Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

eAppendix 1. Description of TransUnion Data

This study includes publicly available data that has been assembled and warehoused by TransUnion™ for people 18 years of age and older. All data are publicly available and no data from credit reports or other non-public sources was used. For this study specifically, we used data from January 01, 2007 to December 31, 2019. Address changes were aggregated by TransUnion and are provided for the previous seven years as of October 02, 2020, the date we obtained the data. No data on demographics, including race or ethnicity were provided by TransUnion. TransUnion was able to match 98% of all patient records.

Disruptive life events

We obtained data on five different disruptive life events: arrests, address changes, bankruptcy filings, lien filings, and judgement filings. Address changes were provided as counts by TransUnion. A judgement filing by a creditor asks a court to declare a debtor liable to pay the creditor a certain amount.[1] A creditor can use a judgement to garnish the debtors' wages, bank accounts or place liens on the debtor's property such as a car or real estate. Lien filings can be involuntary or consensual. An involuntary lien can result from a judgement filing that was obtained by a creditor. A consensual lien uses a debtor's property as a collateral, often for a loan or a mortgage. In either case, a lien indicates that there is a claim against a person's assets.[2] Bankruptcy filings, if approved, allow qualifying persons to re-organize or discharge debt, including credit card debts and personal loans.[1] A bankruptcy may or may not free a debtor from a judgement filing depending on the kind of debt behind each judgement. Certain debts, such as child support, criminal fines or federal student loans, cannot be discharged through a bankruptcy filing.[1] Arrest data comes from local law enforcement and court systems. An arrest does not imply that charges were filed as a result of that arrest.[3]

Data sources and completeness

All data come from publicly available data sources and do not include credit scores, credit reports or other non-public financial data. Data from motor vehicle departments was excluded as well.

Address changes: Address changes come from publicly available data sources. Examples include the National Change of Address Database maintained by the United States Postal Service (USPS)[4], public websites and, per TransUnion, hundreds of proprietary databases. Counts were computed using proprietary algorithms. Some of the data sources for address changes, such as the Postal Service's database, may be considered self-reported.

Financial outcomes: Data on judgment filings, lien filings and bankruptcy filings came from county-level court records that are available through the Freedom of Information Act. These records were assembled by and provided to TransUnion by third party vendors. Per TransUnion, differences in the number of vendors over time are at the source of differences in data availability for lien filings and may impact other outcomes. Data from court or law enforcement systems were not manipulated by the vendor or by TransUnion to preserve the integrity of the public record.

Arrest data: Arrest records were made and kept by local law enforcement agencies and courts. They are considered public records. TransUnion accessed some of these records directly from these sources and some via third party vendors. In either case, no changes were made to the public records obtained.

Considerations for analyzing TransUnion data: We were able to analyze data that varied in completeness over time since we were analyzing differences between pairs of cases and comparisons that were matched on key demographics, including age and the age at diagnosis (for patients with MDD). For this first study with TransUnion data, we reduced the risk of data error by using a simple yes/no flag for each disruptive life event (except for the number of address changes that was provided by TransUnion). Information on whether a person ever had an arrest, or a court filing was less likely to be in error than, for example, the number of judgements filed against a person or the specific amount for which a lien was filed. Further data exploration will be necessary to validate this additional information available via TransUnion. It is possible that patients diagnosed with BPI or SCZ may be discriminated against and pursued in court more frequently by debtors-regardless of their financial status. They may also be more likely to receive unfavorable legal decisions compared to their matched comparisons. Whether patients with BPI or SCZ diagnoses are experiencing this kind of discrimination needs to be explored. The simple fact of having a lien,

judgement, or bankruptcy filing or an arrest *recorded* however is unlikely to vary by exposure status of patients in our cohorts.

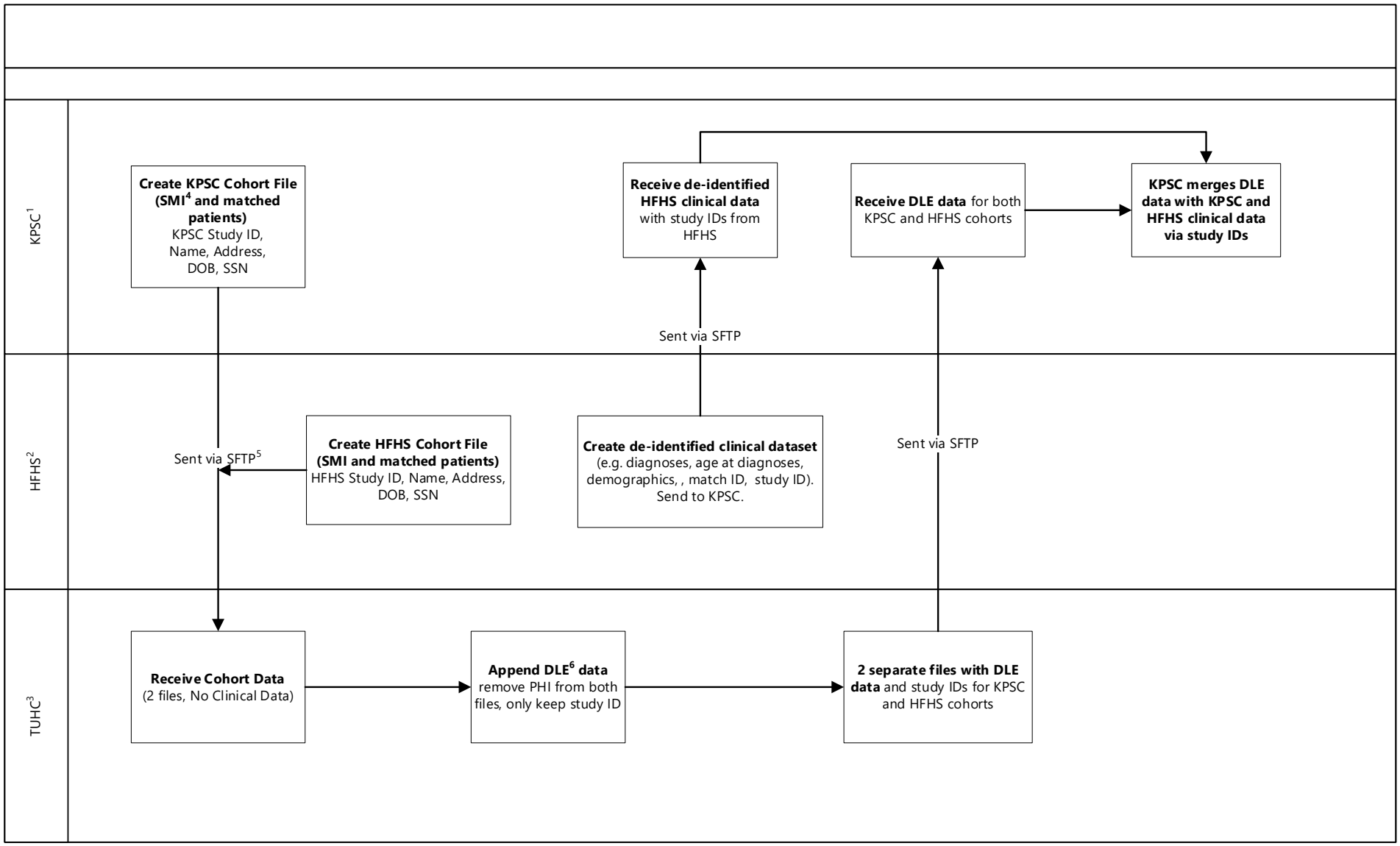
eReferences

1. Experian.com. Does Bankruptcy Get Rid of Judgments? https://www.experian.com/blogs/ask-experian/does-bankruptcy-get-rid-of-judgments/.
2. Experian.com. What is a Lien? https://www.experian.com/blogs/ask-experian/what-is-a-lien/.
3. California Courts TJBoC. How Criminal Cases Work. https://www.courts.ca.gov/1069.htm?rdeLocaleAttr=en.
4. Service USP. NCOALink. https://postalpro.usps.com/mailing-and-shipping-services/NCOALink.

eAppendix 2. Multistep process to safeguard health data

To guard the safety of health care data the authors used a multistep process to create a de-identified analytic dataset of TransUnion and EHR data (eFigure 1). KPSC and HFH each combined their case and comparison cohorts into a single dataset and removed all health-related information. KPSC and HFH, separately, TransUnion then removed all identifying information except the study ID and transferred disruptive life events data for HFH and KPSC patients back to KPSC. HFH shared demographics, data on diagnoses and study IDs with KPSC separately and via secure file transfer. KPSC merged data on clinical diagnoses and demographics back onto the de-identified dataset for both KPSC and HFH patients. The study data set with pseudo-ID's is kept on firewalled and encrypted KPSC servers. The same safety procedures were followed for this analytic dataset as for all individual level electronic health records data.

eFigure. Process of merging clinical data from Kaiser Permanente Southern California (KPSC) and Henry Ford Health Systems (HFHS) and Transunion HealthCare (TUCH) disruptive life events data (DLE)



1. Kaiser Permanente Southern California
2. Henry Ford Health System
3. TransUnion HealthCare
4. Serious Mental Illness
5. Secure File Transfer Site
6. Disruptive Life Events

eAppendix 3. Analysis code for the study outcomes

For the address change outcome:

```
proc genmod data=&data desc;
      class &class / param=glm;
      model &outcome = &covariates / dist=binomial link=logit type3;
      repeated subject=&strata / type=unstr corrw covb;
run;
```

For all other outcomes:

```
proc genmod data=&data desc;
      class &class / param=glm;
      model &outcome = &covariates / dist=negbin link=log type3;
      repeated subject=&strata / type=unstr corrw covb;
run;
```

eTable 1. P-values adjusted for multiple testing using the Benjamini-Hochberg method[1]

	Address changes			Bankruptcy filings			Judgment filings			Lien filings			Arrests		
	IRR[a] (95% CI[b])	p-value	adjusted p-value	OR[c] (95% CI)	p-value	adjusted p-value	OR (95% CI)	p-value	adjusted p-value	OR (95% CI)	p-value	adjusted p-value	OR (95% CI)	p-value	adjusted p-value
SCZ[d] vs. MDD[e] (n = 31268)	0.74 (0.72, 0.76)	<.0001	<.0001	0.64 (0.59, 0.69)	<.0001	<.0001	0.85 (0.79, 0.92)	<.0001	<.0001	0.64 (0.57, 0.72)	<.0001	<.0001	2.43 (2.07, 2.85)	<.0001	<.0001
SCZ vs. GH[f] (n = 32066)	0.85 (0.83, 0.88)	<.0001	<.0001	0.88 (0.80, 0.95)	0.0019	0.0022	0.99 (0.92, 1.07)	0.7992	0.7992	0.85 (0.75, 0.96)	0.0089	0.0099	3.04 (2.57, 3.59)	<.0001	<.0001
BPI[g] vs. MDD (n = 58760)	1.03 (1.01, 1.05)	0.0019	0.0022	1.01 (0.96, 1.06)	0.695	0.7316	1.15 (1.09, 1.21)	<.0001	<.0001	1.15 (1.07, 1.24)	0.0003	0.0004	2.15 (1.90, 2.44)	<.0001	<.0001
BPI vs. GH (n = 59514)	1.25 (1.23, 1.28)	<.0001	<.0001	1.50 (1.42, 1.58)	<.0001	<.0001	1.48 (1.39, 1.56)	<.0001	<.0001	1.39 (1.29, 1.51)	<.0001	<.0001	3.27 (2.84, 3.78)	<.0001	<.0001

[a]IRR= incidence rate ratio

[b]CI= confidence interval

[c]OR= odd ratio

[d]SCZ= schizophrenia

[e]MDD= major depressive disorder

[f]GH=general health

[g]BPI= bipolar I disorder

1. Benjamini Y, Hochberg Y. Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. 1995;57(1):289-300.

eTable 2. Sensitivity analysis restricting patients to those aged 20 or older at time of diagnosis.

	Address changes	Bankruptcy filings	Judgment filings	Lien filings	Arrests
	IRR[a] (95% CI[b])	OR[c] (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
SCZ[d] vs. MDD[e] (n = 25219)	0.74 (0.72, 0.77)	0.64 (0.59, 0.69)	0.85 (0.78, 0.92)	0.63 (0.56, 0.71)	2.57 (2.14, 3.08)
SCZ vs. GH [f] (n = 25936)	0.89 (0.86, 0.92)	0.88 (0.81, 0.96)	1.00 (0.92, 1.08)	0.84 (0.74, 0.95)	3.14 (2.59, 3.80)
BPI[g] vs. MDD (n = 49006)	1.03 (1.01, 1.06)	1.02 (0.97, 1.07)	1.14 (1.08, 1.21)	1.15 (1.07, 1.25)	2.04 (1.77, 2.36)
BPI vs. GH (n = 49695)	1.29 (1.26, 1.32)	1.50 (1.42, 1.59)	1.44 (1.36, 1.53)	1.39 (1.29, 1.51)	3.12 (2.65, 3.68)

[a]IRR= incidence rate ratio

[b]CI= confidence interval

[c]OR= odd ratio

[d]SCZ= schizophrenia

[e]MDD= major depressive disorder

[f]GH=general health

[g]BPI= bipolar I disorder

eTable 3. Coefficients and Confidence Intervals for the full models

Address changes[a] (IRR[b] (95% CI [c]))					
		SCZ[d] to MDD[e]	BPI[f] to MDD	SCZ to GH[g]	BPI to GH
		n = 31,266	n = 58,760	n = 32,060	n = 59,514
Effect of SCZ/BPI diagnosis versus respective comparison cohort		0.74 (0.72, 0.76)	1.03 (1.01, 1.05)	0.85 (0.83, 0.88)	1.25 (1.23, 1.28)
Age group at diagnosis	18-29 years old	0.83 (0.79, 0.87)	0.94 (0.91, 0.97)	0.85 (0.81, 0.89)	0.97 (0.95, 1.00)
	<18 years old	0.63 (0.59, 0.67)	0.78 (0.75, 0.81)	0.67 (0.63, 0.71)	0.79 (0.76, 0.82)
	>=30 years old	Reference	Reference	Reference	Reference
Current age (as of 12/31/2019)	18-44 years old	2.38 (2.20, 2.59)	2.18 (2.07, 2.29)	2.19 (2.00, 2.39)	2.04 (1.92, 2.16)
	45-64 years old	1.56 (1.44, 1.68)	1.53 (1.45, 1.60)	1.40 (1.28, 1.52)	1.39 (1.31, 1.47)
	65 years or older	Reference	Reference	Reference	Reference
Race	Asian	0.90 (0.85, 0.96)	0.90 (0.86, 0.95)	0.88 (0.83, 0.94)	0.91 (0.87, 0.96)
	Black	1.19 (1.15, 1.23)	1.19 (1.15, 1.22)	1.17 (1.13, 1.22)	1.23 (1.19, 1.26)
	Other/Multiple/Unknown	0.87 (0.84, 0.91)	0.89 (0.86, 0.92)	0.88 (0.84, 0.92)	0.91 (0.88, 0.94)
	White	Reference	Reference	Reference	Reference
Gender	Male	0.84 (0.81, 0.86)	0.86 (0.84, 0.88)	0.85 (0.83, 0.88)	0.89 (0.87, 0.91)
	Female	Reference	Reference	Reference	Reference
Incident/ prevalent diagnosis	Incident	0.84 (0.80, 0.87)	0.83 (0.81, 0.86)	N/A	N/A
	Prevalent	Reference	Reference	N/A	N/A

[a] Models additionally adjusted for patient health system; coefficients not shown.

[b] IRR= incidence rate ratio
[c] CI= confidence interval
[d] SCZ= schizophrenia
[e] MDD= major depressive disorder
[f] BPI= bipolar I disorder
[g] GH=general health

Bankruptcy Filings[a] (OR[b] (95% CI[c]))					
		SCZ[d] to MDD[e]	BPI[f] to MDD	SCZ to GH[g]	BPI to GH
		n = 31,266	n = 58,760	n = 32,060	n = 59,514
Effect of SCZ/BPI diagnosis versus respective comparison cohort		0.64 (0.59, 0.69)	1.01 (0.96, 1.06)	0.88 (0.80, 0.95)	1.50 (1.42, 1.58)
Age group at diagnosis	18-29 years old	0.53 (0.46, 0.62)	0.55 (0.50, 0.61)	0.34 (0.29, 0.39)	0.40 (0.36, 0.44)
	<18 years old	0.14 (0.09, 0.20)	0.12 (0.09, 0.15)	0.09 (0.06, 0.13)	0.06 (0.05, 0.08)
	>=30 years old	Reference	Reference	Reference	Reference
Current age (as of 12/31/2019)	18-44 years old	0.99 (0.83, 1.18)	1.21 (1.08, 1.36)	0.93 (0.77, 1.12)	1.17 (1.03, 1.32)
	45-64 years old	1.55 (1.34, 1.79)	1.84 (1.66, 2.04)	1.39 (1.19, 1.63)	1.67 (1.50, 1.87)
	65 years or older	Reference	Reference	Reference	Reference
Race	Asian	0.76 (0.65, 0.90)	0.75 (0.65, 0.87)	0.75 (0.63, 0.89)	0.78 (0.67, 0.91)
	Black	1.08 (0.98, 1.20)	1.27 (1.18, 1.37)	1.09 (0.99, 1.21)	1.18 (1.09, 1.27)
	Other/Multiple/Unknown	1.01 (0.90, 1.13)	1.10 (1.02, 1.19)	1.07 (0.95, 1.21)	1.09 (1.01, 1.18)
	White	Reference	Reference	Reference	Reference
Gender	Male	0.93 (0.85, 1.01)	0.94 (0.89, 0.99)	1.00 (0.91, 1.09)	0.91 (0.86, 0.97)
	Female	Reference	Reference	Reference	Reference
Incident/ prevalent diagnosis	Incident	0.42 (0.35, 0.51)	0.51 (0.45, 0.57)	N/A	N/A
	Prevalent	Reference	Reference	N/A	N/A

[a] Models additionally adjusted for patient health system; coefficients not shown.
[b] OR= odds ratio
[c] CI= confidence interval
[d] SCZ= schizophrenia
[e] MDD= major depressive disorder
[f] BPI= bipolar I disorder

[g] GH=general health

Judgment filings[a] (OR[b] (95% CI[c]))					
		SCZ[d] to MDD[e]	BPI[f] to MDD	SCZ to GH[g]	BPI to GH
		n = 31,266	n = 58,760	n = 32,060	n = 59,514
Effect of SCZ/BPI diagnosis versus respective comparison cohort		0.85 (0.79, 0.92)	1.15 (1.09, 1.21)	0.99 (0.92, 1.07)	1.48 (1.39, 1.56)
Age group at diagnosis	18-29 years old	0.44 (0.38, 0.50)	0.53 (0.49, 0.59)	0.36 (0.32, 0.40)	0.43 (0.39, 0.47)
	<18 years old	0.17 (0.14, 0.23)	0.22 (0.18, 0.26)	0.14 (0.11, 0.18)	0.15 (0.13, 0.18)
	>=30 years old	Reference	Reference	Reference	Reference
Current age (as of 12/31/2019)	18-44 years old	2.17 (1.80, 2.60)	2.40 (2.09, 2.77)	2.14 (1.75, 2.60)	2.28 (1.96, 2.65)
	45-64 years old	1.91 (1.62, 2.26)	2.31 (2.02, 2.64)	1.77 (1.47, 2.12)	2.13 (1.85, 2.46)
	65 years or older	Reference	Reference	Reference	Reference
Race	Asian	0.59 (0.50, 0.70)	0.56 (0.47, 0.67)	0.50 (0.41, 0.60)	0.54 (0.45, 0.64)
	Black	2.11 (1.93, 2.31)	2.28 (2.12, 2.46)	2.15 (1.96, 2.35)	2.24 (2.08, 2.42)
	Other/Multiple/Unknown	1.09 (0.98, 1.22)	1.09 (1.01, 1.19)	1.05 (0.93, 1.17)	1.08 (0.99, 1.18)
	White	Reference	Reference	Reference	Reference
Gender	Male	1.58 (1.46, 1.72)	1.60 (1.51, 1.69)	1.75 (1.61, 1.90)	1.73 (1.64, 1.83)
	Female	Reference	Reference	Reference	Reference
Incident/ prevalent diagnosis	Incident	0.60 (0.52, 0.69)	0.59 (0.53, 0.65)	N/A	N/A
	Prevalent	Reference	Reference	N/A	N/A

[a] Models additionally adjusted for patient health system; coefficients not shown.
[b] OR= odds ratio
[c] CI= confidence interval
[d] SCZ= schizophrenia
[e] MDD= major depressive disorder

[f] BPI= bipolar I disorder
[g] GH=general health

Lien filings[a] (OR[b] (95% CI[c]))					
		SCZ[d] to MDD[e]	BPI[f] to MDD	SCZ to GH[g]	BPI to GH
		n = 26,600	n = 52,744	n = 27,572	n = 53,324
Effect of SCZ/BPI diagnosis versus respective comparison cohort		0.64 (0.57, 0.72)	1.15 (1.07, 1.24)	0.85 (0.75, 0.96)	1.39 (1.29, 1.51)
Age group at diagnosis	18-29 years old	0.45 (0.35, 0.58)	0.53 (0.45, 0.63)	0.30 (0.25, 0.38)	0.38 (0.32, 0.44)
	<18 years old	0.10 (0.04, 0.24)	0.15 (0.09, 0.24)	0.11 (0.06, 0.23)	0.11 (0.06, 0.18)
	>=30 years old	Reference	Reference	Reference	Reference
Current age (as of 12/31/2019)	18-44 years old	0.65 (0.52, 0.81)	0.59 (0.51, 0.69)	0.75 (0.58, 0.96)	0.64 (0.54, 0.76)
	45-64 years old	1.15 (0.97, 1.37)	1.24 (1.09, 1.42)	1.13 (0.91, 1.39)	1.27 (1.10, 1.47)
	65 years or older	Reference	Reference	Reference	Reference
Race	Asian	0.74 (0.58, 0.94)	0.46 (0.34, 0.62)	0.57 (0.43, 0.76)	0.54 (0.40, 0.72)
	Black	1.91 (1.67, 2.18)	1.90 (1.71, 2.11)	1.84 (1.60, 2.12)	2.09 (1.88, 2.31)
	Other/Multiple/Unknown	0.91 (0.76, 1.08)	0.97 (0.86, 1.09)	1.08 (0.91, 1.28)	1.02 (0.89, 1.16)
	White	Reference	Reference	Reference	Reference
Gender	Male	1.62 (1.44, 1.82)	1.70 (1.58, 1.84)	1.74 (1.53, 1.97)	1.91 (1.76, 2.06)
	Female	Reference	Reference	Reference	Reference
Incident/ prevalent diagnosis	Incident	0.46 (0.33, 0.64)	0.38 (0.29, 0.50)	N/A	N/A
	Prevalent	Reference	Reference	N/A	N/A

[a] Models additionally adjusted for patient health system; coefficients not shown.
[b] OR= odds ratio
[c] CI= confidence interval
[d] SCZ= schizophrenia
[e] MDD= major depressive disorder
[f] BPI= bipolar I disorder
[g] GH=general health

Arrests[a] (OR[b] (95% CI[c]))					
		SCZ[d] to MDD[e]	BPI[f] to MDD	SCZ to GH[g]	BPI to GH
		n = 31,266	n = 58,760	n = 32,060	n = 59,514
Effect of SCZ/BPI diagnosis versus respective comparison cohort		2.43 (2.07, 2.85)	2.15 (1.90, 2.44)	3.04 (2.57, 3.59)	3.27 (2.84, 3.78)
Age group at diagnosis	18-29 years old	1.65 (1.28, 2.14)	1.40 (1.16, 1.68)	1.58 (1.24, 2.01)	1.57 (1.31, 1.89)
	<18 years old	1.17 (0.83, 1.65)	1.57 (1.25, 1.97)	1.02 (0.73, 1.42)	1.76 (1.41, 2.19)
	>=30 years old	Reference	Reference	Reference	Reference
Current age (as of 12/31/2019)	18-44 years old	3.28 (1.85, 5.81)	2.40 (1.65, 3.50)	2.73 (1.54, 4.85)	2.25 (1.48, 3.41)
	45-64 years old	2.42 (1.40, 4.19)	1.55 (1.08, 2.24)	2.11 (1.22, 3.66)	1.64 (1.09, 2.45)
	65 years or older	Reference	Reference	Reference	Reference
Race	Asian	0.63 (0.44, 0.89)	0.52 (0.35, 0.75)	0.52 (0.35, 0.76)	0.60 (0.40, 0.88)
	Black	1.25 (1.04, 1.50)	1.22 (1.02, 1.46)	1.30 (1.08, 1.56)	1.31 (1.09, 1.58)
	Other/Multiple/Unknown	1.07 (0.88, 1.30)	0.97 (0.82, 1.16)	1.01 (0.82, 1.24)	1.01 (0.83, 1.21)
	White	Reference	Reference	Reference	Reference
Gender	Male	1.97 (1.66, 2.35)	1.61 (1.43, 1.82)	2.07 (1.73, 2.48)	1.76 (1.55, 2.00)
	Female	Reference	Reference	Reference	Reference
Incident/ prevalent diagnosis	Incident	0.85 (0.70, 1.02)	1.00 (0.86, 1.17)	N/A	N/A
	Prevalent	Reference	Reference	N/A	N/A

[a] Models additionally adjusted for patient health system; coefficients not shown.
[b] OR= odds ratio
[c] CI= confidence interval
[d] SCZ= schizophrenia
[e] MDD= major depressive disorder
[f] BPI= bipolar I disorder
[g] GH=general health