Welcome

Office for State, Tribal, Local and Territorial Support

presents . . .

CDC *Vital Signs*

When Food Bites Back: Act Locally, Control Nationally

June 11, 2013

2:00–3:00 pm (EDT)

Agenda

2:00 pm	**Welcome & Introductions**	**Richard Schieber, MD** Coordinator, CDC *Vital Signs* Program, CDC
2:04 pm	**Presentations**	**Benjamin Silk, PhD, MPH** Staff Epidemiologist, Division of Foodborne, Waterborne, and Environmental Diseases, National Center for Emerging and Zoonotic Diseases, CDC
		Hugh Maguire, PhD Microbiology Program Manager, Colorado Department of Public Health and Environment, Laboratory Services
		Melissa Cummings, MS Senior Epidemiologist, Division of Epidemiology and Immunization, Massachusetts Department of Public Health
2:30 pm	**Q&A and Discussion**	**Richard Schieber, MD**
2:55 pm	**Wrap-up**	**Richard Schieber, MD**
3:00 pm	**End of Call**	




CDC Vitalsigns™ **Teleconference to support STLT efforts and build momentum around the monthly release of CDC *Vital Signs***







Vital Signs
Town Hall Teleconference

Listeria Illnesses, Deaths, and Outbreaks United States, 2009–2011

Benjamin Silk, PhD, MPH

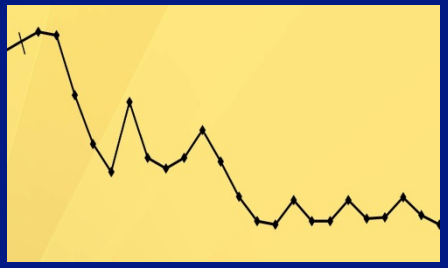
Staff Epidemiologist
Division of Foodborne, Waterborne, and Environmental Diseases
Centers for Disease Control and Prevention

June 11, 2013

Objectives of Vital Signs *Listeria* Report

1. Summarize demographic and clinical characteristics of patients with *Listeria* infection

2. Estimate rates of disease overall and in demographic subgroups



3. Describe foods associated with outbreaks of *Listeria* infection

Listeria monocytogenes

- Found in soil and water
- Transmitted through contaminated food
- Strikes most vulnerable people
- Typically causes bacteremia or meningitis
  - In pregnancy, preterm labor, fetal loss, and neonatal infection

Color-enhanced scanning electron micrograph

Burden of *Listeria* Infections

METHODS

Review of *Listeria* Surveillance Systems, 2009–2011

- *Listeria* Initiative: patients and illness
- FoodNet: rates of illness and risk factors
- FDOSS: outbreaks, foods, and settings

Characteristics of Patients with *Listeria* Infection
United States, 2009–2011

	Pregnancy-associated cases	Patients ≥ 65 years old	Non-pregnant patients < 65 years old
Number reported	227	950	474
Isolate source			
Cerebro-spinal fluid	18%	10%	25%
Blood	66%	87%	70%
Other	16%	4%	5%
Hospitalization	90%	94%	93%
Death or fetal loss	21%	24%	14%
Hispanic ethnicity	43%	7%	20%

**Listeria* Initiative, 2009-2011. Mother-infant pairs are considered a single case.

Incidence of *Listeria* Infection

Laboratory-confirmed cases per 1,000,000/year

	Cases per 1,000,000/year	Relative rate (compared with overall rate)
Overall	2.9	referent
Adults ≥ 65 years old	13	4 times higher
Pregnant women	30	10 times higher
Hispanic pregnant women	70	24 times higher

FoodNet, 2009–2011

Risk Factors in Non-pregnant Patients < 65 Years Old

- Information on comorbidities not collected regularly, but can be reported voluntarily
- ≥1 comorbidity reported for 74%
  - Immunosuppressive therapy (i.e., steroids, chemotherapy, radiation)
  - Cancer
  - Other conditions

- In all, >90% of reported patients were pregnant, ≥ 65 years old, or had underlying medical condition

FoodNet, 2009–2011

Listeria Outbreaks
United States, 2009–2011

- **12 outbreaks reported**
  - 224 outbreak-associated cases
  - 38 states involved
- **Cheese: 6 outbreaks**
  - Soft cheeses: 5 outbreaks
  - Mexican-style soft cheeses: 4 outbreaks
- **Raw produce: 2 outbreaks**
  - Pre-cut celery
  - Cantaloupe

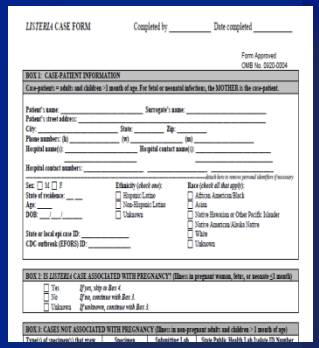
FDOSS, 2009–2011

PulseNet and the *Listeria* Initiative: State/local health dept. participation is everything!

- PulseNet (1998) and *Listeria* Initiative (2004) now established and proven nationally

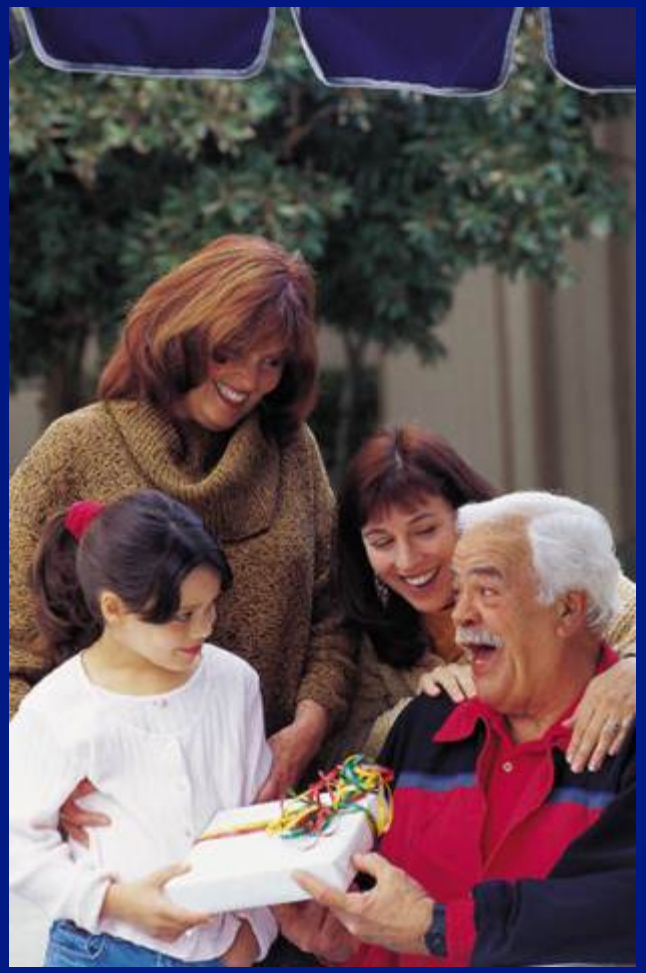
- Steady gains in participation from 2004 to 2011
  - A three-fold increase in the percentage of patients whose *Listeria* Initiative report, included DNA fingerprinting result (21% to 69%)
  - A nearly five-fold increase in number of states reporting *Listeria* cases (10 to 47 states)

- Rapid outbreak detection and respond prevents illness and saves lives


LISTERIA CASE FORM

Summary

- *Listeria* targets our most vulnerable groups of people
- We have made some progress but rates of *Listeria* infection have not declined in >10 years
- Making food safer for people at their most vulnerable ages and stages of life makes it safer for everyone



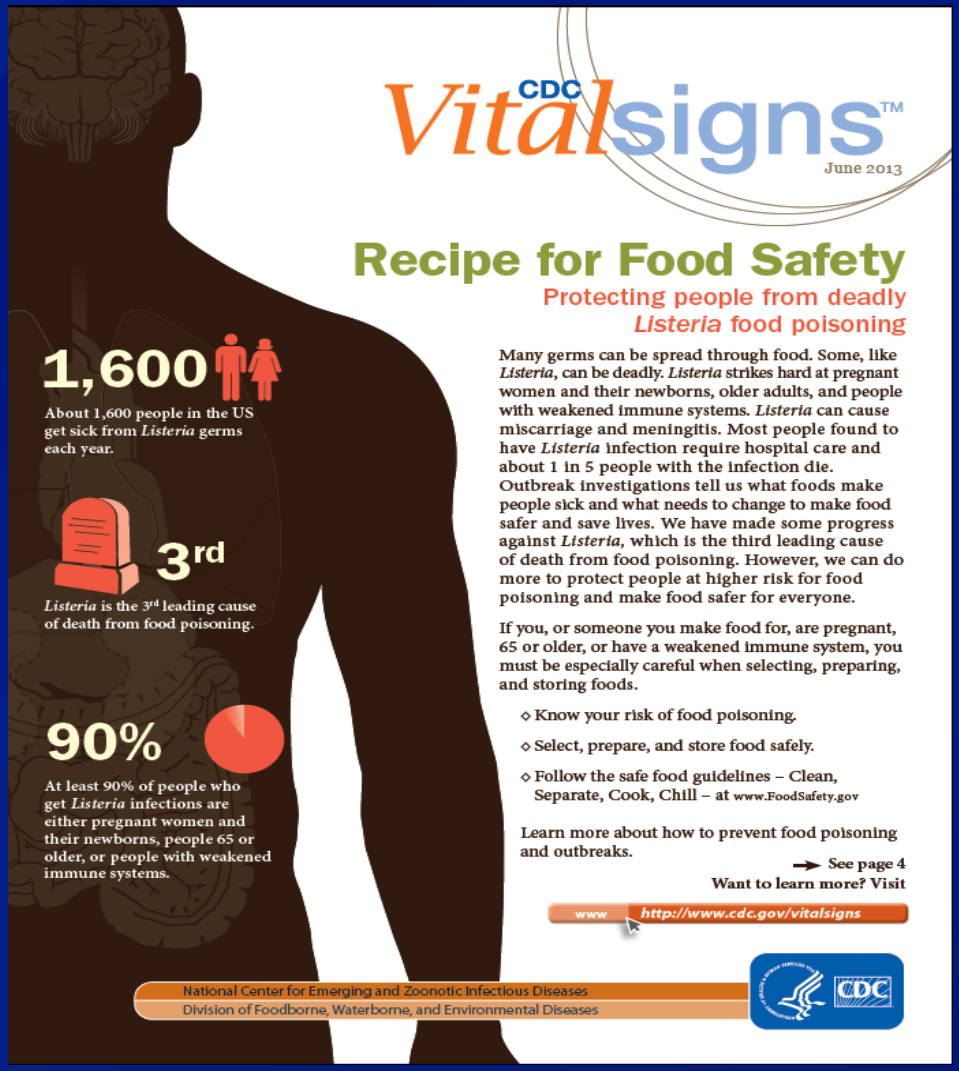
What is *Vital Signs*?

More than data…it's about protecting vulnerable people

Vital Signs Fact Sheet

4 pages of important consumer-friendly information

- Key statistics
- Overview of problem
- Basics of prevention
- Invitation to learn more…



For more information, please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: http://www.cdc.gov

From the Field: Environmental Microbiology Laboratory Capacity Building

Hugh Maguire

Vital Signs Town Hall Teleconference

June 11, 2013

Colorado Department of Public Health and Environment

Environmental Microbiology Unit

- Four staff members
  - Three classically trained microbiologists, each with ≥20 years on staff
- Food, milk, water, and environmental testing
- Unit holds certification from FDA and EPA
- Collaboration with Public Health Microbiology unit (clinical isolates)
  - Shared instrumentation

Colorado Department of Public Health and Environment

Capacity Building

Colorado Department of Public Health and Environment

- Staff re-organization
  - Temporary staff and APHL fellows
- Intensive cross-training to include molecular-based testing
- Use of technology and instrumentation available in other work units
  - Resource sharing
- Electronic data transfer
  - Internal/external
- Funding flexibility from various sources (EIP, ELC, FDA, CO general fund, fee/service testing)

Integrated Resources

- PulseNet
- Epidemiology—Enhanced surveillance system; extended questionnaires
  - Food history
- Federal partnerships—CDC, FDA, USDA FSIS
- Local public health agencies

Colorado Department of Public Health and Environment

Live Challenge of System

Colorado Department of Public Health and Environment

- *Listeria monocytogenes* outbreak linked to cantaloupe
- Combined efforts of staff, APHL fellow, temporary staff using molecular methods and new instrumentation
- Isolates available from both clinical and food
  - PulseNet uploads and MLVA data
- Identified four outbreak patterns
  - Three linked to clinical illness
- Enhanced surveillance system and extended questionnaire of food consumption history
- Coordinate regulated response
  - All partners

Key Elements

Colorado Department of Public Health and Environment

- Continuous funding streams
  - Priority is federal-level support
- New instrumentation
  - Broad scope and high capacity
- Coordinated surveillance program with communicable disease epidemiologists and environmental health specialists
- Guidance documents for public health partners
- Active partnership with regional FDA laboratory

Contact Information

- Hugh Maguire, PhD, Program Manager, Microbiology, Colorado Department of Public Health and Environment, Laboratory Services Division
- Email: hugh.maguire@state.co.us
- Phone: 303-692-3494

Colorado Department of Public Health and Environment

Post-Pasteurization Contamination of Milk by *Listeria monocytogenes* in Massachusetts

Melissa Cumming, MS
Division of Epidemiology and Immunization
Bureau of Infectious Disease
Massachusetts Department of Public Health
Melissa.Cumming@state.ma.us

MDPH Working Group on Foodborne Illness Control (WGFIC)

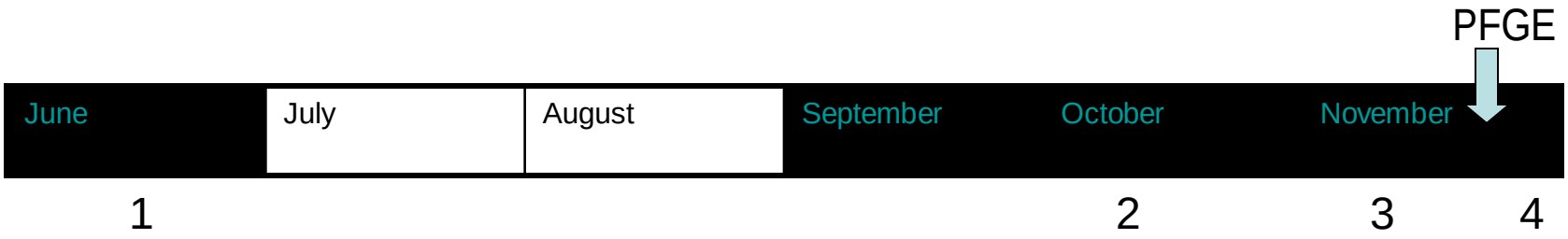
- Formed in 1986
- To respond to foodborne outbreaks in a timely, comprehensive, and collaborative manner
- Consisting of representatives from:
  - Epidemiology
    - Gather case information
  - Food Protection Program (FPP)
    - Conduct investigation of suspect establishment and focus on how contaminated food reached the consumer
  - Laboratory
    - Analysis of food and clinical samples
- Meet bi-weekly
- Shared access of investigational and case data

Background on *Listeria* in Massachusetts and 2007 Outbreak

- On average, 25–35 cases/year in Massachusetts
- For 2007, n=33 confirmed cases
  - (Mother/newborn = 1 case)
- For 2007, isolates never sent to Hinton State Laboratory Institute (SLI) for 11 cases, thus no Pulsed Field Gel Electrophoresis (PFGE) testing could be performed
- Of the 22 (2007) isolates submitted for PFGE testing, only four had patterns that matched the outbreak strain
- This outbreak represented only the third instance in 30 years where pasteurized milk was implicated in human infection with *Listeria monocytogenes*

Case Identification Timeline

- June 19 — Lab report received at MDPH for **Case #1; a 78 year old male**
- October 12 — Lab report received at MDPH for **Case #2; a 75 year old male**
- November 5 — Lab report received at MDPH for **Case #3; mother/baby pair**
- November 20 — The lab reported that clinical isolates from all three cases had matching PFGE patterns using two restriction enzymes
  - *MDPH = Massachusetts Department of Agriculture Resources*
  - *These cases were posted to the National Web Board, but they were not assigned a national cluster code because they were >120 days apart.*
- November 27 — A local health agent reported **Case #4; an 87 year old male**
  - *Food history included unpasteurized cider and pasteurized, coffee-flavored milk both purchased at a local farm stand; food samples submitted for testing*



Laboratory Results: Food

- On December 21, the PFGE lab confirmed that the *Listeria monocytogenes* that grew from the opened, coffee-flavored milk matched (using two restriction enzymes) the outbreak pattern

- On December 27, the lab indicated a presumptive positive result for *Listeria* in one of the unopened containers of coffee-flavored milk collected from the dairy on December 19

Response

Recall

- As a result of these findings, the dairy agreed to a voluntary cessation of operations and a recall of all products on December 27, 2007

Environmental

- On December 26, 2007 FPP conducted full environmental inspection
  - Cooperation with Food and Drug Administration (FDA) and Local Board of Health (LBOH)
  - Inspection occurred over multiple days
  - Collected more than 100 samples of milk and environmental swabs
  - Conducted review of all procedures, mandatory recording charts, inspection of facilities, and sanitizing process

Background on Dairy

- Maintained a herd of 300 cows on farm in Central Massachusetts
- Raw milk transported by truck to 50-year-old processing facility in nearby town
- Produced a variety of flavored and non-flavored milk products in plastic and glass bottles
- Retail outlets at the dairy and farm
- Sold through home delivery and other retail sites
- Dairy brand as well as other “custom” brands
- Routinely inspected by Massachusetts Department of Agriculture
- Compliant with FDA Interstate Milk Shippers Program (IMP)

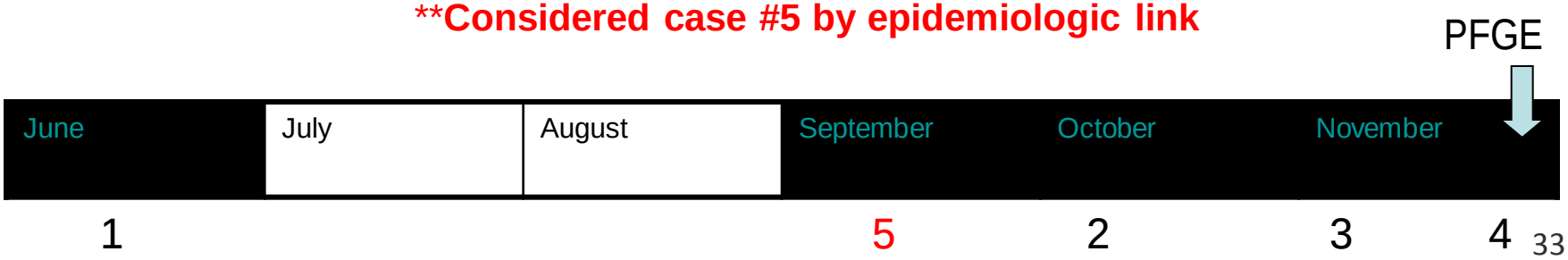
Additional Case Identified

- The potential existed that cases for whom no isolate was submitted for PFGE testing, were linked to the outbreak
- Epidemiologists systematically contacted and interviewed the 11 (2007) cases for whom no isolates were submitted

Identified:

- 31 year old female from Middlesex County who presented a fever and pre-term labor on 9/05/07
  - Delivered a healthy, pre-term infant
  - Placental and maternal blood cultures were positive for *Listeria monocytogenes*
  - No isolate submitted to SLI by hospital lab
  - Interview revealed that the case drank 2% and whole milk produced by the implicated dairy throughout her pregnancy

****Considered case #5 by epidemiologic link**



Outbreak Morbidity and Mortality Summary

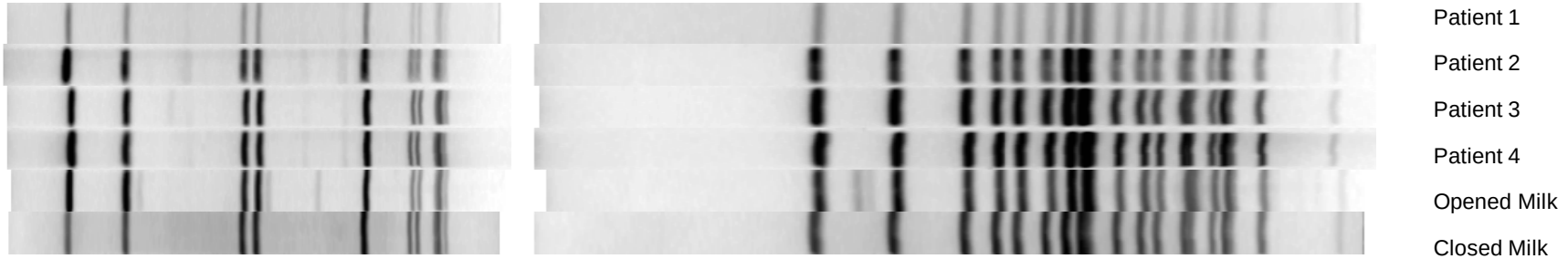
- **Outbreak-Associated Case Total: 5**
  - Three fatalities (all ≥ 75 y)
  - 34 year old female had a stillborn at 37 weeks gestation
  - 31 year old female delivered a premature, but healthy baby

Laboratory Result Summary

- ***Listeria monocytogenes* matching the outbreak strain grew in 8 milk samples and one environmental swab**
  - Positive swab from floor drain near homogenizer unit

- An additional 4 milk samples and 2 environmental swabs grew *L. monocytogenes* and other *Listeria* species that did not match outbreak strain
  - Positive swabs from shield in bottle washer and fill room floor drain

PFGE-AscI **PFGE-ApaI**



Conclusions

- **Without the use of molecular typing detection of outbreak would have taken much longer to identify** or would not have been identified at all
- **Outbreak exposed a gap in isolate submission.** Although requested, all *Listeria* isolates were not being routinely submitted to MDPH for PFGE testing
- Because listeriosis is a “tip of the iceberg” disease, **contamination can occur for a prolonged period of time, before enough evidence of a problem is apparent**
- In the investigation of this outbreak, several distinct strains of *Listeria* were found in both the environment of the dairy and pasteurized milk samples, suggesting **post-pasteurization contamination can go undetected**

Outcomes and Accomplishments

- Following the outbreak, regulations were instituted that required clinical laboratories in MA to submit **all** *Listeria* isolates to SLI for PFGE testing

- The number of *Listeria* isolates uploaded and cases reported to national surveillance systems increased four-fold from 2007 to 2011

- Food laboratory capacity was bolstered and an increased emphasis was placed on food testing resulting in an approximately three-fold increase in the number of food samples submitted for testing in the food laboratory at SLI, from approximately 100 specimens/year to 300

CDC *Vital Signs* Electronic Media Resources

Become a fan on Facebook

www.facebook.com/cdc

Follow us on Twitter

twitter.com/CDCgov/

Syndicate *Vital Signs* on your website

http://tools.cdc.gov/syndication/search.aspx?searchURL=www.cdc.gov%2fvitalsigns

Vital Signs interactive buttons and banners

www.cdc.gov/vitalsigns/SocialMedia.html

Public Health Practice Stories from the Field

- Stories about the implementation of Public Health Practice Stories from the Field

www.cdc.gov/stltpublichealth/phpracticestories

Provide feedback on this teleconference:
OSTLTSFeedback@cdc.gov

Please mark your calendars for the next

***Vital Signs* Town Hall Teleconference**

July 9, 2013

2:00–3:00 pm (EDT)

For more information, please contact Centers for Disease Control and Prevention.

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Email: cdcinfo@cdc.gov Web: www.cdc.gov