

Analysis of 2022 California Correctional Health Care Services Inmate Mortality Reviews

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Table of Contents

I.	Introduction	1
II.	Mortality Review Purpose and Process	2
III.	Definitions	3
IV.	The California State Prison Population in 2022	3
V.	2022 Study Findings.....	6
A.	Causes of Inmate Death.....	6
B.	Expected and Unexpected Deaths in 2022.....	10
1.	<i>Expected deaths</i>	10
2.	<i>Unexpected deaths</i>	10
C.	Discussion of trends in inmate death	11
1.	<i>CCHCS mortality rates</i>	11
2.	<i>Natural Deaths</i>	14
3.	<i>Unnatural deaths</i>	22
D.	Opportunities for Improvement, 2022.....	28
1.	<i>Opportunities to improve the application of the “Model of Care” as described in the CCHCS Complete Care Model</i>	32
2.	<i>Opportunities to improve clinical decision making by improved recognition and management of important clinical signs and symptoms</i>	36
3.	<i>Opportunities to improve recognition and action in response to abnormal laboratory and other diagnostic test results</i>	37
4.	<i>Opportunities to improve adherence to COVID-19 protocols, CCHCS Clinical Care Guides for specific diseases, conditions, or risk factors</i>	37
5.	<i>Opportunities to improve communication between primary care teams and in care transitions</i>	41
6.	<i>Opportunities to improve medical record documentation</i>	42
7.	<i>Opportunities to prevent delays in diagnosis or treatment</i>	43
8.	<i>Opportunities for improving the practice and documentation of emergency medical responses</i>	45
9.	<i>Miscellaneous</i>	45
10.	<i>Potential Quality Issues (PQI)</i>	46
VI.	Quality Initiatives and Performance Improvement Tools	46
VII.	Conclusions	48

Tables and Figures

Figure 1. California State Prison Population 2006-2022.....	4
Figure 2. Racial Representation in California General Population and CDCR In-Custody Populations.....	5
Table 1. Causes of Death Among All California Inmates, 2022.....	7
Table 2. Top Causes of Death Among California Inmates, 2006-2022.....	9
Figure 3. Inmate Deaths by Expectation and Category, CCHCS 2022.	11
Table 3. Annual Mortality Rates Among California and U.S. State Prison Inmates, 2006-2022.....	12
Figure 4. Annual Death Rates per 1000,000 Inmates, CCHCS, all U.S. State Prisons 2006-2022.	13
Figure 5. Numbers and Trends of Natural and Unnatural Deaths, CCHCS, 2006-2022.....	13
Table 4. COVID-19 Inmate Deaths and Rates in California State Prisons, CCHCS 2020-2022.....	14
Figure 6. COVID-19 Inmate Deaths and Vaccinations in California State Prisons, CCHCS 2020-2022.....	15
Figure 7. Numbers and Rates of (non COVID-19) Infectious Disease Deaths, CCHCS 2012-2022.	16
Figure 8. Death Rates in Select Causes of Infectious Disease, CCHCS 2012-2022.....	16
Table 5. Numbers and Rates of Cardiovascular Deaths, CCHCS 2012-2022.	18
Figure 9. Numbers and Rates of Cardiovascular Deaths, CCHCS 2012-2022.....	18
Table 6. Numbers and Rates of Lung Cancer Deaths, CCHCS 2012-2022.	19
Figure 10. Numbers and Rates of Lung Cancer Deaths, CCHCS 2012-2022.....	19
Table 7. Numbers and Rates of Advanced Liver Disease Deaths, CCHCS 2012-2022.....	20
Figure 11. Numbers and Rates of Advanced Liver Disease Deaths, CCHCS, 2012 - 2022.	21
Table 8. Numbers and Rates of Overdose Deaths, CCHCS 2012-2022, and U.S. State Prisons 2012-2019....	22
Figure 12. Numbers and Rates of Overdose Deaths, CCHCS 2012-2022, and U.S. State Prisons 2012-2019.	23
Table 9. Numbers and Rates of Suicide, CCHCS 2012-2022 and U.S. State Prisons 2012-2019.....	25
Figure 13. Numbers and Rates of Suicide, CCHCS 2012-2022 and U.S. State Prisons 2012-2019.....	25
Table 10. Numbers and Rates of Homicides, CCHCS 2012-2022 and U.S State Prisons 2012-2019.....	27
Figure 14. Numbers and Rates of Homicides, CCHCS 2012-2022, and U.S State Prisons 2012-2019.	27
Figure 15. Deaths and OFI Findings, CCHCS 2018-2022.....	29
Table 11. Opportunities for Improvement in Expected and Unexpected Deaths, CCHCS, 2022.....	31
Table 12. Missed Clinical Signs and Symptoms, and Eventual Diagnoses, CCHCS 2022.....	37
Table 13. Other Care Guides, Programs and Protocols OFI and related deaths, CCHCS, 2022.	41
Table 14. Delayed Diagnoses, CCHCS 2022.....	44
Figure 16. Screen capture showing partial CCHCS Health Care Services Dashboard for December 2022.	47

I. Introduction

Since April of 2006, healthcare services in the California Correctional Health Care System (CCHCS) have been the responsibility of the U.S. District Court-appointed Federal Receiver, which ruled that the medical care in California state 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. In 2015, after a decade of meaningful reform, the Receivership began delegating institutions back to the California Department of Corrections and Rehabilitation (CDCR) for management of health care. In that same year, the Complete Care Model, based on the industry standard known as the Patient Centered Health Home, was adopted as the standard for the delivery of health care in the CCHCS. The CCHCS fact sheet provides a summary of the timeline of the Receivership and a list of delegated institutions.

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 and their effect on specific mortality subsets will be discussed and summarized.

This is the sixteenth consecutive annual report on mortality reviews of inmate deaths occurring in the CCHCS.

All previous annual mortality reviews can be accessed at <https://cchcs.ca.gov/reports/>.

II. Mortality Review Purpose and Process

Every patient death triggers an initial death report generated by the prison in which the death occurs. This report includes significant clinical events, summarizes the emergency medical response, and identifies lapses in health care delivery and any systemic issues that may have contributed to the patient's death. The initial report is forwarded to the Receiver's Mortality Review Unit.

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.

At the Mortality Review Unit, an independent review is conducted. This Mortality Review (MR) summarizes the patient's movement history within the California prison system and records any significant conditions contributing to but not related to the immediate cause of death.

The patient's COVID-19 status and COVID-19 vaccination history are noted.

Any history of drug and alcohol abuse is noted, including interactions with the CCHCS substance use program and experience with medication assisted therapy.

The patient's mental health care is also summarized, including significant mental illnesses, interactions with the mental health system of care, significant non adherence problems, and potential for self-harm.

An extensive review of the patient's clinical record is recorded, dating back at least six months prior to the date of death. (A reviewer may include older records to review pertinent antecedents to the terminal event.) 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 responses are reviewed.

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

The Mortality Review is 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 services, and one (non-voting) member of the Quality Management staff.

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

In addition to OFI the MRC also identifies Potential Quality Issues (PQI), which are incidents which 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. Such events have potential quality of care implications.

The final mortality report, the CCHCS Mortality Review, is sent to the institution (prison) and regional health care leadership and findings are entered in the Electronic Health Care Incident Reporting (eHCIR) system. Pertinent findings are also sent to the Nursing Professional Practices Committee and other 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 (usually) 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 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 2022

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

Since then, Federal court-mandates, California state propositions and legislative actions all contributed to a sizeable reduction in the inmate population.

Figure 1 is an annotated run chart of the California prison population from 2006 to 2022.

In 2011, Assembly Bill 109, an “Alternate Custody Program” had some felons and parole violators remain in local county jails.

In 2012, Proposition 36 (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.

In 2014, Proposition 47 converted some theft and drug possession felonies into misdemeanors.

In 2017, Proposition 57 increased good behavior early release opportunities.

By 2019, the prison population was 125,270.

During the COVID-19 pandemic an Executive Order by the California Governor in March 2020 suspended the intake of new inmates from county jails into state prisons. The CDCR took further actions in 2020 to reduce population and maximize space.

By 2022, the California average quarter-end in-custody population was 96,341 – a 44% reduction from 2006.

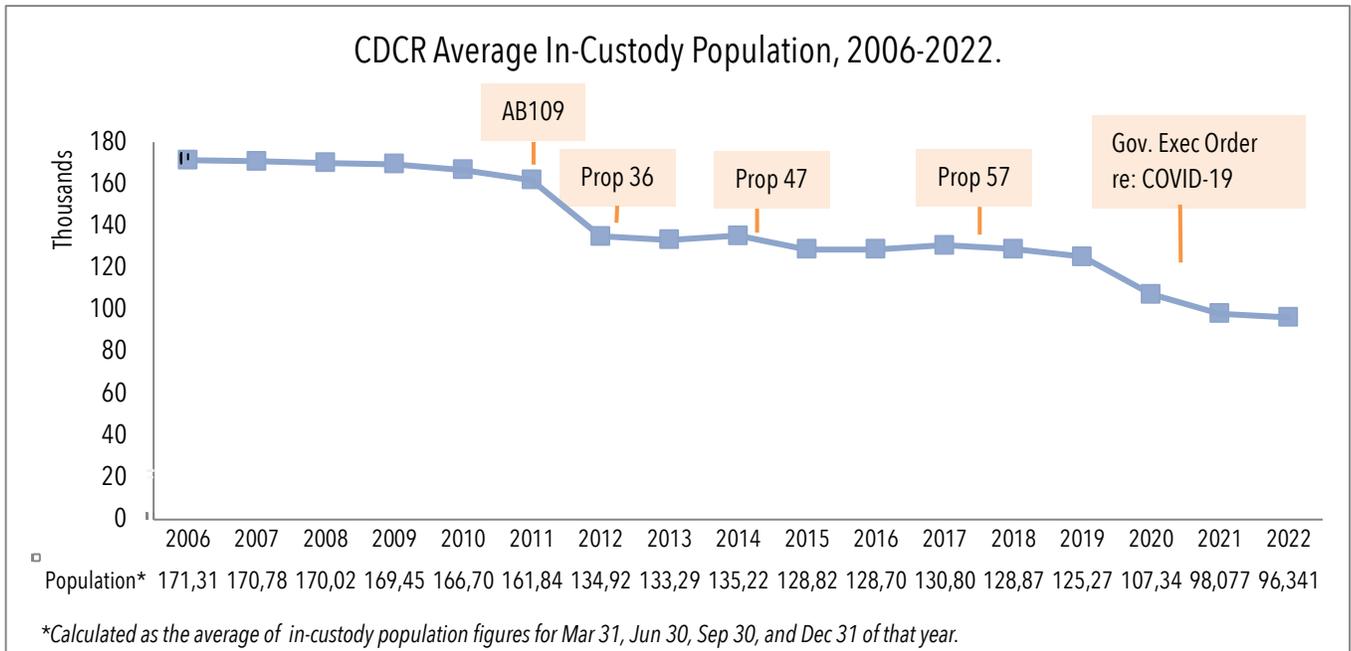


Figure 1. California State Prison Population 2006–2022.

Age: The average age of the California prison population in December 2022 was 41.7 years, with males averaging 41.8 and females 39.7. Individuals under 45 represented roughly two thirds 61.6% of the total prison population.

Prisoners older than 55 comprised 12.3% of the CCHCS population in 2022 compared to 12.5% in 2015 (Offender Data Points, CDCR Public Dashboard).

Gender: In December 2022, 91,385 (95.5%) of the 95,707 inmates were male, 3,934 (4.2%) were female, and 388 (0.3%) were non-binary (Monthly TPOP4 Report for December 2022).

Ethnicity: The in-custody population in December 2022 was 27.9% Black, 45.5% Hispanic, 20.1% White, and 6.5% other races (Offender Data Points, CDCR Public Dashboard).

According to the California Department of Finance Demographic Research Unit, the 2020 census showed 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, 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 27.9% of inmates. Hispanics are also disproportionately represented, comprising 39.4% of the general population and 45.5% of inmates.

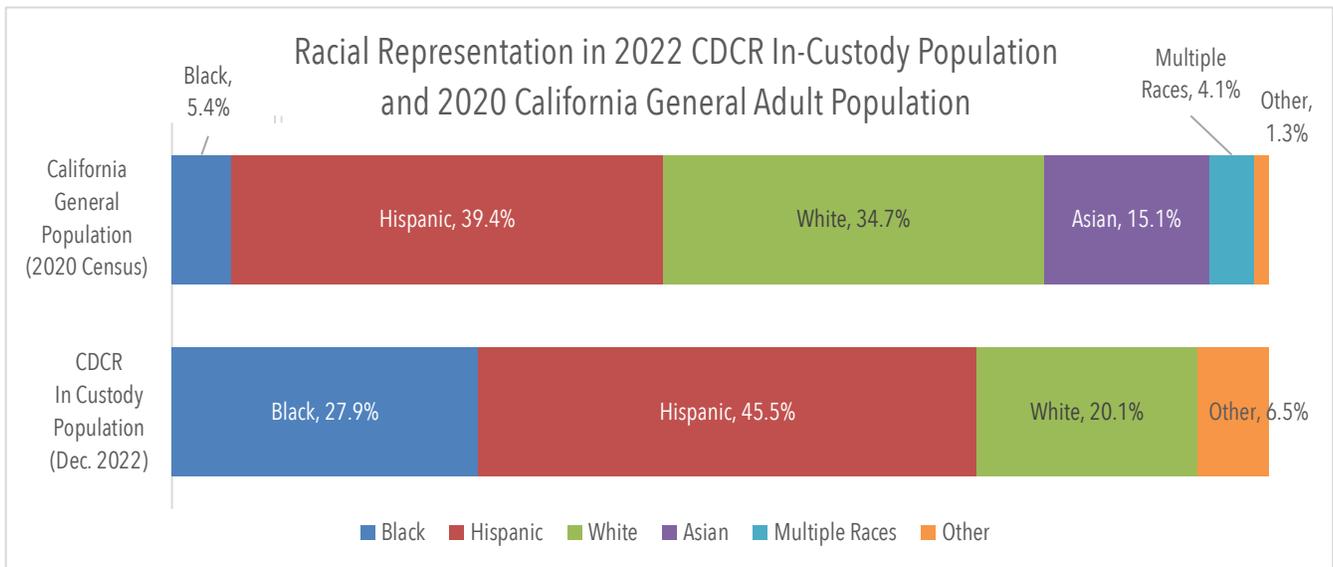


Figure 2. Racial Representation in California General Population and CDCR In-Custody Populations

V. 2022 Study Findings

A. Causes of Inmate Death

In 2022 there were 389 inmate deaths. The counts and causes of these deaths are listed in Table 1 below.

Number of Cases	Category and Causes of Death
69	Cancer (CA) CA-lung (17); CA-pancreas (6); CA-colorectal (5); CA-esophagus (4); CA-head and neck (4); CA-multiple myeloma (4); CA-prostate (4); CA-stomach (4); CA -neuroendocrine (3); CA-unknown primary (3); CA-urinary bladder (3); CA-lymphoma (2); CA-brain (1); CA-gall bladder (1); CA-acute myeloid leukemia (1); CA-testis (1); CA-anus (1); CA-kidney (1); CA-melanoma (1); CA-oligodendroglioma (1); CA-ovary (1); CA-plasmacytoma (1)
64	Cardiovascular Disease sudden cardiac arrest (41); congestive heart failure (11); acute myocardial infarction (10); intracerebral hemorrhage (2)
53	Drug Overdose fentanyl (14); fentanyl/methamphetamine (12); fentanyl/heroin (7); fentanyl/alcohol (2); fentanyl/morphine (2); fentanyl/methamphetamine/heroin (1); fentanyl/methamphetamine/morphine (1); fentanyl/opiate (1); fentanyl/venlafaxine (1); methamphetamine (3); drug unspecified (3); heroin (2); heroin/alcohol (1); synthetic cannabinoid (1); buprenorphine/venlafaxine/olanzapine (1); olanzapine/hydroxyzine (1)
41	Advanced (End Stage) Liver Disease (ESLD) ESLD with hepatocellular carcinoma (HCC) (22); ESLD hepatitis C positive without HCC (16); ESLD alcoholic (2); ESLD non hep-C (1)
26	Infectious Disease (non-COVID-19) sepsis (16); pneumonia (4); infective endocarditis (3); pneumonia, aspiration (2); coccidioidomycosis (1)
25	Homicide
21	Suicide
20	Neurological Disease dementia (10); Parkinson Disease (4); amyotrophic lateral sclerosis (2); seizure disorder (2); anoxic encephalopathy (1); neurodegenerative disorder (1)
13	Infectious Disease (COVID-19)

Number of Cases	Category and Causes of Death
11	Gastrointestinal Disease upper gastrointestinal hemorrhage (5); small bowel obstruction (2); small bowel perforation (1); gastric outlet obstruction (1); gastric ulcer perforation (1); ulcerative colitis (1)
11	Pulmonary Disease chronic obstructive pulmonary disease (7); interstitial pulmonary fibrosis (3); pneumonia, atypical (1)
9	Renal Disease end stage renal disease (7); acute renal failure (2)
8	Cerebrovascular Disease stroke, hemorrhagic (3); stroke, ischemic/thrombotic (5)
6	Circulatory System pulmonary embolus (4); aortic aneurysm rupture (2)
5	Autoimmune mixed connective tissue disease (2); inflammatory bowel disease (1); myasthenia graves (1); systemic lupus erythematosus (1)
4	Metabolic/Endocrine/Nutritional pheochromocytoma (1); hunger strike (1); diabetic ketoacidosis (1); morbid obesity (1)
1	Accidental motor vehicle accident (1)
1	Unknown traumatic asphyxiation (1)
389	Total

Table 1. Causes of Death Among All California Inmates, 2022.

Cancer was the leading cause of mortality again in 2022, causing 69 deaths. Cancer of the lung, with 17 cases, caused 25% of all neoplastic death.

Cardiovascular disease, with 64 deaths, was the second leading cause of death in 2022. Sudden death or sudden cardiac arrest (41 cases) represented nearly two-thirds of these deaths. The others were caused by congestive heart failure (11 cases), acute myocardial infarction (10 cases), and intracranial hemorrhage from poorly controlled hypertension (two cases).

Drug overdose caused 53 deaths in 2022. This was a significant increase over prior years. Fentanyl was implicated, alone or in combination with other drugs, in 41 (77%) of these cases.

Advanced or end stage liver disease (ESLD), including hepatocellular cancer (HCC), caused 41 deaths in 2022. HCC is a consequence of advanced liver disease and caused 22 of these deaths. Nineteen deaths were caused by liver cirrhosis (ESLD) without demonstrable HCC; two of these were caused by alcoholic cirrhosis, and one was of unknown etiology.

Infectious diseases caused 39 deaths. Sepsis was responsible for 16 of these deaths. COVID-19 caused 13 deaths, continuing and sharpening the decline from 2020 (141 deaths) and 2021 (90 deaths).

Homicides accounted for 25 deaths. Suicide attempts caused 21 deaths. Both were significantly higher than in 2021.

Neurological diseases numbered 20, with 10 of these caused by dementia.

Gastrointestinal diseases caused 11 deaths, five from upper gastrointestinal hemorrhage.

Pulmonary diseases caused 11 deaths, seven from chronic obstructive pulmonary disease.

Cerebrovascular disease (stroke) caused eight deaths, five ischemic and three hemorrhagic.

End stage renal disease caused seven deaths, and pulmonary embolism caused four deaths in 2022.

Table 2 shows the top causes of death in the California prisons from 2006 through 2022.

Top Causes of Death in California State Prisons, 2006-2022.

YEAR	RANK	1	2	3	4	5	6	7	8	9
2022		Cancer	Cardiovascular Disease	Drug Overdose	Advanced Liver Disease	Infectious Disease (not COVID-19)	Homicide	Suicide	Neurological Disease	Infectious Disease (COVID-19)
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

Top Causes of Death in California State Prisons, 2006–2022.

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
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, 2006–2022.

Cancer and cardiovascular deaths regained their places as first and second most common causes of death in 2022.

Drug overdose deaths spiked significantly in 2022, becoming the third leading cause of death overall.

Deaths from COVID-19 dropped from the leading cause of mortality in 2020 and 2021 to ninth most common in 2022.

The average age of the 379 male inmates who died in 2022 was 58.1 years; the average age of the 13 deceased female inmates was 65 years.

The youngest inmate death was at age 19; the oldest at age 94.

In 2022, drug overdoses, suicides, and homicides caused death at an average age of 42 while the average age of death by all other causes was 63.8.

B. Expected and Unexpected Deaths in 2022

1. Expected deaths

There were 188 expected deaths in 2022. They were the result of chronic disease processes like cancer, end stage liver disease, 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 amyotrophic lateral sclerosis, Parkinson Disease and dementia are also included here.

2. Unexpected deaths

There were 201 cases of unexpected death in 2022. Drug overdoses, suicides, and homicides together accounted for 100 of these. Most cardiovascular deaths, including sudden cardiac arrests and acute myocardial infarctions, were unexpected.

Figure 3 compares unexpected and expected deaths in each category.

Inmate Deaths by Expectation and Category, CCHCS, 2022.

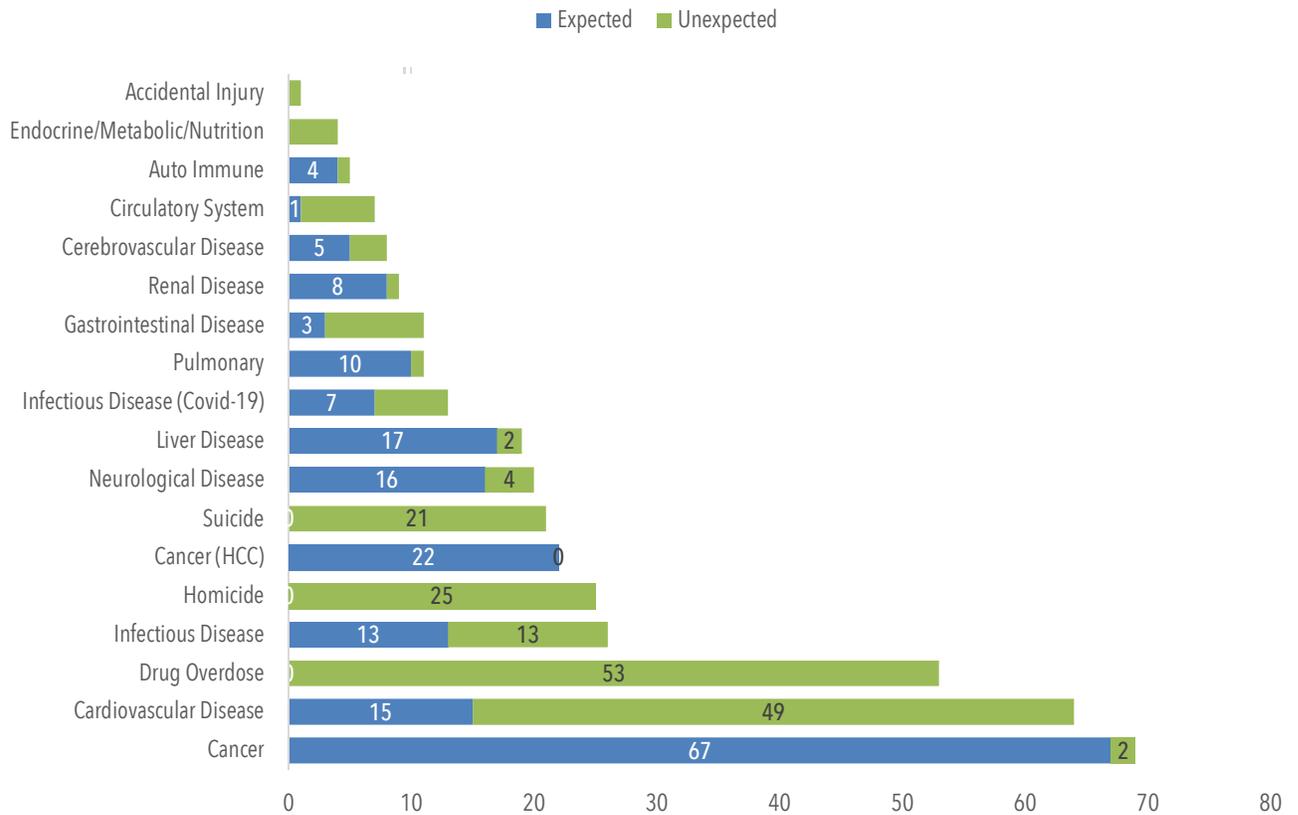


Figure 3. Inmate Deaths by Expectation and Category, CCHCS 2022.

C. Discussion of trends in inmate death

This section examines mortality trends in key areas. Where referenced, comparative U.S. State Prison data through 2019 are sourced from the U.S. Bureau of Justice Statistics (BJS), *Mortality in State and Federal Prisons, 2001-2019 – Statistical Tables*, Table 4 (NCJ 255970, December 2021). Sources for more recent statistics are noted where used.

1. CCHCS mortality rates

The following table shows the number of deaths and the corresponding mortality rates in California prisons from 2006–2022, 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	525
2021	(all) 392 (COVID-19) 90 (non-COVID-19) 302	98,077	400 92 308	443
2022	389 (COVID-19) 13 (non-COVID-19) 376	96,341	404 13 390	422

*U.S. figures may have been revised by BJS from previously published statistics. Years 2007-2019 from Table 4, *Mortality in State and Federal Prisons, 2001-2019 - Statistical Tables | December 2021*; NCJ 300953. Years 2020 and later from Tables 1 and 9, *“Prisoners in [2020, 2021, 2022] - Statistical Tables”*, NCJ 307149; U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. 2022 figure is preliminary.

Table 3. Annual Mortality Rates Among California and U.S. State Prison Inmates, 2006–2022.

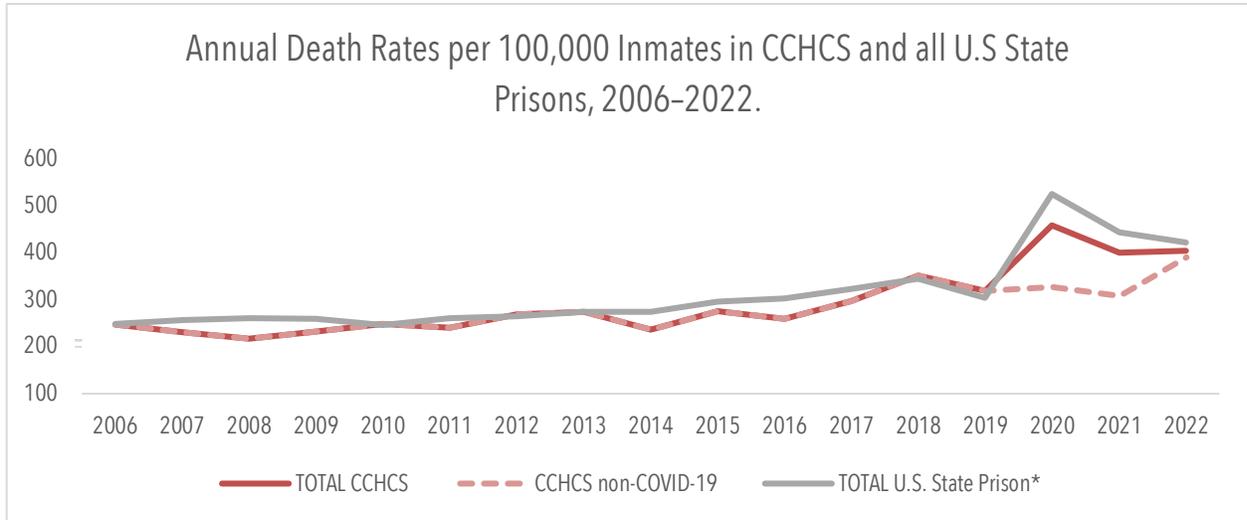


Figure 4. Annual Death Rates per 1000,000 Inmates, CCHCS, all U.S. State Prisons 2006–2022.

While there were significant decreases in COVID-19 mortality, the 2022 non-COVID-19 mortality rate was the highest in the history of the Receivership at 390/100,000.

A recent online publication from the Prison Policy Initiative notes the Bureau of Justice Statistics separation of prison deaths into “natural” and “unnatural” categories. Natural deaths are those caused by illness. Unnatural deaths are caused by suicide, homicide, drug and alcohol intoxication and accidents. It is useful to discuss trends in inmate death in a similar fashion, separating trends into two sections: natural deaths and unnatural deaths.

The following chart shows the number and trends of natural and unnatural deaths from 2006-2022. In prisons there are very few accidental deaths, leaving drug overdoses, suicides, and homicides as the three major determinants of unnatural death. In general, we see a slowly rising trend in unnatural deaths as a proportion of total deaths.

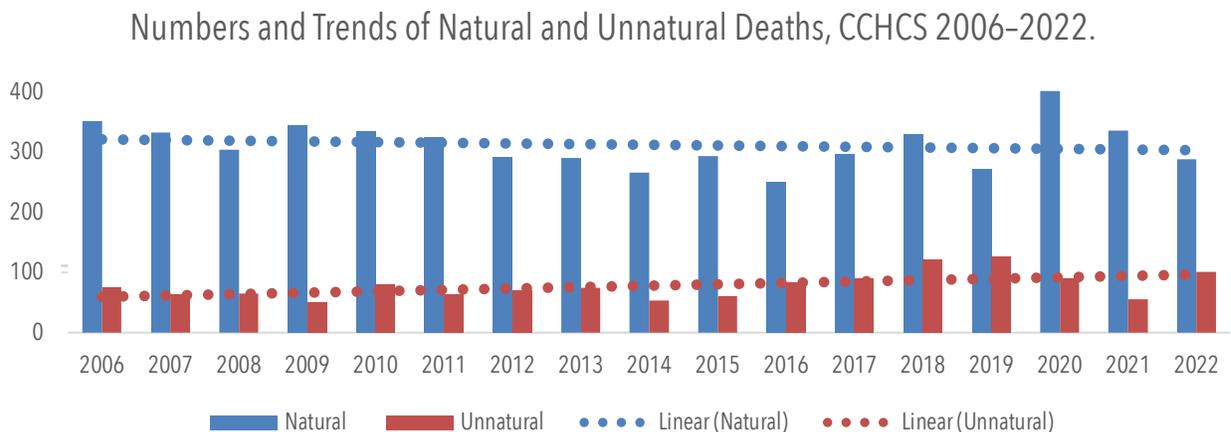


Figure 5. Numbers and Trends of Natural and Unnatural Deaths, CCHCS, 2006–2022.

2. Natural Deaths

a) COVID-19

In 2022, the successful response to the COVID-19 pandemic remained a high priority for the CCHCS and the CDCR. Table 4 shows quarterly and annual counts of COVID-19 deaths and the corresponding mortality rates for the three years 2020, 2021 and 2022.

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
Q1 2022	5	5
Q2 2022	3	3
Q3 2022	2	2
Q4 2022	3	3
Year 2022	13	13

Table 4. COVID-19 Inmate Deaths and Rates in California State Prisons, CCHCS 2020–2022.

CCHCS began its COVID-19 policy development in late February 2020, and by March of that year an extensive mitigation and control strategy was underway, including universal detection, early isolation, and the curtailing of programs that had resulted in significant person to person contact.

The COVID-19 vaccination project started in December 2020. From the end of 2021 through 2022, 80% of all patients and 43% of all staff had been vaccinated. Immunization rates were even higher, over 93%, among high-risk patients. Vaccine boosters were administered to 78%

of patients over age 65, though younger patients had significantly reduced acceptance of COVID-19 boosters.

Figure 6 shows the number of COVID-19 deaths, mortality rates and vaccination rates in the CCHCS patient population from 2020 through 2022.

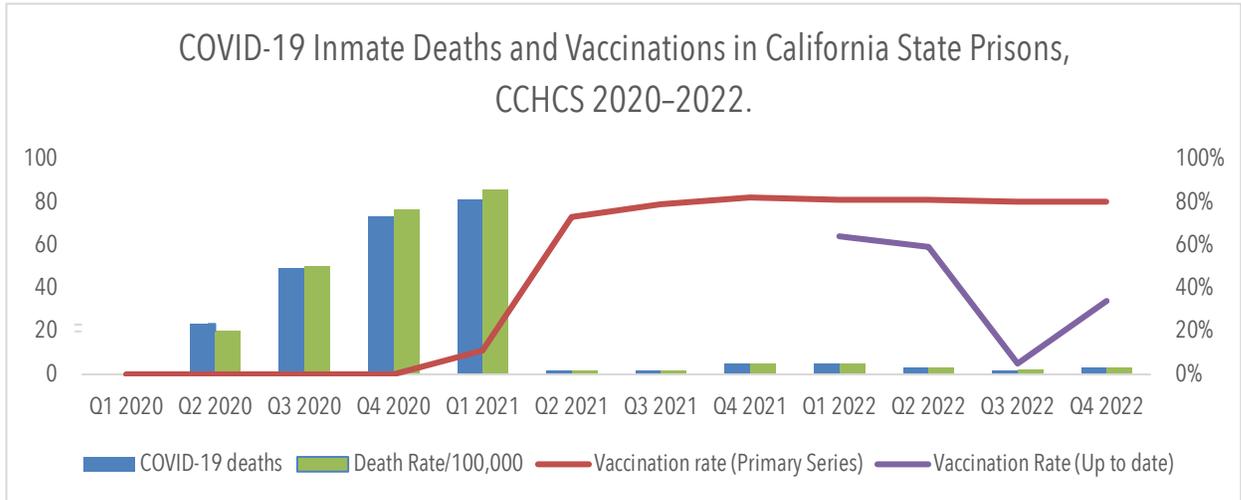


Figure 6. COVID-19 Inmate Deaths and Vaccinations in California State Prisons, CCHCS 2020–2022.

The COVID-19 mortality rates were on a rising trajectory through the first quarter of 2021. With widespread vaccination, the COVID-19 mortality rates dropped dramatically and remained low throughout 2022; only thirteen patients died of COVID-19. Eleven of these thirteen patients had received at least a primary series of COVID-19 vaccine; at least two refused the booster. Another two patients had refused the COVID-19 primary vaccination series. The mortality rate from COVID-19 in 2022 was 13/100,000, a reduction of 90% from the rate of 135/100,000 in 2020, and 86% lower than in 2021. The COVID-19 mortality rate remained low despite a significant drop in the booster acceptance rate.

b) Infectious diseases other than COVID-19

There were 25 deaths from infectious diseases other than COVID-19. Three causes – sepsis (16 deaths), pneumonia (4), and infectious endocarditis (3) – accounted for 88% of those cases.

The next figure shows the non-COVID-19 infectious disease mortality rate for the years from 2012 to 2022.

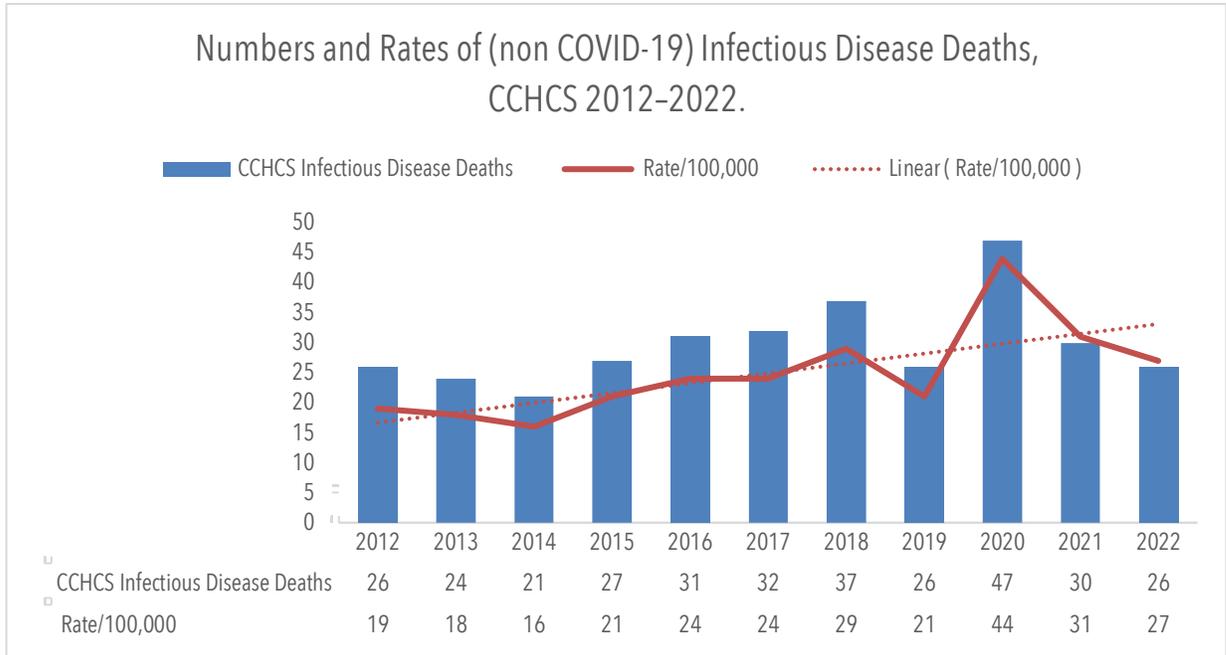


Figure 7. Numbers and Rates of (non COVID-19) Infectious Disease Deaths, CCHCS 2012–2022.

Figure 8 shows the sepsis, pneumonia, and infectious endocarditis mortality rates for each of the years from 2012 to 2022.

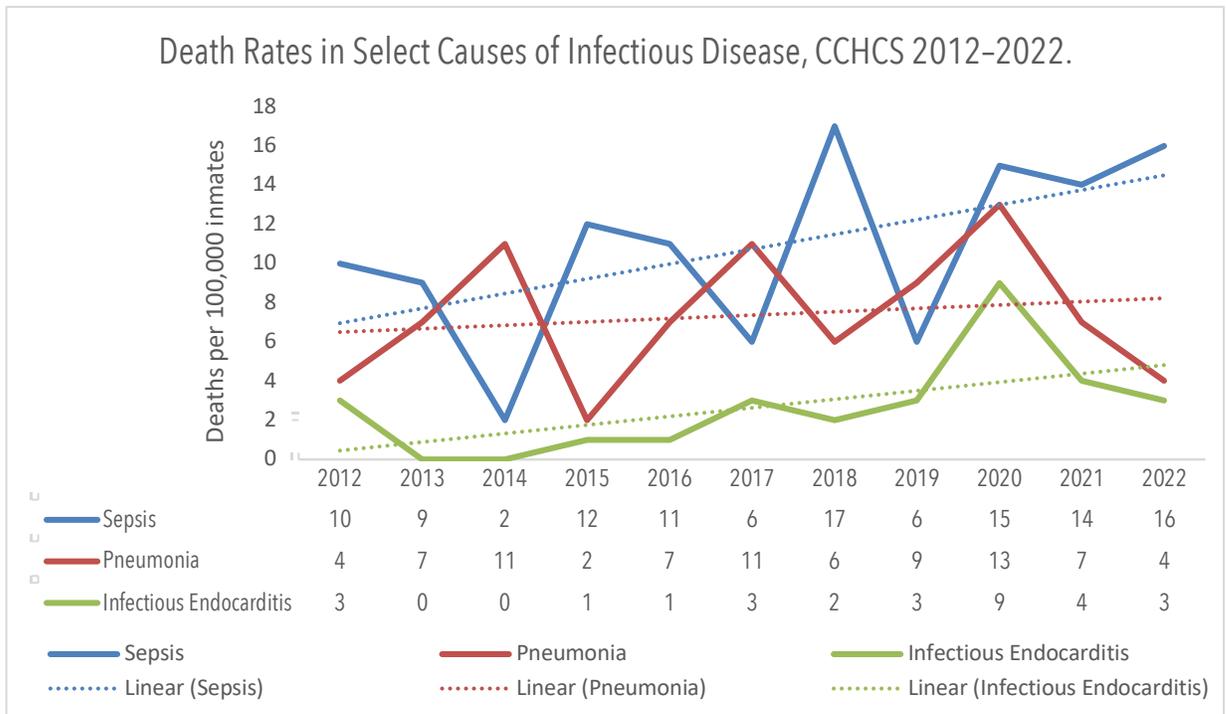


Figure 8. Death Rates in Select Causes of Infectious Disease, CCHCS 2012–2022.

Sepsis mortality rates for 2012-2022 ranged from a low of two per hundred thousand in 2014 to a high of 17/100,000 in 2018, averaging 10.3/100,000. The 2022 rate of 16/100,000 is compatible with a rising death rate from sepsis. As noted in prior years, reasons for the rising incidence may be related to an evolution in the definition and recognition 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.)

The source of systemic infection in the sixteen cases in 2022 included four cases of sepsis secondary to pneumonia, three cases in intravenous drug users (two of which arose from soft tissue abscesses), one hepatic abscess in a liver transplant patient, two urinary tract infections, one infected gall bladder, an infected heart valve, and a patient with severe osteomyelitis, a bone infection of the cervical spine.

Pneumonia mortality rates range from two in 2015 to 13 in 2020. There were four cases of pneumonia in 2022, in addition to the four cases of sepsis arising from pneumonia infected patients.

Infective endocarditis mortality rates range from zero in 2013 and 2014 to nine in 2020. In 2022 the mortality rate was three. Although not grouped with drug overdose deaths, most infective endocarditis deaths in CCHCS patients are due to the intravenous use of narcotics. In 2022 two of the three patients with infective endocarditis also had substance use disorder.

c) Cardiovascular disease

Cardiovascular disease was the second most common cause of death in 2022 with 64 deaths for a mortality rate of 66/100,000.

Table 5 and Figure 9 show the numbers, rates, and trends of cardiovascular death from 2012 through 2022.

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

Year	CCHCS Cardiovascular Deaths	Rate/100,000
2019	52	42
2020	54	50
2021	47	48
2022	64	66

Table 5. Numbers and Rates of Cardiovascular Deaths, CCHCS 2012–2022.

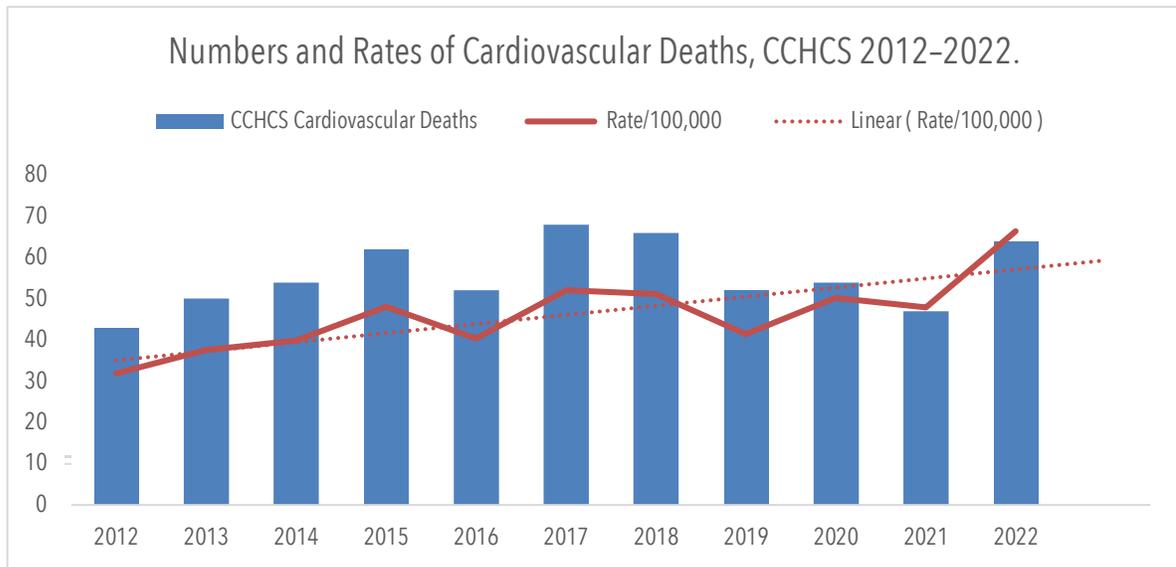


Figure 9. Numbers and Rates of Cardiovascular Deaths, CCHCS 2012–2022.

The CCHCS Care Guides for chest pain, diabetes, dyslipidemia, and hypertension have stressed the importance of estimating cardiac risk in all patients and the appropriate use of education and medication to manage risk factors for coronary heart disease. There has also been an increased awareness of recognizing and managing red flag symptoms indicative of acute coronary syndromes or exacerbations of congestive heart failure.

Despite these efforts, 2022 saw an increase in cardiovascular deaths, largely due to the increase in the number of sudden cardiac arrests in 2022 (41) compared with 2021 (24).

d) Lung cancer

Lung cancer has been the leading cause of cancer death, both in the CCHCS and in the general population.

Table 6 and Figure 10 show the numbers, rates, and trends of lung cancer deaths from 2012 through 2022.

Year	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
2022	17	18

Table 6. Numbers and Rates of Lung Cancer Deaths, CCHCS 2012–2022.

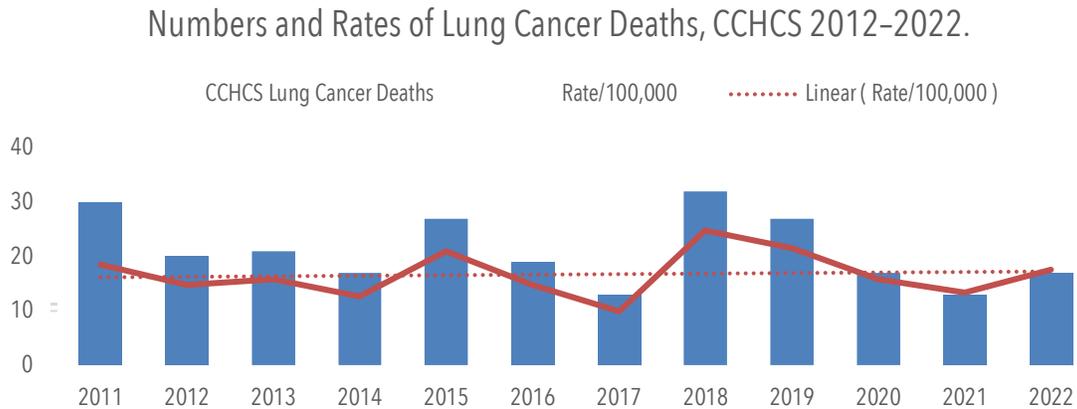


Figure 10. Numbers and Rates of Lung Cancer Deaths, CCHCS 2012–2022.

In 2022 there were 17 deaths from lung cancer for a mortality rate of 18/100,000. In 2021, the CCHCS incorporated the US Preventative Services Task Force recommendation to screen all heavy smokers over age 55 for lung cancer with annual low dose CT scanning. This practice would not be expected to result in significant decreases in lung cancer mortality for several years.

e) Advanced (end stage) liver disease

Advanced liver disease (cirrhosis) and its sequelae, including liver cancer, was the fourth most common cause of death in 2022, with 41 deaths for a mortality rate of 43/100,000. In the

prison population, both liver cirrhosis and liver cancer are mainly caused by a high prevalence of chronic hepatitis C virus (HCV) infection, which is primarily associated with intravenous drug use. In 2022, the overall prevalence of hepatitis C antibody in the CCHCS population was 25.4%. Chronic hepatitis C infection was the cause of 37, or 88%, of deaths due to advanced liver cirrhosis.

Table 7 and Figure 11 show the cases, rates and trends of liver disease deaths seen in the years 2012–2022.

YEAR	CCHCS Liver Cancer Deaths	CCHCS Cirrhosis Deaths	CCHCS Total Advanced Liver Disease 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
2022	22	19	41	43

Table 7. Numbers and Rates of Advanced Liver Disease Deaths, CCHCS 2012–2022.

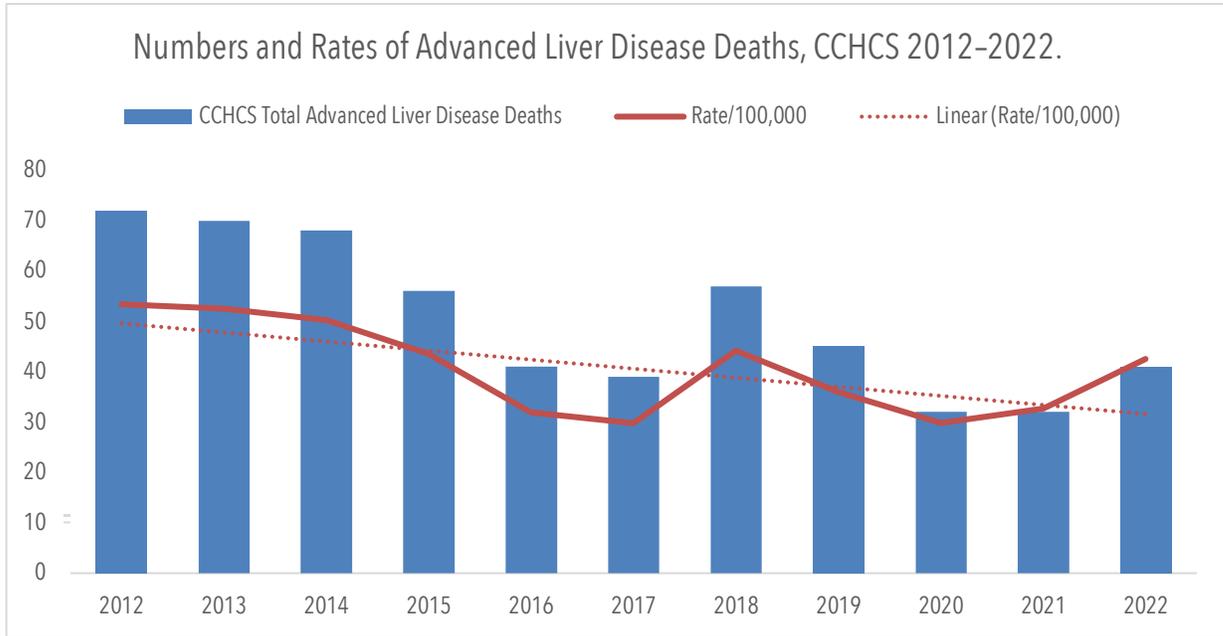


Figure 11. Numbers and Rates of Advanced Liver Disease Deaths, CCHCS, 2012 – 2022.

The CCHCS has adopted initiatives to improve screening and treatment of chronic hepatitis C and to prevent liver cancer and other complications of advanced liver disease. The Care Guide for Hepatitis C includes a comprehensive program for identification and treatment of hepatitis C involving universal screening for hepatitis C antibodies, with confirmatory testing for active infection, monitoring stages of liver injury (fibrosis) and efficient access to safe and effective antiviral treatment for patients who test positive for HCV. Education regarding the prevention of hepatitis C is conducted for the entire population at entry and annually thereafter.

As noted in the ISUDT Second Annual Outcome Report (April 2023), patients on medical treatment for opiate use disorder have a 60% reduction in HCV reinfections. Another study, “The hepatitis C care cascade in California state prisons: Screening and treatment scale-up and progress toward elimination, 2016-2023”, found that the Integrated Substance Use Disorder Treatment Program along with the robust HCV screening, monitoring and treatment program resulted in a greater than 50% decrease in active HCV infections between 2018 and 2022.

The Care Guide for Liver Cirrhosis advocates staging of liver fibrosis to identify all candidates for biannual abdominal ultrasound screening for liver cancer. Routine measures for detecting and treating other potentially fatal complications such as esophageal varices, ascitic fluid collections, and avoiding the use of harmful medications (non steroidal anti inflammatory agents) are contained in these comprehensive Care Guides.

Performance dashboards are published in monthly Health Care Services Dashboards for each institution. In 2022, monthly overall performance in HCV care ranged from 84 to 87%, and overall liver cirrhosis care trended upward from 82% in January to 87% in December.

All these initiatives have contributed to improvements in the care of patients with advanced liver disease, and death rates have trended downward over the past eight years.

3. Unnatural deaths

a) Drug overdose

There were 53 drug overdose deaths in 2022, for an annualized mortality rate of 55/100,000, the third most common cause of patient death.

Table 8 and Figure 12 show the numbers and mortality rates from drug overdose in the CCHCS from 2012-2022 and in all US prisons from 2012 to 2019. (U.S. State Prison data also includes drug and alcohol intoxication.)

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
2022	53	55	NA

Table 8. Numbers and Rates of Overdose Deaths, CCHCS 2012–2022, and U.S. State Prisons 2012–2019.

Numbers and Rates of Overdose Deaths, CCHCS 2012–2022, and U.S. State Prisons 2012–2019.

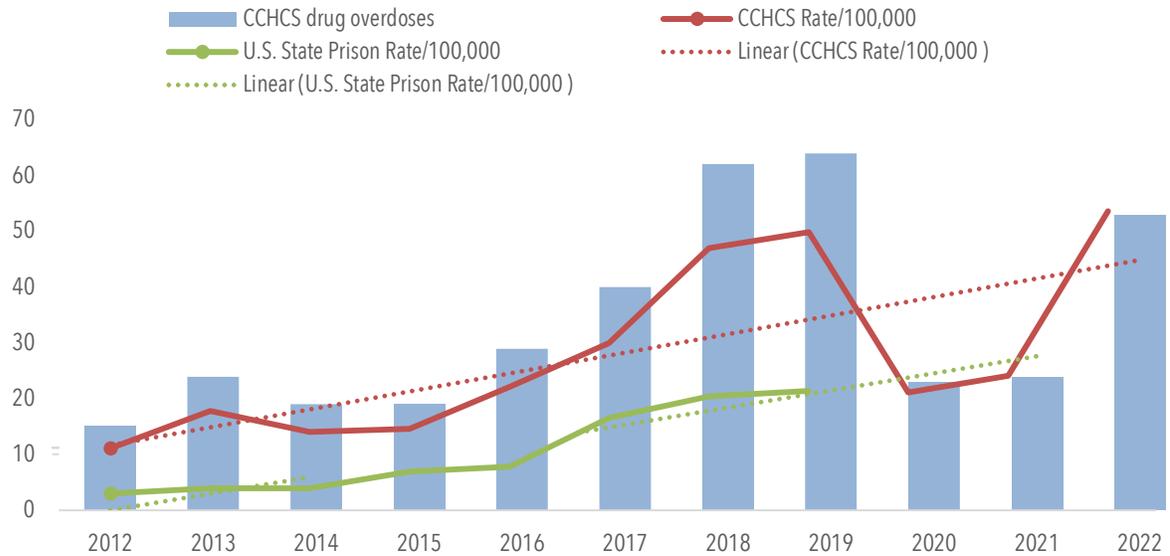


Figure 12. Numbers and Rates of Overdose Deaths, CCHCS 2012–2022, and U.S. State Prisons 2012–2019.

Fentanyl was the most commonly overdosed drug, used in 77% of the deaths from drug overdose in 2022; alone in 14 cases and in combination with other drugs in 27 cases. Methamphetamine was used alone in 3 cases, and in combination with fentanyl in 14 cases. Buprenorphine, the drug commonly prescribed in the Medication Assisted Treatment program (MAT), was found in one case in combination with other psychiatric drugs. There were three cases in which death was attributed to a drug prescribed by a physician in the CCHCS: one case, described above, in which a narcotic used in the MAT program (buprenorphine) was found in combination with other psychiatric drugs, and two cases in which psychiatric drugs were implicated. The full list of drugs involved in overdose deaths can be found in Table 1.

Of the thirty-three California state prisons, there were 12 with no overdose deaths. Overdose deaths occurred in 21 institutions; 10 institutions had one occurrence each, three institutions had two occurrences, three institutions had three overdoses, while another three sites had four overdoses each. Two institutions were responsible for 30% of all drug overdoses, having seven and nine overdoses, respectively.

The dramatic rise in drug overdose deaths mirrors what is happening in the general population. In the CCHCS, this has occurred despite the aggressive promotion of ongoing statewide initiatives. The Integrated Substance Use Disorder Treatment (ISUDT) program and

the availability of Medication Assisted Treatment (MAT) are integrated into all prison practices. This “state of the art” multidisciplinary program educates staff and patients to frame drug addiction appropriately as a chronic disease. All patients are screened within days of intake for substance use disorder (SUD) and medical treatment is offered to all appropriate SUD patients. 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, and the Care Guide for SUD was released in May 2020. By late 2020, training was completed in all CCHCS facilities. According to the Receiver’s 52nd Triannual report, there were 15,544 patients receiving MAT by year-end 2022.

The second annual outcomes report, published in April 2023, contains a detailed description of the drug overdose epidemic, the effect of synthetic opioids such as fentanyl on the “unprecedented numbers of drug overdose deaths”, describes the ISUDT program and gives some preliminary outcomes through 2021.

The overall drug overdose mortality rate both in society and in prisons is high and rising. The pandemic years of 2020 and 2021, when CCHCS began to treat opioid use disorder using medication assisted treatment, saw significant reductions in California state prison overdoses, even as mortality rates continued to increase in the U.S. and California. The 2022 mortality rate for CCHCS drug overdose, however, was the highest in the past decade, with notable increases in overdose deaths attributable to fentanyl.

b) Suicide

There were 21 deaths by suicide in 2022, six more than in 2021, for a suicide mortality rate of 22/100,000.

The most recent estimates of suicide rates in all U.S. state prisons, published by the Bureau of Justice Statistics, are for years 2001 through 2019. The national state prison suicide rate in 2019 was 27 per 100,000 incarcerated individuals. Suicide rates in all state prisons increased from 15/100,000 in 2001-2004 to 22/100,000 in 2015-2019.

Table 9 and Figure 13 list the numbers, rates, and trends of suicide from 2012 through 2022.

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
2020	31	29	NA
2021	15	15	NA
2022	21	22	NA

Table 9. Numbers and Rates of Suicide, CCHCS 2012–2022 and U.S. State Prisons 2012–2019.

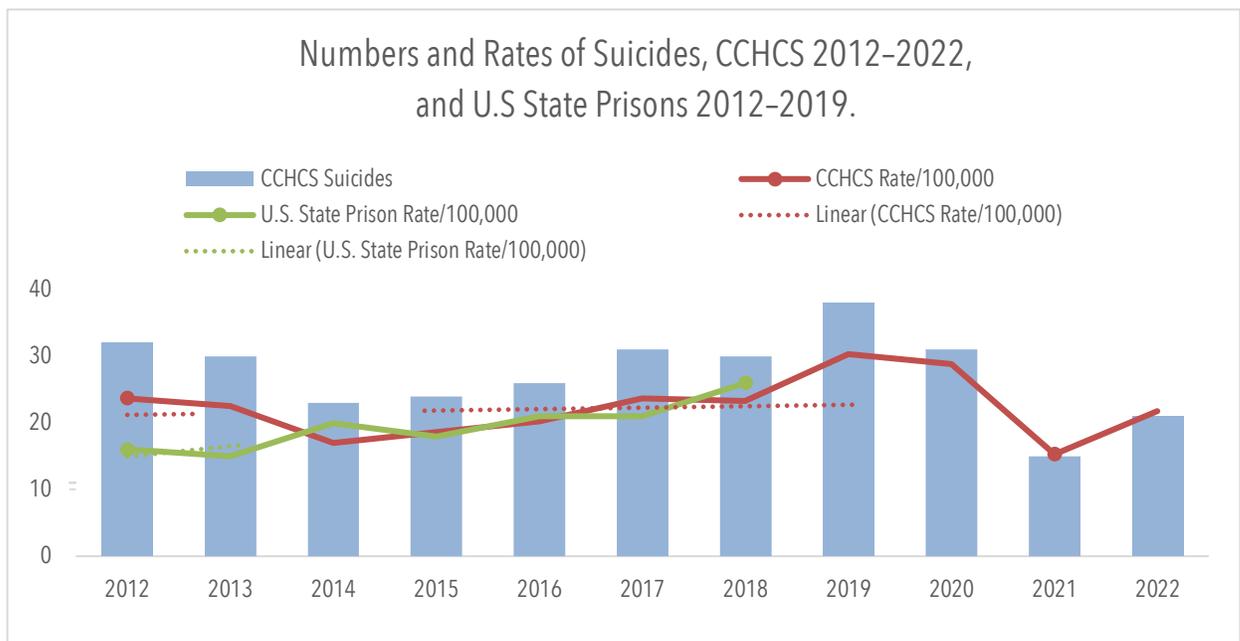


Figure 13. Numbers and Rates of Suicide, CCHCS 2012–2022 and U.S. State Prisons 2012–2019.

A system to evaluate all CCHCS patients for suicide risk, to treat risk factors and to closely monitor all high-risk patients is in place. All CDCR staff, especially first responders and mental health clinicians, are involved in suicide prevention and response. The recognition and

treatment of severe depression and suicidal ideation and liaison between the mental health and medical departments of CCHCS have been systematized.

The 2020 annual report to the California State Legislature on Suicide Prevention and Response in CDCR audited all 2020 suicides and found that 83% (N = 19 of 23) had deficiencies in risk assessment and 87% had poor treatment planning. The quality of mental health contacts was deficient in 30%. Other concerns were suicide watch practices and documentation (10%); the adequacy of “wellness checks” in segregated housing (10%); emergency response issues, particularly delays in calling 9-1-1 (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 with rigor mortis. The report identified the inadequacy of suicide risk assessment. Management of that risk is an area of primary concern across the California prison system.

Of the 21 suicide patients in 2022, eighteen were being actively followed by mental health providers. Nine patients were enrolled in the basic Correctional Clinical Case Management System (CCCMS). Ten were followed in the Enhanced Outpatient Program (EOP), the highest level of outpatient mental care in the Mental Health Delivery System. Two patients had no mental health interaction.

The overall suicide rate in the CCHCS had been on a slightly downward trajectory since 2012; the higher number of suicides in 2022 has flattened that trajectory.

c) Homicide

There were 25 homicides in the CCHCS in 2022 for a homicide rate of 26/100,000. Twenty-two of these homicides (92%) were committed by fellow inmates, and two (8%) were committed by custody responding to prison yard altercations.

Table 10 and Figure 14 show the numbers of deaths and mortality rates from homicides in the CCHCS from 2012-2022 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
2022	25	26	NA

Table 10. Numbers and Rates of Homicides, CCHCS 2012–2022 and U.S State Prisons 2012–2019.

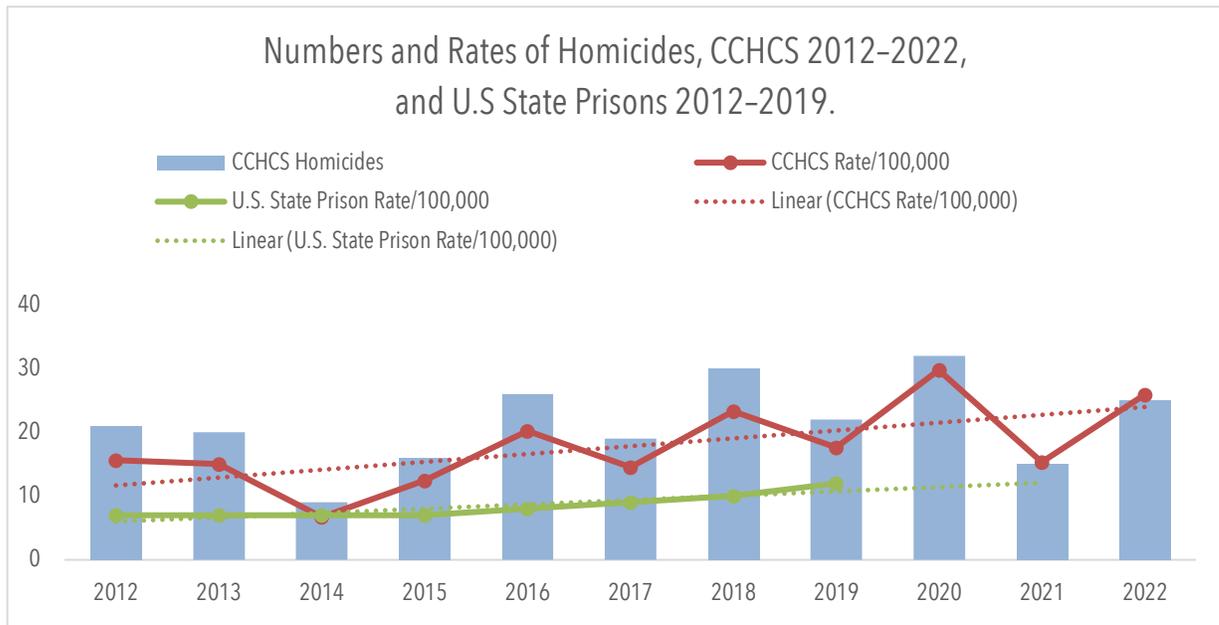


Figure 14. Numbers and Rates of Homicides, CCHCS 2012–2022, and U.S State Prisons 2012–2019.

As noted in a recent online [publication](#) from the Prison Policy Institute, “While prisons are secure, they are largely unsafe.” According to the report, violence is common. Compared to the general population, 30-60% of male prisoners have PTSD (ten times the rate in the general population), and imprisonment itself is a traumatic life experience. Prisoners have a higher

incidence of having experienced trauma prior to incarceration and continue to witness violent episodes in prison itself. Racism and gang culture also contribute.

Through 2022, the California state prison homicide rate was higher and rising faster than the rate for all U.S. prisons.

d) Accidental deaths

There was only one accidental death in 2022, caused by a motor vehicle accident during transport.

D. Opportunities for Improvement, 2022

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, which are noted as “findings” in their reviews. These OFI are forwarded to the appropriate prison and region for review and further action if indicated.

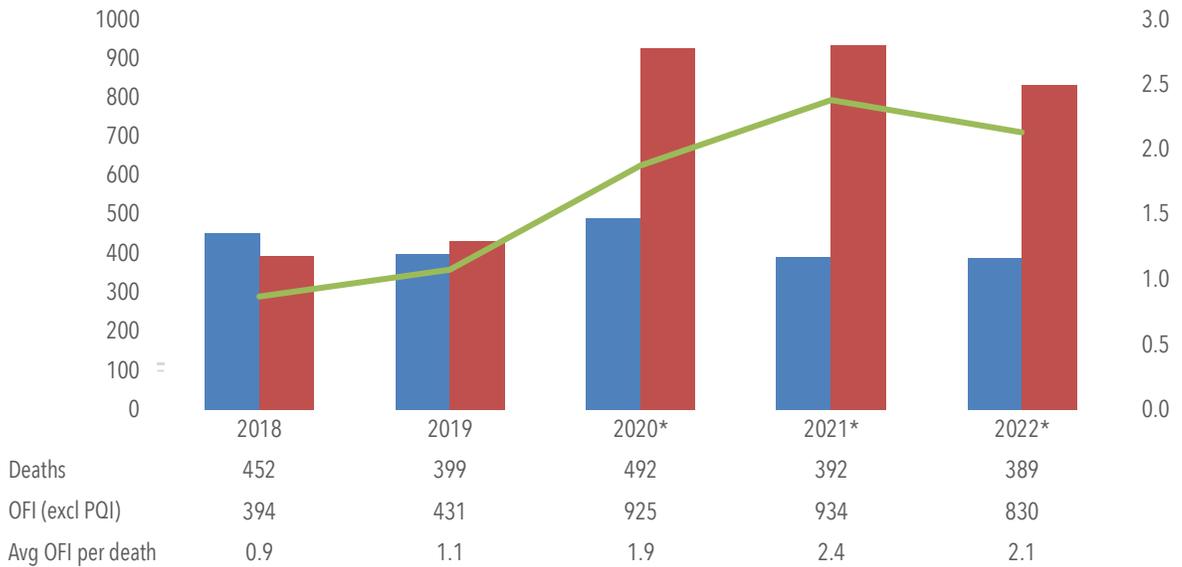
An OFI finding in Mortality Review can be relatively minor (documentation of a time off by an hour) or potentially serious (a specialist recommendation lost during a patient transfer, resulting in a significant delay in the diagnosis of a treatable condition). An OFI finding is an observation that may not have been consistent with the CCHCS policies and procedures, or not consistent with current evidence based practice or recommendations in the CCHCS Care guides.

A classification system for OFI findings was devised in 2018 for use in this annual analysis and has been refined in each subsequent annual report.

The MRC recorded 392 OFI findings in 2018 and 431 OFI findings in 2019. Three subsequent years have generated about twice the number of OFI annually. In 2022, there were 821 opportunities for improvement identified in the findings of the Mortality Review Committee. Of these, 396 OFI occurred in unexpected deaths and 434 OFI occurred in expected deaths.

The following chart shows the number of OFI per death by year since the use of OFI classifications began.

Deaths and OFI Findings, CCHCS 2018–2022.



*with COVID-19

Figure 15. Deaths and OFI Findings, CCHCS 2018–2022.

In 2020 and 2021, the larger number of OFI were related to findings regarding adherence to new and rapidly changing policies and processes dealing with the COVID-19 pandemic. OFI per death peaked at 2.4 in 2021. In 2022, there were 2.1 OFI per death.

There are 9 general categories of OFI. The following table shows these categories, the numbers of findings in unexpected and expected deaths and the total number of 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. Access timeframes			
i. Meeting access timeframes for routine care	9	22	31
ii. Meeting access timeframes for urgent or emergency care	1	3	4
b. Applying complex care management for improved coordination or continuity	15	8	23
c. Transferring a patient to a more appropriate level of care	2	4	6

d. Optimizing care near the end of life			
i. Physician’s Orders for Life Sustaining treatment (POLST) and Do Not Resuscitate (DNR) orders addressed and documented when indicated or changed when a patient’s clinical condition changes	26	34	60
ii. Honoring POLST and DNR orders	4	17	21
iii. Improving pain and other symptom management, especially in cancer care	-	11	11
iv. Offering hospice care to terminally ill patients	1	8	9
e. Non-adherent or non-compliant patient management	8	4	12
f. Substance Abuse Disorder Program referral indicated but not made	20	2	22
g. Compassionate release request indicated but not made	1	31	32
2. Opportunities to improve clinical decision making by improved recognition and management of important clinical signs and symptoms	44	52	96
3. Opportunities to improve recognition and action in response to abnormal laboratory, imaging and other diagnostic test results	21	33	54
4. Opportunities to improve adherence to policies and procedures, and adherence to Guides for specific diseases, conditions, or risk factors			
a. COVID-19 Interim Guidance	9	13	22
b. Care Guides			
i. Fall risk (institution-specific protocols and evidence-based practice)	5	13	18
ii. Chronic Wound Management - prevention/avoidance	2	9	11
iii. Medication Management (multiple care guides and evidence-based practice)	15	15	30
iv. Cardiovascular Risk	2	-	2
v. Advanced Liver Disease	3	8	11
vi. Preventive Services - Lung Cancer Screening	4	4	8
vii. Other Care Guides, protocols and evidence-based practice	30	4	34

5. Opportunities to improve communication between primary care teams and various care transitions			
a. Specialty referral	2	7	9
b. Hospital	4	6	10
c. Emergency Department	1	-	1
d. Mental Health	2	-	2
e. Custody	1	-	1
f. Primary Care Physicians	4	1	5
g. Primary Care Physician and Nursing	4	-	4
h. Orders not followed	2	6	8
6. Opportunities to improve medical record documentation			
a. Inadequate or inaccurate record	11	17	28
b. Missing Report	8	21	29
c. Missing Provider notes	5	10	15
d. Missing Nurse notes	4	6	10
e. Legacy Charting	5	7	12
f. Incomplete Problem List	15	18	33
g. Electronic Health Record not closed	8	4	12
h. Other	2	2	4
7. Opportunities to prevent delays in diagnosis and/or treatment	1	13	14
8. Opportunities to improve the practice and documentation of CCHCS Emergency Protocols			
a. Delay calling 9-1-1	23	6	29
b. Documentation lapse	34	6	40
c. Other	34	6	40
9. Miscellaneous	4	3	7
TOTAL CCHCS Opportunities for Improvement	396	434	830
10. Potential Quality Issue (PQI) referrals	4	18	22

Table 11. Opportunities for Improvement in Expected and Unexpected Deaths, CCHCS, 2022.

A detailed discussion of each OFI category follows.

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

Since 2015, the Complete Care Model (CCM) has been the foundation for delivery of all care in the CCHCS.

The CCM assigns every patient to one Interdisciplinary Care Team. Each Care Team delivers continuous, comprehensive, coordinated, and patient centered care for its panel of assigned patients. A care team follows written standards for access and disease prevention, promotes wellness, provides episodic care, chronic disease management, addresses urgent and emergent needs, and provides exemplary 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.

Application of this model should reduce the need for hospitalizations and emergency services, improve health outcomes, and enhance patient and staff satisfaction.

a) Meeting access standards for Routine Care or Urgent/Emergency Care.

32 total findings. (29 for routine care, 3 for urgent or emergency care)

The standards for access in the CCHCS are:

Nursing triage: Patient-generated requests for evaluation of medical symptoms are triaged by registered nursing (RN) staff within 24 hours. If an RN triage determines an emergency, they are to make immediate arrangement for appropriate care; if urgent, same day face-to-face evaluation; if any other medical symptoms, the next business day.

Primary care: Nursing generates requests for primary care physician evaluation. Urgent: same calendar day; Routine - 14 days; Post hospital discharge - 5 days

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

In 2022, a preponderance of OFI in routine care access were patient-generated requests for symptom evaluation (9 cases) and routine follow-up visits with primary providers that were delayed (3 cases). Of more concern were specialist requests for referral to other specialists or for diagnostic tests that were either delayed or, in some cases, not done at all. A later section discussing delays in care addresses these in more detail.

There were two cases involving patient requests for urgent evaluation for symptoms which were not addressed within one day. There was one case in which a specialist (oncology) requested high priority consultation with a surgical oncologist for evaluation of a patient with hepatocellular cancer. That patient was not seen for six months.

b) Applying complex care management for improved care coordination or continuity

23 Total: 15 in cases of unexpected death; 8 in cases of expected death

Primary care teams are expected to identify their patients who are at high risk for adverse outcomes. These patients often have complex care needs requiring coordination of visits to specialists, appointments for special diagnostic tests or procedures, and other special education and counseling. Candidates for such complex care management include patients with cancer, dementia or chronic degenerative neurological conditions, patients with multiple medical problems and complex medical regimens, patients who require assistance with activities of daily living, patients with serious mental health problems, and patients who have had multiple or prolonged recent hospitalizations or multiple specialists involved in their care. Specific selection for high-risk criteria and for candidates suitable for complex care management are given in the Health Care Department Operations Manual.

In 2022, the MRC cited twenty-three patients who would have benefited from better care coordination. They included three patients who needed complex cancer care. Two patients had severe dementia and one had poorly controlled Parkinson's disease. Two patients had severe chronic obstructive pulmonary disease with oxygen maintenance therapy. There were two chronically non adherent patients – one with very poor diabetes control and one with end stage renal disease who intermittently refused hemodialysis. Two patients had serious mental illness with poorly managed suicide risk. One patient was on a prolonged hunger strike.

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

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

In 2022, examples of patients who might have benefitted from transfer to a higher level of care included two patients with cancer, one patient with decompensating COVID-19 pneumonia, one with sepsis from Staphylococcal aureus infection, one with diabetic ketoacidosis, and one with advanced liver disease.

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, and have a life expectancy of one year or less. The primary care team is expected to have discussions regarding goals of treatment or continued treatment in these situations. Repeat discussions should occur when patients' clinical conditions change. During these discussions, a patient might choose to forego resuscitation in the event of a terminal emergency, generating a "do not resuscitate/do not intubate" (DNR/DNI) order.

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

60 Total: 26 in cases of unexpected death; 34 in cases of expected death

These patients were appropriate for POLST discussions, but care teams did not initiate them. In some cases, discussions were conducted but the patient's decision was not documented in the medical record. In some cases, a patient's clinical condition changed but a followup discussion was not conducted.

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

21 Total: 4 in cases of unexpected death; 17 in cases of expected death

In 2022 there were 21 patients who had orders written for modifications in their life-sustaining treatment but who 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 manage pain and other symptoms, especially in cancer

11 Total: 0 in unexpected deaths; 11 in expected deaths

The Care Guide for Pain Management emphasizes a comprehensive approach to the diagnosis and management of all types of pain. The importance of chronic pain as a red flag symptom of underlying malignancy is emphasized. The importance of screening for coexisting depression and the judicious use of non-narcotic and narcotic medications are covered in detail.

In 2022, there were 11 OFI in cases in which patients might have experienced better management of their pain. Five of these patients had cancer.

iv. Opportunity to offer hospice care to eligible patients

9 total: 1 in cases of unexpected death; 8 in cases of expected death

Hospice is a model of care that focuses on providing palliative care to patients with life-limiting illnesses. Hospice care can be provided at every inpatient medical facility, and a special hospice unit is located at the California Medical Facility.

In 2022 there were nine citations for missed opportunities to offer hospice care to eligible patients.

e) Better management of non-adherent or noncompliant patients

12 total; 8 in cases of unexpected death; 4 in cases of expected death

The high frequency of mental illness and substance use disorders in the CCHCS contributes to the significant problem of non-adherence or noncompliance in this patient population. Non adherence is responsible for much redundant effort in the system, with rescheduling and multiple delays leading to poor treatment outcomes.

The management of non-adherence/noncompliance was cited as representing a missed opportunity in 12 cases in 2022.

f) Interdisciplinary Substance Use Disorder Treatment (ISUDT) Program referral indicated

22 Total; 20 in cases of unexpected death; 2 in cases of expected death

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 (MAT) to help manage drug and alcohol addiction. Referral to the ISUDT program should be offered to any patient with SUD or at high risk for SUD identified by the universal screening test.

The 2022 mortality reviews identified 22 patients with indications of drug or alcohol addiction who might have benefitted from ISUDT program referral. Several of these patients were referred but their referrals were either lost or delayed.

g) Compassionate release parole application indicated

32 Total; 1 in cases of unexpected death; 31 in cases of expected death

In 2021, California state law was changed to make compassionate release for medical reasons easier to obtain. Patients who have less than 12 months to live or who are permanently medically incapacitated are eligible if there is a place in the community where they can go for post parole care.

In 2022 the MRC identified 32 patients for whom a compassionate release parole application might have been sought.

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

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 previous editions of this analysis have included chest pain or shortness of breath as indicators of acute coronary syndromes, unexplained weight loss or prolonged abdominal pain indicative of malignancy, and atypical headache or an alteration in mental status heralding brain tumor or hemorrhagic stroke. Specific red flags such as unilateral leg swelling, 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.

In 2022, there were 96 OFI for symptoms or signs that were thought to have been incompletely evaluated or evaluated more slowly than was indicated. In many cases, an eventual significant diagnosis was made.

Table 12 shows many of these OFI citations and the eventual diagnoses, if known.

Clinical Sign or Symptom	Count of Findings	Eventual Diagnoses (if related to the clinical symptom or sign)
weight loss	8	cancer colon, leukemia, cancer stomach, cancer lung
hypertension	7	sudden cardiac death 3
abdominal pain	6	cancer pancreas 3, cancer liver
altered mental status	5	stroke 2, dementia, cancer lung disseminated
chest pain	3	acute myocardial infarction, sudden cardiac death, cancer lung
depression	2	suicide
falls	2	Parkinson disease
fever	2	infective endocarditis, pneumonia
melena	2	cancer rectum, UGI hemorrhage
swollen stomach	2	cancer liver, ascites (ESLD)
arm abscess	1	drug overdose
arm pain	1	

Clinical Sign or Symptom	Count of Findings	Eventual Diagnoses (if related to the clinical symptom or sign)
back pain	1	cancer
cough	1	cancer lung, congestive heart failure
decreased hearing	1	
delirium	1	diabetic ketoacidosis
diarrhea	1	cancer liver
edema	1	congestive heart failure
emesis	1	upper gastrointestinal hemorrhage
hematemesis	1	upper gastrointestinal hemorrhage
jaundice	1	cancer liver
shoulder pain	1	lymphoma

Table 12. Missed Clinical Signs and Symptoms, and Eventual Diagnoses, CCHCS 2022.

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

51 total; 31 in unexpected deaths; 20 in expected deaths

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 should have processes which identify, track and follow up all abnormal testing results. Results that are released after hours, during shift changes and in care transitions are especially vulnerable to being lost or not followed up appropriately.

In 2022, the 51 OFI in this category included laboratory and radiological tests indicative of underlying malignancy in 17 cases and abnormal ECGs in three patients who died of sudden cardiac arrest.

Several of the OFI cited in this category were associated with delays in diagnosis or treatment and will be discussed in a later section.

4. Opportunities to improve adherence to COVID-19 protocols, CCHCS Clinical Care Guides for specific diseases, conditions, or risk factors

a) COVID-19 Interim Guidance

22 Total: 9 in cases of unexpected death; 13 in cases of expected death

In 2020 the CCHCS developed a COVID-19 guidance manual for all staff and patients in California prisons. The manual included well referenced information on prevention strategies, infection control, use of personal protective equipment, vaccination procedures, testing and isolation of infected patients, identification and quarantine of all contacts, monitoring and treating infected patients, and containing local outbreaks.

The workload imposed on CCHCS staff by new and frequently changing elements of COVID-19 control created a significant burden for documentation and resulted in a large number of OFI citations - 230 in 2020 and 188 in 2021. The 22 OFI in 2022 represent a nearly 90% reduction in citations in this area.

b) Clinical Care Guides

114 Total: 70 in cases of unexpected death; 53 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. They are reviewed annually and are updated frequently. They are evidence based and well referenced, and each guide contains a summary section, decision support tools, and a section specifically designed for patient education and self-management. They can be accessed on the CCHCS website at <https://cchcs.ca.gov/clinical-resources/>

Similar resources for nursing staff are also in use, including protocols and encounter forms for patients with common symptoms or conditions. These include allergic reactions, asthma, chest pain, constipation, dental or ear problems, nosebleed, eye conditions, female genitourinary complaints, headache, hemorrhoids, rashes, alterations in mental status, musculoskeletal complaints, respiratory distress, seizures, wound care and upper respiratory symptoms.

The following sections discuss OFI in which recommended practices contained in these guides for providers and nurses were not considered or followed.

i. Opportunities to mitigate fall risk

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

Falls can lead to serious injury with potential for hospitalization, increased morbidity, and death. Patients at risk for falls should be identified by their care teams. Patients are screened for ambulatory status, vision and balance, chronic disease/disability, and any medications that might increase fall risk. Any patient who has suffered a fall should be frequently reassessed. 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. These guidelines are covered in Regulations and CCHCS Local Operating Procedures (LOP) such as the *CCHCS Fall Prevention and Management Program* and *Inpatient LOP - Fall Risks Assessment*.

The 18 OFI in this category involved 15 patients. Two of these patients had advanced cancer, two had dementia, three had advanced liver disease, three had advanced renal disease, and four had chronic pulmonary disease or acute infection.

ii. Pressure Ulcer (Injury) Avoidance

11 Total: 2 in cases of unexpected death; 9 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. All patients with these risk factors are screened frequently for pressure injury risk and any patient at risk is given a prevention and treatment plan. 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.

Pressure injuries are a major source of morbidity at hospitals and long-term care facilities.

Of the eleven OFI cited for pressure injury in 2022, three were acquired during inpatient stays at contracted hospitals, generating Potential Quality Issue (PQI) citations.

iii. Medication Management

30 Total: 15 in cases of unexpected death; 15 in cases of expected death

There were 30 OFI involving 27 cases in which the management of prescribed medication could have been improved. Nine patients were prescribed medications contraindicated by their medical condition or by other medications they were receiving (two of these patients were on inappropriately long opioid therapy, and one was receiving anticoagulation despite developing anemia after a procedure). Four patients with diabetes mellitus were being managed inappropriately with an outmoded protocol known as "sliding scale insulin". Three patients had delay in delivery of ordered medications. In one case, the medication was never received. Two patients on KOP (keep on person) medication could have been converted to DOT (directly observed therapy). One patient on multiple medications did not have a medication reconciliation review upon his return from a hospital.

iv. Management of cardiovascular risk

2 total; 2 in cases of unexpected death; 0 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. There were only two such citations in 2022.

v. Screening for lung cancer

8 total; 4 in cases of unexpected death; 4 in cases of expected death

In 2021, the CCHCS incorporated the US Preventive Services Task Force recommendation to screen all heavy smokers over age 55 for lung cancer using annual low dose CT scanning.

In 2022 there were 8 citations for failure to do so. Four of these patients were among the 17 who died of cancer of the lung.

vi. Hepatitis C and Liver Cirrhosis

11 total; 8 in cases of unexpected death; 3 in cases of expected death

The comprehensive care guides for hepatitis C and liver cirrhosis management have been described previously.

In 2022 there were 11 citations. The Hepatitis C Care Guide was referenced four times (three times for inadequate HCV viral load monitoring, once for delayed HCV antiviral therapy). The Liver Cirrhosis guide was referenced six times (three times for inadequate screening for liver cancer, and once each for not following the protocol for preventing bleeding from esophageal varices, for not considering a shunt procedure in recurrent ascites, and for being incomplete in evaluating a patient for the cause of his cirrhosis.

vii. Other Care Guides, Programs, and Protocols

2022 saw 34 additional OFI in 25 patients concerning adherence to recommended practices in care guides, nursing or custody protocols or other CCHCS programs.

The following table shows the Care Guide or program, the number of relevant OFI finding(s) and final cause of death when related to the finding.

Program or Care Guide	Number of OFI findings	Cause of Death
Medication Assisted Therapy (MAT)	17 in 9 patients	drug overdose (6), sepsis from intravenous drug use, infectious endocarditis
Suicide risk	4	suicide
ISUDT Program	3	drug overdose
Hunger Strike	3 in 2 patients	protein calorie malnutrition
Custody protocols	1	suicide
Screening for colon cancer	1	cancer of rectum
Transgender Care Guide	1	drug overdose

Table 13. Other Care Guides, Programs and Protocols OFI and related deaths, CCHCS, 2022.

Single OFI were cited in the following areas: 1:1 watch protocol, diarrhea monitoring protocol, wound management care guide, TTA vital sign monitoring. In these cases, the finding was unrelated to the final cause of death:

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

40 Total: 18 in cases of unexpected death; 22 in cases of expected death

The accurate transfer of clinical information between care teams at transitions of medical care is essential 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 46 OFI in this category, 12 cited poor primary care - nursing interactions (eight of these were physician orders that were not followed). There were nine citations for primary care team-to-specialist communication and many of these were specialist recommendations that were not acted upon. There were ten cited miscommunications between the primary care team and the hospital or emergency department, and only two cited miscommunications between primary care and mental health teams. There was one citation of a primary-care-to-custody

communication issue, and there were 5 citations for communication problems between primary care teams. There were six citations for physician orders not followed. These included orders for frequency of vital sign monitoring, COVID-19 vaccination administration, a soft diet, urinary catheter care, fluid volume intake, and two instances of post operative orders not followed.

6. Opportunities to improve medical record documentation

139 Total: 56 in cases of unexpected death; 83 in cases of expected death

The Cerner 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.*

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

b) *Incomplete or missing documentation of care*

29 Total: 8 in cases of unexpected death; 21 in cases of expected death

When care is provided outside of the CCHCS, the record of the patient encounter in an emergency room, hospital, or specialist's office may be incomplete, unavailable or missing.

c) *Missing physician or other provider notes*

15 Total: 5 in cases of unexpected death; 10 in cases of expected death

Examples include missing provider notes when patients in the TTA were consulted by the on-call provider. In two of these cases the patient was sent out to a higher level of care. Regular monthly progress notes were missing in two cases.

d) *Missing RN notes*

10 total; 4 in unexpected death; 6 in expected deaths

Examples included missing forms, missing wound care and notes on the status of a surgical drain.

e) *Legacy charting*

12 total: 5 in cases of unexpected death; 7 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 if at all. Legacy charting was seen in many of the COVID-19 protocol OFI noted previously.

There were 12 citations for legacy charting in 2022, a significant reduction from the 34 citations in 2021.

f) Incomplete problem lists

33 total: 15 in cases of unexpected death; 18 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 2022 included high cholesterol or dyslipidemia (6), cancers of the colon, lung, prostate, and pancreas, smoking history (3), chronic kidney disease (3), congestive heart failure (2), cirrhosis (2), chronic obstructive pulmonary disease (2), hepatitis C (2), and one instance each of diabetes type 2, Bell's palsy, deep vein thrombosis, dementia, Parkinson disease, remote transient ischemic attack, and a history of methamphetamine use. These missing diagnoses have potential implications for patients' further evaluations and management.

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 documentation lapses cited for the COVID-19 guidance manual. These are all counted in their respective sections.

g) Electronic Health Record System not closed at time of patient's death

12 total: 8 in cases of unexpected death; 4 in cases of expected death

At the time of patient death, nursing is expected to close the electronic medical record chart and mark the patient deceased. If any post mortem charting is attempted, an alert is prompted. Failure to close the EHR was noted in 12 cases in 2022.

7. Opportunities to prevent delays in diagnosis or treatment

14 Total: 1 in cases of unexpected death; 13 in cases of expected death

In 2022, there were 14 cases in which delays were noted in the Mortality Review Committee reports.

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

Delay	Length of Delay	Eventual Diagnosis
<i>“Red flag” symptoms or signs: 2 cases</i>		
altered mental status	3 months	cancer of lung w brain metastases
neck swelling	6 months	no diagnosis - biopsy never performed
<i>Abnormal laboratory or other diagnostic test results: 10 cases</i>		
abnormal chest x ray	3 months	cancer lung
abnormal chest x ray	16 months	cancer lung
abnormal chest x ray, abnormal CT	18 months	cancer lung
abnormal CT abdomen	6 weeks	cancer hepatocellular
abnormal CT abdomen	3 months	cancer hepatocellular
abnormal CT chest	8 months	cancer lung
abnormal ultrasound	3-4 years	cancer hepatocellular
abnormal lab	12 months	cancer myeloma
abnormal labs	5 years	liver cirrhosis
abnormal biopsy	18 months	cancer melanoma
<i>Specialist Recommendation: 2 cases</i>		
oncologist referral for transplant	6 months	cancer myeloma
oncologist referral for surgery	5 months	cancer hepatocellular

Table 14. Delayed Diagnoses, CCHCS 2022.

A delay in diagnosis can occur when clinical “red flags” are not pursued. In 2022, altered mental status was a red flag for metastatic cancer. Persistent neck swelling in one patient was never diagnosed but there was a high degree of clinical suspicion of an underlying malignancy.

Prompt recognition and management of an abnormal laboratory or diagnostic imaging result is dependent on an integrated care team process. In 2022, ten cases had delays in responding to abnormal test results in which the final diagnosis was an underlying malignancy. A delay in acting on specialist recommendations contributed to significant delays in treating two additional cases of cancer. Patients with abnormal imaging tests suggesting malignancy would benefit from care coordination strategies.

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

108 Total: 90 in cases of unexpected death; 18 in cases of expected death

A statewide quality initiative in 2018 resulted in a redesigned Emergency Medical Response (EMR) Program.

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

Delays in activation of a 9-1-1 call or in first responder arrival to a medical emergency were noted in 28 cases. These delays ranged from five to 14 minutes.

Documentation lapses were noted in 40 cases.

There were 40 miscellaneous citations. These included the underuse of naloxone (Narcan) to reverse possible narcotic overdose in six cases, excessive administration of naloxone in three cases, nonbreathing masks used inappropriately in four cases, difficulties in securing intravascular access, equipment issues - AEDs not working in one case, not activated properly in another; miscellaneous equipment malfunction in three cases, and difficulty with transport vehicles in two cases.

9. Miscellaneous

7 total: 4 in unexpected deaths; 3 in expected deaths

The seven miscellaneous OFI in 2022 included two premature discharges from an emergency department, one premature discharge from a hospital, and one CPAP equipment malfunction with non-replacement of the machine for three months. One citation concerned a case in which the patient had multiple transfers in one year, making care coordination very difficult. One patient had five letters sent post mortem. One patient had a terminal event during a non-emergency transport, and documentation of that occurrence was inadequate.

10. Potential Quality Issues (PQI)

22 Total: 4 in cases of unexpected death; 18 in cases of expected death

The CCHCS defines a potential quality issue as “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.”

Mortality reviews may generate a PQI which is then forwarded to the appropriate emergency department, hospital, or specialist for their further review and action.

In 2022, there were 22 PQIs, compared with 16 in 2021, 34 in 2020 and 24 in 2019. Twelve patients were discharged prematurely from emergency departments or hospitals and were readmitted to a higher level of care within 24 hours. Seven patients developed pressure ulcers in hospital. One hospital discharged a patient who developed empyema following a blind chest tube insertion. One hospital did not do a toxicology screen in a patient who was sent for a drug overdose. One hospital was cited for not releasing records after repeated requests from the CCHCS.

All PQIs are managed by the entity to which the PQI was forwarded, and the CCHCS does not necessarily receive any follow-up communication.

VI. Quality Initiatives and Performance Improvement Tools

The 2015 Complete Care Model continues to form the basis of healthcare in the CCHCS. Its core principles of comprehensive and continuous patient centered healthcare depend on a well-functioning health information system, supported by additional tools which help staff reach performance targets. The Healthcare Services Dashboard has been in existence since 2012 and is continually refined. Recommendations for good practice that appear in the Clinical Care Guides can be monitored. The dashboard allows healthcare leaders and managers to see and trend statewide and intra institutional performance over time for 286 measures organized into 12 domains including Scheduling and Access to Care, Population Health Management, Resource Management, Staffing, and Costs.



Figure 16. Screen capture showing partial CCHCS Health Care Services Dashboard for December 2022.

Care team registries are used to monitor performance in areas such as cancer screening or cancer care management. Other registries such as advanced liver disease, diabetes, and hypertension have been in use for some years.

Care Guides for specific clinical conditions have been described previously. These point of service guides for clinicians and patients are well referenced and should be useful in the day-to-day management of patients.

Other major quality initiatives in 2022 included the Emergency Medical Response program, the Hepatitis C Treatment program, the Integrated Substance Use Disorder Treatment Program including Medication Assisted Treatment for opioid use disorder, ongoing Suicide Prevention and Response, and the COVID-19 mitigation and control effort.

VII. Conclusions

The overall mortality rate in 2022 was 404/100,000, the second-highest since the inception of the receivership. The only year in which there was a higher rate was 2020, during the pre-vaccine period of the COVID-19 pandemic.

The COVID-19 mortality rate continued to decrease in 2022, the 13 deaths representing 3% of all CCHCS deaths, a 90% reduction from 2020 and 2021. The successful reduction in COVID-19 mortality was offset in 2022 by increases in drug overdose attributed to fentanyl, sudden cardiac arrests, and homicides. End stage liver disease and chronic neurological disease mortality also increased in 2022. Longer term there were upward trends in drug overdose, homicide, non COVID-19 infectious diseases, and all-cause cardiovascular disease. Advanced liver disease all-cause mortality continued to trend downward.

The process of finding opportunities for systemic improvement continued to evolve, resulting in a reduction of total findings, particularly in areas of red flag symptom evaluation. There remain significant areas for improvement in palliative and end of life care, including more coordinated care of complex patients, documenting and improving the implementation of appropriate end of life patient care, and seeking compassionate release when appropriate.

The success of the receivership in transforming healthcare in the California prisons had resulted in a process of delegation of the medical care program back to the CDCR with ongoing monitoring by the Receiver. During the COVID-19 pandemic, there were no further delegations. Delegation resumed in 2022. One additional facility was delegated to the CDCR, for a total of 20 of the 33 California prisons.