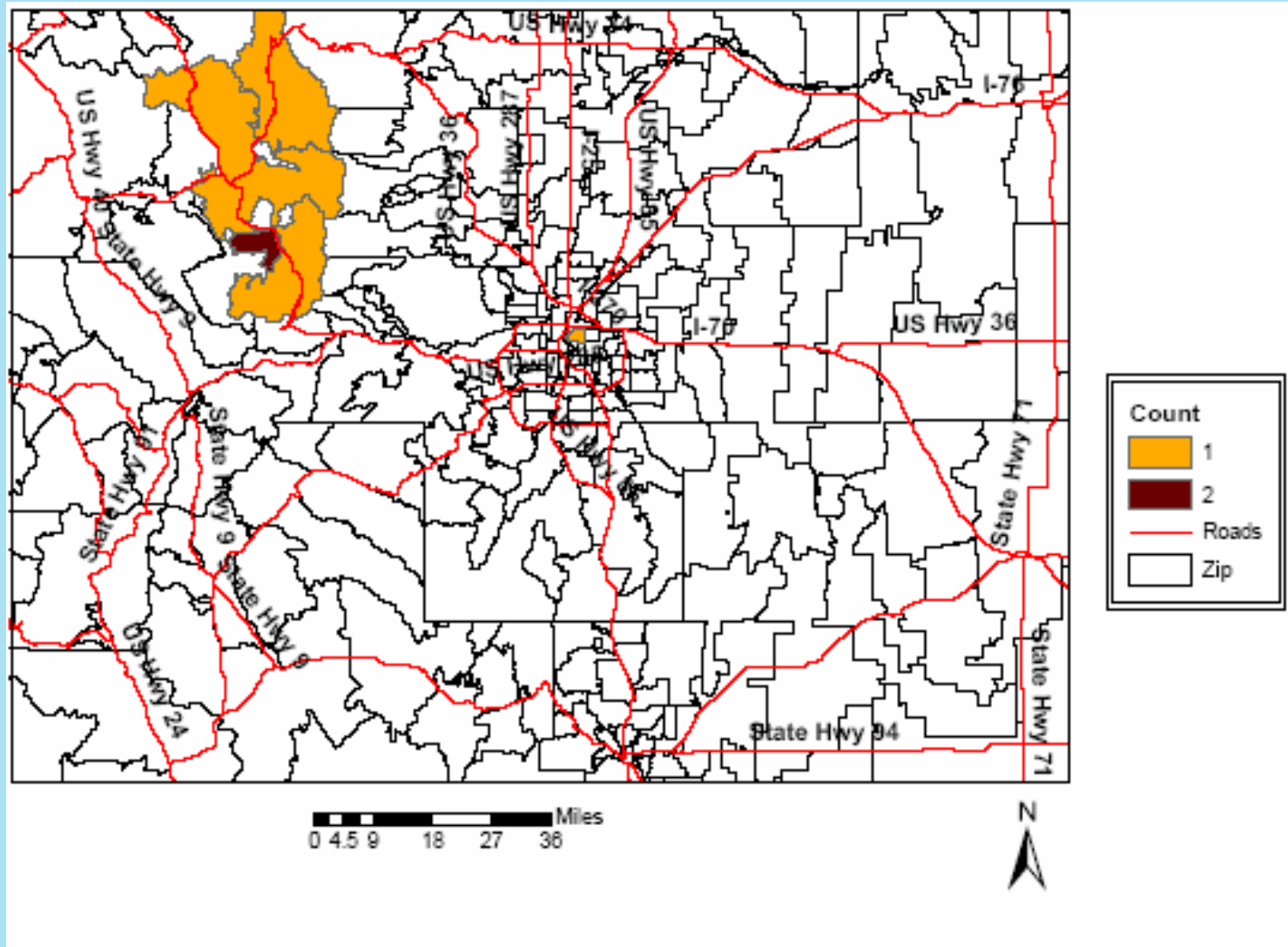State Highway
Ferry
Other

2004 WNV EWS

Influenza Calls: Nov03 to Jan04
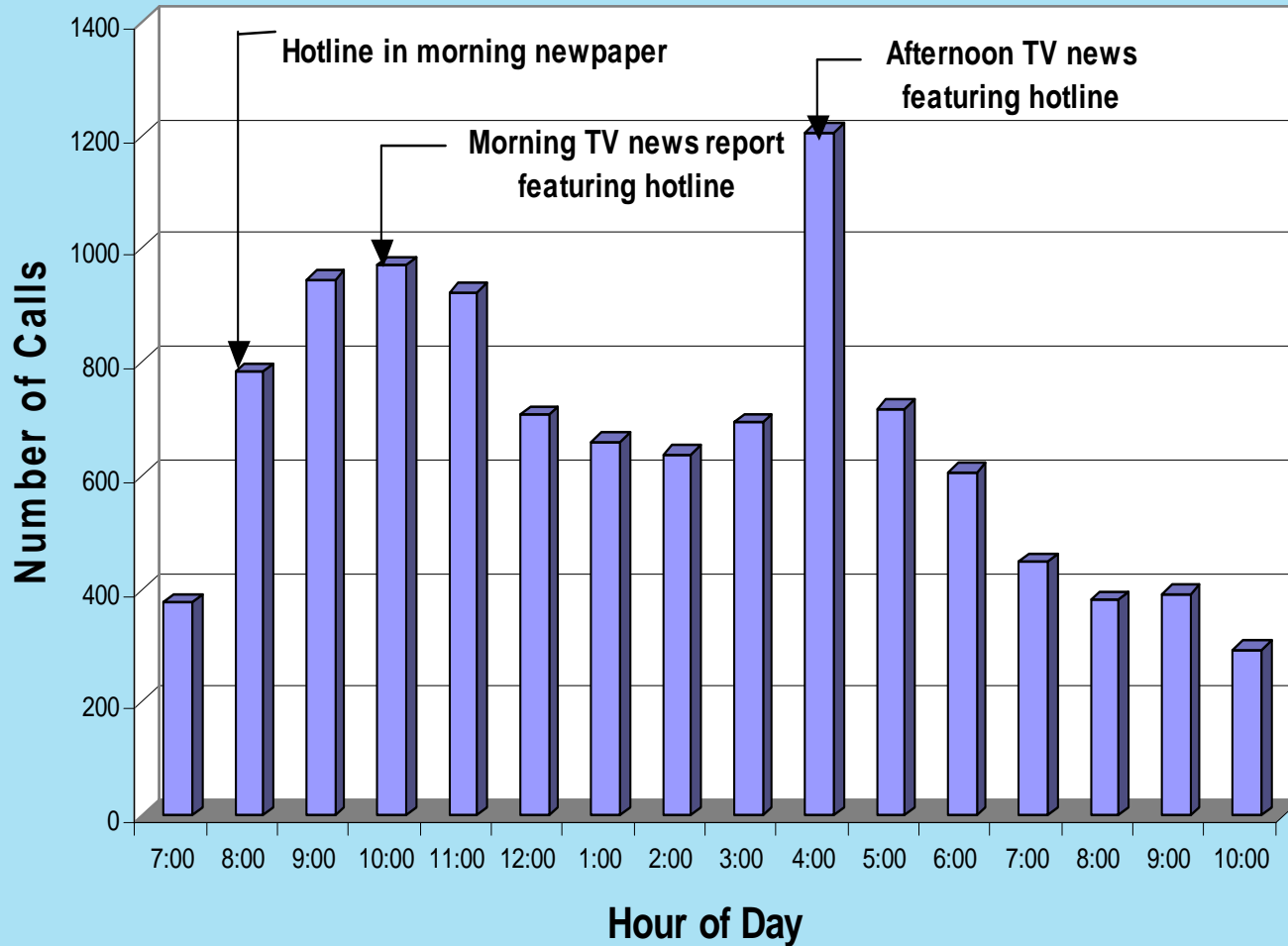
Mold Calls: July 2004 (close-up)

TB Calls: Jan to Jun 2004 (close-up)

Adaptability/Capability

- Can rapidly change FAQ content and public health messages
- Can handle surge responses
  - Recordings/Announcements
  - Partnering with media to deliver info
  - Capacity pool—trained ancillary staff
- Can learn from experiences

Hourly Call Volumes

Call surges were directly related to media announcements including the hotline.

Lessons Learned

– Call volume driven by event and media attention
– Adaptation to local health department specifics and CDPHE messages are necessary to meet both public health and public needs
– Surveillance—not the original purpose of line, became an important function
  - Ongoing surveillance
    – WNV—DBR
    – Mold Calls
  - Sentinel event system (identified new health concerns)
    – Tuberculosis
    – Hantavirus
    – White Powder
    – Mold clusters (encephalitis, county-specific)

RMPDC/CDPHE Partnership

- Model for Poison Center/State Health partnerships
  - Improves information support for public and providers
  - Improves surge capacity for health events
  - Expands surveillance signals and data collection
- Assists the New Public Health Environment
  - Increases visibility (extends response capabilities outside of Mon to Fri 8 am to 5 pm, improves access)
  - Handles rapidly evolving info while maintaining control (assists info management, improves dissemination)
  - Aids decision support (can help with health disparities and control of healthcare costs)

RMPDC/Clark County Health Dept Partnership

- CC HELP—Second partnership for our public information line

- Supported WNV season 2004 as a trial

- Tested rapid response with a Hepatitis A public health event

  - Public health information and support services were in place within 8 hrs. of notification

Clark County HELP (CC HELP)

- Hepatitis A Event
  - Event length—10 days
  - Call total—888
  - Daily alert reporting during event
  - Transition back to normal services post event
  - Full report post event
    - Call volume by hour, by day
    - Call type
    - Top 10 FAQ's
    - Zip Codes, Counties, States, Countries accessing line

Potential Roles for Health Call Centers: Related to DHS National Planning Scenarios

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&

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Planning Scenarios

1. Nuclear Detonation
2. Biological Attack – Aerosol Anthrax
3. Biological Disease Outbreak – Pandemic Influenza
4. Biological Attack – Plague
5. Chemical Attack – Blister Agent
6. Chemical Attack – Toxic Industrial Chemicals
7. Chemical Attack – Nerve Agent
8. Chemical Attack – Chlorine Tank Explosion

Planning Scenarios

9.   Natural Disaster – Major Earthquake
10. Natural Disaster – Hurricane
11. Radiological Attack –Dispersion Devices
12. Explosives Attack –Improvised Explosive Devices
13. Biological Attack – Food Contamination
14. Biological Attack – Foreign Animal Disease
15. Cyber Attack

Reviewed scenarios, potential impacts and expected community response needs

Health Call Center Capabilities

- Health information
- Disease/injury surveillance
- Triage/decision support
- Quarantine/isolation support
- Outpatient drug information & adverse drug event reporting
- Mental health assistance/referral
- Mass risk communication support

Community Response

- Community response plans should include:
  - Pre-event, mass communication campaigns to prepare public for self-triage and sustainment
  - Testing of pre-event campaign for effectiveness
  - Means to disseminate info via broadcast media
  - Telephone/internet centers with robust hardware
  - Event-specific protocols for triage, monitoring, mental health intervention, and other services
  - Referral system for home care practitioners, home diagnostic testing, and transfer to definitive care
  - Capacity to gather epidemiological data during response and for follow up

Best Scenarios for Model

   2) Biological Attack – Aerosolized Anthrax
   3) Biological Disease Outbreak – Pandemic Influenza
   4) Biological Attack – Plague
 13) Biological Attack – Food Contamination

- These four afford the opportunity to address all health call center capabilities proposed.
- Scenario-based models for these three can then be examined for how they could be adapted for other 11 scenarios.
- Using national planning scenarios will assist with development of consistent community response capabilities

Estimates of Influenza Impact

Health Outcomes	15% Gross Attack Rate	35% Gross Attack Rate
Fatalities	87,000	207,000
Hospitalizations	314,400	733,800
Outpatients Visit	18.1 million	42.2 million
Self-care Ill	21.3 million	49.7 million

GRA is the % US population with a clinical case of influenza

Exercises

- Simulation exercises
- Integrated with community response planning
  - Rural community (Q&I)
  - Urban community (CRI)
- In addition, there will be other smaller exercises to test protocols, algorithms and technology applications.

Next Steps

- Research of existing models, protocols and algorithms
- Develop scenario-based models for response
- Begin testing these models for applicability and utility
- Ask panel to refer any information to aid us in this model development phase