

# Use of Electronic Death Registration System for Infectious Disease Surveillance

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**August 3, 2009**



# California Electronic Death Registration System (EDRS)

- Electronic creation and registration of Death Certificates, Amendments, and Disposition Permits
- Went “live” January 2005
- By December 2008, 98.6% of Certificates created in EDRS
- ~ 240,000 – 250,000 deaths in California annually

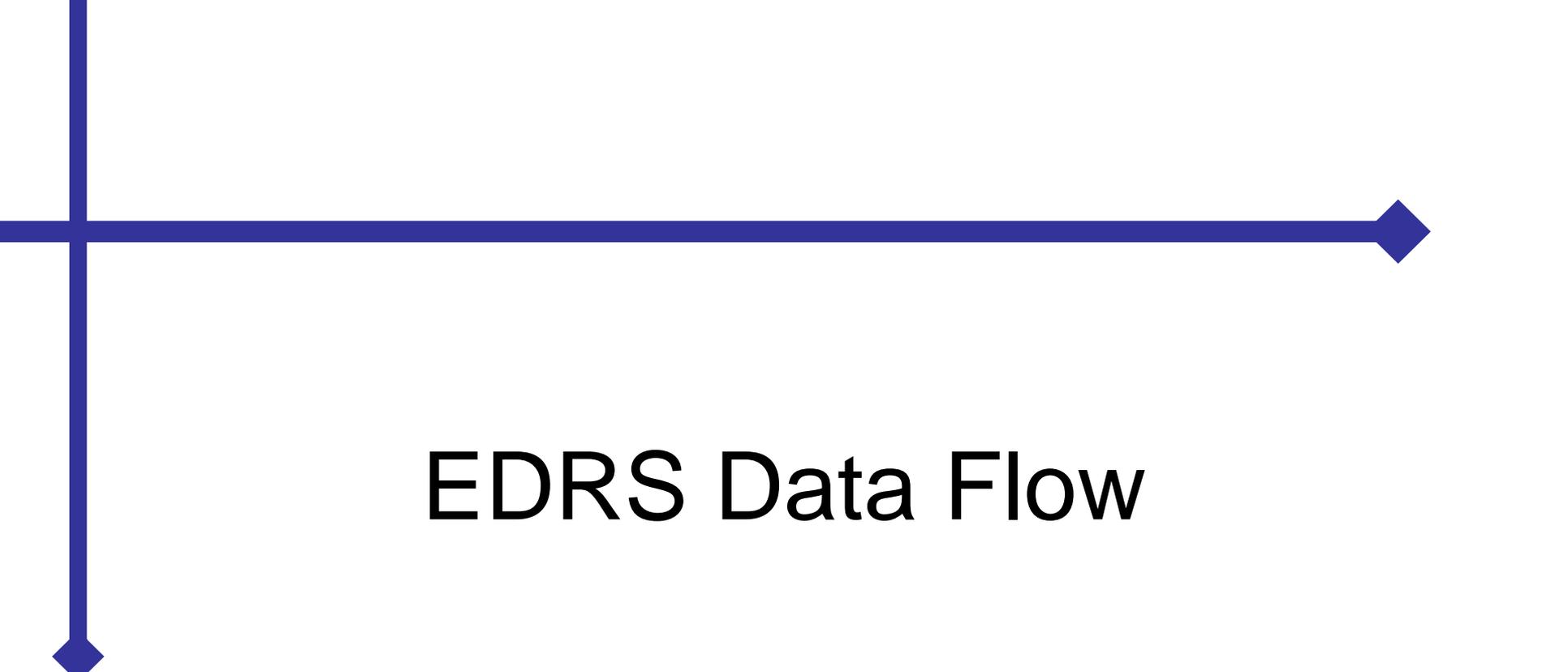
**CERTIFICATE OF DEATH**

3200617000029

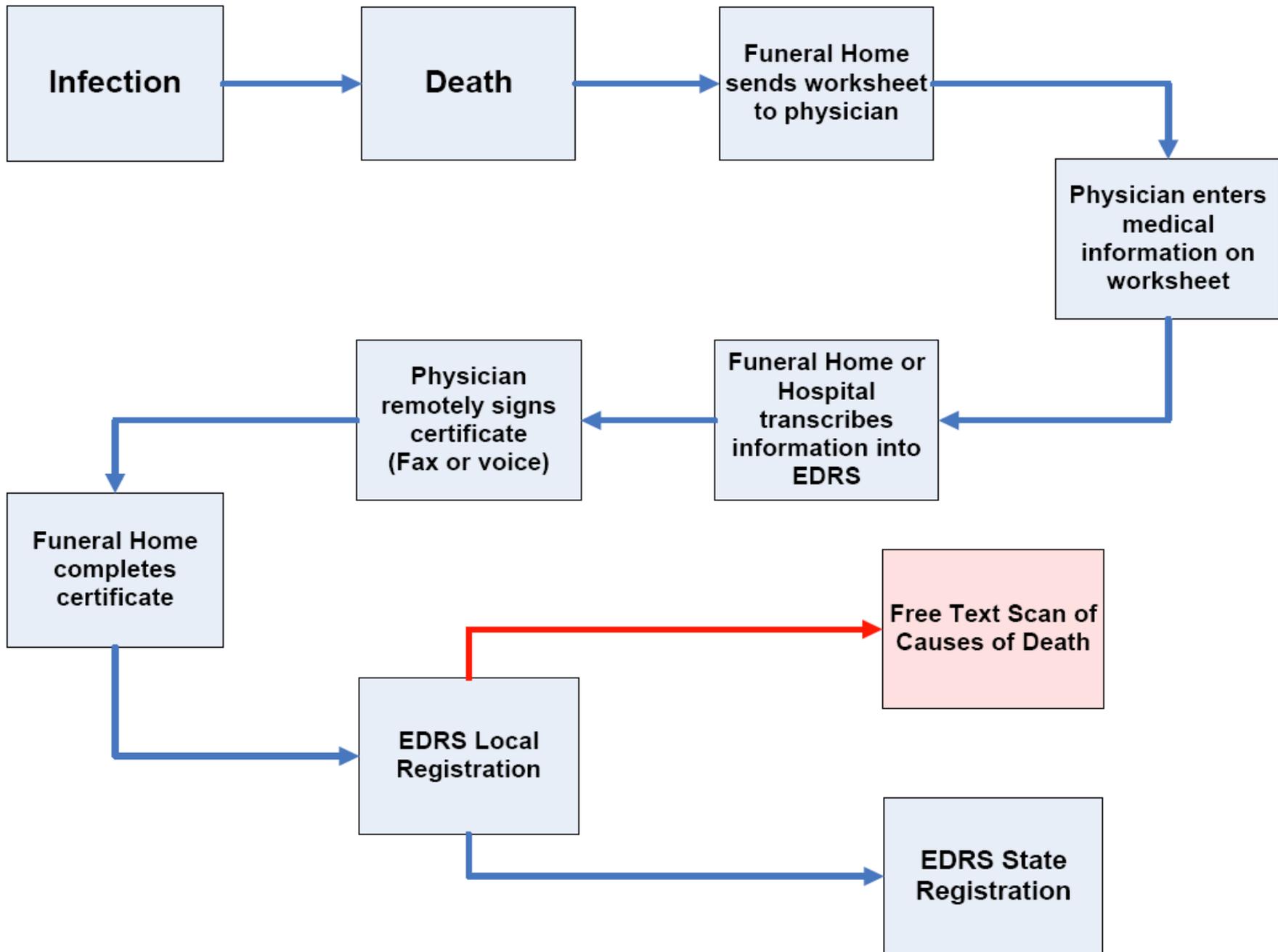
STATE FILE NUMBER		DECEASED'S SEX		LOCAL REGISTRATION NUMBER	
1. NAME OF DECEASED - FIRST (Given)		2. MIDDLE		3. LAST (Family)	
PEACH		M		PEAR	
4. DATE OF BIRTH - month/day				5. AGE Yrs	
01/01/1955				51	
6. SEX		7. RACE		8. ETHNICITY	
M		W		F	
9. BIRTH STATE/FORIGN COUNTRY		10. SOCIAL SECURITY NUMBER		11. U.S. BORN IN U.S. ARMED FORCES	
ANTARC FR		222-55-8877		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
12. MARRIAGE STATUS (at time of death)		13. DATE OF DEATH - month/day		14. HOUR (24-hour)	
MARRIED		07/26/2006		1200	
15. EDUCATION - (Type or level of education) (See instructions on back)		16. DECEASED'S RACE - (Up to three may be listed (see instruction on back))		17. DECEASED'S OCCUPATION	
MASTERS		WHITE		40	
18. LEGAL OCCUPATION - (Type or level of work) (DO NOT USE RETIRED)		19. FUND OF BUSINESS OR INDUSTRY (e.g., grocery store, retail construction, employment agency, etc.)		20. DECEASED'S RESIDENCE (Street and number or location)	
FRUIT		AGRICULTURE		1 SOME ST	
21. CITY		22. COUNTY/PROVINCE		23. ZIP CODE	
SOMECITY		LAKE		88888	
24. YEARS IN COUNTY		25. STATE/FORIGN COUNTRY		26. INFORMATION NAME, RELATIONSHIP	
20		CA		1 SOME ST, SOMECITY, CA 77777	
27. NAME OF SURVIVING SPOUSE - FIRST		28. MIDDLE		29. LAST (Family Name)	
APPLE		M		PEAR	
30. NAME OF FATHER - FIRST		31. MIDDLE		32. LAST	
DAD		D		PEAR	
33. NAME OF MOTHER - FIRST		34. MIDDLE		35. LAST	
MOM		E		MAIDEN	
36. DISPOSITION DATE - month/day		37. PLACE OF FINAL DISPOSITION		38. TYPE OF DISPOSITION	
07/31/2006		SOME CEMETERY 1 CEMETERY LN, SOMECITY, CA 99999		BU	
39. NAME OF FUNERAL ESTABLISHMENT		40. LICENSE NUMBER		41. SIGNATURE OF EMBALMER	
DEMONSTRATION MORTUARY		FD1111		DEMONSTRATION EMBALMER	
42. PLACE OF DEATH		43. SIGNATURE OF LOCAL REGISTRAR		44. DATE - month/day	
DEMONSTRATION HOSPITAL		DEMO REGISTRAR MD, PHD		07/26/2006	
45. COUNTY		46. FACILITY ADDRESS OR LOCATION (Street and number or location)		47. CITY	
LAKE		123 HOSPITAL LANE		SOMECITY	
48. CAUSE OF DEATH		49. ICD-10 CODE		50. ICD-10 CODE	
A GOOD CAUSE		I00		I00	
A GOOD UNDERLYING CAUSE		I01		I01	
NONE		I02		I02	
51. SIGNATURE OF CORONER/DEPUTY CORONER		52. DATE - month/day		53. TYPE NAME, TITLE OF CORONER/DEPUTY CORONER	
[Signature]		07/04/2006		DEMONSTRATION PHYSICIAN M.D.	
54. SIGNATURE OF PHYSICIAN		55. DATE - month/day		56. TYPE NAME, TITLE OF PHYSICIAN	
[Signature]		07/15/2006		DEMONSTRATION PHYSICIAN M.D.	

# Value of EDRS Surveillance

- Identifies most serious cases for further epidemiological investigation
- Complements other data sources (e.g. Confidential Morbidity Reports, ED visits, hospitalizations)
- Encompasses entire population, not just a sample
- Minimum added resource cost—uses data from existing system



# EDRS Data Flow



# Why wait until local registration?

- Quality Check: Local offices will contact physicians if needed (e.g. Cause of Death is non-specific)
- Prior to local registration, medical information can be freely changed without documentation
- After local registration, certificate becomes a legal document and further changes must be done by filing an amendment

# Free Text Surveillance

- Free text search: Cause of Death (COD) entries from physician
- Done before ICD-10 coding for COD assigned to Death Certificates
- Influenza disambiguation example:
  - *Haemophilus influenzae*
  - Parainfluenza
  - Misspellings

# Preliminary Data Cautions

- Late Entries
- Pending Certificates
- Amendments
- Duplicate Entries

# False Positives/Negatives

- Potential False Positives
  - Disease reported without lab confirmation
- Potential False Negatives
  - Disease not tested
  - Tested but not recorded on death certificate (e.g. influenza positive but only secondary bacterial pneumonia listed as COD)

# Processing Times

- Date of Death to Local Registration (for period 1/1/09 – 6/17/09):
  - Average: 5.6 days
  - Standard Deviation: 6.3 days
  - Minimum: < 1 day
  - Maximum: 145 days
- Average time from Local to State Registration was 60 days

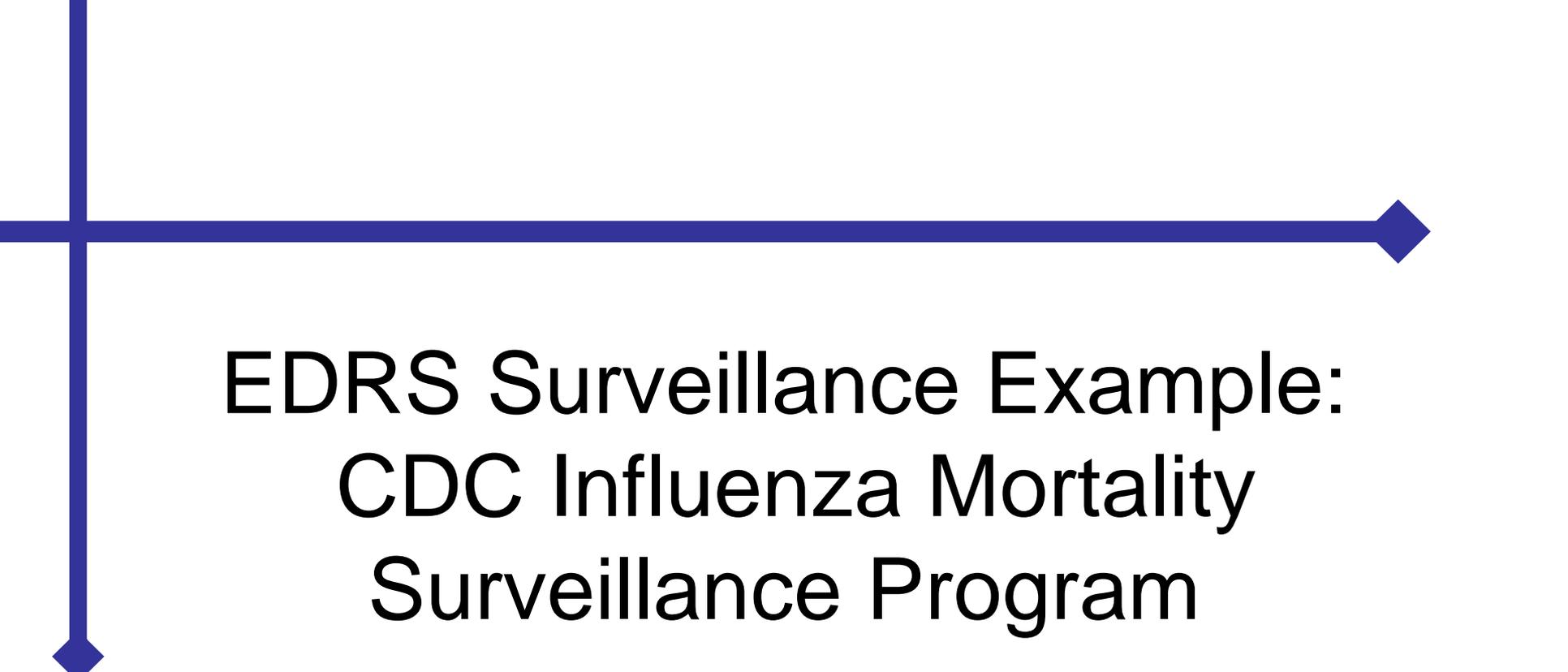
# Processing Delays

- Biggest delays:
  - Physician COD entry
  - Physician signing of certificate
- Delays can also occur on the personal information half of certificate (e.g. clarifying family information)
- Can pull data prior to local registration but at cost of decreased data quality

# How to Improve?

## Physician education:

- on importance of accurate COD entry
- on importance of timely COD entry and signature



# EDRS Surveillance Example: CDC Influenza Mortality Surveillance Program

# CDC Program Overview

- 122 cities monitored nationally
- Influenza or pneumonia as underlying or contributing COD on Death Certificate
- Totaled by age group
- In California:
  - San Francisco
  - Santa Clara
  - Glendale
  - Los Angeles County
  - Los Angeles City

# EDRS and CDC Surveillance

- Data pull from EDRS by city/county, time period, and age group
- Data pull from EDRS – Weekly
- Algorithm developed to pull “influenza” from multiple COD lines
- Disambiguate from *H. influenzae* and parainfluenza

# Algorithm

- Influenza: Count if “INFLUENZA” anywhere in (107A, 107B, 107C, 107D, or 112) except as (“HAEMOPHILUS INFLUENZA” or “HEMOPHILUS INFLUENZA” or “PARAINFLUENZA”)
- Pneumonia: Count if “PNEUMONIA” appears anywhere in (107A, 107B, 107C, 107D, or 112) except as (“ASPIRATION PNEUMONIA”) unless already counted as Influenza

# Algorithm Examples

- If “INFLUENZA” and “PNEUMONIA”, count as **Influenza**
- If “PNEUMONIA” and (“HAEMOPHILUS INFLUENZA” or “HEMOPHILUS INFLUENZA” or “PARAINFLUENZA”), count as **Pneumonia**
- If “INFLUENZA” and “PNEUMONIA” and (“HAEMOPHILUS INFLUENZA” or “HEMOPHILUS INFLUENZA” or “PARAINFLUENZA”), count as **Influenza**

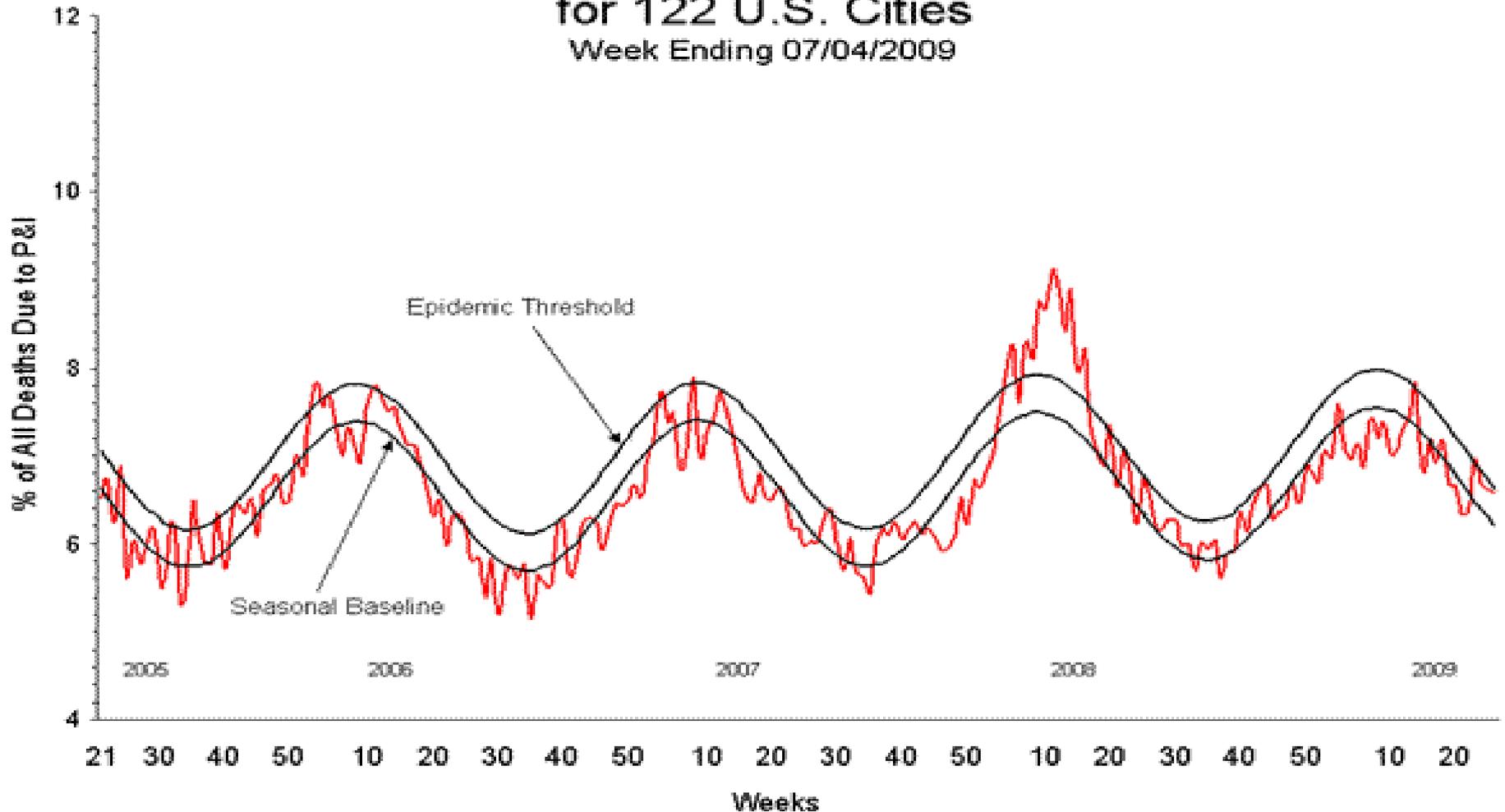
# Example Report to CDC

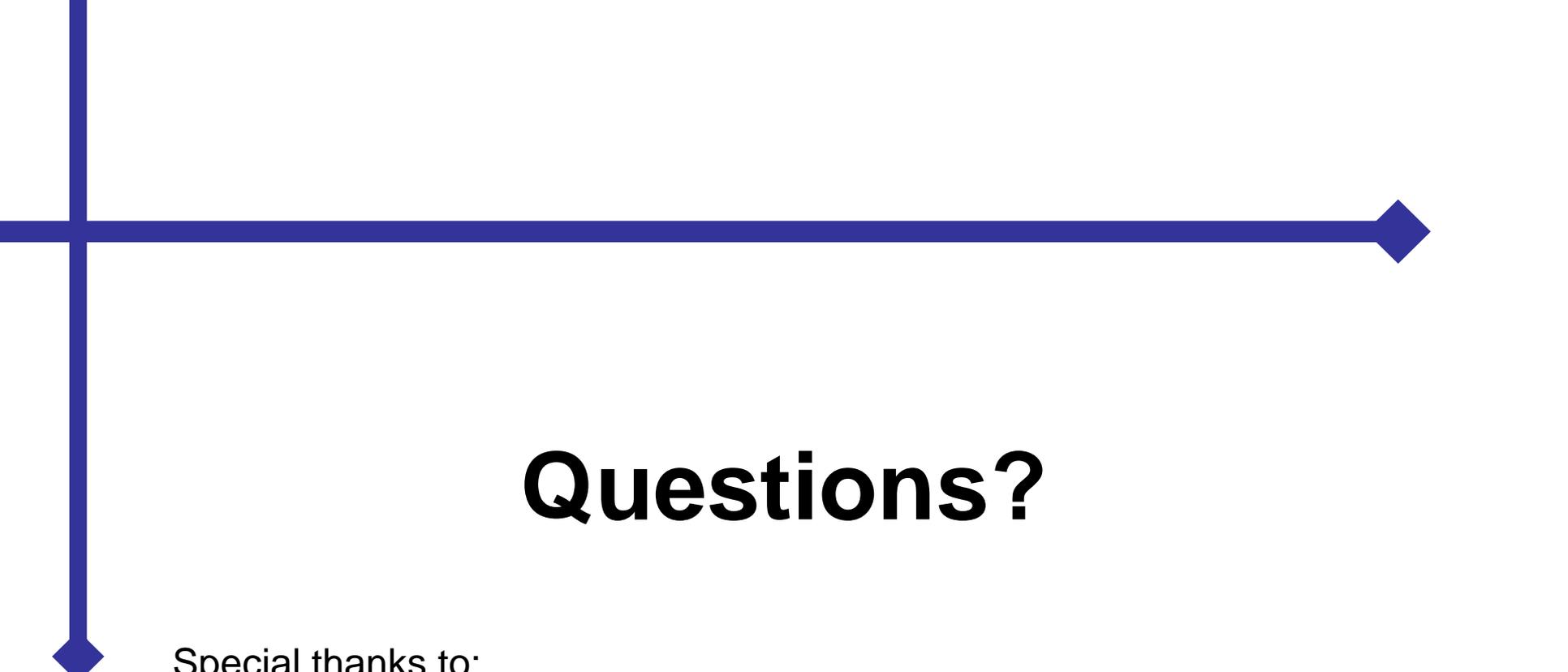
For Date of Registration Range: From: 07/01/2009 To: 07/15/2009

Age Group	Count for Pneumonia	Count for Influenza	Total Count
<28 days	0	0	1
28 days - 1 year	0	0	0
1 - 14 years	2	0	2
15 - 24 years	0	0	1
25-44 years	0	0	0
45-64 years	0	2	2
65-74 years	0	2	2
75-84 years	0	0	0
85 + years	0	0	1
Age Unknown	0	0	1

# CDC Surveillance Example

Pneumonia and Influenza Mortality  
for 122 U.S. Cities  
Week Ending 07/04/2009





# Questions?

Special thanks to:

Glenna M Gobar, DVM, MPVM, MS (U.C. Davis School of Medicine) for information on EDRS role in the CDC Influenza Mortality Program.

Scott Fujimoto, MD, MPH (CDPH) in preparation of this presentation.

Entire EDRS Staff.