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# BMJ Open How do ED patients with criminal justice contact compare with other ED users? A retrospective analysis of ED visits in California

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## ABSTRACT

**Objective** To assess the patterns of emergency department (ED) utilisation among those with and without criminal justice contact in California in 2014, comparing variation in ED use, visit frequency, diagnoses and insurance coverage.

**Design** Retrospective, cross-sectional study.

**Setting** Analyses included ED visits to all licensed hospitals in California using statewide data on all ED encounters in 2014.

**Participants** Study participants included 3 757 870 non-elderly adult ED patients who made at least one ED visit in 2014.

**Primary and secondary outcome measures** We assessed the patterns and characteristics of ED visits among those with criminal justice contact—patients who were either admitted to or discharged from the ED by a correctional institution—with patients who did not have criminal justice contact recorded during an ED visit.

**Results** ED patients with criminal justice contact had higher proportions of frequent ED users (27.2% vs 9.4%), were at higher risk of an ED visit resulting in hospitalisation (26.6% vs 15.2%) and had higher prevalence of mental health conditions (52.8% vs 30.4%) compared with patients with no criminal justice contact recorded during an ED visit. Of the top 10, four primary diagnoses among patients with criminal justice contact were related to behavioural health conditions, accounting for 19.0% of all primary diagnoses in this population.

In contrast, behavioural health conditions were absent from the top 10 primary diagnoses in ED patients with no observed criminal justice contact. Despite a high burden of disease, a lack of health insurance coverage was more common among those with criminal justice contact than those without (41.3% vs 14.1%).

**Conclusions** Given that a large proportion of ED patients with criminal justice contact are frequent users with considerable mental health conditions, current efforts in California's Medicaid programme to identify individuals in need of coordinated services could reduce costly ED utilisation among this group.

## INTRODUCTION

In California, criminal justice reforms implemented in recent years have resulted in a reduction in the number of people incarcerated in

## Strengths and limitations of this study

- To our knowledge, this is the first study that examines emergency department (ED) visits among patients with criminal justice contact in California since implementation of the state's Medicaid expansion under the Affordable Care Act which greatly increased access to insurance coverage for this group.
- It is also the first to compare ED visits made while justice-involved individuals are in custody versus those made while they are in the community.
- Our use of routinely collected hospital data to profile frequent ED users with criminal justice contact illustrates a potential tool that for administrative data could provide to identify and target high-need individuals that access multiple public systems.
- We were only able to examine criminal justice contact tied to a hospital encounter which may not be representative of the overall criminal justice population.
- The frequency of criminal justice contact and the number of patients with criminal justice contact may be underestimated due to missing patient identifiers among this population which allow us to link ED visits across patients.

the state. Public safety realignment, enacted in 2011 in response to a court-ordered mandate to reduce the state prison population, shifted responsibility for 'lower-level felons' from state prisons to local jails. A few years later, Proposition 47 was approved by voters and reclassified certain drug and property crimes from felonies to misdemeanours.<sup>1</sup> These policy changes have shifted focus as well as funding resources towards alternatives to incarceration and efforts to improve transitions back into the community.<sup>1</sup> As increasing numbers of people return home from correctional settings, there is a growing urgency to understand their healthcare needs to improve health and re-entry outcomes and to deploy an efficient use of healthcare resources.

Available data suggest that 80% of incarcerated men and 90% of women have health conditions requiring treatment or management,<sup>2</sup> and the high prevalence of behavioural health conditions including serious mental illness and substance use disorders among criminal justice-involved populations contributes to recidivism.<sup>3</sup> Yet, a minority of prisoners receives treatment for behavioural health or medical conditions while incarcerated, and treatment further declines on release.<sup>2 4-8</sup> Many challenges are encountered when accessing healthcare postrelease, including lack of insurance and medication supplies, high costs of care, long wait times for appointments and difficulties navigating siloed medical, behavioural health and social services.<sup>2 7</sup>

While these difficulties likely contribute to high rates of emergency department (ED) utilisation among the justice involved, research on this population's acute care usage patterns is primarily limited to small samples, self-report data and short timeframes. Institutionalised individuals are excluded from most population surveys,<sup>9</sup> and informational gaps are compounded by funding limitations, with just 0.1% of funded National Institutes of Health grants focusing on criminal justice health research.<sup>10</sup> Despite these challenges, studies that followed cohorts in the first year postrelease found high proportions of ED use, ranging from 25% to 56% after release from prison,<sup>11 12</sup> and 65% of individuals with HIV after release from jail.<sup>13</sup> National studies found individuals with past-year criminal justice involvement were more likely than the overall population to have used the ED or been hospitalised in the last year.<sup>14 15</sup> Other studies linked administrative data from correctional departments, hospitals and Medicare claims to show higher rates of ED visits and hospitalisations among those released from correctional institutions, particularly for mental health, substance use disorders and other ambulatory care sensitive conditions.<sup>16 17</sup>

Few studies have examined acute care utilisation among justice-involved individuals in more recent years after the Affordable Care Act (ACA) provided opportunities for health coverage among the justice involved in states that chose to expand their Medicaid programmes.<sup>15</sup> And no studies have focused on California—where major criminal justice reforms, coupled with state legislation, have created both opportunities and incentives for correctional institutions, including local jails and the state's prison system, to connect justice-involved individuals with insurance coverage.<sup>18</sup> Still, despite these policy changes and the dramatic reduction in incarceration in California, rearrest and reconviction rates have remained largely unchanged.<sup>1 19</sup> And given the substantial burden that correctional healthcare places on state budgets, especially in California, which has the highest per-capita spending on inmate healthcare in the nation, it is crucial to understand the acute care needs of those involved with criminal justice systems.<sup>20</sup>

In order to reduce recidivism, management of behavioural health conditions that often lead to

incarceration must be improved.<sup>21</sup> The possibility for achieving this has been greatly bolstered under the ACA, which has been linked to increased insurance coverage for the justice involved,<sup>22</sup> and provides a much needed funding source to correctional agencies and safety net providers who serve this population. Characterising diagnostic profiles and the patterns and drivers of ED use in the year after California implemented its Medicaid expansion provides important baseline information that can inform strategies to better meet the continuing healthcare needs of this population—both while they are in custody and in the community—and could contribute to reduced acute care utilisation and recidivism rates. Additionally, no studies to our knowledge have looked specifically at differences in ED visits that have direct contact with the criminal justice system compared with those that occur while justice-involved individuals are not incarcerated and in their community.

In this study, we leveraged statewide data on all ED encounters in California hospitals to assess the patterns of ED utilisation among patients who had criminal justice contact recorded during an ED visit in 2014. We compared patient characteristics including demographics, health conditions, and coverage sources and examined variations in frequency of ED use among those with and without justice-involved ED visits. We also examined primary diagnoses and health insurance coverage across visits with different types of criminal justice contact in order to better understand how health conditions are being managed in the communities to which correctional populations are returning.

## METHODS

### Study design and data source

We performed a retrospective analysis of ED visits in 2014 using non-public data from the California Office of Statewide Health Planning and Development (OSHPD). All licensed hospitals in California except those federally operated are required to report inpatient admissions and ED discharge data to OSHPD. The ED discharge dataset does not include ED visits that resulted in a hospitalisation; those visits are captured using the patient discharge dataset, which indicates whether a patient was admitted to the hospital from the ED. Using patient-level identifiers (constructed from an encrypted nine-digit alphanumeric identifier and deidentified by OSHPD), we constructed a dataset of all individuals with at least one ED visit in 2014 and linked multiple visits to patients. We successfully linked 88% of all ED discharge records, although visits that had criminal justice contact had a linkage rate of 70%.

### Participants

We included all adult patients, age 18–64, with any ED visit in a California hospital during the study period. We focused on non-elderly adults as they were the group most impacted by the coverage expansions under the

ACA. We identified individuals with any direct criminal justice contact during an ED visit over the course of the year based on codes for admission source and disposition. These codes indicate whether patients were admitted from a prison or jail (available only for ED visits that resulted in an inpatient admission), or discharged to a prison or jail after an ED or inpatient visit (available for all ED visits). All patients with at least one ED visit with direct criminal justice contact are coded as having criminal justice involvement during the year. Our ability to link visits across patients allows us to observe ED use while individuals who had a recent ED visit with criminal justice contact were in the community.

### Patient involvement

Patients were not involved in the development of the research question, outcome measures or study design. We did not actively recruit patients for this study, and the results will not be disseminated to the study participants as we used unidentified data and have no way of contacting the patients.

### Variables

#### Frequent ED use

There is no standard for what constitutes a 'frequent ED user'.<sup>23</sup> Definitions range from 2 to 12 visits per year, though the most commonly used threshold is four or more annual ED visits.<sup>24</sup> We chose to examine frequency of ED use based on the following ordinal categories: 1 visit, 2–3 visits, 4–6 visits, 7–10 visits and more than 10 visits. Our analysis of frequent users relies on the most common definition of four or more annual ED visits.

#### Diagnoses

We examined health conditions using diagnostic information from all hospital encounters in 2014. Principal diagnosis and up to 24 additional diagnoses are recorded by hospitals using Institutional Classification of Disease, Ninth Revision, Clinical Modification (ICD-9-CM) codes. We grouped all ICD-9-CM codes into clinically meaningful categories using the Agency for Healthcare Research and Quality's Clinical Classifications Software. We used all diagnoses reported across any available patient discharge records, including inpatient visits, to construct our measures of health conditions. We also examined primary diagnoses, which for outpatient ED visits indicate the main cause for the visit and for ED visits that resulted in an inpatient admission indicate the main cause for the entire episode of care.

#### Patient characteristics

Patient characteristics included age, gender, race/ethnicity, preferred language and primary insurance coverage. Race and ethnicity were self-reported by patients. Primary coverage source was defined based on the payer reported for the largest share of a patient's ED visits. In the limited cases where shares were equal among multiple coverage sources, we first assigned patients to Medicare, then Medicaid, then uninsured.

### Statistical analysis

We calculated descriptive statistics to compare patient demographics, ED use, health conditions, primary diagnoses and visit frequencies among patients with and without criminal justice contact recorded during any ED visit in 2014. We performed bivariate analyses using t-tests and  $\chi^2$  tests. Analyses were conducted in SAS V.9.4 software.

## RESULTS

### Patient and ED visit load

More than 33 000 non-elderly adult ED patients had direct criminal justice contact during an ED visit in 2014 out of a total of 3 757 870 adult patients who made at least one ED visit during the year (table 1). Although they represented only 0.9% of all ED patients in California, patients with criminal justice contact accounted for 2.6% of all frequent ED users (four or more annual ED visits) and 5.6% of all heavy ED users (more than 10 annual ED visits) in the state. More than a quarter (27.2%) of justice-involved patients were classified as frequent ED users, and made 71.0% of ED visits among this group. In comparison, 9.4% of all non-elderly adult ED patients were frequent ED users, and made 34.9% of all ED visits.

Of the more than 131 000 ED visits made by patients with any criminal justice contact during the year, 29.7% had direct criminal justice contact coded for the visit. The remaining 70.3% of ED usage by this group occurred while individuals were back in the community. Among frequent ED users (4+ visits annually) with a justice-involved visit, 86.1% of ED visits were made while they were in the community and not in the custody of law enforcement.

### Characteristics of ED users with and without criminal justice contact

Comparison of non-elderly adult ED users with and without criminal justice contact (table 2) reveals distinct profiles. Despite their higher frequency of ED use, justice-involved ED patients were a younger population, and less likely to be female (22.7% vs 55.6%,  $p<0.05$ ). They were more likely to be non-Hispanic black (18.0% vs 11.7%,  $p<0.05$ ), which could reflect the disproportionate share of African-Americans incarcerated in California and the nation as a whole.

Justice-involved ED patients also had unique diagnostic profiles, with a higher prevalence of behavioural health conditions relative to ED patients without a justice-involved ED visit during the year. Specifically, ED users with criminal justice contact were approximately five times more likely to have substance use (33.7% vs 6.8%,  $p<0.05$ ) or alcohol-related disorder (25.1% vs 5.2%,  $p<0.05$ ). Mental health conditions were diagnosed in 52.8% of ED users with criminal justice contacts, compared with 30.4% of those without ( $p<0.05$ ). Schizophrenia was more common in patients with criminal justice contact (12.4% vs 2.3%,  $p<0.05$ ), and represented a far higher

**Table 1** Frequency of ED visits for patients aged 18–64 by criminal justice contact in California, 2014

	No of total annual ED visits					Total	Frequent users (4+)
	1	2–3	4–6	7–10	10+		
<b>All adult ED patients</b>							
Total patients (N)	2 460 890	942 142	245 632	68 472	40 734	3 757 870	354 838
% patients	65.5%	25.1%	6.5%	1.8%	1.1%	100.0%	9.4%
Total ED visits (N)	2 460 890	2 153 072	1 140 640	551 671	780 513	7 086 786	2 472 824
% visits	34.7%	30.4%	16.1%	7.8%	11.0%	100.0%	34.9%
<b>ED patients with criminal justice contact*</b>							
Total ED patients (N)	14 374	10 020	4832	2013	2255	33 494	9100
% patients	42.9%	29.9%	14.4%	6.0%	6.7%	100.0%	27.2%
Total ED visits (N)	14 374	23 658	22 954	16 468	53 700	131 154	93 122
% visits	11.0%	18.0%	17.5%	12.6%	40.9%	100.0%	71.0%
Visits with direct criminal justice contact (in custody)	100%	49.4%	27.4%	17.5%	7.1%	29.7%	13.9%
Visits no criminal justice contact (in community)	0	51.6%	72.6%	82.5%	92.9%	70.3%	86.1%
% of all ED patients with criminal justice contact	0.6%	1.1%	2.0%	2.9%	5.6%	0.9%	2.6%

\* Criminal justice contact is defined as having at least one ED visit during the year that had an admission source coded as jail or prison or had a disposition coded as discharged to jail or prison.  
ED, emergency department.

proportion of their mental health diagnoses. Among ED users with any mental health diagnosis, schizophrenia was diagnosed in nearly a quarter (23.5%) of ED users with criminal justice contact, as compared with 7.6% of those without.

Justice-involved ED patients also had much higher proportions of infectious diseases compared with those without criminal justice contact. The prevalence of HIV and hepatitis (0.9% and 7.2%, respectively) was substantially higher than in users without criminal justice contact (0.3% and 1.6%, respectively,  $p < 0.05$  for both comparisons). Chronic conditions such as hypertension and heart disease were slightly higher in patients with criminal justice contacts (21.9% vs 19.9% and 12.9% vs 10.0%, both  $p < 0.05$ ), despite their younger age distribution. ED users with criminal justice contact also had higher shares of an inpatient hospitalisation (12.6% vs 8.3%,  $p < 0.05$ ) and an ED visit resulting in admission (26.6% vs 15.2%) in the past year compared with those without criminal justice contact.

While similar proportions of each population were covered by Medicaid (33.9% of those with criminal justice contact, and 31.9%), being uninsured at most or all ED visits occurred in 41.3% of patients with criminal justice contact, as compared with only 14.1% of those with no such contacts ( $p < 0.05$ ).

#### Top diagnoses of ED visits with and without criminal justice contact

Of the top 10, four primary diagnoses of ED visits made by patients with criminal justice contact included behavioural health conditions (alcohol-related disorders,

schizophrenia/other psychotic disorders, substance-related disorders and mood disorders), the sum of which accounted for nearly one in five (19.0%) of all primary reasons for ED visits made by this population (table 3). In contrast, behavioural health conditions were absent from the top 10 diagnoses in patients with no criminal justice contact during the year which were driven by physical pains such as abdominal pain, sprains and strains, chest pain and back problems.

Further examination of primary diagnoses across ED visits with direct criminal justice contact compared with those that occurred when the individual was in the community reveals additional insights (online supplementary table 1). Nearly a quarter (22.4%) of ED visits in which the patient was discharged to a jail or prison were for a medical examination or evaluation, likely driven by policies among criminal justice agencies to assess individuals before incarceration. The top diagnosis for ED visits where the source of admission was jail or prison was schizophrenia, pointing to the challenges of criminal justice institutions to manage inmates with severe mental health conditions. ED visits that occurred while justice-involved individuals were in the community again showed several behavioural health conditions topping the list of diagnoses, with alcohol-related visits comprising 10.9%, followed by schizophrenia, which accounted for another 4.8% of primary diagnoses.

#### DISCUSSION

ED patients with a history of criminal justice involvement during the year had far higher shares of frequent ED use



**Table 2** Patient characteristics for non-elderly adult ED users with and without criminal justice contact in California, 2014

	ED patients with criminal justice contact (n=33 494)	ED patients with no criminal justice contact (n=3 724 376)	P values
<b>Type of criminal justice contact</b>			
At least one admission from jail/prison	11.3%	N/A	
At least one discharge to jail/prison	90.5%	N/A	
At least one ED visit in community	53.8%	N/A	
Age at admission (mean)	37.2	40.0	<0.05
<b>Age categories</b>			
Age 18–34	48.0%	40.6%	<0.05
Age 35–44	21.3%	18.8%	<0.05
Age 45–54	20.5%	21.0%	<0.05
Age 55–64	10.2%	19.6%	<0.05
<b>Gender</b>			
Female	22.7%	55.6%	<0.05
<b>Race/ethnicity</b>			
Non-Hispanic white	45.3%	43.3%	<0.05
Non-Hispanic black	18.0%	11.7%	<0.05
Hispanic	31.0%	33.2%	<0.05
Non-Hispanic Asian	1.9%	6.3%	<0.05
Non-Hispanic other race	0.8%	0.6%	<0.05
Race missing	3.0%	5.1%	<0.05
<b>Primary coverage source</b>			
Medicare	5.9%	7.3%	<0.05
Medicaid	33.9%	31.9%	<0.05
Uninsured	41.3%	14.1%	<0.05
Private	18.9%	46.7%	<0.05
Inpatient hospitalisation	12.6%	8.3%	<0.05
ED visit resulting in admission	26.6%	15.2%	<0.05
English, primary language	97.9%	91.5%	<0.05
<b>Health conditions (any diagnosis)</b>			
Mental health	52.8%	30.4%	<0.05
Schizophrenia	12.4%	2.3%	<0.05
Alcohol	25.1%	5.2%	<0.05
Substance use	33.7%	6.8%	<0.05
Diabetes	10.9%	11.4%	<0.05
Hypertension	21.9%	19.9%	<0.05
Heart disease	12.9%	10.0%	<0.05
Asthma	9.3%	7.7%	<0.05
COPD	5.1%	3.8%	<0.05
Cancer	2.1%	3.2%	<0.05
HIV	0.9%	0.3%	<0.05
Hepatitis	7.2%	1.6%	<0.05

Criminal justice contact is defined as having at least one ED visit during the year that had an admission source coded as jail or prison or had a disposition coded as discharged to jail or prison. All P values are based on two-tailed t-test of the difference in means across the two groups. ED, emergency department. COPD, chronic obstructive pulmonary disease.

compared with other adult ED users, and were at higher risk of inpatient admissions. Given that only 6.7% of ED patients with criminal justice contact comprised 40.9% of all ED visits by this group, identifying individuals in need of more coordinated health and social service provision

could reduce a portion of this costly health service utilisation.<sup>25</sup> Our results corroborate previous research that demonstrates high rates of acute care use among criminal justice-involved populations, particularly for mental health and substance use disorders,<sup>12–14 16 17 26</sup> and

**Table 3** Top primary diagnoses among ED users with and without criminal justice contact in California, 2014

Criminal justice contacts (n=131 154)	%	No criminal justice contacts (n=6 955 632)	%
Alcohol-related disorders	9.2	Abdominal pain	5.7
Medical examination/evaluation	6.8	Sprains and strains	4.3
Superficial injury; contusion	4.7	Non-specific chest pain	3.9
Schizophrenia/other psychotic disorders	4.2	Spondylosis; intervertebral disc disorders; other back problems	3.5
Non-specific chest pain	3.5	Superficial injury; contusion	3.2
Skin/tissue infections	3.4	Headache; including migraine	3.1
Abdominal pain	3.0	Skin/tissue infections	3.0
Substance-related disorders	2.9	Urinary tract infections	2.7
Injuries/conditions due to external causes	2.8	Other upper respiratory infections	2.5
Mood disorders	2.7	Open wounds of extremities	2.3
All other diagnoses	56.9	All other diagnoses	65.8

Criminal justice contact is defined as having at least one ED visit during the year that had an admission source coded as jail or prison or had a disposition coded as discharged to jail or prison.  
ED, emergency department.

provides new information about the characteristics of ED visits with and without direct criminal justice contact.

Focusing on addressing the uniquely high burden of behavioural health conditions in patients with a history of incarceration would be particularly beneficial. Among ED users with criminal justice contacts, the high prevalence of mental health conditions (52.8%), particularly schizophrenia (12.4%) and alcohol-related (25.1%) and substance use disorders (33.7%), likely contributes to their cycling between EDs and the criminal justice system. These findings appear to reflect the product of criminalising substance use disorders and drastically reducing psychiatric beds in the mental health system, which has led to an 80% prevalence of mental health and substance use disorders in jail and prison populations.<sup>5 27</sup> Previous research has found that only 22.6% of inmates with mental health disorders in jails and 22.3% in state prisons receive any form of mental health treatment in the year before arrest.<sup>5</sup> The frequent contacts across hospital and correctional systems reflected in our data further suggests these conditions are inadequately managed, and that there may be opportunities to better use contacts with either correctional institutions or EDs to connect individuals to needed behavioural health services to interrupt this cycle of acute care utilisation and recidivism.

Our examination of demographic profiles of ED users with criminal justice contact indicated whites and females were vastly over-represented among justice-involved ED patients, as compared with the total incarcerated population. In California, whites comprised 18.1% of inmates in jails and 22.2% in prisons,<sup>28 29</sup> but represented 45.3% of ED patients with criminal justice contacts. A very small proportion of the correctional population in California is female—4.4% in prisons and 13.3% in jails<sup>28 29</sup>—while females made up nearly one-quarter (22.7%) of justice-involved ED patients. While there is evidence of higher disease burden among female jail inmates,<sup>30</sup> our results indicate differences in race and gender patterning of disease profiles among the justice involved which may

signal disparities in access to acute care services both in custody and on release and warrants further research.

Despite a high burden of disease, a lack of health insurance coverage was much more common among those with criminal justice contacts than those without (41.3% vs 14.1%). The ACA has expanded insurance coverage, particularly for mental health and substance use disorders, which could prove salutary for the justice involved in particular if sustained.<sup>31–33</sup> Other studies have found that the dependent coverage mandate and Medicaid expansion have resulted in declines in uninsurance among justice-involved individuals, but reflect our findings that uninsurance rates remain higher than the general population.<sup>22 34</sup> An increasing number of states, including California, are adopting policies that suspend rather than terminate Medicaid coverage during incarceration, which could reduce gaps in health coverage on release. Jails operating as enrolment sites provide a promising strategy to achieve coverage gains for hard-to-reach populations who are uninsured prior to incarceration.<sup>18</sup>

Though critical, coverage is only the first step in improving health conditions and service utilisation in justice-involved populations. While coverage improved following ACA, evidence is limited and mixed as to whether treatment for behavioural health disorders has improved among the justice involved,<sup>22 34</sup> and barriers to substance use disorder and other mental health treatment are not limited to insurance.<sup>35</sup> The geographical distribution of substance use and mental health treatment facilities is highly variable, with lower access in African-American and Latino communities disproportionately impacted by the criminal justice system.<sup>7</sup> Focusing resources on improving access to behavioural health treatments is imperative to reduce costs, crime and improve population health and social outcomes.

For the services that are available, linkages to community health providers following incarceration are often poor, contributing to high acute care utilisation.<sup>2</sup> These poor linkages are notable given that this population is at high risk for poor health outcomes due to several factors

that are commonly reported in this population, including: poor access to medical care before contact with the criminal justice system; low quality medical care received during detainment; mistrust of medical providers; experiences of bias or racism in the doctor–patient relationship and—for some—the criminal justice system itself may have an adverse impact on health including post-traumatic stress disorder and poorly controlled chronic health conditions.<sup>36 37</sup> Fostering the continuity of care between correctional and community health systems will be vital to better manage health conditions in justice-involved populations, reduce the high rate of ED use on release and improve re-entry outcomes.<sup>33 38</sup> Doing so will require increased coordination between corrections and community healthcare settings, particularly information exchange.<sup>38</sup> An assessment of opportunities for health and criminal justice information exchange identified the potential, with privacy and confidentiality protections in place, for such data linkages to improve health and public safety outcomes and to reduce expenditures across systems.<sup>39</sup> In addition to improving routine service provision, data linkages would enable more rigorous evaluations of programmes and policies by creating a system for tracking access to services and subsequent changes in health and criminal justice outcomes.

Finally, the routinely collected hospital data we analysed indicate there is considerable potential for ED utilisation to identify frequent users of multiple systems, and to serve as a point of linkage for insurance enrolment and referrals for behavioural healthcare and social services. This is especially true in a post-ACA environment where many of justice-involved individuals are now eligible for Medicaid coverage. A few California counties have developed integrated data systems to identify high users of multiple systems and have used this metric to target individuals for enrolment in Whole Person Carepilot projects, which have been approved by the Centers for Medicare and Medicaid Services and funded through the state's current 1115 Medicaid waiver.<sup>40</sup> Individuals with criminal justice contact are one prime target population for this intervention, as are the homeless, those with severe mental illness and substance use disorders. Medicaid managed care plans, along with other local partners, are responsible for coordinating care and improving outcomes for this group. It will be essential to monitor and evaluate these programmes and identify successful strategies for service and systems integration that can be expanded to address the profound and urgent need to improve outcomes for the justice-involved population.

### Limitations

First, due to the nature of the hospital discharge data, only criminal justice contact tied to a hospital encounter was observed and may not be representative of the overall criminal justice population. We should note that because we only observe criminal justice contact during an ED visit, it is quite likely that some patients in our comparison group of adults without criminal justice contact may

have been incarcerated at some point during the year, but did not have an ED visit while in custody. Second, although California is a very large and diverse state, the heterogeneity of criminal justice systems and the differential implementation of the ACA across states may limit the generalisability of this study. Third, valid patient linkage numbers were more often missing in patients with criminal justice contact, resulting in a lower linkage rate in this group (70%, as compared with 88% in those without criminal justice contacts). Thus, the frequency of criminal justice contact and the number of patients with criminal justice contact may be underestimated. This underscores the extent to which patients are contacting both systems and the benefits that coordinated data systems would offer for cross-system collaboration. Furthermore, with fewer visits linked among patients with criminal justice contact, greater disparities in frequent ED use between patients with and without criminal justice contact are probable. Further exploration is needed to understand and reduce missing data in this patient group, and maximise the value of state hospital data for monitoring and addressing the health needs of this population.

### Public health implications

Improving the health of individuals with histories of incarceration can advance several public health goals including reductions in the transmission of communicable disease, declines in racial/ethnic health disparities, increased public safety, and improved health status and outcomes of disadvantaged families and communities.<sup>41 42</sup> Medicaid coverage expansions under the ACA offer essential supports and funding to do this, but require more coordinated efforts. Our identification and profiles of ED patients with criminal justice contact found many were frequent ED users with uniquely high rates of behavioural health conditions and infectious diseases. High utilisation across multiple public systems and prevalent, poorly managed chronic diseases indicate the need and opportunity for improved collaboration across health and criminal justice systems to reduce recidivism and improve the health of justice-involved individuals and their communities. Recent health and criminal justice policy reforms have increased the possibilities, and the urgency, for more coordinated strategies to meet the health needs of individuals returning home after periods of incarceration.

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