Disaster Surveillance: Hurricane Katrina, New Orleans, 2005

灾难监测: 卡特利那飓风 新奥尔良，2005

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Surveillance Timeline
监测时间段

LDHH implements ER Surveillance

LDHH负责突发事件监测

Hurricane Katrina

卡特利那飓风

CDC/ LDHH implements enhanced surveillance

CDC/LDHH负责强化监测

Hurricane Rita

瑞塔飓风

CDC/LDHH implements automated ED-based syndromic surveillance

CDC/LDHH负责自动化ED为基础的症状监测

Surveillance Questions
实施监测的问题

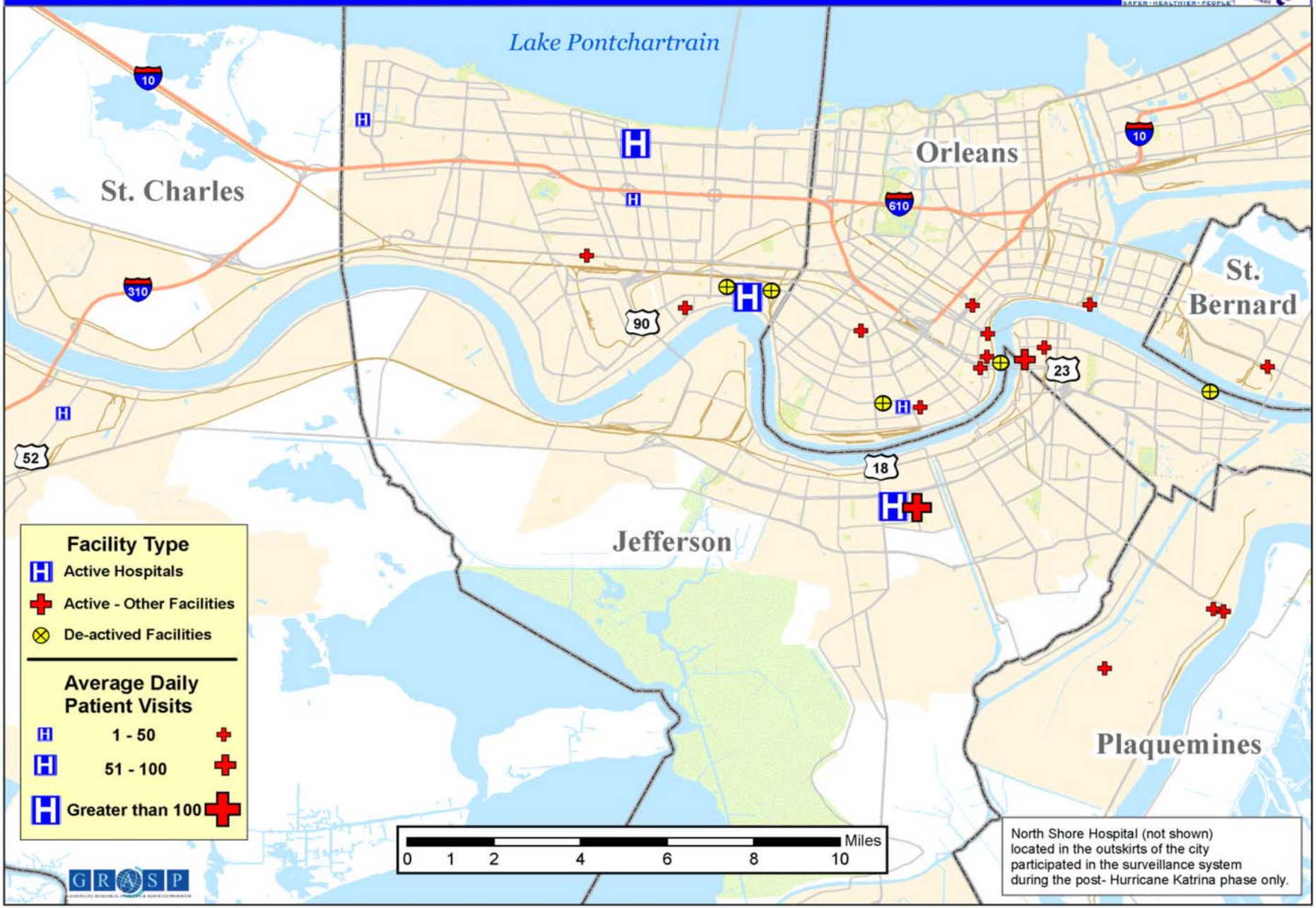
- What specific injuries and illnesses?
  会出现哪些特别的伤害和疾病？
- Identify clusters and outbreaks?
  有没有群聚性和暴发性？
- What are common etiologies for injuries?
  带来伤害的共因是什么？
- Are there differences in morbidity between residents and relief workers?
  居民和救援者的发病率是否不同？

Active Surveillance
主动监测

- Target population: persons New Orleans metropolitan area
  目标人群：在新奥尔良城区的人们
- All acute care facilities
  急救机构包括：
  - 8 Hospitals
    8所医院
  - 6 Disaster Medical Assistance Teams (DMAT)
    6支灾难医疗救助队（DMAT）
  - 5 Community clinics and first aid stations
    5个社区门诊部和急救站
  - 10 Military or other treatment facilities (e.g., MASH, EMEDS)
    10个军方或其他治疗机构(如, MASH, EMEDS)

Facilities Providing Acute Medical Care in the New Orleans Area

Average Daily Patient Visits: Sep. 25 - Oct. 15, 2005



Surveillance Form
监测表

- Demographics
  人口统计学数据
- Epidemiology
  流行病学
- Injury/illness categories
  伤害/疾病分类
- Detailed etiology and outcome questions
  详尽的病因学和结果询问
- Severity
  严重程度
- Disposition
  处置结果

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Hurricane Katrina Surveillance–State of Louisiana Department of Health and Hospitals — Injury and Illness Report v1.3LA

1. Name *(Last, First, Middle Initial)*:

2. Race: [1] White [2] Black [3] Other [4] DK/NS

3. Hispanic or Latino? [1] YES [2] NO

4. Home address before hurricane: STREET CITY STATE ZIP CODE

5. Name of facility/station:

6. Date of visit: _____/_____/2005 (MONTH / DAY)

7. DOB: MONTH (MM) DAY (DD) YEAR (YYYY)

8. SEX: M F

9. Medical Record No.:

10. Relief worker or responder? [1] YES → [1] Paid civilian [2] Paid military [3] Self employed [4] Volunteer; [2] NO

11. Reason for contact:
- [1] An **Injury** → **Complete Q12 — Q17, 'Injury' and Q22 — Q23**
- [2] An **Illness** → **Complete Q18 — Q21, 'Illness' and Q22 — Q23**
- [3] **Both** an illness and an injury → **Complete Q12 — Q23**
- [4] **Medication refill** → **STOP**
- [5] **Routine or follow-up care visit** → **STOP**

Injury

12. Date and time of **injury**:

_____/_____/2005 at _____ [1]AM [2]PM [9]Unknown (MONTH / DAY)

13. Location at the time of injury:
- [01] Car, pickup truck, or van
- [02] Heavy transport vehicle
- [03] Boat or watercraft
- [04] Outside
- [05] Manufactured/mobile home
- [06] Single-/multiple-family home
- [07] Public or commercial building
- [99] Unknown
- [88] Other:_____

14. Activity at time of injury *(Mark all that apply)*
- [01] Evacuating from hurricane/flood
- [02] Attempting rescue or recovery
- [03] Swimming, wading, or floating
- [04] Operating power generator
- [05] Operating power tool(s)
- [06] Cleaning-up
- [07] Repairing buildings, utilities, etc.
- [99] Unknown
- [88] Other: _____

15. Primary Mechanism of Injury
- [01] Motor-vehicle crash
- [02] Struck by/against or crushed
- [03] Stab/cut/pierce
- [04] Poisoning/toxic effects
- [05] Drowning/submersion
- [06] Lightning
- [07] Electrical current
- [08] Fall, *specify*: _____
- [09] Bite or sting
- [10] Exposure to natural heat
- [11] Exposure to natural cold
- [12] Exposure to smoke and fire
- [13] Contact w/ hot object or substance
- [14] Intentional, self-inflicted harm
- [15] Violent behavior
- [99] Not recorded/undetermined
- [88] Other:_____

16. Anatomic Place of Injury *(Primary reason for seeking medical care)*
- [1] Head/face
- [2] Spine/back/neck
- [3] Thorax/upper abdomen
- [4] Lower abdomen/pelvic
- [5] Upper extremity
- [6] Lower extremity
- [7] Multiple sites
- [9] Not recorded/undetermined
- [8] Other:_____

17. Nature of the Injury *(Primary reason for seeking medical care)*
- [01] Laceration, abrasion
- [02] Brain injury/concussion
- [03] Impalement/foreign body
- [04] Strain/sprain/dislocation
- [05] Fracture
- [06] Burn
- [07] Bruise/contusion
- [08] Bite/sting, *specify*:_____
- [09] Carbon monoxide poisoning
- [10] Sexual assault
- [99] Not recorded/undetermined
- [88] Other:_____

Illness

18. Date and time of **symptom onset**:

_____/_____/2005 at _____ [1]AM [2]PM [9]Unknown (MONTH / DAY)

19. Chief complaint *(Mark all that apply)*:
- [01] Chest pain
- [02] Shortness of breath
- [03] Asthma/Wheezing
- [04] Cough/congestion
- [05] Fever
- [06] Nausea/vomiting
- [07] Diarrhea
- [08] Abdominal pain
- [09] Headache
- [10] Musculoskeletal pain
- [11] Elevated blood pressure
- [12] Skin condition or rash
- [13] Extreme fatigue/weakness/exhaustion
- [14] Anger, voicing threats, or acting out
- [15] Altered mental status/LOC
- [16] Seizure or other neurological
- [17] Distress, insomnia, or emotional numbing
- [88] Other: _____

20. Primary Clinical Impressions
- [30] Dehydration
- [31] Heat illness, not dehydration *(e.g., heat stroke)*
- [32] Febrile illness
- [33] Heart disease *(e.g., heart attack)*
- [34] Cerebrovascular disease *(e.g., stroke)*
- [35] Hyperglycemia, hypoglycemia, or diabetes mellitus
- [37] Chronic lower respiratory disease *(e.g., asthma, COPD)*
- [39] Gastroenteritis/diarrhea → ☐ body ☐ tery
- [40] Gastritis or other GI condition, not gastroenteritis
- [41] Acute respiratory illness → ☐ RI ☐ I
- [42] Carbon monoxide poisoning
- [44] Drug use or seeking
- [45] Depression, anxiety, or adjustment disorder
- [46] Psychotic, suicidal, or homicidal
- [50] Rash
- [38] Skin or wound infection
- [43] Other infectious disease: _____
- [88] Other: _____
- [99] Not recorded/undetermined

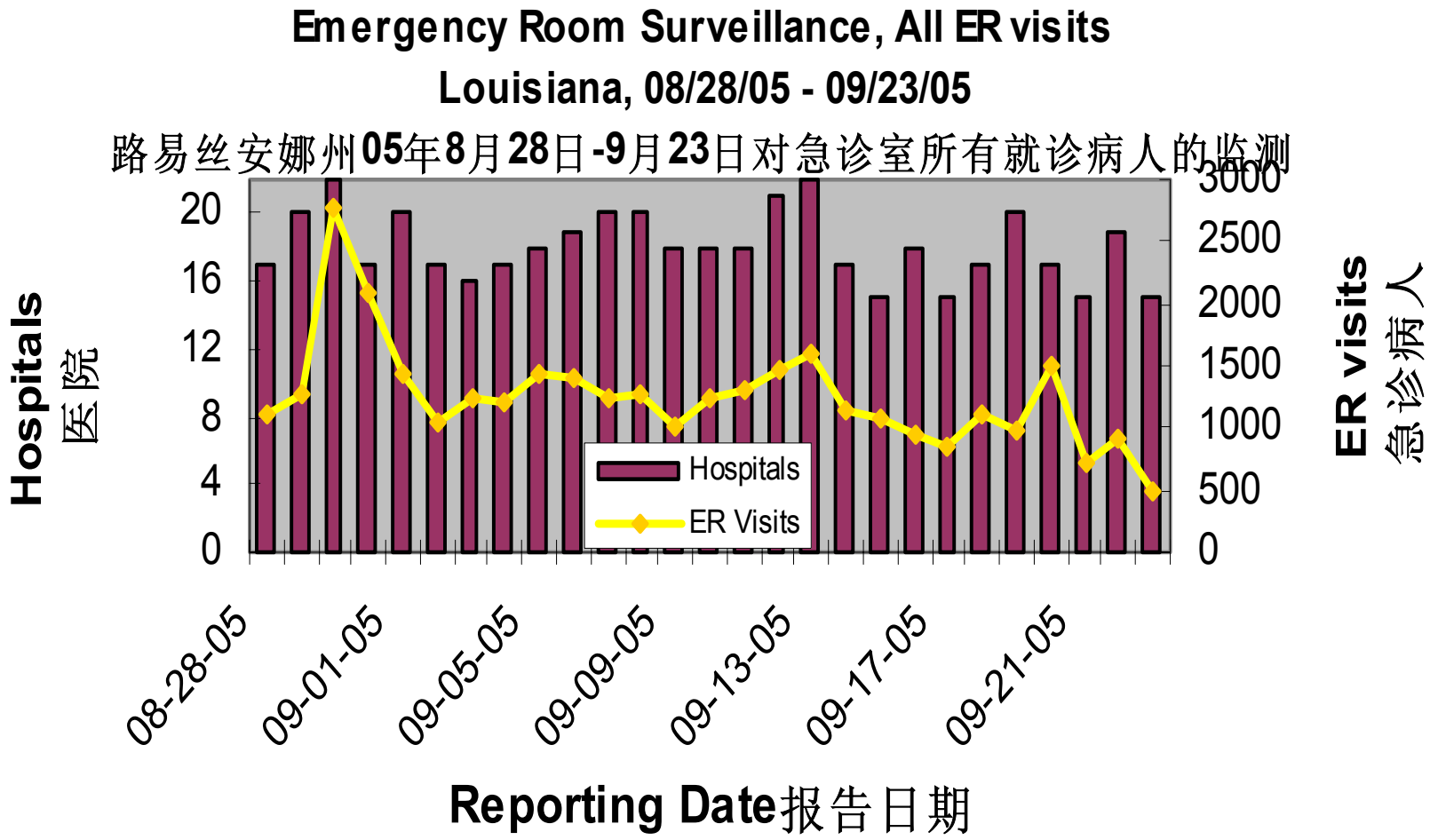
21A. Is this due to a complication of a pre-existing condition? [1] YES [2] NO [9] Unknown

21B. If ***YES*** — Indicate condition:

22. Severity
- [1] Minor
- [2] Moderate, some skilled Tx
- [3] Severe, intensive med/surgical Tx
- [4] DOA

23. Disposition
- [1] Discharged
- [2] Left w/o treatment
- [3] Left/AMA
- [4] Transferred
- [5] Expired
- [6] Admitted
- [9] Unknown

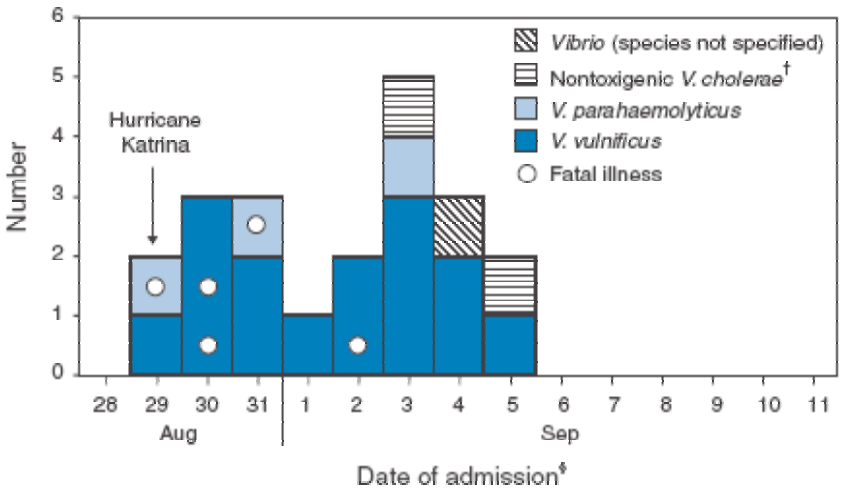
Emergency Department Surveillance
急诊室的监测工作



Detection of *Vibrio* illness
霍乱弧菌的检测

路易斯安娜州22例感染*V. vulnificus, V. parahaemolyticus,* and nontoxigenic *V. cholerae* （5例死亡），7例伤口感染。

FIGURE 1. Cases of post-Hurricane Katrina *Vibrio* illness among residents of Louisiana and Mississippi,* by date of hospital admission — United States, August 29–September 11, 2005



*N = 22; Alabama, a third state under surveillance, reported no cases.
†Nontoxigenic *V. cholerae* illnesses represent infections entirely distinct from the disease cholera, which is caused by toxigenic *V. cholerae* serogroup O1 or O139.
§Date of admission was not available for one Louisiana resident. In cases that did not require hospitalization, the date represents the first contact with a health-care provider for the illness.

by V
assc
cases in Louisiana.

FIGURE 3. Primary septicemic skin lesions caused by *Vibrio vulnificus*

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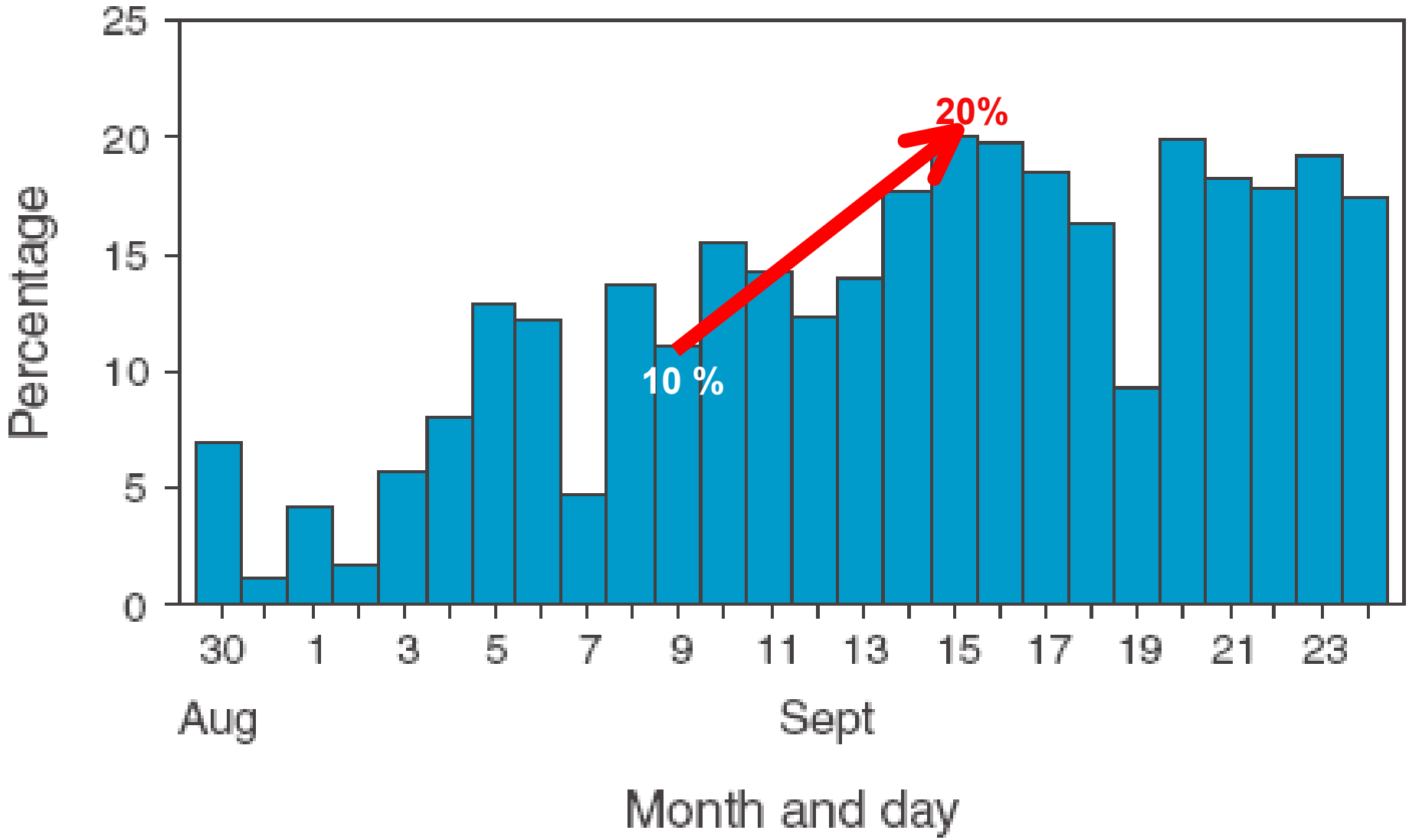
FIGURE. Proportion of acute respiratory infections among reported illnesses after Hurricane Katrina — New Orleans, Louisiana area, August 30–September 24, 2005



Increase in Acute Respiratory Infections
急性呼吸道感染病例增加

- Stratified analyses determined:
  决定在以下地点进行分层分析：
  - Among DMAT and military acute care stations
    灾难救助队和军方急救站
  - National Guard battalion
    国家护卫队
- Prompted epidemiologic investigation
  快速的流行病学调查
  - Perhaps viral transmission among soldiers in close quarters
    在封闭性营地的士兵中病毒传播的可能性

Rash Investigation
皮疹调查

- Increase in all facilities over time
  随着时间推移，所有医疗救助站的皮疹患者数量增加
- High prevalence among relief workers
  救援者中高流行
- Prompted epidemiologic investigation
  快速的流行病学调查
  - Non-infectious
    非传染性
  - Classified as: prickly heat, arthropod bites and fiberglass exposure
    分类：痱子、虫咬和玻璃纤维过敏

Active Surveillance Totals
主动监测合计

- Between September 9 and October 15:
  9月9日至10月15日期间：
  - Approximately 25,000 surveillance case report forms completed and analyzed
    完成了约25,000份监测表并进行了分析
  - Potential infectious disease (diarrhea, ARI, wound infectious) accounted for 18%
    潜在的传染性疾病（腹泻、ARI、伤口感染）占18%
  - Injuries (MVA, trauma, falls) accounted for 26%
    伤害（MVA，外伤、坠落）占26%
  - **32% of visits for chronic disease related conditions and medication refills**
    为慢性病相关症状和治疗就诊病人中**32%**填写了监测表
    - **Indicated lack of treatment or referrals in community**
      社区患者缺乏治疗或转诊
    - **Poor pharmaceutical access**
      缺少治疗药品

Active v. Syndromic Surveillance following a disaster
灾难出现后的主动监测与症状监测

	Active主动监测	Syndromic症状监测
Disadvantages 缺点	Labor intensive 大量的人力投入 Paper-based 依赖书面材料 Not sustainable 没有持续性	Non-specific 非特异性 No etiology 没有病因学依据 Automated 自动操作
Advantages 优点	Specific outcomes 结果明显 Etiologic data 有病因学数据	Automated 自动操作 Little burden 负担小
Lessons learned 教训	When to use 何时使用 Modify forms 修改表格 Standardize 标准化	Evaluate case definitions 病例定义评估 Effectiveness 效果

Disaster Surveillance Workgroup
灾难监测工作组

- Standardize surveillance materials
  标准的监测资料
  - State and local health departments
    州和当地的卫生部门
  - Federal response agencies
    联邦灾难应对机构
- Determine and recommend reporting systems
  决定和推荐使用何种报告系统
  - Develop reporting templates for daily epidemiology and surveillance data
    制做流行病学和监测数据日报告模板
  - Refine reporting mechanisms
    建立精确的报告机制

Coordinated surveillance in emergency operations
突发应对行动的协调

- Epidemiology/Surveillance Team
  流行病/监测工作队
  - System representation (e.g., BioSense, NEDDS)
    系统演练 (如, BioSense, NEDDS)
  - Liaisons with Laboratory and Clinical Teams
    与实验室和临床人员的联络
  - Supervises epi/surveillance field deployments
    监督流行病/监测现场调配
  - Tasked with:
    同时还需要：
    - situational awareness reports (e.g., epidemic curves, case counts, distributions)
      情况发展报告（如，流行曲线、病例数量、分布）
    - coordinate integrated epi investigations and surveillance methods
      流行病调查和监测方法相结合