**Discussion** | This analysis found that FES is associated with reduced criminality. The low overall prevalence of convictions in this sample was reassuring but limited detection of group differences. Nevertheless, allocation to STEP reduced subsequent and first-time convictions and was less than levels in a larger European trial. Putative mechanisms include STEP’s improvement of vocational functioning, which is associated with reduced youth criminality, and reduction of psychiatric hospitalizations, which disrupt work and school functioning but may also signal reductions in episodes of behavioral dysregulation that can result in arrests. However, these speculations need to be tested against more granular information about the circumstances of each arrest. Such replication with a larger sample and more comprehensive (eg, adding juvenile, jail diversion, and department of corrections data) databases is urgently needed to inform service design and policy.

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**Health Care Spending by Enrollees With Substance Use and Mental Health Disorders in High-Deductible Health Plans vs Traditional Plans**

High-deductible health plans (HDHPs) have proliferated in the US in recent years. Such plans are heterogeneous and sometimes paired with savings accounts or transparency tools. Cost savings may come at a price if increased financial strain associated with high deductibles leads to poorer health outcomes. Little is known about health care spending among HDHP enrollees with substance use and mental health (SU/MH) disorders. These conditions are highly prevalent, undertreated, and high cost, which may exacerbate the effects of HDHPs.

**Methods** | Using the Truven Health MarketScan database (January 1, 2011, to December 31, 2016), we identified enrollees who were continuously enrolled in HDHPs and traditional plans for at least 12 months. HDHPs were defined in MarketScan as a statutory HDHP, meaning they had a sufficiently large deductible coupled with a tax-advantaged health savings account. Traditional plans included a mix of lower-deductible plans, such as preferred provider organizations and health maintenance organizations. This study was approved and found to be exempt from informed consent by the Johns...
Table. Annual Mean Total and OOP Spending Comparing Traditional and HDHP Enrollees With and Without SU/MH Disorder, 2011-2016<sup>a</sup>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Enrollees with an SU/MH disorder</th>
<th>Enrollees without an SU/MH disorder</th>
<th>With vs without an SU/MH disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional (n = 27 485 702)</td>
<td>HDHP (n = 1 624 961)</td>
<td>Difference (n = 21 564 925)</td>
</tr>
<tr>
<td>Overall health care spending, mean (SD), $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7924 (15 971)</td>
<td>7012 (15 285)</td>
<td>−912&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>OOP</td>
<td>1034 (1387)</td>
<td>1607 (1807)</td>
<td>573&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Inpatient spending, mean (SD), $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1618 (8631)</td>
<td>1320 (7743)</td>
<td>−298&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>OOP</td>
<td>87 (509)</td>
<td>118 (675)</td>
<td>31&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Outpatient spending, mean (SD), $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4692 (9556)</td>
<td>4372 (9546)</td>
<td>−320&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>OOP</td>
<td>719 (1070)</td>
<td>1165 (1479)</td>
<td>446&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pharmaceutical spending, mean (SD), $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Rx spending</td>
<td>1614 (5255)</td>
<td>1320 (5057)</td>
<td>−294&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>OOP Rx spending</td>
<td>228 (441)</td>
<td>324 (646)</td>
<td>93&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Abbreviations: HDHP, high-deductible health plan; OOP, out-of-pocket; Rx, prescription; SU/MH, substance use and mental health.

<sup>a</sup> Study sample includes person-years continuously enrolled for at least 12 calendar months without switching plans with and without an SU/MH disorder. HDHP by definition had a minimum statutory deductible ($1200 for 2011-2012, $1250 for 2013-2014, $1300 for 2015-2016) and a health savings account.

<sup>b</sup> Traditional vs HDHP difference significantly different from 0 at the <i>P</i> < .01 level.

<sup>c</sup> Enrollees with and without an SU/MH disorder significantly different from 0 at the <i>P</i> < .01 level.

Results | In all, our analysis included 52 230 886 person-years of data with a mean (SD) age of 34.75 (17.73) years; 28 815 776 (55.17%) were female. Overall spending was higher for those in traditional plans than those in HDHPs, with a greater difference among those with an SU/MH disorder ($912) than those without ($667) (Table). Although overall spending was higher in traditional plans than HDHPs for both populations, OOP spending was substantially higher for those in HDHPs compared with traditional plans, especially for those with SU/MH disorders ($573 vs $280).

Larger differentials in total and OOP spending in HDHPs compared with traditional plans were detected for the group with SU/MH disorders within subcategories of inpatient and pharmaceutical spending. There was no significant difference in total outpatient spending in HDHPs compared with traditional plans between the group with SU/MH disorders compared with those without ($320 vs $334). However, the outpatient OOP spending difference between HDHPs and traditional plans was almost double in the SU/MH group compared with the group without these disorders ($446 vs $238).

The Figure presents spending differences by SU/MH diagnosis. Across all categories, HDHP enrollees had significantly higher OOP spending compared with traditional plan enrollees.

Discussion | Commercially insured HDHP enrollees with SU/MH disorder diagnoses had 12% less in overall health care spending than traditional plan enrollees. However, OOP spending was 55% higher in the HDHP group and the share of spending paid OOP was 23 percentage points higher in the HDHP group. This suggests that HDHPs might be posing differential barriers for enrollees with SU/MH disorders compared with enrollees with other conditions. Because baseline spending among those with SU/MH disorders is much higher than the general population, financial strain associated with OOP spending in HDHPs may hit those with SU/MH disorders significantly harder. This
study did not examine selection into different plan types or differences in networks across plans. Future research is needed to understand the causes of the differences observed in this study.

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Author Contributions: Drs Eisenberg and Du had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Eisenberg, Du, Kennedy-Hendricks, Barry.
Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: Eisenberg, Du, Barry.
Critical revision of the manuscript for important intellectual content: Du, Sen, Kennedy-Hendricks, Barry.
Obtained funding: Eisenberg, Barry.
Administrative, technical, or material support: Kennedy-Hendricks, Barry.
Supervision: Eisenberg, Barry.

Conflict of Interest Disclosures: None reported.

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Limitations of Case Register Studies for Violence and Psychiatric Disorders

To the Editor The Original Investigation by Sariaslan and colleagues is important in questioning previous misperceptions of violence by individuals with serious mental illness and that it is primarily due to comorbid substance misuse. However, case registers do not have perfect coverage of all mental disorders in a population, and complex cases with co-occurring disorders may be disproportionately registered—those most likely to experience violence and be perpetrators. There is then the problem of temporal proximity.

The fundamental methodological flaw is lack of precise information on whether symptoms of mental disorder were actually present at the time of the violent acts. Were symptoms of schizophrenia present that cause violence? Did the patient actually feel depressed, anxious, or intoxicated at the time? Which drug? Which personality disorder? These complications cannot be unraveled using case registers. All that is shown is that diagnostic labels, applied before contact with services for injury or later criminal conviction and over varying time periods, are statistically associated.

Psychiatric studies of violence are currently bedeviled by poor outcome data. Criminologists rejected sole reliance on criminal records more than 40 years ago owing to the dark figure of crime, that which is never reported or detected, where criminal convictions represent merely the visible tip of the iceberg of crime in a population. Persons with mental illness are more likely to be detected, reported, processed, and appear in court at stages of a long, uncertain pathway to conviction. Many live in social circumstances where violence is more common. Without additional self-report data (criticized by the authors) or, best of all, observations, the study is primarily of the functioning of the Swedish criminal justice system. It cannot draw any overall or final conclusions on violence. However big the data, they cannot compensate for poor violence outcome, unknown temporal proximity to symptoms of mental illness, and where the latter may not even have been present.

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In Reply In our study, we examined the risks of violent victimization and perpetration among patients with psychiatric disorders in Sweden. Clearly, there are strengths and weaknesses of register-based approaches in psychiatric epidemiology. In our study, the strengths outweigh the limitations for the reasons of reliability and consistency of the exposures and outcomes, large sample size for diagnostic subgroups yielding precise estimates, avoidance of certain selection biases, and the ability to use comparison groups, including unaffected siblings. Coid’s first point is that case registers do not have full coverage of psychiatric disorders. However, this is not a unique limitation of case registers because clinical samples often rely on consent and participants remaining in the follow-up (both leading to underrepresentation of patients with severe illness and comorbidities). By using nationwide registers, we had access to reliable, valid, and consistent data on International Classification of Diseases–diagnosed psychiatric disorders that presented to clinical services in the whole country across several decades. This additionally had the advantage of being potentially treatable as they accessed health care services. Some of the limitations with clinical studies are shown in Coid’s work on links between psychiatric morbidity and UK extremism, where the cases to examine the psychiatric disorders were based on 566 pro-British extremists and 47 anti-British extremists.

Coid also suggests that case registers lack information to determine whether symptoms were present at the time of perpetration. We agree but would argue that limiting epidemiologic studies to investigating symptoms solely would be too narrow. Being diagnosed with psychiatric disorders is a phe-