

Analysis of 2021 California Correctional Health Care Services Inmate Mortality Reviews

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I. Introduction

This is the sixteenth consecutive annual report on mortality reviews of inmate deaths occurring in the California Correctional Health Care System (CCHCS).

Since April of 2006, healthcare services in the CCHCS have been the responsibility of a Federal Receiver appointed by the U.S. District Court, which ruled that the medical care in California's prisons was in violation of the Eighth Amendment of the U.S. Constitution, citing cruel and unusual punishment of the incarcerated.

The work of the Receivership has been transformational. By 2015, the Receivership began delegating institutions back to the California Department of Corrections and Rehabilitation (CDCR). In that same year, the Complete Care Model, based on the industry standard known as the Patient- Centered Health Home, became the foundation for CCHCS health care services delivery.

In 2020, the CCHCS and the CDCR jointly released a new vision and mission statement with an emphasis on restorative justice, successful community reintegration and public safety.

Vision

We enhance public safety and promote successful community reintegration through education, treatment, and active participation in rehabilitative and restorative justice programs.

Mission

To facilitate the successful reintegration of the individuals in our care back to their communities equipped with the tools to be drug-free, healthy, and employable members of society by providing education, treatment, rehabilitative and restorative justice programs, all in a safe and humane environment.

Following the format of prior years, this report will describe the mortality review process in the prison system. Demographics of the California prison population will be reviewed. The causes of death will be described and mortality rates will be trended. Opportunities for system improvement will be categorized and analyzed. Quality Improvement Initiatives will be discussed and summarized.

This and all prior death report analyses are available at <https://cchcs.ca.gov/reports/>.

II. Mortality Review Purpose and Process

The purpose of the Mortality Review Unit is to utilize mortality data to mitigate patient harm, and to identify opportunities for improvement (OFI) as they relate to patient safety, the quality of health care services, and patient outcomes.

An inmate death triggers an initial death report generated by the prison in which the death occurs. This report goes through the Electronic Health Record System to the central headquarters (HQ) mortality review unit staff. Next, the prison submits a local death summary to HQ within five business days. This summary includes significant clinical events, the emergency medical response, any identified lapses in health care delivery and any systemic issues that may have contributed to the death.

At the Mortality Review Unit, an extensive review of the patient's clinical record is conducted, dating back at least six months prior to the date of death. A reviewer may include older records to determine the antecedents to the terminal event. The totality of care experienced by the patient is evaluated. The quality of triage and evaluation, timeliness of access to care, the quality of care for any chronic medical condition, adherence to published evidence-based care guides and nationally recognized standards of care, responses to all abnormal laboratory and imaging studies, and the timing and quality of emergency response are reviewed. The patient's mental health care is also summarized.

All suicides or possible suicides undergo an additional, separate case review by a member of the Suicide Prevention and Response Focused Improvement Team (SPRFIT).

The results of these reviews are then presented at the HQ Mortality Review Committee (MRC). MRC members are appointed by the Statewide Deputy Directors of Medical and Nursing Services. Membership consists of three physicians, three nurses, one mental health professional, one member representing custody, and one (non-voting) member of the Quality Management staff.

For each death, the three physician members attribute the cause of death and the MRC assigns the death to one of four categories: expected or unexpected death, with or without findings of OFI.

In addition to findings of OFI the MRC also identifies Potential Quality Issues (PQI), which refers to incidents with potential quality implication that occur outside the CCHCS prison system, in one of the Healthcare Provider Networks that contract with the state to provide hospital care or specialist care.

The final mortality report is sent to the institution (prison) and health care leadership and findings are entered in the Electronic Health Care Incident Reporting (eHCIR) system. When relevant, findings are also sent to the Nursing Professional Practices Committee and other relevant peer review bodies.

III. Definitions

Expected Death: A medically anticipated death which is related to the natural course of a patient's illness or underlying condition.

Unexpected Death: An unanticipated death which is not related to the natural course of a patient's illness or underlying condition.

Opportunity for Improvement (OFI): An occasion or situation from which it is possible to improve systems or processes related to the delivery of health care. (In the mortality reviews, OFI are called "Findings".)

Potential Quality Issue (PQI): A health care incident, regardless of severity, which occurs during the course of treatment by a Healthcare Provider Network facility or provider and requires submission of a written Potential Quality Issue referral.

IV. The California State Prison Population in 2021

Number of inmates – The Receivership was created in 2006, when the California prison population numbered 171,310.

Since then, Federal court-mandated reductions resulted in significant decreases in the number of inmates in custody. Additionally, California state propositions and legislative actions have contributed to the reduction in inmate population. Figure 1 is an annotated run chart of the California prison population from 2006 to 2021.

- Assembly Bill 109, an "Alternate Custody Program" passed in 2011, had some felons and parole violators remain in local county jails.
- Proposition 36 in 2012, the Three Strikes Reform Act, decreased the number of individuals at risk for long prison terms by allowing re-sentencing for convicts serving life sentences for felonies that were nonviolent.
- Proposition 47 in 2014 converted some theft and drug possession felonies into misdemeanors.
- Proposition 57 in 2017 increased good behavior early release opportunities for inmates.

By 2019, these steps had resulted in a prison population of 125,270.

The COVID-19 pandemic resulted in a further reduction following 1) an Executive Order by the California Governor in March 2020 which further suspended the intake of new inmates from county jails into state prisons and 2) CDCR’s actions in spring and summer of 2020 to reduce population and maximize space.

By December 31, 2020, the California prison population was 95,432, of which 92,116 were housed in the 35 state prison facilities. This population, the lowest since 2006, was 102.8% of the designed capacity of the prisons. (<https://www.cdcr.ca.gov/research/population-reports-2/>)

Calendar year 2021 saw a slight increase in the number of inmates. By December 31, 2021, the population totaled 99,729. For purposes of calculating mortality and disease case rates, following the convention of prior mortality reviews, this report will use the average of the four end of quarter populations in 2021. This number is 98,077.

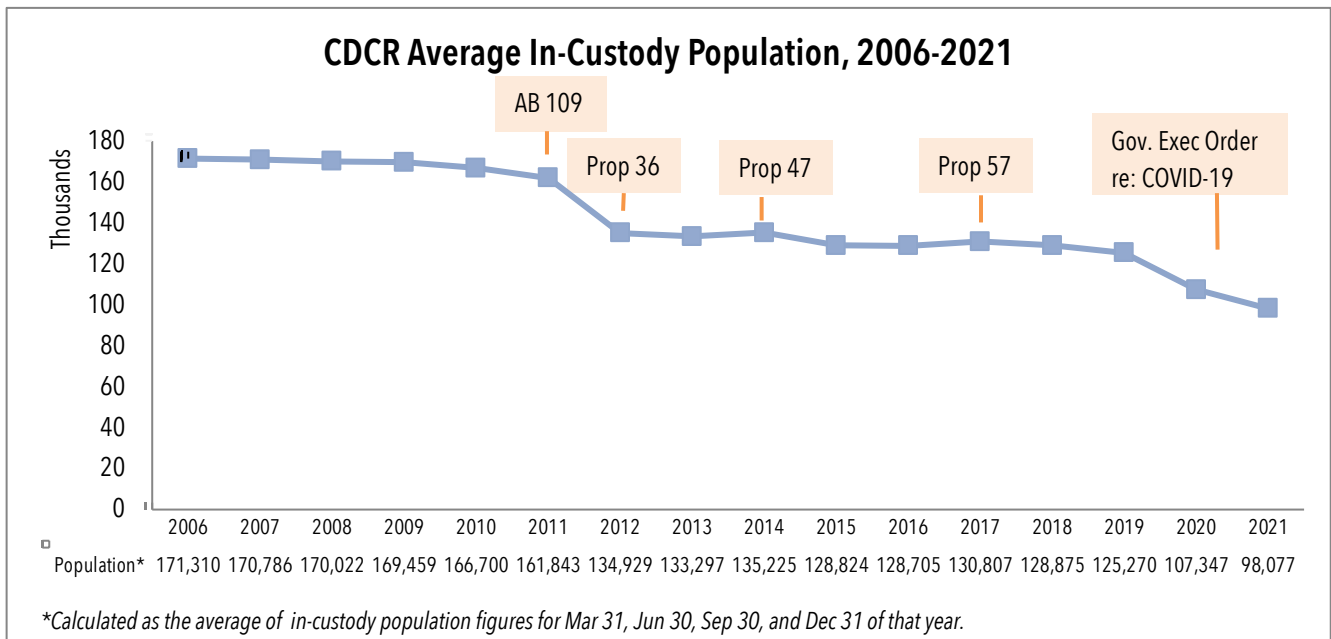


Figure 1. California State Prison Population 2006–2021.

The following demographic statistics are sourced from the CDCR Office of Research.

Age – The average age of the California prison population in December 2021 was 41.7 years, with males averaging 41.8 and females 39.7. Individuals under 45 represent roughly two thirds (62.6%) of the total prison population.

The prison population has been increasing in average age, with prisoners older than 55 comprising 19.3% of the CCHCS population in 2021 (Offender Data Points, CDCR Public Dashboard), compared with 12.5% in 2015.

Gender – In December 2021, of 99,729 inmates, 95,276 (95.5%) were male, 4,200 (4.2%) were female, and 253 (0.3%) were non-binary (Monthly TPOP4 Report for December 2021).

Ethnicity – The in-custody population in December 2021 was 28.3% Black, 45.3% Hispanic, 19.8% White, and 6.5% other races (Offender Data Points, CDCR Public Dashboard); the total may not equal 100% due to rounding.

According to the California Department of Finance, Demographic Research Unit, the 2020 Census shows the California general adult (18+) population to be 5.4% Black Non-Hispanic, 39.4% Hispanic Any Race, 34.7% White Non-Hispanic, 15.1% Asian Non-Hispanic, 4.1% Multiracial Non-Hispanic, and 1.3% other single races non-Hispanic (including American Indian and Alaska Native, and Native Hawaiian and Other Pacific Islander, and other).

Figure 2 shows the overrepresentation of California’s Black and Hispanic populations in its prison system. Black overrepresentation is the most significant, comprising 5.4% of the general population and 28.3% of inmates. Hispanics are also disproportionately represented, comprising 39.4% of the general population and 45.3% of inmates.

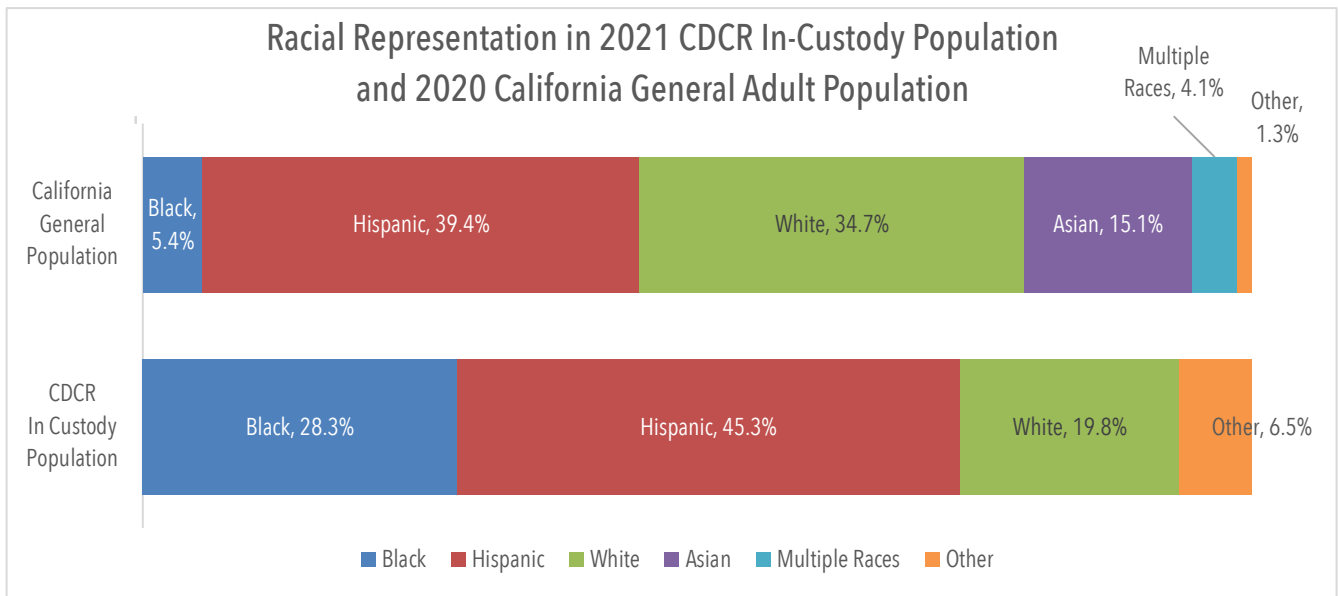


Figure 2. Racial Representation in California General Population and CDCR In-Custody Populations

V. 2021 Study Findings

A. Causes of Inmate Death

In 2021 there were 392 inmate deaths. Table 1 shows the number and causes of all inmate deaths.

Number of Cases	Category and Causes of Death
90	Infectious Disease (COVID-19)
76	Cancer (CA) CA-lung (13); CA-prostate (9); CA-colorectal (8); CA-pancreas (7); CA-kidney (4); CA-stomach (4); CA-unknown primary (4); CA-brain (3); CA-esophagus (3); CA-sarcoma (3); CA-lymphoma (3); CA-gall bladder (2); CA-thyroid (2); CA-urinary bladder (2); CA-head and neck (2); CA-chronic lymphocytic leukemia (1); CA-acute lymphoblastic leukemia (1); CA-acute myelogenous leukemia (1); CA-testis (1); CA-urothelial (1); CA-appendix (1); CA-adenocarcinoma of unknown origin (1)
47	Cardiovascular Disease sudden cardiac arrest (24); congestive heart failure (11); acute myocardial infarction (8); aortic dissection (2); aortic aneurysm (1); aortic stenosis (1)
32	Advanced (End Stage) Liver Disease (ESLD) ESLD with hepatocellular carcinoma (HCC) (24); ESLD without HCC (7), ESLD-alcoholic (1)
32	Infectious Disease (non-COVID-19) sepsis (15); pneumonia (8); infectious endocarditis (4); pneumonia-aspiration (3); bacterial sinusitis (1); abscess shoulder (1)
24	Drug Overdose fentanyl (15); methamphetamine/opiate (3); methamphetamine (2); fentanyl/methamphetamine/buprenorphine (1); fentanyl/methamphetamine (1); buprenorphine (1); other - quetiapine plus mirtazapine (1)
15	Homicide
15	Suicide
14	Pulmonary chronic obstructive pulmonary disease (7); pulmonary fibrosis (5); pneumonia, atypical (1); pulmonary aspiration (1)
11	Cerebrovascular Disease stroke, hemorrhagic (6); stroke ischemic/thrombotic (4); stroke, embolic (1)
10	Gastrointestinal Disease upper gastrointestinal hemorrhage (6); ischemic bowel (2); intestinal perforation (1); cholecystitis, gangrenous (1)
9	Neurological Disease dementia (3); amyotrophic lateral sclerosis (2); seizure disorder (2); Guillain-Barre syndrome (1); Parkinson Disease (1)

Number of Cases	Category and Causes of Death
6	Circulatory System pulmonary embolus (6)
4	Renal Disease end stage renal disease (4)
2	Accidental accidental injury/trauma (1); adverse drug reaction (1)
2	Metabolic diabetic ketoacidosis (1); morbid obesity (1)
2	Unknown closed head injury, cause uncertain (2)
1	Auto Immune mixed connective tissue disease (1)
392	Total

Table 1. Causes of Death Among All California Inmates, 2021.

The SARS-CoV-2 virus (COVID-19) was the number one cause of mortality in 2021. COVID-19 caused 90 deaths, representing 23% of the total mortality. This was a significant reduction from 2020, when COVID-19 caused 141 deaths, 29% of the total.

Cancer was the second leading cause of death in 2021, causing 76 deaths. Cancer of the lung (13 cases) was the most common, followed by colorectal (8), prostate (9), and pancreatic cancer (7 cases).

Cancer of the liver (hepatocellular carcinoma or HCC) caused 24 deaths but is not included in cancer deaths. Since hepatocellular carcinoma is almost always associated with, and a consequence of, cirrhosis of the liver, this report has historically included liver cancer deaths within the category of advanced liver disease deaths.

Cardiovascular disease, with 47 deaths, was the third leading cause of death in 2021. Sudden death or sudden cardiac arrest (24 cases), congestive heart failure (11 cases), and acute myocardial infarction (8 cases), together accounted for 91% of these cases. The majority of these are attributed to underlying coronary artery disease.

Advanced liver disease, including HCC, caused 32 deaths. Of these, 24 had hepatocellular cancer, and all of these were associated with hepatitis C virus infection. Another seven deaths were caused by hepatitis C positive ESLD. Alcohol caused one death from ESLD.

Infectious diseases excluding COVID-19 caused 30 deaths. Sepsis (15), pneumonia (8) and infective endocarditis (4) were the top three causes in this category.

Drug overdose caused 24 deaths in 2021.

Suicide attempts and homicide each caused 15 deaths. Both were significantly lower than in 2020. Pulmonary diseases caused 14 deaths, half from chronic obstructive pulmonary disease.

Cerebrovascular disease (stroke) caused 11 deaths, a variety of gastrointestinal diseases caused 10 deaths, and neurological degenerative diseases caused 9 deaths.

Pulmonary embolism caused six deaths and end stage renal disease caused four deaths in 2021. Table 2 shows the top causes of death in the California prisons from 2006 through 2021.

Top Causes of Death in California State Prisons, 2006-2021.									
YEAR	RANK								
	1	2	3	4	5	6	7	8	9
2021	Infectious Disease - COVID-19	Cancer	Cardiovascular Disease	(tied) Advanced Liver Disease; Infectious Disease (not COVID-19)**		Drug Overdose	(tied) Homicide; Suicide		Pulmonary
2020	Infectious Disease - COVID-19	Cancer	Cardiovascular Disease	Infectious Disease (not COVID-19)**	(tied) Advanced Liver Disease; Homicide		Suicide	Drug Overdose	Neurological Disease
2019	Cancer	Drug Overdose	Cardiovascular Disease	Advanced Liver Disease*	Suicide	Infectious Disease**	Homicide	Pulmonary	Neurological Disease
2018	Cancer	Cardiovascular Disease	Drug Overdose	End Stage Liver Disease*	Infectious Disease**	(tied) Suicide, Homicide		Pulmonary	Circulatory System
2017	Cancer	Cardiovascular Disease	End Stage Liver Disease*	Drug Overdose	Infectious Disease**	Suicide	Homicide	Cerebrovascular Disease	Pulmonary
2016	Cancer	Cardiovascular Disease	End Stage Liver Disease*	Infectious Disease**	Drug Overdose	(tied) Suicide, Homicide		Cerebrovascular Disease	Pulmonary
2015	Cancer	Cardiovascular Disease	End Stage Liver Disease*	Infectious Disease**	Suicide	Drug Overdose	Homicide	Cerebrovascular Disease	Pulmonary
2014	Cancer	End Stage Liver Disease*	Cardiovascular Disease	Suicide	Drug Overdose	Pneumonia **	Homicide	Pulmonary	(tied) Infectious; Stroke-Hemorrhagic
2013	Cancer	End Stage Liver Disease*	Cardiovascular Disease	Suicide	Drug Overdose	Homicide	Sepsis**	(tied) Pulmonary; Pneumonia**	
2012	Cancer	End Stage Liver Disease*	Cardiovascular Disease	Suicide	Homicide	Drug Overdose	(tied) Sepsis; Infectious**		Stroke

Top Causes of Death in California State Prisons, 2006–2021.										
YEAR	RANK	1	2	3	4	5	6	7	8	9
2011		Cancer	End Stage Liver Disease*	Cardiovascular Disease	Suicide	Pneumonia**	Homicide	Sepsis**	Drug Overdose	Stroke
2010		Cancer	End Stage Liver Disease*	Cardiovascular Disease	Suicide	(tied) Drug Overdose; Homicide		Pneumonia**	Congestive Heart Failure	(tied) Coccidioidomycosis; End Stage Renal Disease; Stroke
2009		Cancer	End Stage Liver Disease*	Cardiovascular Disease	Suicide	Drug Overdose	Pneumonia*	Congestive Heart Failure	Homicide	
2008		Cancer	Suicide	End Stage Liver Disease*	Cardiovascular Disease	Drug Overdose	Pneumonia*	HIV/AIDS	Congestive Heart Failure	Sepsis**
2007		Cancer*	End Stage Liver Disease	Cardiovascular Disease	Suicide	Homicide	HIV/AIDS	Stroke	Drug Overdose	Pneumonia**
2006		Cancer*	Cardiovascular Disease	End Stage Liver Disease	Suicide	Drug Overdose	Homicide	Pulmonary	End Stage Renal Disease	Stroke

* Liver Cancer was counted as Cancer in 2006 and 2007; as Liver Disease from 2008 onward.

** Beginning with 2015, Pneumonia and Sepsis were included in Infectious Disease, which also includes HIV/AIDS. COVID-19 is its own category.

Table 2. Top Causes of Death Among California Inmates, 2006–2021.

The average age of all male inmates who died in 2020 was 61 years; the average age of deceased female inmates was 53 years.

The youngest inmate death was at age 22; the oldest at age 97.

In 2021, drug overdoses, suicides, and homicides caused death at an average age of 41 while the average age of death by all other causes was 63.

B. Expected and Unexpected Deaths in 2021

1. Expected deaths

The 200 expected deaths in 2021 were the result of chronic disease processes like cancer, end stage liver disease, chronic infections, and chronic cardiovascular processes like congestive heart failure and coronary artery disease. Pulmonary processes like chronic obstructive pulmonary disease or pulmonary fibrosis, and neurologic diseases like ALS, Parkinson Disease and dementia are also included here.

2. Unexpected deaths

There were 192 cases of unexpected death in 2020. Drug overdoses, accidents (unintentional injuries), suicides, and homicides together accounted for 56 of these. Sudden cardiac arrests were an additional 20 cases.

Figure 4 compares unexpected and expected deaths in each causation category. COVID-19 appears in both, probably due to its variable natural history.

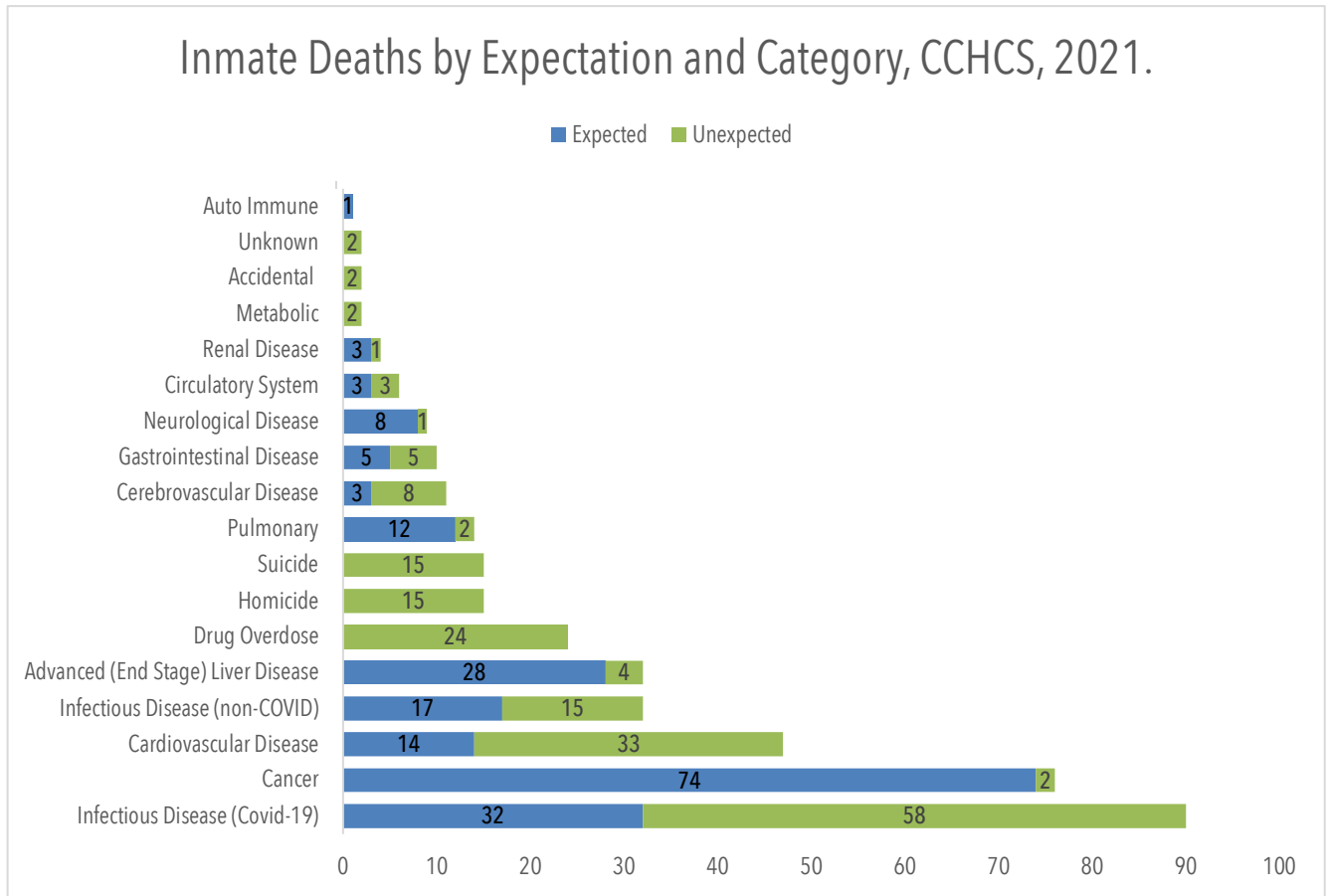


Figure 3. Inmate Deaths by Expectation and Category, CCHCS 2021.

C. Discussion of trends in inmate death

1. Trends in overall prison mortality

This section examines mortality trends in key areas. Where referenced, comparative U.S. State Prison data are sourced from the U.S. Bureau of Justice Statistics (BJS) Mortality in State and Federal Prisons, 2001-2018 - Statistical Tables, Table 4 (NCJ 255970, April 2021).

The following table shows the number of deaths and the corresponding mortality rates in California prisons from 2006–2021, compared to mortality rates in all U.S. state prisons.

YEAR	CCHCS Number of Deaths	CCHCS Number of Inmates	Death Rate per 100,000 Inmates	
			CCHCS	U.S. State Prisons*
2006	424	171,310	248	249
2007	395	170,786	231	258
2008	369	170,022	217	261
2009	393	169,459	232	259
2010	415	166,700	249	246
2011	388	161,843	240	260
2012	362	134,929	268	266
2013	366	133,297	275	274
2014	319	135,225	236	276
2015	355	128,824	276	298
2016	334	128,705	260	304
2017	388	130,807	297	327
2018	452	128,875	351	347
2019	399	125,270	319	330
2020	(all) 492 (COVID-19) 141 (non-COVID-19) 351	107,347	458 131 327	not available
2021	(all) 392 (COVID-19) 90 (non-COVID-19) 302	98,077	400 92 308	not available

*May have been revised by BJS from previously published statistics. Source: Table 4, *Mortality in State and Federal Prisons, 2001-2019 - Statistical Tables | December 2021*; NCJ 300953; U.S. DOJ BJS.

Table 3. Annual Mortality Rates Among California and U.S. State Prison Inmates, 2006–2021.

The COVID-19 mortality rate decreased significantly compared to the previous year; dropping from 131 in 2020 to 92 in 2021.

The non-COVID-19 mortality rate also decreased. Overall, the mortality rate for all causes except COVID-19 in 2021 was 308, the lowest mortality rate since 2017.

2. COVID-19

The first COVID-19 death in the CCHCS occurred in April of 2020. By the end of that year, the pandemic had swept through the California prison system, causing 141 deaths. Table 4 shows the number of COVID-19 deaths and COVID-19 mortality rates by quarter in 2020 and 2021.

Calendar Period	COVID-19 Deaths	Mortality Rate/100,000
Q1 2020	0	0
Q2 2020	23	20
Q3 2020	49	50
Q4 2020	73	76
Year 2020	145	135
Q1 2021	81	85
Q2 2021	2	2
Q3 2021	2	2
Q4 2021	5	5
Year 2021	90	92

Table 4. COVID-19 Inmate Deaths and Rates in California State Prisons, CCHCS 2020–2021.

Although COVID-19 caused the highest number of inmate deaths in 2021, 90% of these deaths occurred in the first quarter. In fact, 63 COVID-19 deaths occurred in January, 14 in February, and four in March of 2021.

The control of COVID-19 was the Receiver’s highest priority during 2020 and 2021. The 2020 version of this report chronicles the many responses of the CCHCS to the COVID-19 pandemic. CCHCS began its COVID-19 policy development in late February 2020, and beginning in March 2020 an extensive mitigation and control strategy was launched. Details are beyond the scope of this report but can be found on the CCHCS website: <https://cchcs.ca.gov/covid-19-interim-guidance/>

COVID-19 vaccination was not available in time to have any effect on 2020 mortality.

The COVID-19 vaccination project was launched in December of 2020. By February of 2021, vaccination had reached 10,626 patients, with an emphasis on high-risk populations.

By April 30, 2021, 98 percent of 95,641 patients had been offered the vaccine with an overall vaccination rate of 73 percent. The overall vaccination rate continued to rise, reaching 79% as of August 31, and 82% by the end of 2021.

Immunization rates were even higher – over 93% – among patients at the highest risk for hospitalization and death.

Vaccination rates among staff were also vigorously promoted. Although not as successful as in the patient population, 43 percent of the more than 65,000 CDCR and CCHCS staff had been fully vaccinated by April 30, 2021.

In October 2021, CDCR and CCHCS began offering booster vaccines to all patients who were fully vaccinated. By December 15, 2021, 93.5 percent of over 65,000 eligible patients were offered the booster with an acceptance rate of over 80 percent.

The success of the COVID-19 vaccination program grafted upon all the other COVID-19 mitigation strategies directly correlates to the dramatic and sustained reduction in COVID-19 mortality seen in 2021.

The next graph shows the number of COVID-19 deaths and the corresponding mortality rates (per 100,000) by quarter and the corresponding vaccination rate in the CCHCS inmate population.

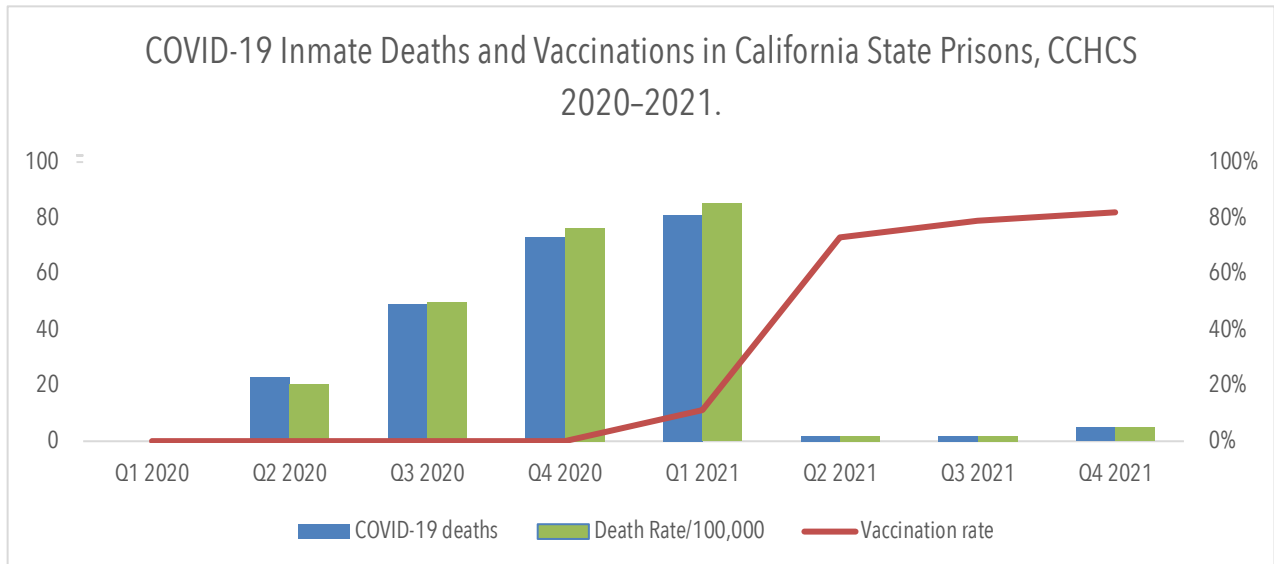


Figure 4. COVID-19 Inmate Deaths and Vaccinations in California State Prisons, CCHCS 2020–2021.

The COVID-19 mortality rates were on a rising trajectory through the first quarter of 2021, which saw a COVID-19 mortality rate of 85/100,000. But by the end of the second quarter of 2021, the

COVID-19 mortality rates had dropped to just over 2/100,000, where it remained until a slight uptick in the fourth quarter of 2021 at 5/100,000.

Although COVID-19 remained the number one cause of death in 2021, the control of the pandemic by the end of the year was a major achievement. COVID-19 vaccinations were life-saving.

3. Infectious diseases other than COVID-19

There were 32 deaths from non-COVID-19 infectious diseases, many fewer than the 47 in 2020. The number of deaths from three causes – sepsis (15), pneumonia (8), and infectious endocarditis (4) accounted for 84%.

Prior to 2020, total non-COVID infectious diseases mortality rates ranged from 16/100,000 in 2014 to 29 in 2018, averaging 21.5. The rate of 44 in 2020 was significantly higher than in any of the past 12 years. In 2021, the rate dropped back to 31. The next table shows the non-COVID-19 infectious disease mortality rate for the years from 2012 to 2021.

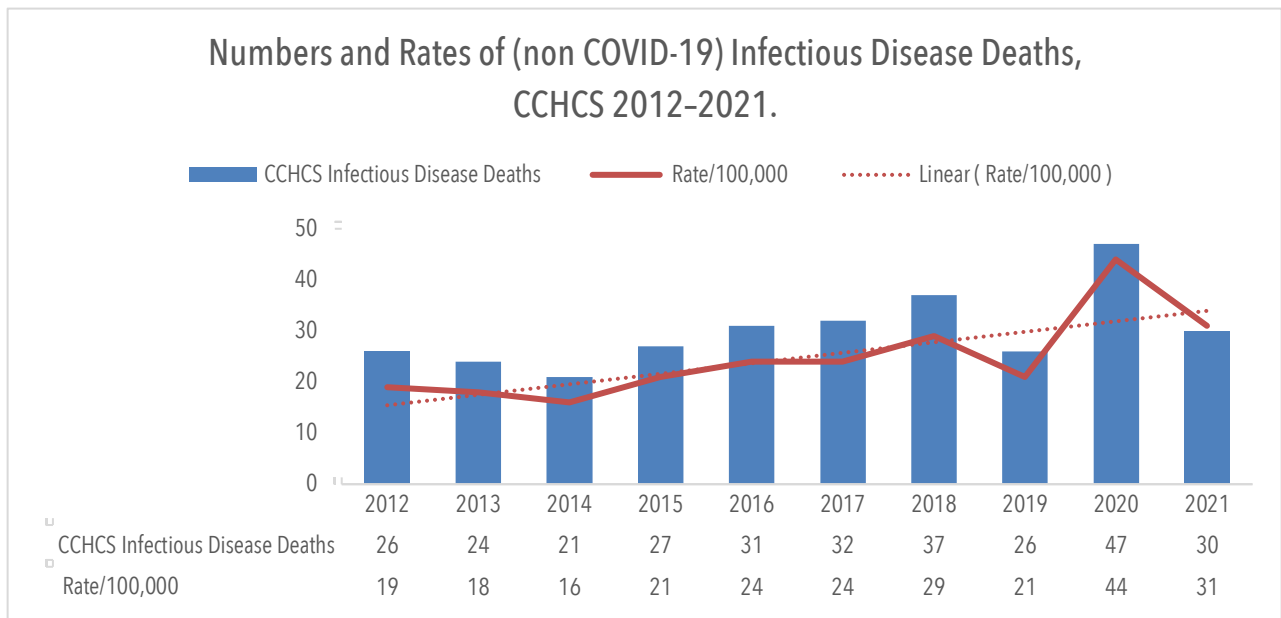


Figure 5. Numbers and Rates of (non COVID-19) Infectious Disease Deaths, CCHCS 2012–2021.

Figure 6 shows the sepsis, pneumonia, and infectious endocarditis mortality rates for each of the years from 2012 to 2021.

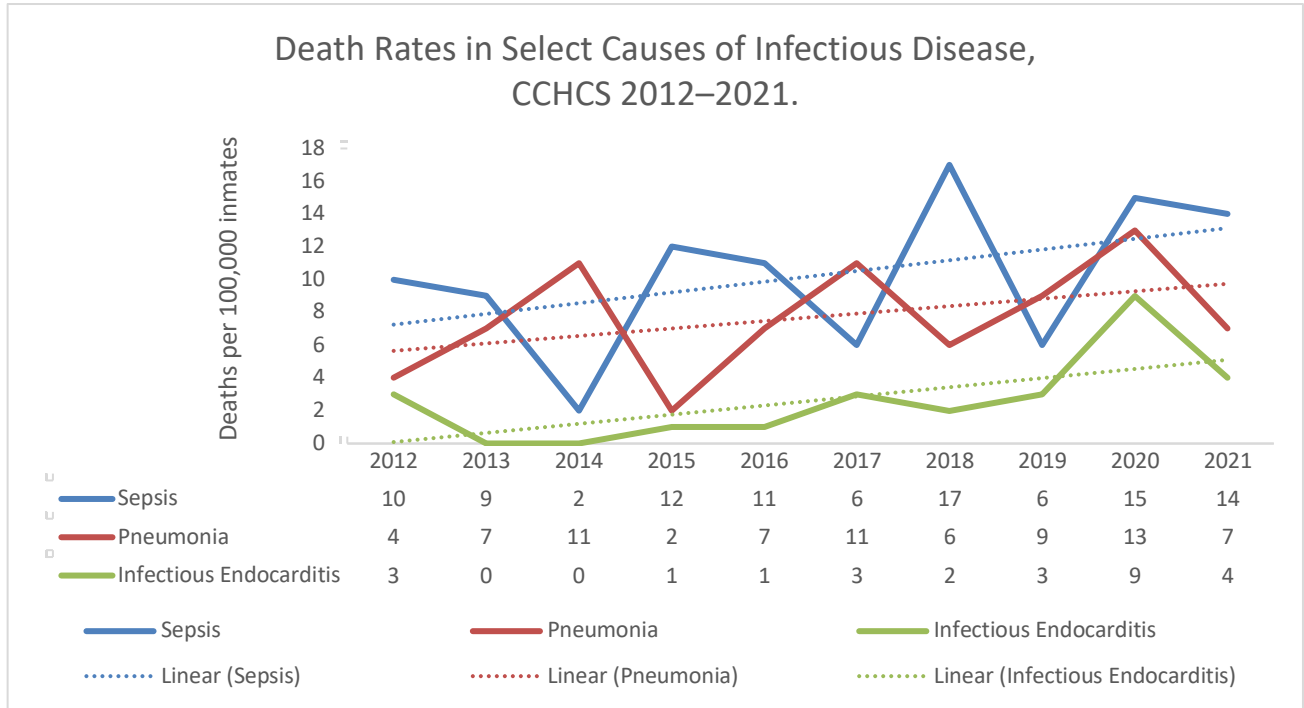


Figure 6. Death Rates in Select Causes of Infectious Disease, CCHCS 2012–2021.

Sepsis mortality rates for 2012-2021 ranged from a low of 2 in 2014 to a high of 17 in 2018, averaging 10.3. The 2021 rate of 15 is again higher than the average and compatible with a rising death rate from sepsis. The source of systemic infection in the 15 cases in 2021 was varied and included 3 soft tissue infections, 2 cases of sepsis secondary to pneumonia, one hepatic abscess, one perirectal abscess, 2 cases of septic arthritis, 3 of septic colitis, and 3 urinary tract infections, one with an indwelling foley catheter. Reasons for the rising incidence may be increasing age, more clinical emphasis on recognition, and evolution in the definitions of sepsis and septic syndromes. One recent reference cites a fifty percent increase in septic shock hospitalizations in the United States from 2005-2014. [Chest. 2017 \(2\) 278-285 27452768 PMID.](#)

Pneumonia mortality rates range from 2 in 2015 to 13 in 2020. The 2021 rate of 8 reversed a rising rate of death from pneumonia over the previous nine years.

Infective endocarditis mortality rates range from 0 in 2013 and 2014 to 9 in 2020. In 2021 the mortality rate dropped to 4. The widespread adoption of the Integrated Substance Use Disorder Treatment Program (ISUDT) program may have contributed to the drop in infective endocarditis deaths in 2021. The 10 patients who died of infective endocarditis in 2020 were all known to have had substance use disorder, including five with known intravenous drug abuse. While not classified as drug overdose deaths, infective endocarditis deaths are often due to narcotic addiction.

4. Cardiovascular disease

Cardiovascular disease was the third most common cause of all deaths in 2021, causing 47 deaths for a mortality rate of 48/100,000. Table 5 and Figure 7 show the numbers, rates, and trends of cardiovascular death from 2012 through 2021.

Year	CCHCS Cardiovascular Deaths	Rate/100,000
2012	43	32
2013	50	38
2014	54	40
2015	62	48
2016	52	40
2017	68	52
2018	66	51
2019	52	42
2020	54	50
2021	47	48

Table 5. Numbers and Rates of Cardiovascular Deaths, CCHCS 2012–2021.

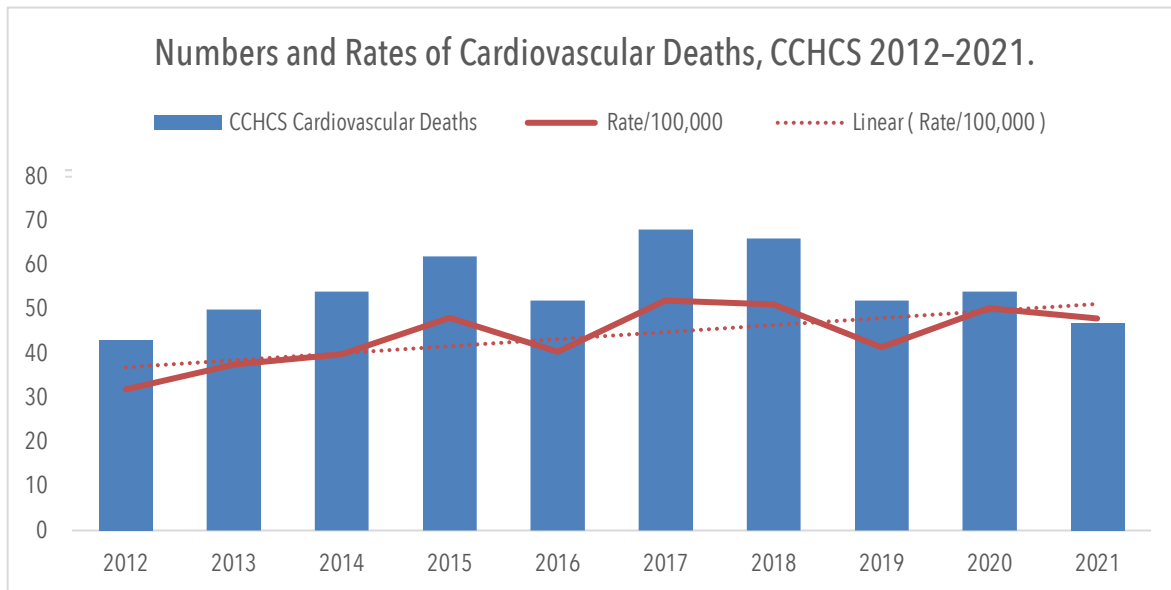


Figure 7. Numbers and Rates of Cardiovascular Deaths, CCHCS 2012–2021.

There was a large decrease in the number of sudden cardiac arrests as a cause of inmate death in 2021 (24) compared with 2020 (38). The CCHCS Care Guides for chest pain, diabetes,

dyslipidemia, and hypertension, have emphasized the management of risk factors for coronary heart disease, the judicious use of statin medication to prevent coronary events, the importance of diabetes control, smoking cessation, and the importance of recognizing and managing red flag symptoms indicative of acute coronary syndromes or exacerbations of congestive heart failure. In 2021 there were four OFI citations for failure to recognize and/or manage acute chest and/or severe recurrent shoulder pain in which the final cause of death was acute myocardial infarction or sudden cardiac arrest.

5. Lung cancer

Lung cancer has been the leading cause of cancer death, both in CCHCS and in the general population. Table 6 and figure 8 show the numbers, rates, and trends of lung cancer deaths from 2012 through 2021.

	CCHCS Lung Cancer Deaths	Rate/100,000
2012	20	15
2013	21	16
2014	17	13
2015	27	21
2016	19	15
2017	13	10
2018	32	25
2019	27	22
2020	17	16
2021	13	13

Table 6. Numbers and Rates of Lung Cancer Deaths, CCHCS 2012–2021

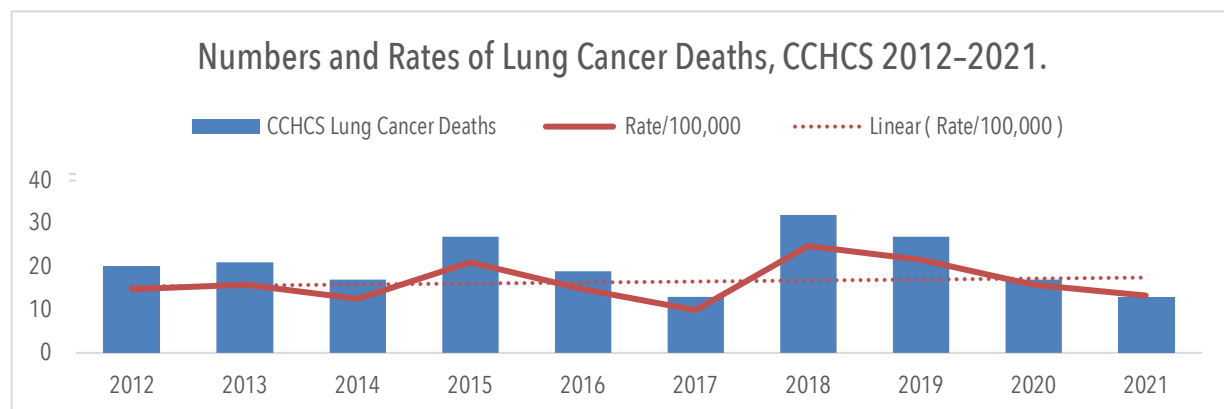


Figure 8. Numbers and Rates of Lung Cancer Deaths, CCHCS 2012–2021.

2021 saw 13 deaths from lung cancer for a mortality rate of 13/100,000, fewer than the historic numbers and rates and continuing a reduction that began in 2020. Although these numbers are small, a 2014 US Preventive Services Task Force Grade B recommendation to screen all heavy smokers over age 55 for lung cancer with annual low dose CT scanning, may have influenced the practice of some CCHCS clinicians.

6. Advanced (end stage) liver disease

Advanced liver disease including liver cancer caused 32 deaths in 2021, a mortality rate of 33/100,000, tied for the fourth most common cause of death. Liver cancer accompanies cirrhosis. In the prison population, both are primarily caused by the high prevalence of chronic hepatitis C infection. Table 7 and Figure 9 show the cases, rates and trends of liver cancer deaths, cirrhosis deaths and total advanced liver disease deaths associated with chronic hepatitis C infection in the years 2012–2021.

YEAR	CCHCS Liver Cancer Deaths	CCHCS Cirrhosis Deaths	CCHCS Total Hepatitis C Deaths	Rate/100,000
2012	25	47	72	53
2013	27	43	70	53
2014	21	47	68	50
2015	19	37	56	44
2016	23	18	41	32
2017	18	21	39	30
2018	28	29	57	44
2019	32	13	45	36
2020	18	14	32	30
2021	24	8	32	33

Table 7. Numbers and Rates of Advanced Liver Disease Deaths, CCHCS 2012–2021.

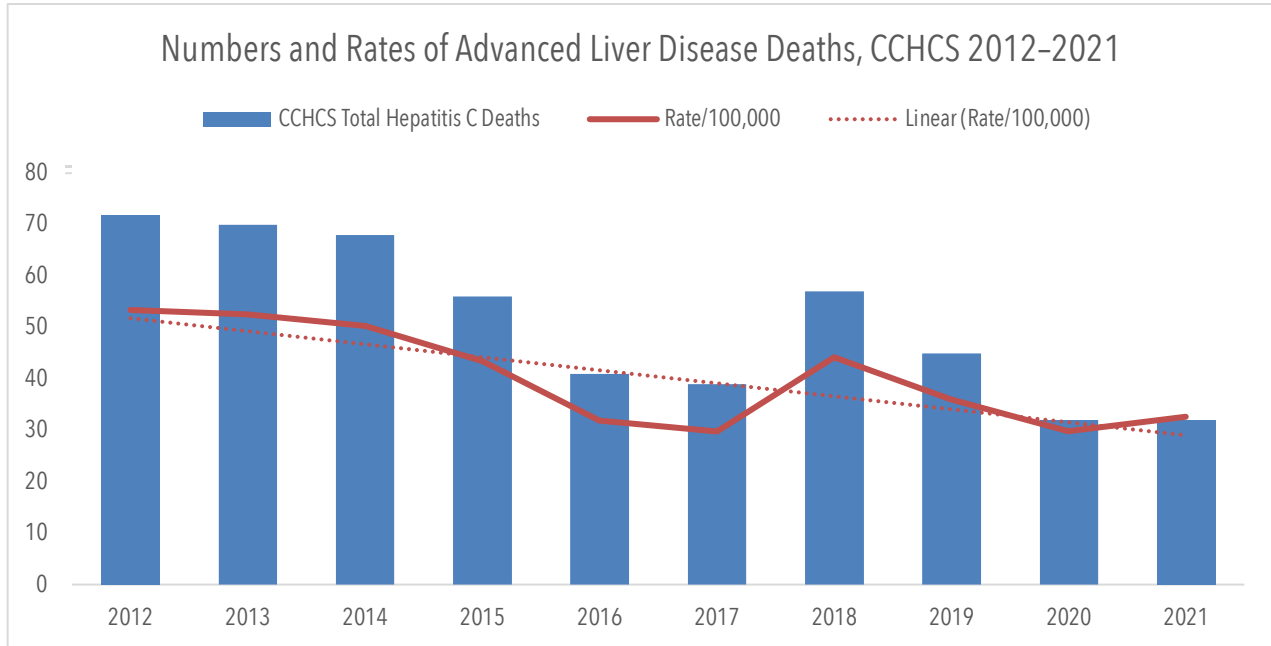


Figure 9. Numbers and Rates of Advanced Liver Disease Deaths, CCHCS, 2012 – 2021.

The CCHCS has adopted several initiatives to improve screening and treatment of chronic hepatitis C and B and liver cancer. These include universal screening for hepatitis C and B antibodies. The Care Guide for Advanced Liver Disease advocates staging of liver fibrosis to identify all candidates for biannual abdominal ultrasound screening for liver cancer, clinical strategies for managing specific complications of advanced liver disease, and an initiative for treatment of hepatitis C with safe and effective agents.

Over 10,000 hepatitis C eligible patients were treated in 2018 - 2020. Performance in the areas of chronic liver disease care and hepatitis C treatment is monitored and publicized in monthly Population Health Management Dashboards for each institution, publicly available at <https://cchcs.ca.gov/reports/#dashboard>. Recent dashboards show 85% or greater statewide performance in monitored areas.

All these initiatives have contributed to improvements in advanced liver disease care and a reduction in liver disease death rates.

7. Drug overdose

There were 24 drug overdose deaths in 2021, for an annualized mortality rate of 25/100,000.

Table 8 and Figure 10 show the numbers and mortality rates from drug overdose in the CCHCS from 2012-2021 and in all US prisons from 2012 -2018. (U.S. State Prison data also includes drug and alcohol intoxication.) As in prior years, none of these deaths were attributable to narcotics prescribed to the patients by physicians in the CCHCS.

Year	CCHCS Drug Overdoses	CCHCS Rate/100,000	U.S. State Prison Rate/100,000
2012	15	11	3
2013	24	18	4
2014	19	14	4
2015	19	15	7
2016	29	23	8
2017	40	31	17
2018	62	48	21
2019	64	51	22
2020	23	21	NA
2021	24	25	NA

Table 8. Numbers and Rates of Overdose Deaths, CCHCS 2012–2021, and U.S. State Prisons 2012–2019.

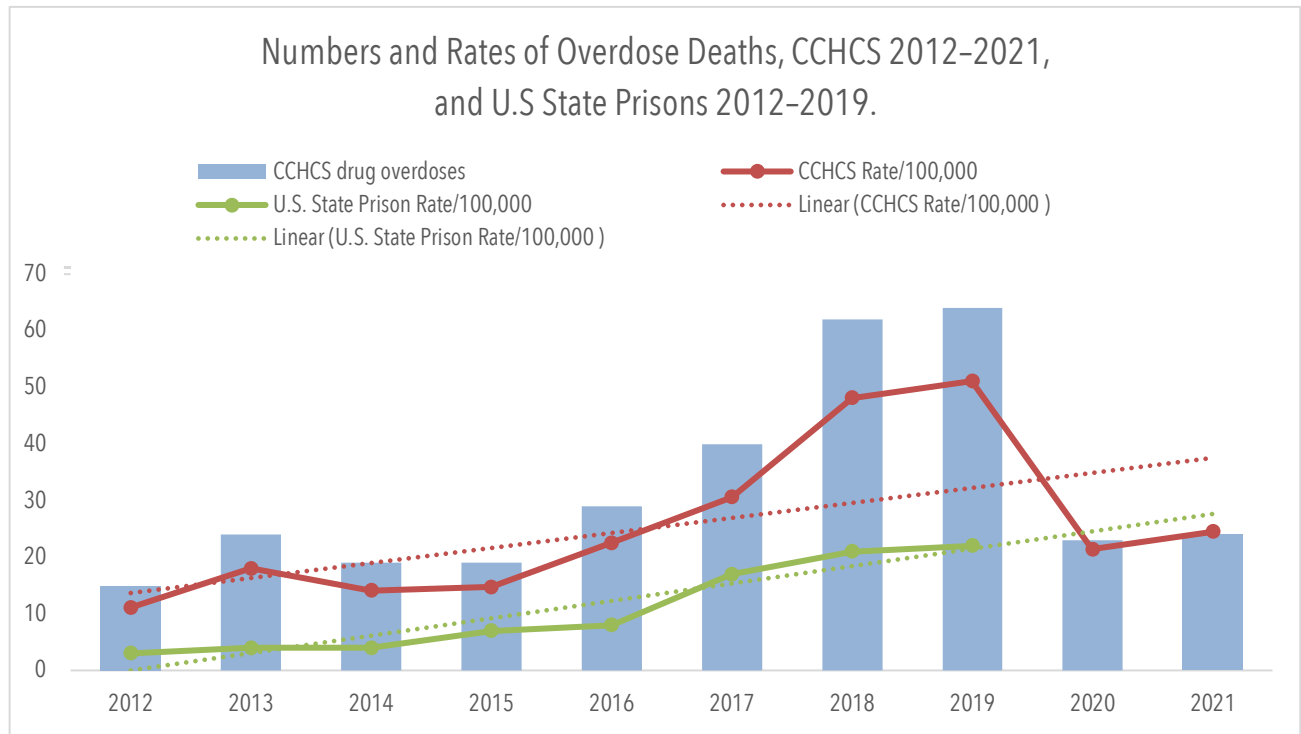


Figure 10. Numbers and Rates of Overdose Deaths, CCHCS 2012–2021, and U.S. State Prisons 2012–2019.

The year 2020 saw a significant decrease in the drug overdose rate, reversing a trend that had begun in 2015. This improvement continued in 2021. Fentanyl was the most commonly overdosed drug, used alone in 15 cases, and in combination with other drugs in 2 additional cases. Methamphetamine was used alone in 2 cases and in combination in 5 additional cases.

Buprenorphine (suboxone) was found among multiple other drugs to be causative in one case, and although it is used in the Medication Assisted Treatment (MAT) program, it had not been prescribed to the patient in this case. One case of drug overdose was attributed to toxic levels of the prescribed psychoactive medications quetiapine and mirtazapine.

Reduction in overdose deaths was also associated with aggressive promotion of an ongoing statewide initiative, the Integrated Substance Use Disorder Treatment (ISUDT) program. This multidisciplinary program frames drug addiction as a chronic disease, screens all patients for substance use disorder (SUD), and offers treatment to all SUD patients. MAT with buprenorphine (suboxone), cognitive behavioral intervention, special housing units, monthly newsletters, and transition to community-based programs after release are other key elements. The ISUDT program began implementation in late 2019, the Care Guide for SUD was released in May 2020 (<https://cchcs.ca.gov/isudt/>) and training was completed in all 35 facilities by the end of 2020. As of December 31, 2021, there were 13,922 patients receiving MAT. These figures come from the Receiver’s 49th Triannual report: <https://cchcs.ca.gov/reports/>

8. Suicide

CCHCS’s 15 suicides in 2021 represent a rate of 15/100,000, a significant reduction from the rates of recent years and the lowest rate in the history of the Receivership.

The most recent estimates of suicide rates in all U.S. state prisons, published by the Bureau of Justice Statistics, are for the years 2001 through 2019. The Bureau estimated the national state prison suicide rate in 2019 to be 27 per 100,000 incarcerated individuals.

Table 9 and Figure 11 show the numbers, rates, and trends of suicide from 2012 through 2021.

Year	CCHCS Suicides	CCHCS Rate/100,000	U.S. State Prison Rate/100,000
2012	32	24	16
2013	30	23	15
2014	23	17	20
2015	24	19	18
2016	26	20	21
2017	31	24	21
2018	30	23	26
2019	38	30	27

Year	CCHCS Suicides	CCHCS Rate/100,000	U.S. State Prison Rate/100,000
2020	31	29	NA
2021	15	15	NA

Table 9. Numbers and Rates of Suicide, CCHCS 2012–2021 and U.S. State Prisons 2012–2019.

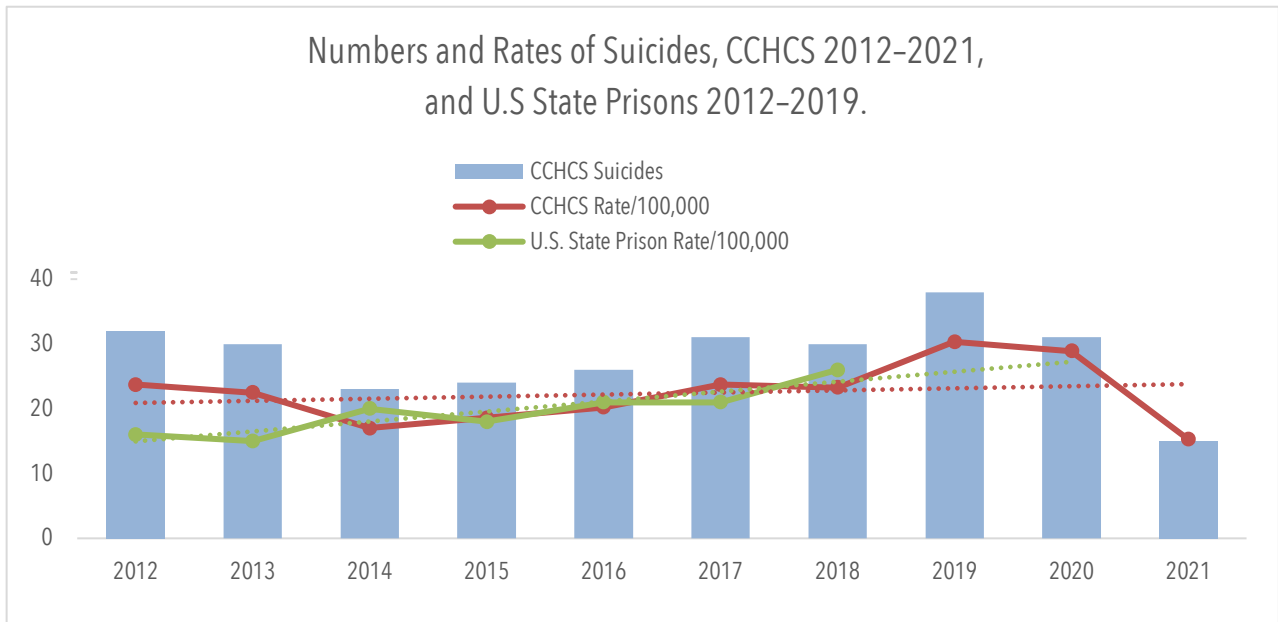


Figure 11. Numbers and Rates of Suicide, CCHCS 2012–2021 and U.S. State Prisons 2012–2019.

Almost all the suicide patients were being followed by mental health providers concurrently with medical providers. The recognition and treatment of severe depression and suicidal ideation and close communication between the mental health and medical departments of CCHCS were encouraged. The system of suicide risk evaluations, prevention and treatment is in place for all CDCR staff, all potential first responders to suicides, and all mental health clinicians.

The 2020 annual report to the California State Legislature on Suicide Prevention and Response in CDCR is available at <https://cchcs.ca.gov/wp-content/uploads/sites/60/MH/CDCR-2020-SB-960.pdf>

The report audited cases of suicide in 2020 and found that 83% (N = 19 of 23) had deficiencies in risk assessment and 87% (N = 20) had poor treatment planning. The quality of mental health contacts was deficient in 30% (N = 7). Other concerns were nursing services including suicide watch practices and documentation (10%); the adequacy of “wellness checks” in segregated housing (10%); emergency response issues, particularly delays in calling 911 (55%); inadequate welfare checks in segregated housing (3%); poor coordination between medical and mental health staff (6%) and two cases (6%) of patients found already deceased and in rigor mortis.

The COVID-19 pandemic had effects on four cases, with failure to interview patients due to COVID-19 quarantine and delayed transfers to higher levels of mental health care. In two cases the recent deaths of family members were thought to have impacted individuals who died by suicide.

The report identified the adequacy of suicide risk assessment and formulation, and subsequent management of that risk as an area of primary concern across all cases.

Following this 2020 report, the 2021 reduction in suicides is possibly significant.

9. Homicide

There were 15 homicides in the CCHCS in 2021 for a homicide rate of 15/100,000. This is the lowest rate of homicide since 2017.

Table 10 and Figure 12 show the numbers of deaths and mortality rates from homicides in the CCHCS from 2012-2021 and in all US prisons from 2012-2019.

Year	CCHCS Homicides	CCHCS Rate/100,000	U.S. State Prison Rate/100,000
2012	21	16	7
2013	20	15	7
2014	9	7	7
2015	16	12	7
2016	26	20	8
2017	19	15	9
2018	30	23	10
2019	22	18	12
2020	32	30	NA
2021	15	15	NA

Table 10. Numbers and Rates of Homicides, CCHCS 2012–2021 and U.S. State Prisons 2012–2019.

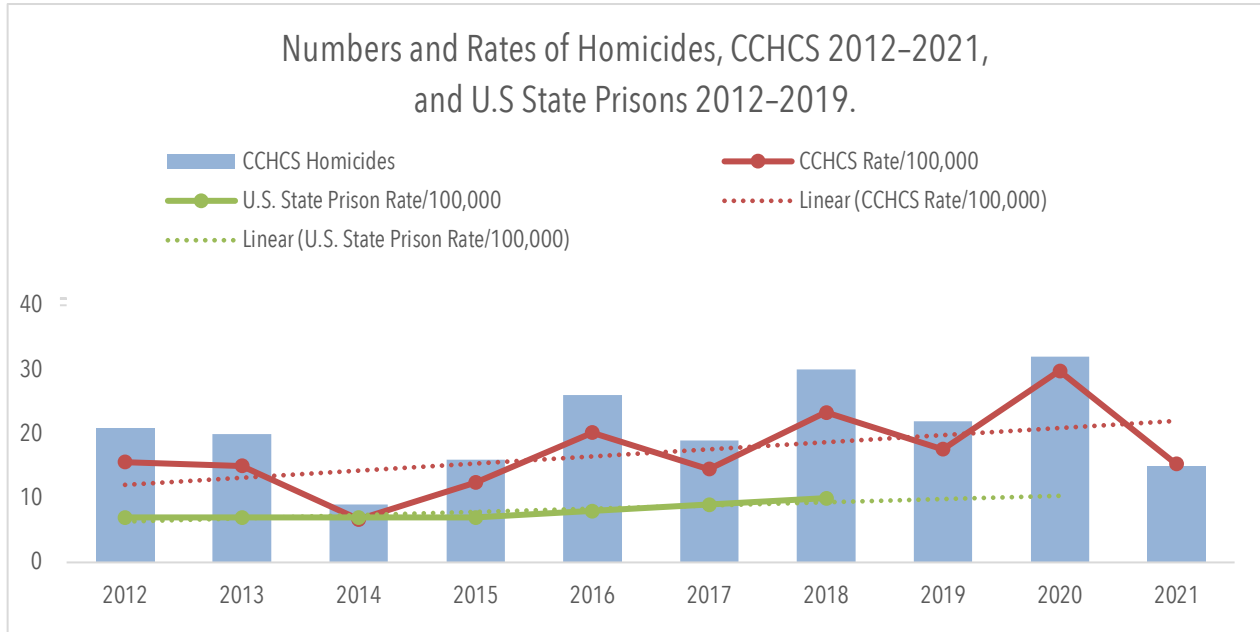


Figure 12. Numbers and Rates of Homicides, CCHCS 2012–2021, and U.S. State Prisons 2012–2019.

The homicide mortality rate of 15 in 2021 reverses the rising trend from 2014 - 2020 but comparing same-year rates shows the California state prison homicide rate to be significantly higher than the rate for all U.S. prisons.

D. Opportunities for Improvement, 2021

Opportunity for Improvement (OFI): An occasion or situation from which it is possible to improve systems or processes related to the delivery of health care.

The Mortality Review Committee (MRC) identifies opportunities for improvement as “findings”, which are forwarded to the appropriate prison and region for review and further action if indicated.

An OFI cited in a Mortality Review can be relatively minor (documentation inconsistency) or potentially serious (an important specialist recommendation lost during a patient transfer, resulting in a significant delay in the diagnosis of a treatable condition).

A classification system for OFI used in this annual report was devised in 2018 and refined in subsequent years. The MRC recorded 392 OFI findings in 2018 and 431 OFI findings in 2019.

In 2021 there were 934 OFI, compared with 925 in the prior year, 2020. These figures exclude the separate count of Potential Quality Issues (PQI).

The increasing numbers of OFI can be explained by the creation of new COVID-19 pandemic related protocols of screening, quarantine, and isolation which resulted in disruptions in standard processes and procedures, with a steep learning curve and increased documentation requirements for staff.

As in 2020, the largest number of OFI in 2021 (188) were specifically related to findings regarding adherence to new and changing COVID-19 policies and processes.

The average number of OFI per death was 0.9 in 2018, 1.1 in 2019, 1.9 in 2020, and 2.4 in 2021.

Of the 934 OFI in 2021, 495 occurred in unexpected deaths and 439 occurred in expected deaths. This difference of 56 more OFI in unexpected deaths is almost entirely accounted for by the OFI identified in review of emergency responses. There are usually no emergency protocols initiated in patients whose deaths are expected. Excluding emergency protocol OFI, the comparative rates of OFI per case in unexpected and expected deaths were 2.0 and 2.1, respectively - an insignificant difference.

The following chart shows the number of OFI per death by year.

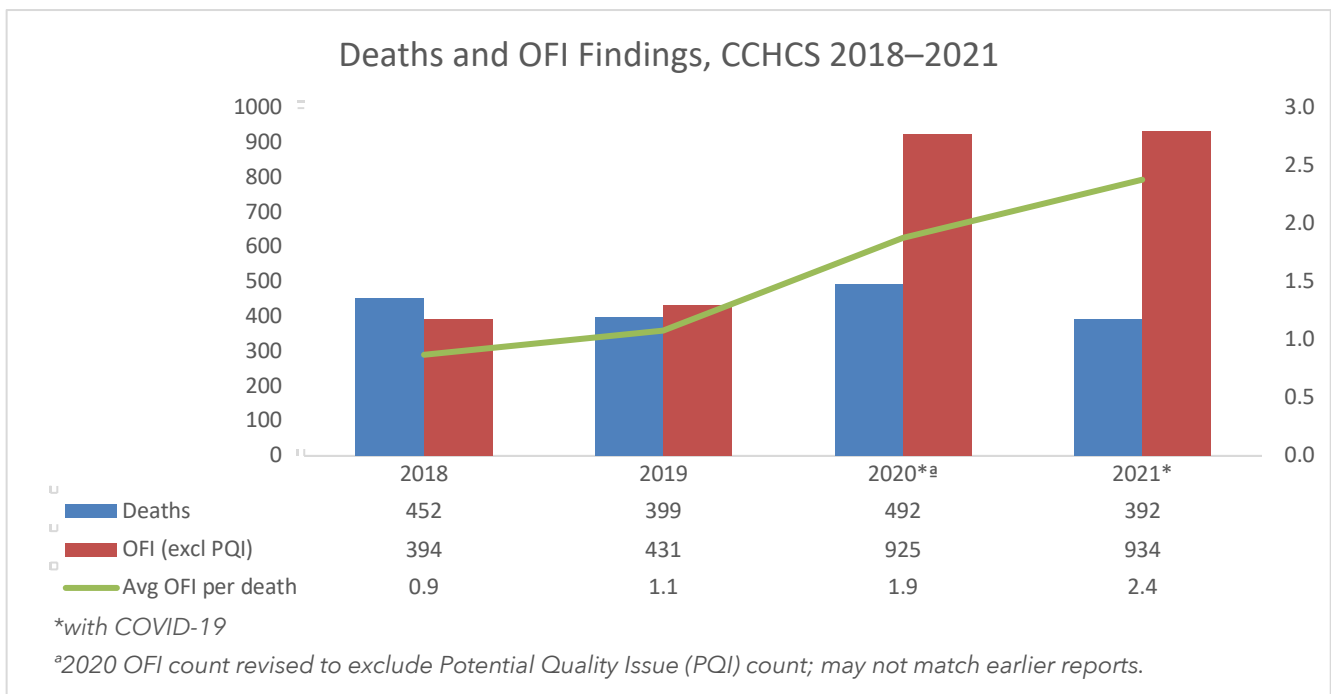


Figure 13. Deaths and OFI Findings, CCHCS 2018–2021.

Table 4 shows OFI categories, numbers of findings in unexpected and expected deaths, and total findings in each category.

Opportunities for Improvement	Unexpected Deaths	Expected Deaths	Total
1. Opportunities to improve application of the "Model of Care" as described in the CCHCS Complete Care Model			
a. Meeting access timeframes for routine and urgent care	8	14	22
b. Applying complex care management for improved coordination or continuity	6	12	18
c. Transferring a patient to a more appropriate level of care	12	5	17
d. Optimizing care near the end of life			
i. Physician's Orders for Life Sustaining treatment (POLST) and Do Not Resuscitate (DNR) orders documented when appropriate	28	27	55
ii. Honoring POLST and DNR orders	6	11	17
iii. Improving pain and other symptom management, especially in cancer care	-	-	-
iv. Offering hospice care to terminally ill patients	-	2	2
e. Non-adherent or non-compliant patient management	10	2	12
f. Substance Abuse Disorder Program referral indicated but not made	16	4	20
2. Opportunities to improve clinical decision making by improved recognition and management of important clinical signs and symptoms	65	72	137
3. Opportunities to improve recognition and action in response to abnormal laboratory, imaging and other diagnostic test results	16	27	43
4. Opportunities to improve adherence to policies and procedures, and adherence to Care Guides for specific diseases, conditions, or risk factors			
a. COVID-19 Interim Guidance	91	97	188
b. Care Guides			
i. Fall risk	5	17	22
ii. Pressure ulcer (injury) avoidance	1	5	6
iii. Medication management	20	12	32
iv. Cardiovascular Risk	9	2	11

Opportunities for Improvement	Unexpected Deaths	Expected Deaths	Total
v. Other Care Guides	31	20	51
5. Opportunities to improve communication between providers in primary care teams and care transitions.			
a. Specialty referral	4	9	13
b. Hospital	2	4	6
c. Emergency Department	-	-	-
d. Mental Health	3	-	3
e. Custody	-	-	-
f. Primary Care Physicians	-	-	-
g. Primary Care Physician and Nursing	4	5	9
h. Other	3	9	12
6. Opportunities to improve medical record documentation			
a. Inadequate or inaccurate record	19	16	35
b. Missing Report	3	9	12
c. Missing Physician or Nurse notes	2	4	6
d. Legacy Charting	9	25	34
e. Incomplete Problem List	13	5	18
7. Opportunities to prevent delays in diagnosis and/or treatment	-	9	9
8. Opportunities to improve the practice and documentation of CCHCS Emergency Protocols			
a. Delay calling 9-1-1	23	6	29
b. Documentation lapse	41	5	46
c. Other	43	4	47
9. Miscellaneous	2	-	2
TOTAL CCHCS Opportunities for Improvement	495	439	934
10. Potential Quality Issue (PQI) referrals	4	12	16

Table 11. Opportunities for Improvement in Expected and Unexpected Deaths, CCHCS, 2021.

1. Opportunities to improve the application of the “Model of Care” as described in the CCHCS Complete Care Model

The Complete Care Model (CCM) has been the foundation for delivery of all care in the CCHCS since 2015. As described in the Health Care Operations Manual, the CCM is based on an industry standard of care, the Patient Centered Medical Home. The CCM recognizes that the best way to improve health outcomes is to consider the full spectrum of a patient’s needs – medical, behavioral, and socioeconomic. Application of this model should improve patient care, reduce the need for hospitalizations and emergency services and enhance staff satisfaction.

In the CCM every patient is assigned to one of several Interdisciplinary Care Teams at an institution. Each Care Team should deliver continuous, comprehensive, coordinated, and patient centered care for its panel of assigned patients. A care team follows standards for access and disease prevention, promotes wellness services, provides episodic care, chronic disease management, urgent and emergent needs, and end-of-life care.

The CCM uses processes such as daily care team huddles, panel management strategies, performance dashboards, master patient registries, patient problem lists, and decision support tools such as the CCHCS Care Guides for Clinical Support. Evidence-based standards for chronic disease management and for management of common acute disease processes are expected to be followed.

a) Meeting access standards for routine and urgent care.

22 Total (15 Routine; 7 Urgent)

The standards for access in the CCHCS are as follows:

Primary care: Emergency – same day; Urgent – 1 day; Routine – 14 days; Post hospital discharge – 5 days

Specialty care: High priority – 14 days; Medium priority – 45 days; Routine priority – 90 days

In 2021, most representative examples of cases not meeting these access standards included patient generated requests for evaluation (“7362s”) for symptoms, and urgent requests for diagnostic tests that were delayed up to several weeks or months. In some cases, patients were never evaluated. One patient was referred for a high priority Urology and Oncology referral but was not seen for 6 weeks. A high priority chest X-ray in a cancer patient was not completed for 6 weeks.

b) Applying complex care management to improve care coordination

18 Total: 6 in cases of unexpected death; 12 in cases of expected death

The opportunity to apply complex care management is based on the risk stratification of patients by the primary care teams. There are criteria for identifying patients who are at high risk for adverse outcomes. Complex care management involves team-based strategies to mitigate the risk and maximize outcomes. Patients with complex care needs often need coordination of visits to specialists, appointments for special diagnostic tests or procedures, pre- and post-operative instructions, and other special education and counseling.

Candidates for complex case management include patients with mental illness, cancer, dementia or chronic debilitating conditions like Parkinson disease or ALS. Other beneficiaries of CCM include patients with multiple medications or advanced age, loss of function requiring assistance with activities of daily living, patients requiring hospice level of care, patients who have had multiple recent hospitalizations or multiple specialists involved in their care. Special populations such as those with substance use disorder or patients with chronic nonadherence may also benefit from care coordination. Risk stratification tools and criteria can be found in the Health Care Department Operations Manual (HCDOM).

In 2021, examples of OFI included a patient who could have benefitted from better coordinated care of a complicated soft tissue abscess, a patient who needed to have evaluation for renal transplant, and a patient with a complicated diabetes management regimen.

c) Transferring a patient to a more appropriate level of care.

18 Total: 12 in cases of unexpected death; 6 in cases of expected death

These represented missed opportunities to transfer patients to levels of care more appropriate to their clinical status. Examples include patients with abnormal vital signs or low oxygenation who would have benefitted from earlier transfer to an Emergency Department for evaluation and management of COVID-19 pneumonia or possible sepsis from infected abscess sites.

d) Optimizing care at the end of life

The principal of patient autonomy directs physicians to provide a Physician Order for Life Sustaining Treatment (POLST) for patients that are elderly, frail, burdened with serious chronic medical conditions, or have shortened life expectancy. The primary care team is expected to have discussions regarding goals of treatment or continued treatment in these situations. During these discussions, a patient might choose to forego resuscitation in the event of a

terminal emergency. Such a decision would generate a “do not resuscitate/do not intubate” (DNR/DNI) order.

i. POLST/DNR discussions in appropriate patients were not initiated

55 Total: 28 in cases of unexpected death; 27 in cases of expected death

These 55 patients were appropriate for POLST discussions, but care teams either did not initiate them or incorrectly documented them in the medical record.

ii. POLST/ DNR in place but patient desires were not honored

17 Total: 6 in cases of unexpected death; 11 in cases of expected death

These patients had orders written for modifications in their life-sustaining treatment but nevertheless experienced attempted cardiopulmonary resuscitation or were inappropriately sent to emergency rooms and experienced hospitalizations and other life-sustaining measures which they did not desire.

iii. Opportunity to better manage pain, especially in cancer patients

0 Total

The optimal management of pain in cancer patients or any patients who experience severe or intractable pain is the goal for all primary care teams. The Care Guide for Pain Management emphasizes a comprehensive approach to the diagnosis and management of all types of pain including the importance of chronic pain as a red flag symptom of underlying malignancy and other occult conditions. The importance of screening for coexisting depression and the judicious use of non-narcotic and narcotic medications are covered in detail.

In 2020, there were 15 OFI for cases in which patients might have experienced better management of pain. Ten of these patients had cancer. In 2021 there were no OFI in this category.

iv. Opportunity to offer hospice care to selected patients

2 total: 0 in cases of unexpected death; 2 in cases of expected death

Hospice is a model of care that focuses on providing palliative care to patients with life-limiting illnesses, managing patients’ pain and supporting other physical, emotional and spiritual needs. In the CCHCS there is one licensed hospice unit at CMF for men. Women can be admitted to the Skilled Nursing Facility at CCWF to received hospice type care and patients at other institutions can receive palliative hospice type care when indicated. Both cases cited in 2021 were older patients with cancer diagnoses.

e) Improving the management of non-adherent patients

12 total: 10 in cases of unexpected death; 2 in cases of expected death

Patient non adherence with treatment recommendations is a vexing problem in healthcare, and particularly so in the prison system. Factors such as depression, sociopathy, and other serious mental illness issues all play a role. Managing these patients can be challenging and time consuming, with poor healthcare outcomes often the result. Best practices include multidisciplinary and case management approaches, with close mental health liaison. In 2021, there were 12 OFI findings identified in 8 patients.

f) Interdisciplinary Substance Use Disorder Treatment Program referral indicated

20 occurrences; 19 patients

The Integrated Substance Use Disorder Treatment (ISUDT) program was implemented in late 2019 and the Care Guide for Substance Use Disorder was issued in May 2020. This program uses evidence-based strategies, including the use of medication assisted treatment to help manage drug and alcohol addiction. It is indicated for any patient identified by the universal screening test.

The 2021 mortality reviews identified 19 patients with indications of drug or alcohol addiction who might have benefitted from earlier referral. Several of these patients were referred but their referrals were lost or significantly delayed.

2. Opportunities to improve clinical decision making by improved recognition and management of important clinical signs and symptoms

137 Total: 65 in cases of unexpected death; 72 in cases of expected death

Previous reviews have discussed “red flag” symptoms or signs as indicators of potential serious diseases. The term “red flag” was originally associated with back pain, but lists of red flag symptoms now exist for many other conditions. Examples cited in prior years have included chest pain or shortness of breath as indicators of acute coronary syndromes, unexplained weight loss or prolonged abdominal pain indicating an underlying malignancy, and atypical headache or an alteration in mental status heralding brain tumor or hemorrhagic stroke. Other important red flags include one-sided leg swelling in deep vein thrombus, and a new heart murmur in endocarditis. Specific red flags such as jaundice, hematemesis or palpable tumors are definitely abnormal and should always be quickly investigated.

An extensive medical literature on “red flags” is covered in this review article:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6060920/>

In 2021, there were 137 OFI for symptoms or signs that were thought to have been incompletely evaluated or evaluated more slowly than was indicated. In some cases, there were missed symptoms or signs that were not associated with an eventual diagnosis. Some of those signs and symptoms were eye pain, foot pain, hoarse voice, hematemesis, weight gain, sore throat, diarrhea, constipation, cognitive decline, suicidal gesture, testicle swelling, history of heart attack, recurrent shortness of breath (SOB), and “dementia”. In many cases, however, an eventual and often significant diagnosis was made.

Table 12 shows these OFI and (if known) the eventual diagnoses.

Clinical Sign or Symptom	Count of Findings	Eventual Diagnoses
Abnormal vital signs -fever tachycardia, abnormal BP	31	COVID-19 (10), cancer (3), UGI hemorrhage (2), sepsis (2), infectious endocarditis (2), pneumonia (2), AMI, SCA, DM, aortic aneurysm, CHF
Low oxygen saturation (85-92%), shortness of breath, cough	27	COVID-19 (10), COPD (2), pulmonary embolism, cancer - lung, CHF, pneumonia
Abdominal pain	10	cancer (3), ischemic bowel (3), COVID-19, pneumonia, UGI hemorrhage
Weight loss	8	cancer - pancreas (2), lung, esophagus, kidney
Chest pain	6	AMI (2), cancer (2), pneumonia, drug overdose
Nausea, vomiting	6	cancer, pneumonia, infectious endocarditis
Back pain	5	cancer, pneumonia, UGI hemorrhage
Arm pain	3	shoulder abscess, SCA
Dizziness	3	COVID-19
Dysphagia	2	pneumonia
Dysuria	2	cancer - kidney
Headache	2	stroke, sinusitis
Knee pain	2	septic arthritis
Dysesthesia	1	cancer - brain
History of cardiac arrest	1	SCA
Insomnia	1	drug overdose

Clinical Sign or Symptom	Count of Findings	Eventual Diagnoses
Request for mental health services	1	drug overdose
Swelling of throat	1	cancer - head/neck

Table 12. Missed Clinical Signs and Symptoms, and Eventual Diagnoses, CCHCS 2021.

Significantly, low oxygenation, especially when accompanied by shortness of breath and cough, heralded COVID-19 or another significant lung disease, and weight loss was a harbinger of cancer.

3. Opportunities to improve recognition and action in response to abnormal laboratory and other diagnostic test results

43 Total: 16 in cases of unexpected death; 27 in cases of expected death

Any abnormality in a diagnostic test should be treated as an indicator of potentially serious disease. All abnormal test results should be flagged, noted, and explained. Care teams all have a system which identifies, tracks and follows up abnormal testing results. Those results that are released after hours, on weekends and during shift changes are vulnerable to being lost. Care transitions involve important transfers of abnormal testing results.

In 2021, the 43 OFI in this category included tests indicative of underlying malignancy in 11 cases: 3 abnormal CT scans, 2 abnormal ultrasounds, 2 anemias, and one each abnormal bone scan, colonoscopy, chest x-ray, abnormal oncologist-reported physical exam, and a positive pathology report showing urothelial cancer cells.

There were 4 positive COVID-19 tests, 3 positive urine toxicology screens, 4 abnormal ECGs, and 3 abnormal white blood cell (WBC) counts, 2 elevated serum creatinine tests, and 2 abnormal glucose tests.

Additional single tests not recognized or followed up were an abnormal echocardiogram in CHF, a reduced glomerular filtration rate, an abnormal electrolyte panel, an abnormal liver function panel in ESLD, an abnormal lipid panel, and an abnormal urinalysis.

Some of the OFI cited in this category led to significant delays in diagnosis or treatment and will be discussed in a later section.

4. Opportunities to improve adherence to COVID-19 and influenza interim guidance protocols, clinical care guides for specific diseases, conditions, or risk factors

310 Total: 157 in cases of unexpected death; 153 in cases of expected death

a) COVID-19 and Influenza Interim Guidance

188 Total: 91 in cases of unexpected death; 97 in cases of expected death

In 2020 the CCHCS developed a COVID-19 guidance manual for all staff and patients in California prisons. The COVID-19 and Seasonal Influenza: Interim Guidance for Health Care and Public Health Providers is a well-referenced document reflecting the current knowledge base for COVID-19. Based on prevailing standards from the Centers for Disease Control and Prevention (CDC) and the California Department of Public Health (CDPH), this guide is frequently updated. There were 54 updates in 2021, with new sections on vaccination and on treatment with monoclonal antibodies in selected high risk patients.

The guide includes information on prevention strategies, infection control, use of personal protective equipment, respiratory protection, vaccination, testing and isolation of infected patients, identification and quarantine of all contacts, monitoring and treating infected patients, and containing local outbreaks. There are sections governing movement of patients within and between housing units, hospitals, and other prison facilities, and safe discharge of patients to the community. <https://cchcs.ca.gov/covid-19-interim-guidance/>

There was a significant additional workload imposed on CCHCS staff by all the COVID-19 control strategies, from universal screening to twice daily quarantine rounding, isolation and daily detailed clinical assessments and treatments of all infected patients, and monitoring for transfer to higher levels of care for patients who needed hospitalization. The burden of documentation created a particularly large number of OFI citations.

In 2021, 188 OFI addressed improved adherence to COVID-19 policies and procedures. This is fewer than the 230 OFI in 2020 but still represents 20% of all the OFI noted by the MRC.

b) Care Guides

122 Total: 66 in cases of unexpected death; 56 in cases of expected death

The Care Guides are tools created by the CCHCS for use by clinicians and care teams in the management of patients. In 2021, the following 31 Care Guides were available, and they can be accessed on the CCHCS website. All are evidence based, well referenced, and each contains a summary section, decision support tools, and a section for patient education and self-management. <https://cchcs.ca.gov/clinical-resources/>

- Advanced Liver Disease
- Anticoagulation
- Asthma *
- Chest Pain
- Chronic Obstructive Pulmonary Disease
- Chronic Wound Management
- Clozapine
- Coccidioidomycosis (Valley Fever)
- Cognitive impairment/dementia
- Diabetes (Type 2)*
- Dyslipidemia (abnormal cholesterol)*
- Foreign body ingestion/insertion
- Hepatitis C
- HIV
- Hunger Strike
- Hypertension*
- Intoxication and Withdrawal
- Major Depressive Disorder
- Medication Assisted Treatment for Opioid Use disorder in Pregnancy
- Pain Management
- Palliative Care*
- Post Renal Transplant
- Primary Care Guide to Foot Care*
- Schizophrenia
- Seizure Disorders
- Sexually Transmitted Diseases **
- Skin and Soft Tissue Infections
- Substance Use Disorder*
- Transgender*
- Tuberculosis
- Weight Management*

** revised in 2021; **new for 2021*

Similar resources for nursing staff are also in use, including protocols and encounter forms for patients with:

- Abdominal Trauma
- Allergic Reaction(s)
- Asthma
- Burns
- Chest Pain
- Chest Trauma
- Constipation
- Dental Conditions

- Earache
- Epistaxis
- Eye injury/irritation
- Female Genitourinary Complaints
- Headache
- Hemorrhoids
- Rash
- Insect Stings
- Intravenous Therapy
- Loss of Consciousness
- Musculoskeletal Complaints
- Respiratory Distress
- Seizure
- Tetanus Prophylaxis
- Upper Respiratory Infections
- Wound Care

i. [Opportunities to mitigate fall risk](#)

22 Total: 5 in cases of unexpected death; 17 in cases of expected death

Falls lead to serious injury with potential for hospitalization, increased morbidity, and death. Patients at risk for falls should be identified by their care teams. All patients are screened for risk for falling, ambulatory status, vision and balance, chronic disease, and medications that might increase fall risk. Patients who have fallen should be reassessed whenever their clinical condition changes significantly. Mitigation of fall risk includes adequate room lighting, beds placed in a lower and safer position, call devices available within easy reach, handrails, mobility support, non-slip footwear, and traffic paths free of clutter.

The 22 OFI in this category involved 20 patients. Eight of these patients had advanced cancer, four had severe COVID-19 or COPD, two were post stroke with mobility issues, one had CHF and one had Parkinson Disease.

ii. [Pressure Ulcer \(Injury\) Avoidance](#)

6 Total: 1 in cases of unexpected death; 5 in cases of expected death

Risk factors for pressure injury are immobilization, malnutrition, sensory loss and decreased circulatory perfusion. Patients with stroke, severe arthritis, paralysis or weakness, advanced age, and patients in restraints are all at risk for developing pressure injury. The development of a pressure injury or ulcer (known as a decubitus ulcer) increases the risk for local and systemic infection which can lead to sepsis and death.

All CCHCS patients with risk factors are screened for pressure injury risk and any patient at risk is given a prevention and treatment plan. Pressure injuries are a major source of morbidity at hospitals and long-term care facilities.

Of the six OFI cited for pressure injury in 2021, five were acquired during inpatient stays at contracted hospitals, generating Potential Quality Issue (PQI) citations, and only one was cited in the 35 CDCR prisons. Overall, the number of citations in this area decreased from 21 in 2020 to 6 in 2021.

iii. Medication Management

32 Total: 20 in cases of unexpected death; 12 in cases of expected death

There were 32 OFI involving 26 cases in which the management of prescribed medication could have been improved. Patients missing prescribed medication on discharge from an inpatient facility was cited in 5 cases. Four patients with COVID-19 who met criteria for monoclonal antibody therapy were not considered. Three prescribed medications were not available - two for COPD (mometasone, tiotropium) and one drug for the treatment of Parkinson Disease (rasagiline). There were two cases in which patients received incorrect doses of antibiotics and steroids. One patient was discovered to have hoarded KOP (keep on person) medication. In another patient, a rescue medication for asthma should have been ordered KOP but was not. One antipsychotic was ordered without the patient having received a recommended premedication ECG. Another patient on an antipsychotic drug should have had drug levels monitored. One patient received a medication that was not prescribed. And one patient received an ordered medication which was not indicated (prednisone for symptomatic bacterial sinusitis).

iv. Management of cardiovascular risk

11 total: 9 in cases of unexpected death; 2 in cases of expected death

All patients over the age of 18 should undergo a risk assessment for cardiovascular disease, using the American College of Cardiology 10-year risk assessment tool, which incorporates the patient's family history and personal risk factors such as sex, age, race, total cholesterol, HDL-cholesterol, blood pressure, history of diabetes mellitus (DM), and smoking history. Patients at intermediate or high risk should be considered for statin therapy and further noninvasive cardiac evaluation. In 2021 there were 11 OFI cited in this area. Eight patients had high cardiovascular (CV) risk scores but no consideration for statin therapy or lifestyle modification, one patient had high CV risk and poor blood pressure control, and one patient had high risk which generated a "non-urgent", rather than an "urgent" evaluation. One patient had clinical criteria for an acute coronary syndrome but was not evaluated.

v. Other

51 Total: 31 in cases of unexpected death; 20 in cases of expected death

There were 51 additional OFI concerning adherence to recommended practices in care guides or deviations from standard protocols.

There were 15 references to OFI in 6 suicide risk patients. The Advanced Liver Disease care guide was referenced 7 times (4 for ultrasound screening, and one each for use of NSAIDs, use of lactulose to treat hepatic encephalopathy, and one OFI for hepatitis C retreatment). The Diabetes Mellitus Type 2 care guide was referenced four times, twice for the use of outmoded sliding scale insulin therapy. There were three references each to lung cancer screening in high-risk patients, and management of congestive heart failure. There were two references each to asthma management, colon cancer screening, and indwelling urinary catheter care, and one reference each to COPD management and the use of CPAP in non-obstructive sleep apnea.

5. Opportunities to improve communication between primary care teams and in care transitions

43 Total: 16 in cases of unexpected death; 27 in cases of expected death

The accurate transfer of clinical information between care teams at transitions of medical care is important for coordination of patient care. Poor communication between specialists and primary care teams can lead to critical tests being delayed or not done. Information missing or lost when patients are transferred can lead to missed diagnoses or delayed treatment. Within care teams there is also potential for missed communication.

Of the 43 OFI in this category, 21 cited poor primary care - nursing interactions (twelve of these were physician orders that were not followed). Thirteen cited primary care team - specialist communication and many of these were specialist recommendations that were not acted upon. Six cited miscommunication between the primary care team and the hospital, and only three cited primary care team - mental health miscommunication (a decrease from the eight citations in this area in 2020).

There were no citations related to emergency department, custody, or other primary care team communication issues.

6. Opportunities to improve medical record documentation

105 Total: 46 in cases of unexpected death; 59 in cases of expected death

The electronic medical record (EMR) installation was completed in 2017. It has resulted in more complete documentation of visits and improved systems for storing and sharing information. However, there are several areas in which opportunities for improvement exist.

a) *Inadequate or inaccurate documentation of care which occurs inside the CCHCS.*

35 Total: 19 in cases of unexpected death; 16 in cases of expected death

b) *Incomplete or missing documentation*

12 Total: 3 in cases of unexpected death; 9 in cases of expected death

This occurs when care is provided outside of the CCHCS. A patient encounter in an emergency room, hospital, or specialist's office may be unavailable or missing.

c) *Missing physician or registered nurse notes*

6 Total: 2 in cases of unexpected death; 4 in cases of expected death

Examples include missing progress notes or shift entries, a missing order for vaccination for pain medication, no order written for an inserted foley catheter, missing documentation for anuria, for evaluation of eye trauma, and for evaluations of chest and neck pain.

d) *Legacy charting*

34 Total: 9 in cases of unexpected death; 25 in cases of expected death

“Legacy charting” is a term used to describe a workaround by some providers who “cut and paste” sections of previous patient encounter documentation in order to save time. This can result in an inaccurate record if careful editing of the pasted material is not done and is a practice which should be utilized infrequently. Legacy charting was also seen in many of the COVID-19 protocol OFI noted previously.

e) *Incomplete “problem list”*

18 Total: 13 in cases of unexpected death; 5 in cases of expected death

The problem list includes all a patient's known medical and psychiatric conditions and should be kept current. Examples of missing entities from problem lists in 2021 include three cases of substance use disorder, two cases of chronic hepatitis C, one each of prediabetes, diabetes type 2, morbid obesity, anemia, stroke, history of gastric cancer, COVID-19 infection, and splenectomy. All these missing diagnoses have implications for patients' further evaluations and management. A splenectomy, for example, confers a high risk for pneumococcal sepsis,

which should be managed by providing prophylactic antibiotic prescriptions before certain procedures.

The OFI captured in this category do not include the documentation lapses cited during an Emergency Medical Response, the documentation of POLST and DNI/DNR orders or the numerous documentation lapses cited for the COVID-19 guidance manual. These are all counted in their respective sections.

7. Opportunities to prevent delays in diagnosis or treatment

9 Total: 0 in cases of unexpected death; 9 in cases of expected death

In 2020, there were 31 cases in which delays were noted, the same number of cases as in 2019. In 2021 there were nine such cases noted as OFI of this type in the mortality reviews. An additional eight were identified as delays during the analysis for this report. It is useful to consider them together.

Table 13 describes the reason for delay, the approximate duration of delay, and the eventual diagnosis in each of these seventeen cases.

Delay	Duration	Eventual Diagnosis
<u>“Red flag” symptoms or signs: 6 cases</u>		
recurrent chest pain	5 weeks	acute myocardial infarction
weight loss, 17 kg	4 mo	ca pancreas
weight loss, 10 kg	8 mo.	ca kidney
leg mass	6 mo	ca sarcoma
throat swelling, dysphagia	11 mo	ca head/neck
dysuria	19 mo	ca urothelial
<u>Abnormal laboratory or other diagnostic test results: 8 cases</u>		
CT scan abdomen	6 weeks	ca kidney
pathology report	3 mo	ca bladder
abnormally high alkaline phosphatase level	5 mo	ca prostate
chest x-ray	5 mo	ca lung
abnormal eye exam	6 mo	vitreous hemorrhage
ultrasound abdomen	7 mo	ca kidney

Delay	Duration	Eventual Diagnosis
chest x-ray	7 mo	ca esophagus
abnormal rectal examination by specialist	18 mo	ca rectum
<u>Specialist Recommendation - 2 cases</u>		
refer to oncology	3 mo	ca bladder
refer for muscle biopsy	1 year	ALS
<u>Multifactorial: 1 case</u>		
abnormal chest x-ray, referral to specialist	4 months	ca lung

Table 13. Delayed Diagnoses, CCHCS 2021.

A delay in diagnosis can occur when clinical “red flags” are not pursued. Unexplained weight loss, persistent or recurrent pain, or difficulty swallowing (dysphagia) or urinating (dysuria) were red flags signifying potential cancers.

The proper recognition and management of abnormal laboratory or diagnostic imaging results is dependent on an integrated care team process. Workflows can be complicated. Patients with abnormal imaging tests suggesting malignancy might benefit from care coordination strategies.

A delay in access to specialists contributed to delays in 2 cases.

In all, 14 of the 17 citations resulted in delays in the diagnosis and treatment of cancers.

8. Opportunities for improving the practice and documentation of emergency medical responses.

122 Total: 107 in cases of unexpected death; 15 in cases of expected death

A statewide quality initiative to redesign the Emergency Medical Response (EMR) Program began in 2018. The EMR Program was rewritten in March of 2019 and training commenced in 14 institutions by the end of 2019. The COVID-19 pandemic caused a temporary suspension of training in 2020, and training resumed in May of 2021.

There were many more emergency responses activated in cases of unexpected death, so these accounted for most of the OFI.

Delays in activation of a 9-1-1 call were noted in 29 cases. These delays ranged from three to 22 minutes.

Documentation lapses were noted in 46 findings.

Another 47 miscellaneous citations included the underuse of naloxone (Narcan) to reverse possible narcotic overdose, difficulties in securing intravascular access, response to abnormal ECG patterns, not checking blood glucose for hypoglycemia, equipment issues - missing a pulse oximeter and finding a dead battery for a bone drill, and irregularities in the process of declaring patient deaths.

9. Miscellaneous

2 Total: 2 in cases of unexpected death; 0 in cases of expected death

Two opportunities for improvement not fitting into other categories were identified. Both involved postmortem toxicology screening showing the presence of illicit buprenorphine.

10. Potential Quality Issues (PQI)

16 Total: 4 in cases of unexpected death; 12 in cases of expected death

Potential Quality Issue: A health care incident, regardless of severity, which occurs during the course of treatment by a Healthcare Provider Network facility or provider and requires submission of a written Potential Quality Issue referral.

Primary health care is provided to California's inmate population in outpatient and inpatient units in the 35 CDCR institutions. For specialty care services, emergency department and hospital-based care CCHCS has contracted with independent outside contractors.

Mortality reviews which uncover OFI involving these contracted services will generate a PQI which is forwarded to the appropriate emergency department, hospital, or specialist for their further review and action.

In 2021, there were 16 PQIs, compared with 34 in 2020 and 24 in 2019. Six referrals involved patients who developed pressure injuries/ulcers in hospital. Eight patients were discharged prematurely from emergency departments or hospitals and were readmitted to a higher level of care within 24 hours of discharge. One patient was discharged despite unexplained tachycardia in the prior 24 hours and died later the day of discharge with bilateral pulmonary embolism. One patient had the wrong kidney biopsied for a suspicious mass.

All PQIs are managed by the entity to which the PQI was forwarded.

VI. Conclusions

Mortality review continues to evolve, with particular attention to the identification of opportunities for system improvement. The number of OFI findings in 2020 rose to 2.4 per death. There were increases in identified OFI in the areas of the identification/management of red flag symptoms and signs, lapses in Emergency Protocol, and opportunities to improve documentation, including increased findings for legacy charting. There were reduced numbers of findings in meeting access times, cases that needed complex care management, and optimizing care near the end of life. There were also fewer citations in COVID-19 protocol lapses and pressure ulcer avoidance, and there were fewer lapses in Mental Health - Primary Care communication.

Overall, the mortality rate in 2021 was 309, the lowest since 2017. COVID-19 was again responsible for the largest number of deaths, but the COVID-19 mortality rate decreased significantly in 2021. COVID-19 caused 90 fatalities, representing 23% of all deaths. This was a significant reduction from 2020, when COVID-19 caused 141 deaths, 29% of the total.

The non-COVID-19 mortality rate also decreased. The 30 deaths from infectious diseases other than COVID-19 were many fewer than the 47 in 2020. The infective endocarditis mortality rate halved in 2021. The widespread adoption of the Integrated Substance Use Treatment (ISUDT) program may have contributed to this reduction.

There was a reduction in the number of sudden cardiac arrests as a cause of sudden death in inmates in 2021 (24) compared with 2020 (38).

The lung cancer mortality rate continued a reduction that began in 2020, possibly as a result of increased chest CT screening in high-risk patients.

There were 15 homicides in the CCHCS in 2021 for a homicide rate of 15/100,000, the lowest rate since 2017.

The suicide rate in 2021 was the lowest in the history of the Receivership dating back to calendar year 2007. <https://cchcs.ca.gov/reports/death>

Major quality initiatives included the Hepatitis C treatment program, the Integrated Substance Use Disorder Treatment Program, and the COVID-19 vaccination program. Each contributed to the mortality rate reduction.

Improvements in advanced liver disease care was documented by performance dashboards achieving 85% or greater performance system wide.

The drug overdose mortality rate showed sustained improvement, reversing the trend that had begun in 2015. This was associated with system wide implementation of the Integrated Substance Use Disorder Treatment (ISUDT) program.

From December of 2020 to April of 2021, the COVID-19 vaccination program was highly successful, resulting in the administration of vaccine to over 73% of the patients and over 90% of high-risk groups. This resulted in a dramatic decrease in COVID-19 mortality, beginning in the second quarter of 2021 and continuing for the remainder of the year. This campaign was the single most life-saving initiative in the history of the Receivership.

The success of the receivership in transforming healthcare in the California prisons had resulted in a process of revocable delegation with detailed periodic audits. By the end of 2019, 19 of the 35 California prisons had been delegated to the control of the state. During the covid pandemic, there were no further delegations. Delegation now may be resumed.