

Use of Electronic Death Registration System for Infectious Disease Surveillance

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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		DEATH DATE AND TIME AND THE DECEASED'S QUALIFICATION		LOCAL REGISTRATION NUMBER	
1. NAME OF DECEASED - FIRST (Given)		2. MIDDLE		3. LAST (Family)	
PEACH		M		PEAR	
4. DATE OF BIRTH - month/day/year				5. AGE - Yrs	6. SEX
01/01/1955				51	M
8. BIRTH STATE/FOREIGN COUNTRY		10. SOCIAL SECURITY NUMBER	11. BIRTH IN U.S. ARMED FORCES	12. MARITAL STATUS (at time of death)	7. DATE OF DEATH - month/day/year
ANTARC FR		222-55-8877	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNK	MARRIED	07/26/2006
9. EDUCATION - Type (e.g., college) (Not included in 10a)		15a. HHS DECEASED INFORMATION QUALIFIED? (Type an education contact)		13. DECEASED'S RACE - (Type in Spanish only for listed (see instruction on back))	
MASTER'S		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		WHITE	
17. USUAL OCCUPATION - Type if dead for most of life. DO NOT USE RETIRED			18. KIND OF BUSINESS OR INDUSTRY (e.g., grocery store, retail construction, employment agency, etc.)		16. YEARS IN OCCUPATION
FRUIT			AGRICULTURE		40
20. DECEASED'S RES. DEVICE (Street and number or location)					
1 SOME ST					
21. CITY		22. COUNTY/PROVINCE	23. ZIP CODE	24. YEARS IN COUNTY	25. STATE/FOREIGN COUNTRY
SOMECITY		LAKE	88888	20	CA
26. INFORMANT'S NAME, RELATIONSHIP			27. INFORMANT'S MAILING ADDRESS (Street and number or post office number, city or town, state, ZIP)		
APPLE PEAR, SPOUSE			1 SOME ST, SOMECITY, CA 77777		
28. NAME OF SURVIVING SPOUSE - FIRST		29. MIDDLE	30. LAST (Family Name)		
APPLE		M	PEAR		
31. NAME OF FATHER - FIRST		32. MIDDLE	33. LAST		
DAD		D	PEAR		
34. NAME OF MOTHER - FIRST		35. MIDDLE	36. LAST (Family Name)		
MOM		E	MAIDEN		
38. DEPOSITION DATE - month/day/year		40. PLACE OF FINAL DISPOSITION			
07/31/2006		SOME CEMETERY 1 CEMETERY LN, SOMECITY, CA 99999			
41. TYPE OF DISPOSITION(S)		43. SIGNATURE OF Embalmer		45. LICENSE NUMBER	
BU		DEMONSTRATION EMBALMER		EMB1111	
44. NAME OF FUNERAL ESTABLISHMENT		46. LICENSE NUMBER	48. SIGNATURE OF LOCAL REGISTRAR		47. DATE - month/day/year
DEMONSTRATION MORTUARY		FD1111	DEMO REGISTRAR MD, PHD		07/28/2006
49. PLACE OF DEATH					
DEMONSTRATION HOSPITAL					
50. COUNTY		52. FACILITY ADDRESS OR LOCATION WHERE FOUND (Street and number or location)		51. CITY	
LAKE		123 HOSPITAL LANE		SOMECITY	
53. CAUSE OF DEATH					
Base on chain of events - external, injury or complication - that directly caused death. DO NOT mention events such as used in criminal, regulatory, civil, or resolution litigation without showing the etiology. DO NOT abbreviate.					
54. (Immediate Cause) (Final disease or condition leading to death)		55. A GOOD CAUSE		56. TO BE REPORTED TO CORONER	
57. MIN				<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
58. A GOOD UNDERLYING CAUSE				59. TO BE REPORTED TO CORONER	
60. YRS				<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
61. TO BE REPORTED TO CORONER				<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
62. TO BE REPORTED TO CORONER				<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
63. TO BE REPORTED TO CORONER				<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
11. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RESULTING IN THE UNDERLYING CAUSE (Check in 10)					
NONE					
12. ANY OTHER INFORMATION PERTAINING TO DEATH OR INQUIRY (e.g., legal, religious, or other)					
NO					
14. TO BE REPORTED TO CORONER					
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNK					
17. I CERTIFY THE TRUE NEEDED OF AN UNLICENSED DEATH COURSE AT THE HOUR DATE AND PLACE IN THE PRESENCE OF		18. SIGNATURE AND TITLE OF CORONER		19. LICENSE NUMBER	
Deceased Administered Error		DEMONSTRATION PHYSICIAN M.D.		T1234	
20. I CERTIFY THE TRUE NEEDED OF AN UNLICENSED DEATH COURSE AT THE HOUR DATE AND PLACE IN THE PRESENCE OF		21. TYPE APPROVED PHYSICIAN NAME, SIGNATURE, LICENSE #, IF CODE		22. DATE - month/day/year	
07/04/2006 07/19/2006		DEMONSTRATION PHYSICIAN M.D.		07/28/2006	
23. I CERTIFY THE TRUE NEEDED OF AN UNLICENSED DEATH COURSE AT THE HOUR DATE AND PLACE IN THE PRESENCE OF					
24. NUMBER OF DEATHS: <input type="checkbox"/> Natural <input type="checkbox"/> Accidental <input type="checkbox"/> Homicide <input type="checkbox"/> Suicide <input type="checkbox"/> Pending <input type="checkbox"/> Child not be determined <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNK					
25. PLACE OF INQUIRY (e.g., home, construction site, vehicle, etc., etc.)					
26. DESCRIBE HOW INQUIRY OCCURRED (Check all that apply)					
27. LOCATION OF INQUIRY (Street and number, or location, city, and ZIP)					
28. SIGNATURE OF CORONER/DEPUTY CORONER			29. DATE - month/day/year		30. TYPE NAME, TITLE OF CORONER/DEPUTY CORONER
STATE REGISTRAR		A B C D E		FAX AUTH. #	
				CORONER TRACT	



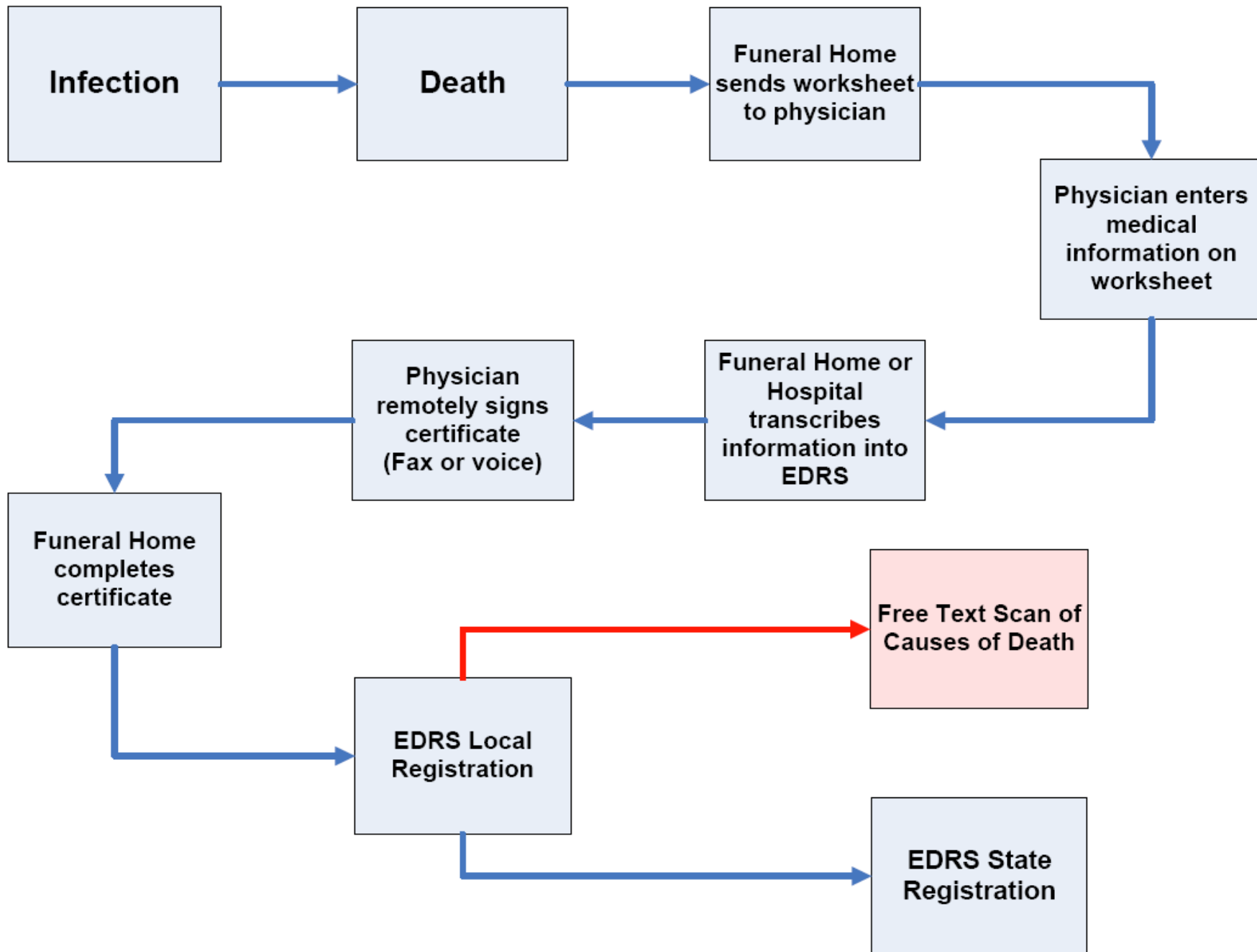
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Value of EDRS Surveillance

- 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



Questions?

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Entire EDRS Staff.