

Analysis of 2013 Inmate Death Reviews in the California Correctional Healthcare System

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I. Introduction

For eight years, since April 2006, the State of California Correctional Healthcare System (CCHCS) has been operating under federal receivership. The Receiver has had responsibility for improving a broken healthcare system and has overseen a comprehensive system redesign. Under the Receiver, a system which had been driven by episodic complaints and very little organized care for chronically ill patients has been replaced by a system which emphasizes primary care, chronic disease management and patient advocacy. Healthcare teams are assigned responsibility for patient outcomes and evidence based guidelines are used to guide care for chronic medical conditions.

The Receiver's quality improvement program identifies and targets specific areas for clinical improvement.

A major piece of the quality improvement program is the death review. Rigorous peer review of all prison deaths identifies serious lapses in care and records numbers of preventable deaths. The death review has been used to find opportunities for systemic improvement and to identify, counsel, and sanction any unsafe providers.

This is the eighth annual analysis of the California state prison system inmate death reviews. The seven previous annual reports can be found on the California Correctional Healthcare Services website (cphcs.ca.gov/Deathreviews.aspx). As in prior years this report will focus on identifying causes of death, trends in mortality, identification and trending of serious lapses in care, and identification and trending of preventable deaths.

This report shows continued improvement in the rate of preventable death, discusses reasons for this improvement, and identifies possible areas for continued improvement.

II. Death Review Process

The death review reporting and review policy and procedure is described in the Receiver's Inmate Medical Services Policies and Procedures (Volume 3, Chapter 7), and has been described in detail in previous annual reports. Each inmate death is reviewed by a trained Clinical Support Unit (CSU) physician and by a registered nurse consultant. Findings are recorded on a standardized death review template. Reviewers summarize the decedent's healthcare record, focusing primarily on all of the clinical encounters that took place during the last six months of the patient's life.

The quality of patient triage and evaluation, the timeliness of access to primary care and specialty referral, the quality of all clinical evaluations, and results of and responses to all laboratory and

diagnostic imaging studies are noted. The quality of care for any identified chronic medical condition is evaluated and reviewed for adherence to standardized and evidence based guidelines for care. All visits to specialty care, emergency departments and inpatient hospital facilities are reviewed. The quality of end of life care for terminal conditions is evaluated. The timing and quality of the responses to emergency “man down” situations are reviewed for compliance with emergency procedural guidelines.

In the past four years, reviewers have also determined whether there was an identifiable primary care physician involved in the patient’s care.

In each case, the cause of death is determined, using autopsy findings when available. All lapses in care are noted, even if lapses did not contribute to the death. The reviewer then makes a judgment as to whether the death was preventable or not preventable.

Completed death reviews are presented by the reviewer to the Death Review Committee (DRC), an interdisciplinary group appointed by the Statewide Chief Medical and Nursing Executives. The eight-member DRC, chaired by a physician and a nurse executive, includes three physicians, three nurses, one (non-voting) mental health representative and one custody representative. The DRC is charged with re evaluating the care provided to the decedent including an evaluation as to the preventability of death. A vote is taken by the committee to achieve concurrence as to whether the death was Not Preventable, Possibly Preventable, or Definitely Preventable. Other functions of the DRC are to identify opportunities for improvement in the health care system, to make recommendations for changes in Clinical Care Guidelines, to recommend statewide training or continuing medical education programs on specific issues, to identify and refer local issues to institution leadership, systemic issues to Statewide leadership, and to identify and refer deficiencies in clinical care to the appropriate Peer Review bodies.

The major purpose of the Death Reporting and Review Policy is to reduce the occurrence of preventable deaths.

III. Definitions

The following definitions are used in this report, and are unchanged from prior annual reports.

Lapse in Care – In the judgment of the reviewers, a clinician has committed a departure from the standard of care that a reasonable and competent clinician would not have committed under the same or similar circumstances.

Not preventable death – In the judgment of the reviewers, the patient’s death could not have been prevented or significantly delayed by more optimal care.

Possibly preventable death – In the judgment of the reviewers, better medical management or improvement in the system of care delivery might have prevented or significantly delayed the patient’s death.

Definitely (or likely) preventable death – In the judgment of the reviewers, better medical management or improvement in the system of care delivery would definitely or likely have prevented or significantly delayed the patient’s death.

IV. Taxonomy for lapses in care

Previous annual reports have described how the taxonomy for grouping lapses in care was developed. This classification system describing fourteen different types of care lapse was proposed to the DRC in 2007. In 2008 the taxonomy was incorporated into the death review template. After having been in use for a year, the taxonomy was presented at the April 2009 meeting of the National Commission on Correctional Health Care and at the September 2009 meeting of the American Correctional Health Services Association.

As described at these meetings, the taxonomy has been a useful quality improvement tool for identifying potentially unsafe clinicians, gaps in the healthcare system, opportunities for system and process redesign, and educational strategies for CCHCS clinical staff.

The fourteen categories of lapse are:

Type 1 – Failure to recognize, evaluate and manage important symptoms and signs – so called clinical “red flags.”

Type 2 – Failure to follow clinical guidelines or departmental policies developed or endorsed by the medical department of the CCHCS. These include evidence based guidelines for the management of asthma, diabetes mellitus, hepatitis C infection, HIV/AIDS, chronic pain, and care at the end of life. Other guidelines include standards for the treatment of hypertension, acute coronary syndromes, congestive heart failure, cardiac arrhythmia, and anticoagulation.

Type 3 – Delay in access to the appropriate level of care, of sufficient duration as to result in harm to the patient.

Type 4 – Failure to identify and appropriately respond to abnormal test results.

Type 5 – Failure of appropriate communication between providers, especially at points where transfers of care occur (care transitions).

Type 6 – Fragmentation of care resulting from failure of an individual clinician or the primary care team to assume responsibility for the patient’s care (lack of a primary care model).

Type 7 – Iatrogenic injury resulting from a surgical or procedural complication.

Type 8 – Medication prescribing error, including failure to prescribe an indicated medication, failure to do appropriate monitoring, or failure to recognize and avoid known drug interactions.

Type 9 – Medication delivery error, including significant delay in a patient receiving medication or a medication delivered to the wrong patient.

Type 10 – Practicing outside the scope of one’s professional capability (may apply to nursing staff, midlevel practitioners, or physicians).

Type 11 – Failure to adequately supervise a midlevel practitioner, including failure to be readily available for consultation or an administrative failure to provide for appropriate supervision.

Type 12 – Failure to communicate effectively with the patient.

Type 13 – Patient non-adherence with suggestions for optimal care.

Type 14 - Delay or failure in emergency response, including delay in activation or failure to follow the emergency response protocol.

V. Limitations and Advantages in the CCHCS Death Review Process

1. Inter-reviewer variability in identifying a preventable death

One study from the medical literature illustrates the problem of reviewer variability in determining preventability of death. In this study, 393 hospital deaths were reviewed by a group of internal medicine specialists. The initial reviewers judged that 23% of the deaths were possibly preventable and 6% definitely preventable. Each death was then reviewed by another physician member of the same group. Concordance in finding of preventability was 0.34 (the reviewers agreed only 34% of the time). The authors of this study conclude “preventability is in the eye of the reviewer.”

(Journal of the American Medical Association. Volume 286, pages 415-423, 2001)

The DRC tries to mitigate the problem of reviewer variability by seeking consensus on the assignment of preventability.

2. Onsite vs. centralized peer review

Traditional peer review takes place at the site where care originated and is conducted by staff who work there. The CCHCS death reviews are conducted off site by a designated group of physicians. Any review physician involved in the direct care of the decedent is exempted from reviewing that

particular case. Any DRC member who has been involved in the supervision or care of a patient whose death is being reviewed is exempted from voting on preventability.

3. Separate process for review of suicide deaths and drug overdoses

All suicides are reviewed separately by a multidisciplinary committee in the Mental Health Program, the Suicide Prevention and Response Focused Improvement Team (SPR FIT). All drug overdose deaths are also separately reviewed by the Mental Health Program

4. Other Potential Advantages

Other advantageous aspects of the CCHCS death review process include the limited number of trained and experienced reviewers, the diligence expended in each review, and the discussion of every death at the DRC. This kind of offsite review has the advantage of mitigating subjective bias generated by a reviewer's personal knowledge of the onsite providers involved in the patient's care. The centralized process also helps in identifying systemic concerns and in standardizing the review process.

VI. Study findings

A. Causes of inmate death, 2013

There were 366 deaths in 2013. Male deaths were 354 (96.7%). Female deaths were 12 (3.3%). The 2013 inmate population was 95.4% male and 4.6% female. Table 1 shows the causes of death in all cases. These listed causes represent the underlying condition that led to the patient's death. For example, if a patient died of sepsis or septicemia (bloodstream infection) because chemotherapy for an underlying cancer compromised the patient's immune system, then the underlying cancer is listed as cause of death.

Table 1. Causes of death among all California inmates, 2013.

NUMBER OF CASES	CAUSE OF DEATH
94	CANCER (except liver): lung, 21; pancreas, 9; colon, 8; stomach, 7; lymphoma, 5; leukemia, 5; esophagus, 4; bladder, 4; prostate, 3; kidney, 3; colorectal, 3; unknown primary, 2; multiple myeloma, 2; tonsil, 2; liposarcoma, 2; melanoma, 2; small intestine, 1; brain, 1; testicular, 1; neck, 1; salivary gland, 1; oropharynx, 1; acute myelogenous leukemia, 1; glioblastoma, 1; mouth, 1; parotid, 1; nasopharynx, 1; lip, 1
70	LIVER DISEASE: end stage liver disease, 43; liver cancer, 27
50	CARDIOVASCULAR: sudden cardiac arrest, 24; congestive heart failure, 13; acute myocardial infarction, 8; dissection aortic aneurysm, 1; aortic stenosis, 1; aortic dissection, 1; cardiomyopathy, 1; coronary artery disease, 1
30	SUICIDE
24	DRUG OVERDOSE: opiates, 8; methamphetamines, 7; combinations of opiates, methamphetamine and/or alcohol, 6; other drugs, 2; alcohol, 1
20	HOMICIDE
12	SEPSIS
9 each	PNEUMONIA CHRONIC PULMONARY: chronic obstructive pulmonary disease, 6; pulmonary fibrosis, 2; pulmonary hypertension, 1
6 each	GASTROINTESTINAL: small bowel perforation, 1; ulcerative colitis, 1; upper GI bleed, 1; ischemic colitis, 1; intestinal obstruction, 1; perforated gastric ulcer, 1 STROKE, HEMORRHAGIC
5	END STAGE RENAL DISEASE
4 each	COCCIDIOIDOMYCOSIS: disseminated, 3; cocci pneumonia, 1 HIV/AIDS
3 each	END STAGE RENAL DISEASE ON HEMODIALYSIS METABOLIC: amyloidosis, 1; drug toxicity, 1; diabetes, 1 NEUROLOGIC: dementia, 2; transverse myelitis, 1 INFECTIOUS: Influenza 2; osteomyelitis, 1 STROKE: ischemic stroke, 2; cerebral aneurysm, 1
2 each	HEMATOLOGIC: myelodysplasia, 2 IMMUNOLOGIC: systemic sclerosis, 1; angioedema, 1
1 each	ACCIDENTAL: accidental asphyxiation HEMORRHAGIC SHOCK: iatrogenic post-operative hemorrhage TRAUMA: head trauma VASCULAR: peripheral vascular disease
366	TOTAL

In 2013, the three top causes of death were cancer (26%), end stage liver disease (19%), and cardiovascular disease (14%). Cancer was again the most common cause of death. Liver cancer is excluded from this total and included in the category end stage liver disease (cirrhosis), because both liver cancer and cirrhosis in this population are consequences of underlying chronic hepatitis C virus infection. Cardiovascular disease includes sudden cardiac arrest, congestive heart failure and acute myocardial infarction. All three of these causes frequently share a common underlying

condition – coronary artery disease. Most of these patients had one or more risk factors for coronary disease – smoking, hypertension, hypercholesterolemia, or diabetes mellitus.

Table 2 compares the top causes of inmate death from 2007-2013. There have been no significant changes or trends. The top six causes of death in 2013 accounted for 79% of all deaths. They were cancer (26%), end stage liver disease (19%), cardiovascular disease (14%), suicide (8%), drug overdose (7%), and homicide (5%). For comparison, in 2010, the last year for which complete statistics are available from the Centers for Disease Control, the top six causes of death for all American males were heart disease (25%), cancer (24%), unintentional injury (6%), chronic pulmonary disease (5%), stroke (4%), and diabetes (3%). Suicide (2.5%) ranked seventh.

Table 2. Top nine causes of death among California inmates, 2007-2013.

RANK	2013	2012	2011	2010	2009	2008	2007
1	Cancer	Cancer	Cancer	Cancer	Cancer	Cancer	Cancer
2	End Stage Liver Disease*	End Stage Liver Disease	End Stage Liver Disease	End Stage Liver Disease	End Stage Liver Disease	Suicide	End Stage Liver Disease
3	Cardiovascular Disease**	Cardiovascular Disease	Cardiovascular Disease	Cardiovascular disease	Cardiovascular disease	End Stage Liver Disease	Cardiovascular disease
4	Suicide	Suicide	Suicide	Suicide	Suicide	Cardiovascular disease	Suicide
5	Drug Overdose	Homicide	Pneumonia	(tied) Drug Overdose; Homicide	Drug Overdose	Drug Overdose	Homicide
6	Homicide	Drug Overdose	Homicide		Pneumonia	Pneumonia	HIV/AIDS
7	Sepsis	(tied) Sepsis; Infectious	Sepsis	Pneumonia	Congestive Heart Failure	HIV/AIDS	Stroke
8	(tied) Pulmonary; Pneumonia		Drug Overdose	Congestive Heart Failure	Homicide	Congestive Heart Failure	Drug Overdose
9		Stroke	Stroke	(tied) Coccidioidomycosis; End Stage Renal Disease, Stroke		Sepsis	Pneumonia

* End Stage Liver Disease includes liver cancer.

** Cardiovascular disease includes sudden cardiac arrest, myocardial infarction, and congestive heart failure.

Table 3 shows the average age of all decedents in 2013. The average inmate life expectancy of 55 is some twenty years younger than that of the average American male. Suicides, homicides and drug overdoses affect a younger population, averaging 40 years of age, and the average age at death excluding these three causes was 59 years.

Table 3. Average ages at death among all California inmates, 2013

Average age of all decedents (range 20 – 97)		55 yrs
Average age of suicides, drug overdoses, and homicides (range 20 – 69)		40 yrs
Suicide (range 23 – 60)	40 yrs	
Drug overdose (range 20 – 54)	37 yrs	
Homicide (range 21 – 69)	43 yrs	
Average age excluding suicide, drug overdose, and homicide (range 21 – 97)		59 yrs

Major factors influencing causes of death in the prison population are:

1. *Drug Addiction.* Intravenous injection using shared needles causes chronic hepatitis C infection, which causes progressive inflammatory liver disease culminating in end stage liver disease - cirrhosis. Hepatocellular cancer (hepatoma) almost always occurs only in the setting of a cirrhotic liver. All but one of the 70 cases of liver cancer and end stage liver disease in 2012 were caused by chronic hepatitis C infection. The prevalence of hepatitis C virus infection in all CCHCS inmates is 14%.

2. *Depression.* Depression is endemic in prisoners. There were 30 suicides in 2013. In addition, many of the 24 drug overdose deaths may in fact have been suicides. Depression also is a significant factor in repeated patient non-adherence to medical advice, which is a contributing factor in many non-suicide deaths.

3. *Violence.* The violent lifestyle for many of the incarcerated population, the gang subculture, and overcrowding all contribute to the high incidence of homicide in the prison population.

B. Lapses in care 2013

The death review process focuses on finding serious lapses in medical care, both those that are contributing causes in cases of preventable death and those that occur without contributing to the patient’s death. The taxonomy for medical error described previously provides a framework for classifying, tracking and trending these lapses.

Table 4 shows the number of lapses by type identified in the 366 inmate deaths in 2013.

Table 4. Summary of lapses of care, 2013.

LAPSES OF CARE TYPES	# OF LAPSES IN THE 331 NON PREVENTABLE DEATHS	# OF LAPSES IN THE 35 POSSIBLY PREVENTABLE DEATHS	TOTAL LAPSES IN ALL 366 DEATHS
#1 – Failure to recognize, identify or adequately evaluate important symptoms or signs	66	32	98
#2 – Failure to follow established guidelines for evaluation and/or management of a specific condition	43	6	49
#3 – Delay in access to care sufficient to result in harm to the patient	12	12	24
#4 – Failure to adequately pursue abnormal test results	24	8	32
#5 – Failure of provider-to-provider communications including botched handoffs	14	7	21
#6 – Fragmentation of care such that individual responsibility for patient is waived	9	13	22
#7 – Surgical/procedural complication resulting in iatrogenic injury	0	1	1
#8- Medication prescribing error	12	9	21
#9- Medication delivery error	6	1	7
#10- Practicing outside the scope of one’s professional capabilities	0	0	0
#11- Unsupervised mid-level (nurse practitioner or physician assistant) care	1	0	1
#12 – Failure to communicate effectively with the patient	1	1	2
#13 – Patient non-adherence with recommendation for optimal care	2	1	3
#14 – Delay in emergency response or failure to follow emergency response protocol	16	6	22
#15 – other	0	0	0
TOTAL LAPSES	206	97	303

There were 98 type 1 lapses – failure to recognize or adequately evaluate important symptoms or signs.

There were 49 type 2 lapses – failure to follow established guidelines for evaluation and/or management of a specific condition.

There were 24 type 3 lapses – important delays in access to an appropriate level of care.

There were 34 type 4 lapses - failure to adequately pursue abnormal test results.

Altogether types 1, 2, 3 and 4 lapses were 67% of the total.

There were also significant numbers of types 5, 6, 8, and 14 lapses, each contributing 7% to the total. Altogether these eight types of lapse accounted for 95% of the total.

C. Non preventable deaths in 2013

Table 5 shows the cause of non-preventable deaths in 2013. With the exception of suicides, homicides, drug overdoses, and accident these deaths were expected as a natural consequence of chronic illness.

Table 5. Causes of non-preventable death among California inmates, 2013.

NUMBER OF CASES	CAUSE OF DEATH
90	Cancer — most frequent types: lung (21), pancreas (9), colon (8), stomach (5), lymphoma (5), leukemia (5), other types had 4 or fewer cases each
66	Liver disease — includes end stage liver disease (41) and liver cancer (25)
43	Cardiovascular disease — most frequently: sudden cardiac arrest (22), congestive heart failure (12), myocardial infarction (5)
29	Suicide
23	Drug overdose
19	Homicide
10	Sepsis
8	Chronic Pulmonary – COPD (6), pulmonary fibrosis (2)
5 each	Pneumonia; Stroke, Hemorrhagic
4 each	End stage renal disease; Gastrointestinal; HIV/AIDS
3 each	Coccidioidomycosis; Infectious (influenza, osteomyelitis); Stroke, non-hemorrhagic
2 each	End stage renal disease; Hematologic (myelodysplasia); Immunologic (angioedema, systemic sclerosis); Neurologic (dementia, transverse myelitis)
1 each	Metabolic (amyloidosis); Vascular (peripheral vascular disease); accidental asphyxiation; head trauma
335	TOTAL NON PREVENTABLE DEATHS

D. Possibly preventable deaths in 2013

Table 6 shows the causes of possibly preventable deaths in 2013.

Table 6. Causes of possibly preventable death among California inmates, 2013.

NUMBER OF CASES	CAUSE OF DEATH
7	Cardiovascular disease (sudden cardiac arrest, acute myocardial infarction)
4 each	Cancer (stomach, bladder, kidney); End stage liver disease (including liver cancer); Pneumonia
2 each	Gastrointestinal (intestinal obstruction, UGI bleed); Metabolic (drug toxicity, diabetes); Sepsis; End stage renal disease
1 each	Coccidioidomycosis; Drug Overdose; Hemorrhagic Shock; Homicide; Neurologic (dementia); Pulmonary hypertension; Stroke, Hemorrhagic; Suicide
35	TOTAL POSSIBLY PREVENTABLE DEATHS

Each of these 35 deaths is described briefly below:

Type 1 lapses – failures to recognize and manage signs and symptoms - were cited as contributing to fourteen possibly preventable deaths.

1. A 57 year old man died of stage 4 bladder cancer. A failure to evaluate recurrent hematuria led to an eight month delay in diagnosis and treatment.

2. A 30 year old man died of alcohol (“pruno”) intoxication. Following initial evaluation for intoxication and vomiting he was judged to be clinically stable and was returned to his cell, where he was found unresponsive and died 2 hours later.

3. A 58 year old man died of acute small bowel obstruction secondary to fecal impaction and constipation caused by psychiatric medication. He had three episodes of severe fecal impaction and constipation in the year prior to death. The first resulted in surgery (subtotal colectomy), the second resolved with conservative treatment, but the third was complicated by bowel perforation, sepsis, and death. Failure to evaluate and prospectively manage recurrent fecal impaction contributed to this death.

4. A 43 year old man died of complications of kidney cancer. A failure to promptly evaluate persistent hematuria and a 22 # weight loss resulted in a 4 month delay in the diagnosis of metastatic kidney cancer.

5. A 65 year old man with gastric cancer died of pneumonia. A failure to aggressively evaluate and manage severe hypoxemia contributed to a premature death.

6. An 81 year old man died of sudden cardiac arrest. Inadequate evaluation of an episode of syncope and abnormal vital signs contributed to death from symptomatic aortic valve stenosis.

7. A 55 year old man died of sudden cardiac arrest. Failure to properly evaluate chest pain contributed to death.

8. A 51 year old woman died of acute myocardial infarction precipitated by sepsis from endocarditis. Failure to communicate a positive cardiac scan and failure to evaluate chest pain and abnormal vital signs in a timely matter contributed to her death.

9. A 45 year old man with multiple risk factors for coronary artery disease died of acute myocardial infarction. Poorly managed diabetes, hypertension and hyperlipidemia coupled with failure to aggressively treat new exertional chest pain contributed to his death.

10. A 55 year old man died of acute myocardial infarction. Failure to aggressively treat new onset of exertional chest pain contributed to his death.

11. A 65 year old man with end stage renal disease on hemodialysis died of pneumonia. On the day of death he presented with fever, shortness of breath and chills but was not treated aggressively. Failure to send the patient immediately to a higher level of care was thought to contribute to death.

12. An 89 year old man with dementia died 6 days after a fall resulting in head injury and an altered mental status. Failure to order a CT scan of the head looking for possible intracranial hemorrhage or contusion was felt to contribute to his death.

13. A 63 year old man died of congestive heart failure. A premature discharge by hospital staff because of failure to appreciate the severity of his CHF contributed to his death.

14. A 69 year old man died of complications arising from a physical sexual assault by another inmate. The assault resulted in a perirectal abscess with subsequent necrotizing fasciitis. The death was felt to be possibly preventable because failure to do a complete examination after the initial presentation with facial injury resulted in a delay of 5 days before the perineal injuries which led to his death were noticed.

Type 2 lapses – failure to follow established guidelines for care - were cited in the following five possibly preventable deaths.

15. A 54 year old man died of recurrent esophageal variceal hemorrhage, a complication of his end stage liver disease. A failure to follow clinical guidelines (repeat endoscopy 6 months after a banding of esophageal varices was not ordered) contributed to death from recurrent bleeding 14 months following the initial episode.

16. A 63 year old man on anticoagulants because of aortic valve replacement died of complications of intracerebral hemorrhage. Poor management of anticoagulation contributed to his death.

17. A 50 year old man with end stage liver disease and known esophageal varices died of massive upper gastrointestinal hemorrhage. The prescribing of a chronic non-steroidal anti-inflammatory drug (naproxen for six months) contributed to his death.

18. A 59 year old man with end stage liver disease died of sepsis secondary to recurrent spontaneous bacterial peritonitis. Failure to prescribe chronic prophylactic antibiotics contributed to his death.

19. A 62 year old man died of sudden cardiac arrest. Poorly controlled hypertension in the months preceding death (BP ranging from 180-220/90-120) was felt to have contributed to his death from probable myocardial infarction.

A Type 3 lapse – delay in access to appropriate level of care – was thought to contribute to possibly preventable death in the following case.

20. A 72 year old man with multiple medical problems died of pneumonia. He was treated for pneumonia as an outpatient and in the emergency room. Five days after initial presentation in the ED, he developed progressive respiratory failure and died while transfer to an acute care hospital was being arranged.

Type 4 lapses - failure to adequately respond to an abnormal test result - contributed to death in the following seven cases.

21. A 75 year old man died of metastatic colon cancer. A mild iron deficiency anemia was noted during an evaluation of chronic diarrhea. Five months later he developed shoulder pain and an xray showed metastatic cancer. The delay in diagnosis resulting from inadequate response to the anemia was thought to contribute to his death.

22. A 26 year old man died of disseminated coccidioidomycosis. A 20# weight loss and abnormal chest xray were not properly evaluated, causing a five month delay in diagnosis. An abnormal T spine MRI was not evaluated for two more months. A large paraspinous fungal abscess was found and treatment was initiated just before the patient's death.

23. A 65 year old man died of hepatic encephalopathy, a complication of his end stage liver disease (ESLD). Failure to follow up on abnormal liver function tests led to a delay in recognition of his underlying ESLD, which was only diagnosed in hospital six days prior to his death.

24. An 81 year old man with chronic obstructive lung disease died of pneumonia. Inadequate tapering of a steroid given for exacerbation of his lung disease coupled with failure to recognize a

rising white blood cell count as evidence of recurrent infection contributed to a delay in recognition of the septic shock which caused his death.

25. A 51 year old man died of pulmonary hypertension. A failure to evaluate prior electrocardiograms which showed an electrical repolarization abnormality might have contributed to his death from ventricular arrhythmia.

26. A 58 year old man died of hepatocellular cancer. An incidental CT scan of the abdomen performed after the placement of a chest tube had revealed an abnormality in the liver. Failure to follow up on this abnormality contributed to a 10 month delay in diagnosis of the liver cancer which caused his death.

27. A 78 year old man died of hepatocellular cancer. A failure to follow up an abnormal abdominal CT scan resulted in more than a year long delay in diagnosis of cancer.

A Type 7 lapse - A surgical or procedural complication resulting in iatrogenic injury - contributed to the following case.

28. A 51 year old man died after a surgical complication. He underwent a fundoplication for refractory gastroesophageal reflux. Two days later he died of hemorrhagic shock resulting from unrecognized hemorrhage near the operative site.

A Type 6 lapses - Fragmentation of care - contributed to the next case.

29. A 48 year old man died of acute myocardial infarction. Poorly managed chronic pain with poorly documented escalation of methadone by multiple providers resulted in delays in access to appropriate care which contributed to his death.

A type 8 lapse - Medication prescribing error - contributed to the following case

30. A 36 year old man with severe mental illness died of hyponatremia. Polypharmacy (he was prescribed 18 different chronic medications including many drugs which can cause or contribute to hyponatremia), contributed to his death.

A type 9 lapse - Medication delivery error - contributed to the following death

31. A 58 year old man with diabetes mellitus died of suspected diabetic ketoacidosis. Ten weeks prior to death a diabetic medication had been added to his regimen, but this prescription was never filled. This failure in medication delivery was felt to have contributed to the patient's death from poorly controlled diabetes.

Type 12 lapses - Failures to communicate effectively with the patient - contributed to the following three deaths.

32. A 74 year old man died of end stage renal disease 2 days following elective inguinal hernia repair. He twice refused to have life sustaining hemodialysis in the three days after surgery. Poor preoperative preparation and suboptimal post op care resulting from poor communication contributed to his death.

33. A 61 year old man with end stage renal disease on chronic hemodialysis died of respiratory failure due to oversedation exacerbated by a lack of hemodialysis for 7 days. Failure to adjust chronic sedative medication and an inadequate resuscitation effort because of miscommunication about the patient's wishes for resuscitation were contributing factors in this patient's death.

34. A 71 year old man with poorly controlled diabetes died of Staphylococcal pneumonia, which was not treated because the patient had signed a form indicating a desire for no treatment or resuscitation. The patient was thought to have had limited or no capacity for making an informed decision regarding treatment status because he had suffered several hypoglycemic episodes with altered mental status in the weeks prior to the terminal illness.

Multiple lapses contributed to the following death

35. A 35 year old man with a history of tracheostomy and tracheal stenosis had been placed on suicide watch in an acute mental health crisis bed. A complicated series of events contributed to a possibly preventable death. On the evening of his death, he harmed himself by placing food and feces in his tracheostomy, discarding the tracheostomy appliance, and self traumatizing his trachea. Custody used pepper spray on the patient without first checking with medical (failure to follow guidelines), and refused to extract the patient for decontamination and assessment of airway adequacy, despite a medical order to do so, citing a danger of assaultive behavior (failure of custody - medical communication, failure to adequately evaluate airway). He continued to be observed by nursing staff at regular intervals, and several hours later was noted to be unresponsive in his cell. There was a ten minute delay in initiating resuscitation (failure to follow emergency response protocol). Autopsy concluded the patient died of asphyxiation from foreign material and blood in his airway.

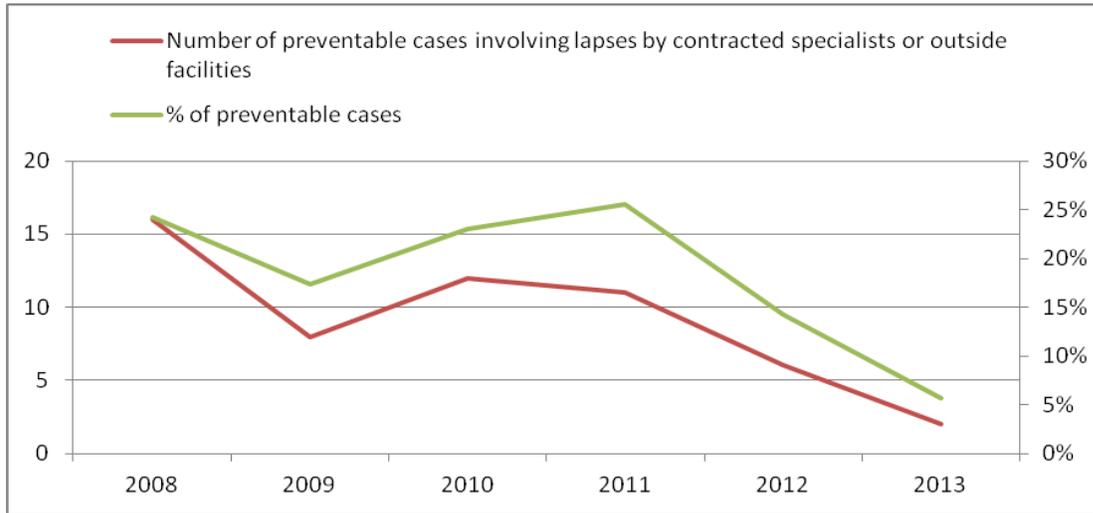
E. Lapses by contracted Specialists and outside facilities.

As in the past five years of the Receivership, all cases of possibly preventable death were reviewed to identify contributory lapses on the part of non-CCHCS specialists or outside facilities. In 2013 there were two such cases, both described previously:

- Case 13, in which providers at a local hospital possibly discharged the patient prematurely, thereby contributing to his death.

- Case 28, in which iatrogenic surgical injury contributed to the patient's death.

Figure 1. Possibly preventable deaths of California prison inmates involving lapses by contracted specialists or outside facilities, 2008-2013.



These 2 cases are 6% of the 35 preventable cases, which continues the favorable downward trend first noted in the 2012 analysis.

F. Likely (Definitely) preventable deaths in 2013

For the first year in the history of the Receivership, there were no likely (definitely) preventable deaths identified in 2013.

VII. Discussion

A. Trends in California prison death rates from 2006- 2013

Table 7. Annual death rates among California inmates, 2006- 2013.

YEAR	NUMBER OF DEATHS	NUMBER OF INMATES	DEATH RATE PER 100,000 INMATES
2006	426	171,310	249
2007	397	170,786	232
2008	369	170,022	217
2009	396	169,459	234
2010	415	166,700	249
2011	388	161,843	240
2012	367	134,929	272
2013	366	133,297	275

The annual death rate of California state prisoners in 2012 was 272/100,000 and in 2013 was 275/100,000. This is compared to death rates in the years 2006 – 2011 which averaged 238/100,000 (ranged from a low of 217 to a high of 249). The increase in the overall CCHCS death rate during the past two years may be related to the mandated reduction in prison population and an associated increase in the average age, or a rising prevalence of chronic disease, or both.

The benchmark state prison death rates from the US Bureau of Justice statistics are available for the years 2001 – 2012. Details are available at their website (www.bjs.gov). Table 8 compares the national state prison death rate to the California experience.

Table 8. Total U.S. State Prison and California prison death rates per 100,000; 2006-2013.

	TOTAL U.S.	CALIFORNIA
2006	249	249
2007	256	232
2008	260	217
2009	257	226
2010	245	249
2011	260	240
2012	264	272
2013	not available	275

For the years 2006 – 2012, the first seven years of the Receivership in California, the national state prison death rates average 256 /100,000 inmates. The death rates average in the CCHCS during the same seven-year period was slightly lower - 241 /100,000.

There were 2,758 deaths in the California state prisons in the years 2006 – 2012 (see Table 7). During that period, there were 23,422 deaths in state prisons reported nationally. Thus, California prison deaths accounted for 12% of the total.

B. Trends in Preventable Deaths from 2006-2013

Figure 2. Trend in preventable death rates in the California Correctional System, 2006-2013.

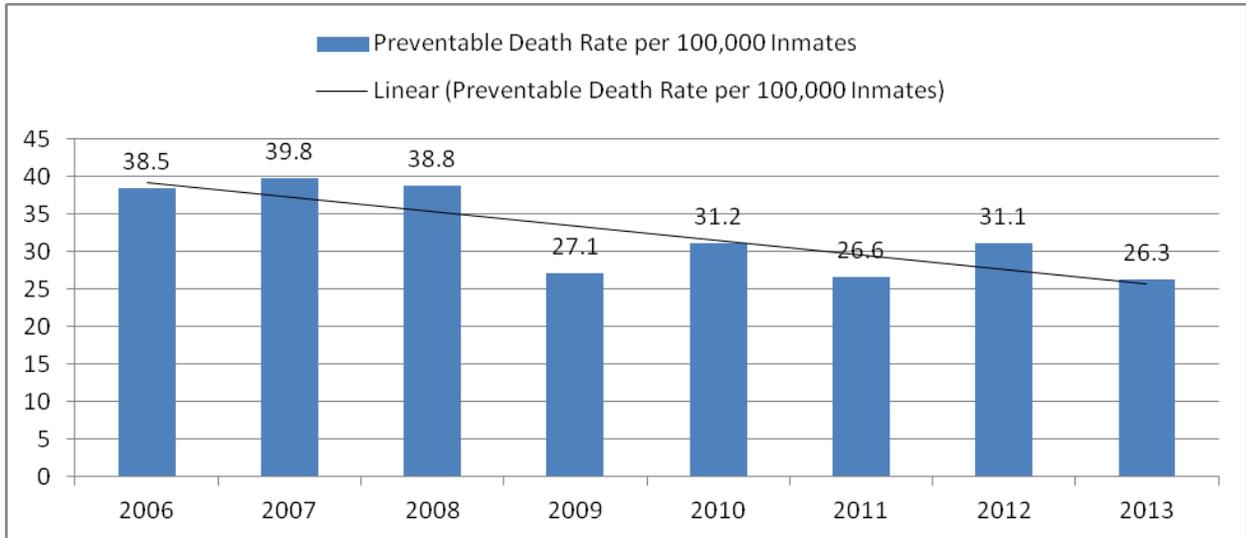


Figure 2 shows the favorable trend in preventable death rates for the past seven years. In 2013, there were 35 total preventable deaths – all possibly preventable. This is a rate of 26.3/100,000 for all preventable deaths.

Table 9 shows the rates of preventable deaths among California inmates from 2006- 2013. It also shows the total number of possibly preventable and likely preventable deaths in each year.

Table 9. Rates of preventable deaths among California inmates, 2006-2013.

YEAR	ALL PREVENTABLE (LIKELY / POSSIBLY)	INMATE POPULATION	RATE/ 100,000
2006	66 total (18 / 48)	171,310	38.5
2007	68 total (3 / 65)	170,786	39.8
2008	66 total (5 / 61)	170,022	38.8
2009	46 total (3 / 43)	169,459	27.1
2010	52 total (5 / 47)	166,700	31.2
2011	43 total (2 / 41)	161,843	26.6
2012	43 total (1 / 42)	134,929	31.1
2013	35 total (0 / 35)	133,297	26.3

Looking only at the likely preventable deaths, there has been a consistent reduction during the past seven years. There were 26 such deaths in the first three years, averaging 8.7/year and only 11 in the past four years, averaging 2.8 per year. There was only one definitely preventable death in 2012, and there were none in 2013.

C. Trends in causes of mortality – suicides and homicides

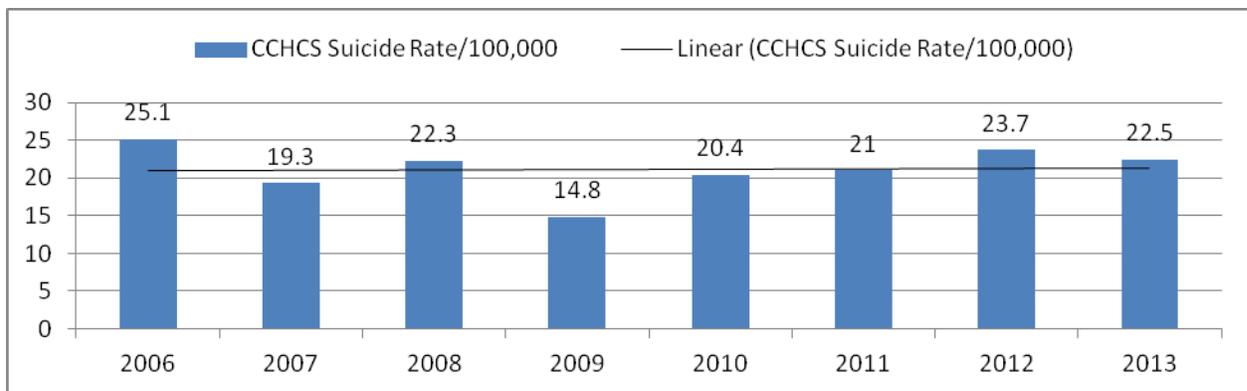
1. *SUICIDES*– Table 10 shows the number and corresponding rates of deaths by suicide from 2006-2013, in California and nationally.

Table 10. Numbers of suicide-related deaths in California and all US State Prisons, 2006-2013.

	2006	2007	2008	2009	2010	2011	2012	2013	Avg
Suicides	43	33	38	25	34	34	32	30	33.6
Rate/100,000	25.1	19.3	22.3	14.8	20.4	21.0	23.7	22.5	21.1
US State Prison rate	17	16	15	15	16	14	16	NA	15.6

NA= Data not available

Figure 3. Suicide death rates in the California Correctional System, 2006 – 2013.



There were 30 deaths by suicide in 2013, a rate of 22.5/100,000.

The CCHCS rates of death by suicide have remained essentially unchanged from 2006 - 2013, averaging 21/100,000.

These rates however, are higher than the average suicide rate of 15.6/100,000 in the total US prison population from 2006 – 2012 (www.bjs.gov).

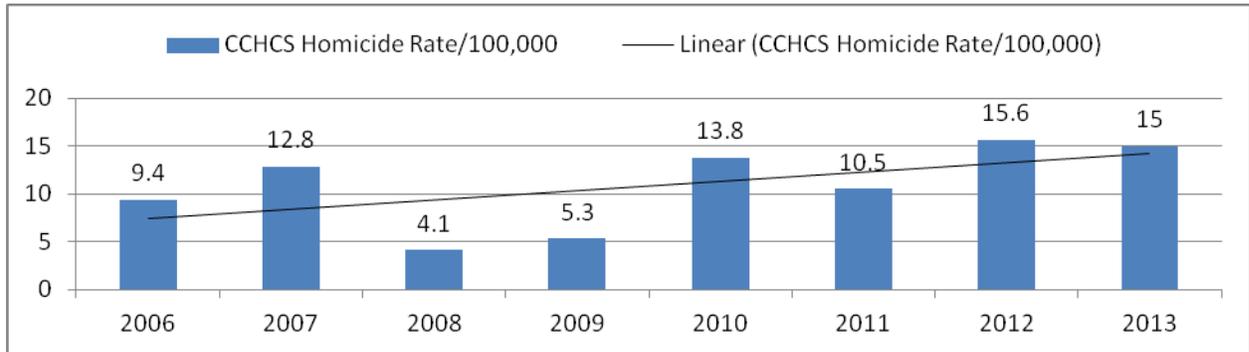
2. *HOMICIDES* – The number of homicides and corresponding rates/100,000 from 2006 – 2013 in California and nationally is shown in Table 11.

Table 11. Numbers of homicide-related deaths in California and all U.S. State Prisons, 2006-2013.

	2006	2007	2008	2009	2010	2011	2012	2013	Avg
No. of CCHCS cases	16	22	7	9	23	17	21	20	16.9
CCHCS Rate/100,000	9.4	12.8	4.1	5.3	13.8	10.5	15.6	15.0	10.8
U.S. State Prison rate	4	4	3	4	5	5	7	NA	4.6

NA=Data not available

Figure 4. Homicide death rates in the California Correctional System, 2006 – 2013.



There were 20 deaths by homicide in 2013, a rate of 15/100,000. Rates of death by homicide in California prisons appear to be rising.

The average CCHCS rate of death by homicide from 2006 - 2013 is 10.8. These rates are more than double the 4.6 average national state prison rate from 2006-2012. (<http://www.bjs.gov>)

D. Trends in lapses in care – 2013

1. The relationship between number of lapses and preventable deaths.

Lapses in care occur commonly in medical practice. For example, a 2009 study in a large VA hospital system found that 58% of significantly abnormal abdominal ultrasounds (ordered to screen for aortic aneurysm) were not documented in the patients' medical records for over three months. Despite the presence of an electronic medical record system, the median time to recognition of the missed abnormal report was 237 days. Fortunately, none of these cases resulted in an adverse outcome. (*Annals of Internal Medicine*, Volume 151, pages 21-27, 2009).

The number of lapses rises in proportion to increasing numbers of medical encounters. Therefore, the patients at highest risk for experiencing lapses in care are those that have the most medical needs, such as the chronically ill, the elderly, and other patients with high numbers of medical encounters such as those with chronic pain and severe behavioral illness.

Prior CCHCS reports have shown that there is a relationship between the number of lapses occurring in a single case and a cascade of events that can lead to preventable death.

This relationship held for 2013 as well, with an average of 2.8 lapses in each preventable death, but only 0.6 lapses per not preventable death.

Table 12 shows this relationship for 2013 deaths.

Table 12. Number of lapses by category of preventability, 2013.

PREVENTABILITY	# DEATHS	# LAPSES	AVERAGE LAPSES/DEATH
Likely preventable	0	n/a	n/a
Possibly preventable	35	97	2.8
Not preventable	331	206	0.6

Figure 5. Average number of lapses per case by preventability, 2007-2013.

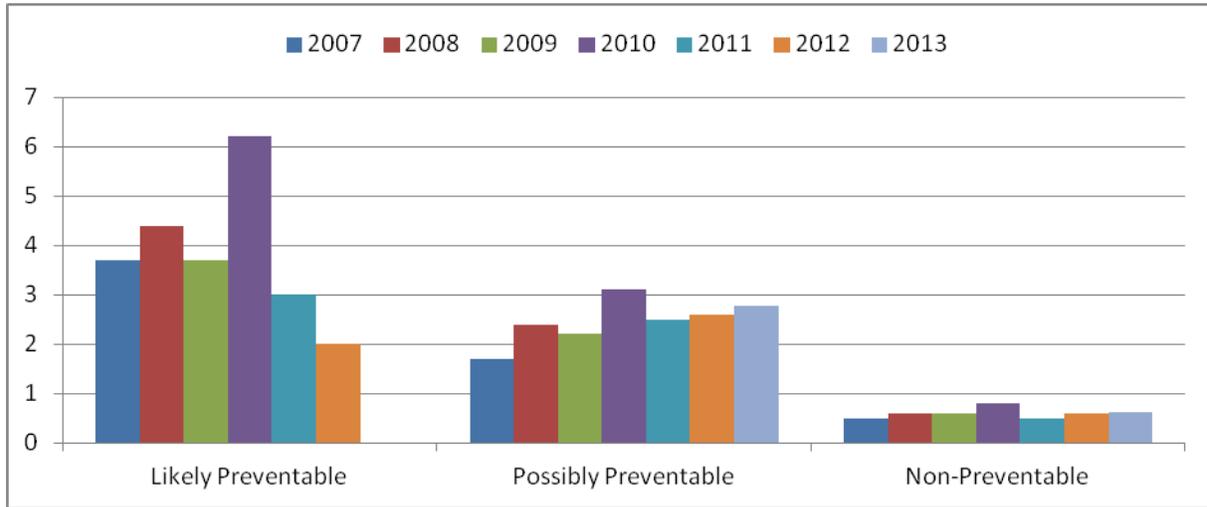


Figure 5 shows the relationship between numbers of lapses and preventability over seven years. In every year, lapses in preventable death averaged five times higher than lapses in non-preventable deaths.

2. Trends in total numbers of lapses in care, 2007 – 2013

Table 13. Number of lapses, by preventability, in California Correctional System deaths, 2007-2013.

YEAR	LIKELY PREVENTABLE		POSSIBLY PREVENTABLE		NON PREVENTABLE		TOTAL
	#	%	#	%	#	%	
2007	11	4%	109	36%	179	60%	299
2008	22	6%	147	41%	193	53%	362
2009	11	4%	90	29%	205	67%	306
2010	31	7%	147	32%	284	61%	462
2011	6	2%	92	37%	154	61%	252
2012	2	1%	105	34%	198	65%	305
2013	0	0%	97	32%	206	68%	303

Table 13 shows the trend in total numbers in lapses identified by the DRC over the past seven years. In 2013, there were a total of 303 lapses. There is a problem in analyzing these numbers, because in 2011, the Death Review Committee stopped distinguishing between extreme lapses

(which were the only type of lapse counted in prior years' death review analyses) and simple lapses, electing to treat all lapses as opportunities for improvement.

Because of this change, both the 2012 and this 2013 analyses of CCHCS deaths do not discuss trends in types of lapses or subsets of lapses, as was done in prior years.

VIII. Targeted Opportunities for Improved Performance

A. Primary Care 2009–2013

Primary Care teams were installed in all California prisons in 2009 in order to establish a higher level of accountability for patient outcomes. Primary care teams are held to high standards of practice, expected to advocate of behalf of patients, to be responsible for timely access, for efficient and appropriate care, and for using evidence based guidelines for managing chronic diseases and conditions.

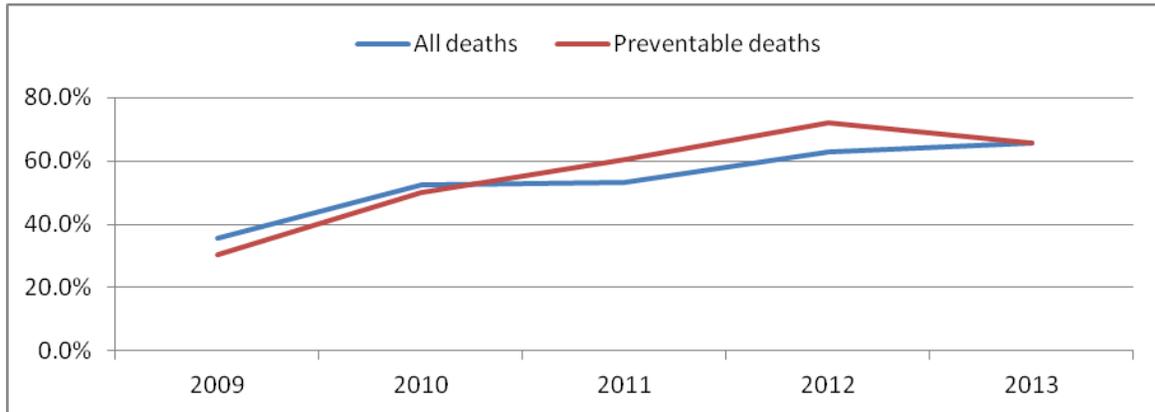
The next table shows the penetration of primary care as measured by the number of cases in which a primary care physician (PCP) could be identified by the reviewers. Since 2009, there has been a significant increase in the percentage of patients who have identifiable PCPs. In 2009, 36% of the patients had identifiable primary care physicians. By 2013, the number of patients with PCPs had increased to 66%.

Table 14. Identifiable primary care in California inmate death cases, 2009 – 2013.

Year	Cases with identified Primary Care Physician (% of total)		
	Preventable deaths (possibly and likely)	Non preventable deaths	TOTAL DEATHS
2009	14 of 46	127 of 248	141 of 393
	30.4%	37.0%	35.5%
2010	26 of 52	191 of 363	217 of 415
	50.0%	52.6%	52.3%
2011	26 of 43	183 of 345	209 of 388
	60.5%	53.7%	53.4%
2012	31 of 43	199 of 324	230 of 367
	72.1%	61.4%	62.7%
2013	23 of 35	217 of 331	240 of 366
	65.7%	65.6%	65.6%

As shown in the run chart below, there is as yet no significant difference in the percent of identifiable primary care physicians in all death cases compared to preventable (possible plus likely) death cases.

Figure 6. Percentage of deaths in the California Correctional System with an identified primary care physician, 2009-2013.



B. Performance Improvement Plans

The Receiver’s 2010 Performance Improvement Plan was described in the 2011 version of this report. Four specific areas for improved quality of care were targeted. These were in the areas of cardiovascular disease, chronic hepatitis C, improved cancer care, and drug overdose prevention.

Coccidioides immitis is a fungus widespread in the soil of the San Joaquin Valley, where many of the California prisons are located. It causes coccidioidomycosis (cocci) infection which can lead to death in susceptible populations. Death from cocci was also targeted for improvement in the past several years.

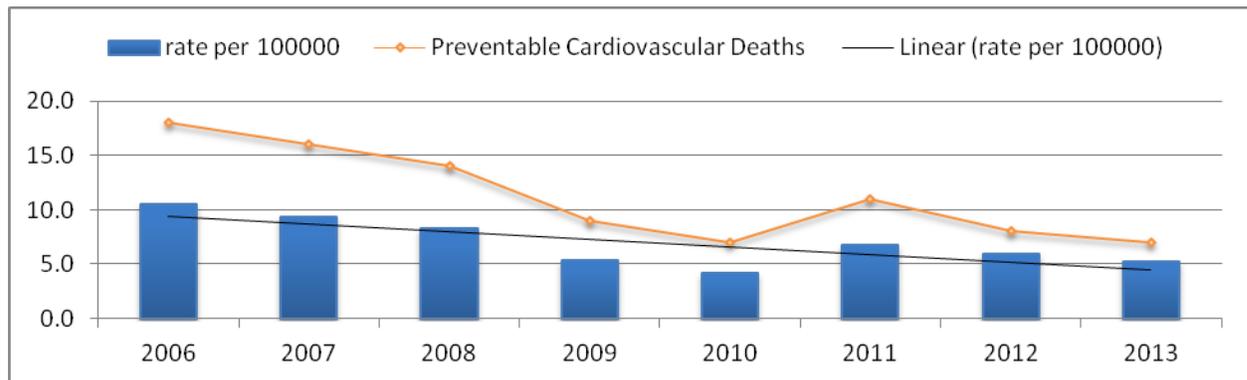
The numbers and rates of **preventable** deaths from cardiovascular, cancer and ESLD are shown in Table 15 and the rates are trended in Figures 8, 9, and 10.

Table 15. Numbers and rates of preventable cardiovascular, cancer and end stage liver disease deaths in the California Correctional System, 2006-2013.

Year	Preventable Cardiovascular Deaths		Preventable Cancer Deaths		Preventable ESLD Deaths	
	Number	Rate/100,000	Number	Rate/100,000	Number	Rate/100,000
2006	18	10.5	6	3.5	2	1.2
2007	16	9.4	7	4.1	6	3.5
2008	14	8.2	9	5.3	4	2.4
2009	9	5.3	10	5.9	4	2.4
2010	7	4.2	4	2.4	2	1.2
2011	11	6.8	6	3.7	1	0.6
2012	8	5.9	1	0.7	3	2.2
2013	7	5.3	4	3.0	4	3.0

1. Preventable Cardiovascular Deaths

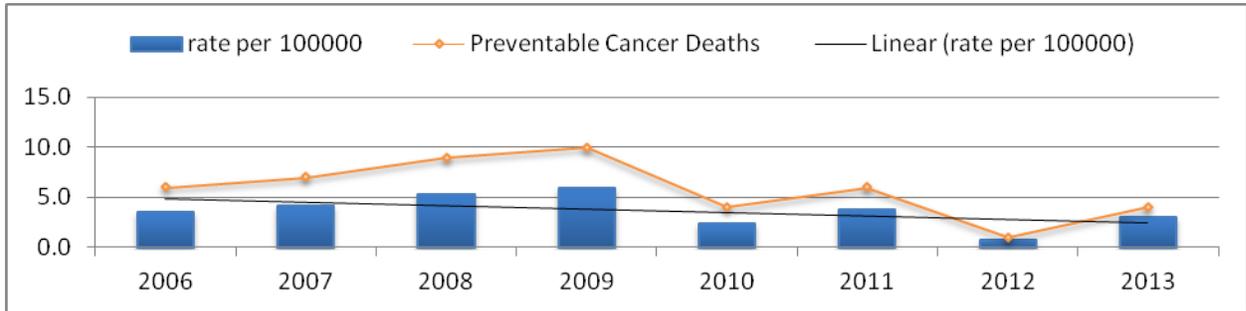
Figure 7. Preventable cardiovascular deaths and rates in the California Correctional System, 2006-2013.



There has been a significant reduction in preventable deaths due to cardiovascular disease (Figure 7), which might be a result of the emphasis on educating medical and nursing staff on better recognition of “red flag” symptoms of coronary ischemia, and on better management of chronic heart disease and risk factors for coronary artery disease.

2. Preventable Cancer Deaths

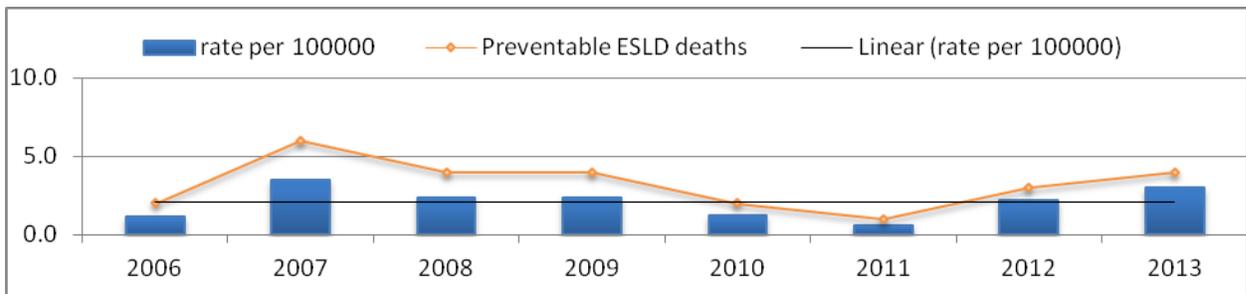
Figure 8. Preventable cancer deaths and rates in the California Correctional System, 2006-2013.



Beginning in 2010, there appears to be a trend in reduction of preventable cancer deaths (Figure 8). This might be the result of improved practices in cancer screening recommendations and earlier recognition of red flag symptoms reducing delays in cancer diagnosis. Improvements in chronic cancer care (after the diagnosis is made) might also result in a reduction of preventable mortality.

3. Preventable End Stage Liver Disease Deaths

Figure 9. Preventable end stage liver disease deaths and rates in the California Correctional System, 2006-2013.



The rates of preventable deaths from ESLD have not yet shown a significant improvement (Figure 8), despite the development of and system wide training on guidelines for management of chronic hepatitis C infection and the complications of cirrhosis.

4. Drug Overdose Deaths

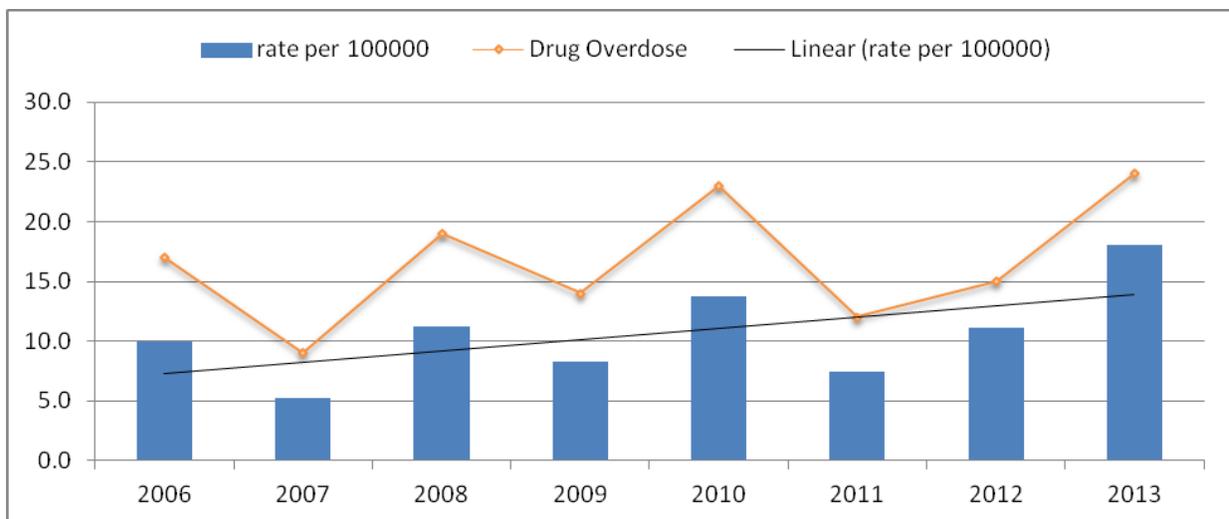
Because drug overdoses have caused a significant number of deaths in the younger inmate population, the Performance Improvement Plan in 2010 stressed adherence to the CCHCS pain management and medication management guidelines, intended to improve control of opiate diversion and to reinforce appropriate indications for narcotic prescription. Table 16 and Figure 10 show a clear reduction in drug overdose death rates in 2011, but in 2012 and again in 2013, the

rates have risen. There were 24 drug overdose deaths in 2013, a rate of 18/100,000. The majority of these were caused by opiates, either alone or in combination with methamphetamines and/or alcohol and 7 were caused by methamphetamine alone. (Table 1) The average death rate from drug overdose from 2006 – 2013 was 10.6/100,000, more than double the national average rate of 3.6/100,000 from 2006 – 2012 (<http://www.bjs.gov>).

Table 16. Numbers and rates of drug overdose-related deaths in the California Correctional Healthcare System and in all U.S. prisons, 2006-2013.

	2006	2007	2008	2009	2010	2011	2012	2013	Avg
CCHCS drug overdoses	17	9	19	14	23	12	15	24	16.6
CCHCS rate/100,000	9.9	5.3	11.2	8.3	13.8	7.4	11.1	18.0	10.6
US state prison rate/100,000	4	3	4	4	3	4	3	NA	3.6

Figure 10. Drug overdose death rates in the California Correctional Healthcare System 2006-2013.



5. Coccidioidomycosis Deaths

Coccidioidomycosis is contracted in the California San Joaquin Valley, where eight of the state’s 34 prisons are located. A program intended to reduce morbidity and mortality caused by this fungal disease has included a number of educational presentations to clinicians and a policy which restricts high risk or immune suppressed patients from being housed in these prisons.

From 2006 – 2012 there were 43 deaths from coccidioidomycosis. Of the ten cases in 2011 - 2012, four were called possibly preventable because of delayed recognition. The continued occurrence of death from coccidioidomycosis prompted the Receivership to mandate the transfer of several

thousand at risk patients in 2013. The trending chart shows decreasing numbers of deaths from coccidioidomycosis, even though 2013 saw four more cases of coccidioidomycosis death, one thought to be possibly preventable.

Figure 11. Coccidioidomycosis related deaths and death rates in the California Correctional System, 2006-2013.

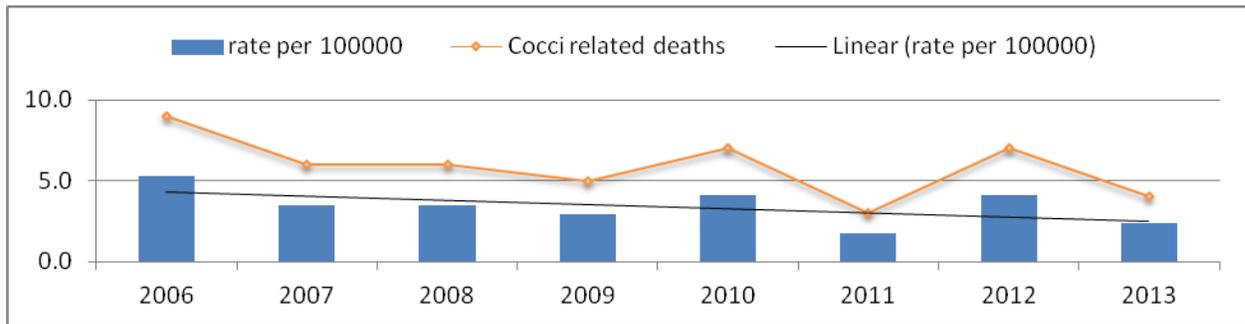


Table 17. Coccidioidomycosis-related deaths in the California Correctional System, 2006-2013.

	2006	2007	2008	2009	2010	2011	2012	2013
Cocci related deaths	9	6	6	5	7	3	7	4
Rate/100,000	5.3	3.5	3.5	2.9	4.1	1.8	4.1	2.3
Preventable cocci related deaths	4	3	3	2	4	1	3	1

C. Evidence Based Clinical Spotlights and Care Guidelines

The DRC also makes recommendations to the Clinical Support Unit (CSU) for changes in existing guidelines and suggestions for topics for targeted provider education. One such activity is the publication “The Clinical Spotlight”, developed by the CSU in order to distribute brief clinical practice communications. A number of these Spotlight topics have been developed in direct response to specific cases discussed at the DRC. Six cases triggered articles in 2012: Hypertensive Crisis; Use of the Advanced Directive; Intraosseous Access (during emergency response); Hypothermia; Hepatic Encephalopathy; and the appropriate use of NSAIDs (non-steroidal anti-inflammatory drugs). In 2013, an additional six cases generated Clinical Spotlights: Urinary Tract Infections and Evaluation of Hematuria in Adult Males; Dermatologic Antibiotic Use, topical vs. oral; Filling out a POLST (Physician order for life sustaining treatment); GI Bleed Transportation; Medical Management of Intoxication and Withdrawal; and Sliding Scale insulin (in the management of diabetes.)

The CCHCS in the past several years has developed, distributed and done training on a large number of Care Guidelines. These are well researched, evidence based, detailed guidelines for the management of most of the important chronic conditions seen in the prisons’ clinical practice.

They are an important decision support tool for frontline providers and nursing staff, who are expected to use them in the day to day management of patients. Twenty-two care guides are in current use and they are frequently cited in determining standards of care in death review cases. Accessible online (cphcs.ca.gov/careguides.aspx) are the Care Guides for Anticoagulation, Asthma, Chest Pain, Coccidioidomycosis, Chronic Obstructive Pulmonary Disease, Diabetes Mellitus, End Stage Liver Disease, Gender Identity Disorder, Hepatitis C Virus infection, HIV/AIDS, Hyperlipidemia, Hypertension, Major Depressive Disorder, Mass Hunger Strike, Minor Procedures, Pain Management, Palliative Care, Seizure Disorders, Skin and Soft Tissue infections, Tuberculosis Surveillance, Wound and Skin Ulcer Management, and Tuberculosis.

D. The California Health Care Facility, A prison for tertiary health care

2013 also saw the opening of the newest California prison, the California Health Care Facility, which serves as the designated institution for highly complex, high risk patients whose needs require proximity to tertiary care in a setting staffed by appropriately trained physicians and other healthcare staff.

E. Recommendations and Referrals of the Death Review Committee

The DRC makes referrals to both Nursing and Physician Peer Review Committees, to the Mental Health Department, to the Quality Management and Utilization Management committees, to specific regional institutional CEOs, medical, and nursing leadership, to the Emergency management committee and other groups dealing with Ethics, Patient Safety, and Adverse Sentinel Events. The DRC has now begun tracking total numbers of referrals to the various peer review and quality improvement committees. In future years, trending the pattern of referral may become a useful indicator of overall system performance.

IX. Conclusions

The California Correctional Healthcare System has used the death review as a major instrument for improving the quality of healthcare. The death review process is rigorous, standardized, and integrated into the overall quality improvement program, and informs much of that program's activities.

During the first years of the Receivership, death reviews and the peer review activity that it activated were largely responsible for identifying and removing unsafe physicians. In subsequent years, an emphasis on developing more clinical accountability and patient advocacy has led to the development of a systemic primary care patient centered infrastructure, chronic disease management and a culture of quality improvement.

Some trends are disappointing. Rates of death from suicide have remained largely unchanged, and rates of death from homicide are rising. Both rates are significantly higher than the national averages for the years 2006-2011, although direct comparison with these national benchmarks are not reliable because of possible differences in age, race, geographic location and other demographic characteristics. Despite the development of specific programs to reduce deaths from drug overdose and to improve the care of end stage liver disease (ESLD), deaths from drug overdose have been rising and preventable death rates from ESLD have remained unchanged.

Nevertheless, there has been significant progress on several fronts. The CCHCS has seen favorable trends in the rates of preventable cardiovascular death, preventable cancer death and coccidioidomycosis death.

The total numbers of and rates of possibly preventable deaths have trended favorably downward during the past several years, and in 2013, for the first time, there were no deaths judged to be definitely preventable.

The continued emphasis on accountable primary care, the focus on ongoing clinical education and training through the use of care guides and other tools, the planned concentration of patients with severe chronic diseases into new medically oriented prison facilities, and the continued reductions in the California state prison population, are expected to result in further measurable improvements in the prevention of unnecessary suffering and death.

CORRECTIONS TO PRIOR YEAR DATA

This edition of the report contains the following corrections to data from prior years:

The 2006 prison population was misstated at 166,844 in prior reports; this figure is actually 171,310. This total 2006 prison population figure has been corrected in this report; and the correct corresponding rates per 100,000 inmates for that year are 249 deaths (Table 8), 38.5 preventable deaths (Table 10), 9.9 drug-overdose-related deaths (Table 12), and 9.4 homicide-related deaths (Table 14).

The 2012 rate for California homicide-related deaths per 100,000 inmates was miscalculated in the 2012 report. This number has been corrected to 15.6 (Table 14).