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# **Mental health services provision in primary care and emergency department settings: Analysis of blended fee-for-service and blended capitation models in Ontario, Canada**

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## **Declarations**

The results are reported according to the Strength in Reporting of Observational Studies in Epidemiology (STROBE) guidelines (Appendix A0)

von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. PLoS Med. 2007;4(10):1623–7.

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**Mental health services provision in primary care and emergency department settings:  
Analysis of blended fee-for-service and blended capitation models in Ontario, Canada**

*Abstract*

**Purpose:** Treating mental illnesses in primary care is increasingly emphasized to improve access to mental health services. Although family physicians (FPs) or general practitioners are in an ideal position to provide the bulk of mental health care, it is unclear how best to remunerate FPs for the adequate provision of mental health services. We examined the quantity of mental health services provided in Ontario's blended fee-for-service and blended capitation models.

**Methods:** We evaluated the impact of FPs switching from blended fee-for-service to blended capitation on the provision of mental health services in primary care and emergency department using longitudinal health administrative data from 2007-2016. We accounted for the differences between those who switched to blended capitation and non-switchers in the baseline using propensity score weighted fixed-effects regressions to compare remuneration models.

**Results:** We found that switching from blended fee-for-service to blended capitation was associated with a 14% decrease (95% CI: 12-14%) in the number of mental health services and an 18% decrease (95% CI: 15-20%) in the corresponding value of services. This result was driven by the decrease in services during regular-hours. During after-hours, the number of services increased by 20% (95% CI: 10-32%) and the corresponding value increased by 35% (95% CI: 17-54%). Switching was associated with a 4% (95% CI: 1-8%) decrease in emergency department visits for mental health reasons.

**Conclusions:** Blended capitation reduced provision of mental health services without increasing emergency department visits, suggesting potential efficiency gain in the blended capitation model in Ontario.

**Keywords:** physician remuneration; blended fee-for-service, blended capitation; primary care; mental health services; emergency department; regular-hours; after-hours; Ontario; Canada

## **1. Introduction**

Improving treatment of mental illness in primary care setting is recognized in numerous reports and commissions (Hewlett & Moran, 2014; World Health Organization, 2008). This is because treating mild to moderate mental illness in primary care setting through accurate diagnoses, initiating and managing appropriate treatment, and coordinating care with other mental health professionals may help reduce the costs of mental illnesses and improve the health of these patients (Chisholm, Sanderson, Ayuso-Mateos, & Saxena, 2004). Indeed, some evidence suggests that integrating mental health services into primary care enhances access to these services in a cost-effective manner (World Health Organization, 2008). Thus, family physicians (FPs) may be in the best position to identify their patients' mental health care needs and provide services before their mental illness reaches a crisis point requiring emergency department visit or hospitalization.

In the past decade or so, many developed countries have reformed primary care to improve access to comprehensive primary care, including mental health services. Many of these reforms involved moving away from pure payment systems of fee-for-service (FFS), capitation, or salary towards blended remuneration, in which the amount that physicians receive in reimbursement has a both a fixed component and a component that depends partly on their performance (McGuire, 2011; OECD, 2016). The main reason for these physician payment reforms is that pure payment systems are inefficient: pure FFS leads to over-provision of health services and higher health system costs, pure capitation leads to under-provision of health services and the selective enrollment of healthy patients, and salary leads to under-provision of services and higher health care costs (Ellis & McGuire, 1993; Gosden et al., 2001; Newhouse, 1996; Robinson, 2001). Blended remuneration schemes combine aspects of retrospective and prospective payments with pay-for-performance incentives to mitigate the weaknesses of pure payment systems.

To date, various forms of blended payments have been trialed in the US (Lee, Bothe, & Steele, 2012; Mattison & Wilson, 2017; Zuvekas & Cohen, 2016), Canada (Hutchison et al., 2011; Marchildon & Hutchison, 2016; Sweetman & Buckley, 2014), Denmark (Olejaz et al., 2012), and the UK and Sweden (OECD, 2016). The theoretical health economics literature suggests that risk-adjusted capitation payment provides better incentives for primary care physicians than pure FFS for efficient supply of health services (Christianson & Conrad, 2012;

Eggleston, 2005; McGuire, 2011). However, Frank et al. argue that a blended form of FFS payment system (case rates, FFS and performance-based contracting) can lead to efficient provision of mental health services for patients with psychoses (Frank, Glied, & McGuire, 2015).

Empirical evidence shows that reforms to physician payment models influence physician behaviour and supply of health services. Studies from the US, the UK, and Canada have found that models that blend capitation and FFS, relative to pure FFS, are associated with fewer services, but better clinical outcomes and reduced risk of adverse events such as hospitalizations (Ham, York, Sutch, & Shaw, 2003; Laberge, Wodchis, Barnsley, & Laporte, 2017; Lee et al., 2012; Somé et al., 2019; Somé, Devlin, Mehta, Zaric, & Sarma, 2020; Zhang & Sweetman, 2018). Similarly, studies of reforms from Norway and the US have found that relative to FPs paid by pure salary, FPs paid by a blended models provide more services (Helmchen & Lo Sasso, 2010; Sørensen & Grytten, 2003). Some recent Canadian studies found that blended capitation, relative to blended FFS, is associated with fewer services and more targeted services like preventative care and chronic disease management (Kantarevic & Kralj, 2013; Kralj & Kantarevic, 2013; Somé et al., 2020; Thavam, Devlin, Thind, Zaric, & Sarma, 2020; Zhang & Sweetman, 2018), but more referrals to specialists (Sarma, Mehta, Devlin, Kpelitse, & Li, 2018). A comparison between the Danish health system (blended capitation and FFS) and Kaiser Permanente in the US (salaried plus incentives) found physicians under Kaiser Permanente performed better in terms of screening and had fewer hospitalizations (Frølich et al., 2008). Currently, there is a dearth of empirical evidence on the link between blended remuneration for primary care physicians and supply of mental health services. We address this gap by conducting an extensive quasi-experimental analysis of the blended FFS and blended capitation models implemented more than a decade ago in Ontario, Canada's most populous province.

In the early 2000s, Ontario introduced several new payment models for primary care physicians (Marchildon & Hutchison, 2016; Sweetman & Buckley, 2014). Two new models that have become very popular are the Family Health Group (FHG), a blended FFS model introduced in 2003, and the Family Health Organization (FHO), a blended capitation model introduced in 2006. In FHO, physicians receive the base capitation payment for their enrolled patients, adjusted for the patient's age and sex, to provide a defined basket of services inclusive of mental health services; they also receive 15% of the FFS amount for each in-basket service provided to enrolled patients. They receive 100% of the FFS amount for services provided outside the basket

with no limit, as well as for all services to non-enrolled patients up to the annual hard cap limit set by the FHO contract. FHO physicians are also eligible to claim targeted financial incentives in the area of illness prevention (influenza vaccination, pap smear, mammography, childhood immunization, colorectal screening), chronic disease management (diabetes management, smoking cessation counselling fee, heart failure management incentive), and after-hours care. FHO contract offered physicians a higher payment amount for specific services including mental health services provided after 5PM on weekdays, or at any time on weekends and statutory holidays than for services provided during regular office hours, which gave physicians an explicit incentive to provide more services after-hours. The amount of this added after-hours premium increased from 10% of the FFS amount to 30% of the FFS amount in April 2011 (Sweetman & Buckley, 2014). Additionally, physicians practicing in the FHO are eligible to form interdisciplinary team-based practice comprising of professionals such as nurses, dietitians, social workers, pharmacists and mental health/addictions professionals funded by the government (Marchildon & Hutchison, 2016). In contrast, FHG is similar to the traditional FFS in terms of the base payment, but includes the same targeted financial incentives as in FHOs with the exception of team-based funding to form interdisciplinary practice. As of March 31<sup>st</sup> 2016, approximately 54% of Ontario's FPs were in one of these two models, covering 92% of enrolled patients (Ministry of Health and Long-Term Care, 2016). The main features of FHG and FHO models are presented in Table 1.

Our paper builds on recent literature studying the impact of Ontario's primary care reform on outcomes (Kralj & Kantarevic, 2013; Somé et al., 2019, 2020; Zhang & Sweetman, 2018). In order to adjust for observed and unobserved confounding, we used a two-stage estimation approach. The first stage accounts for the differences between FHG and those who switched to FHO using an inverse probability weighting technique based on estimated propensity scores to ensure that switchers and non-switchers were comparable in terms of mental health services, observable physician- and patient-characteristics, and expected gain in income at baseline. The second stage estimates the impact of switching from FHG to FHO while accounting for the physician-specific observable and unobservable confounding (Balazsi, Matyas, & Wansbeek, 2018). We analyse the impact of blended remuneration on the number of mental health services provided by FPs per 1000 patients and the value of these services (2006 Canadian dollars). We also investigate whether the services provided during regular-hours and after-hours periods

differ. Finally, as an indirect measure of quality of care, we compared referrals to psychiatrists, enrollment of patients with serious mental illness (SMI: defined as psychosis or bipolar disorder) and emergency department (ED) visits for mental health reasons between FHG and FHO models.

## **2. Methods**

### *2.1 Study Design*

We used a retrospective cohort study design using health administrative data from April 1<sup>st</sup> 2007 to March 31<sup>st</sup> 2016 (i.e. fiscal years 2007/08 to 2015/16) to compare mental health services provided by FPs in blended capitation and blended FFS models. We identified FPs who were practicing in FHGs as of April 1<sup>st</sup> 2007 and followed longitudinally until March 31, 2016. In this period they either remained in FHG (i.e. non-switchers; N = 1236) or switched to FHO and continued to practice in this model (i.e. switchers; N=1418) until March 31<sup>st</sup> 2016. As our analysis was at the physician-level, patients' outcomes and covariates were aggregated to FP for each year. Physicians were excluded if they had fewer than 200 enrolled patients in any year as they may have been working part-time.<sup>1</sup> Patients were also excluded if they met any of the following exclusion criteria: (a) missing or invalid identifying key number; (b) missing or invalid age; (c) age <16 or >105 years old; and (d) missing or invalid sex.

### *2.2 Data Sources and Variables*

We used several linked health administrative databases from ICES (formerly known as the Institute for Clinical Evaluative Sciences). Physician characteristics (age, sex, international medical graduate and rurality) were obtained from the ICES Physician Database. The Corporate Provider Database was used to obtain information on the physician remuneration model and the number of FPs in each practice (physicians' group size). We obtained patient enrollment information from the Client Agency Program Enrolment database allowing the calculation of the number of enrolled patients per physician. The Ontario Registered Persons Database (RPDB) was used to obtain information on patients' residential postal code, age and sex; with these variables we derived patient related covariates for each physician: average patient age, proportion of patients over 65 years old, and proportion of female patients. Census dissemination area-level data were used to calculate patients' area-level material deprivation score and ethnic

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<sup>1</sup> Results were qualitatively similar to increasing to 500 enrolled patients or reducing to 100 enrolled patients.



concentration score.<sup>2</sup> An ICES-derived cohort – Primary Care Population – was used to obtain information on whether patients had been diagnosed with a chronic mental illness, defined as two outpatient or one inpatient visit for a mental health reason over the past two years (Health Quality Ontario, 2016). The Johns Hopkins ACG® System Version 10 case-mix adjustment system was used to derive patients’ Aggregated Diagnosis Groups (ADGs) based on patients’ diagnosis codes, which reflect comorbidity in primary care (Glazier et al., 2008; The Johns Hopkins University, 2011). The ADG score for each enrolled patient was calculated based on 32 diagnosis groups, so a patient may have an ADG score between zero and 32. We then averaged all enrolled patients score per physician to obtain the patients’ average ADG score for each physician. Using postal codes from the RPDB and the Postal Code Conversion File, patients living in rural areas were identified, with towns of less than 10,000 people as rural (Wilkins, 2009). The proportion of FP’s patients living in rural areas was used in the analysis. All outcomes and covariates were constructed for each year.

We used the Ontario Health Insurance Plan (OHIP) database to obtain information on mental health services provided by FPs for each year, including fee codes and the claim amount. After-hours services are provided on weekdays after 5:00PM, on weekends, and statutory holidays, and services provided outside of these times are considered regular-hours services. Mental health services provided during after-hours were captured through a premium code (Q012) along with the OHIP billing codes for mental health services (Appendix Table A1); services that did not have the after-hours premium code were assumed to be provided during regular-hours. The number of services as well as the value of the services (in 2006 Canadian dollars), were obtained from the OHIP database. Information on referrals to psychiatrists was also obtained from the OHIP database. Information on SMI was based on combination of diagnostic and billing codes. In FHG, any enrolled patient with a diagnostic code 295 (schizophrenia) or billing code Q020 (tracking code for bipolar disorder) was considered to have SMI, whereas in FHO, any enrolled patient that used billing code Q020 or Q021 (tracking code

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<sup>2</sup> Material deprivation is a composite score based on the proportion aged 25+ years old without a certificate, diploma, or degree; the proportion of single-parent families; the proportion receiving government transfer payments, the proportion those aged 15+ who are unemployed, the proportion considered low-income, and the proportion living in homes of in need of major repair; ethnic concentration is a composite score based on neighbourhood level proportions, including the proportion who are recent immigrants (within 5 years) and the proportion of those who identify as self-minorities(Matheson, Dunn, Smith, Moineddin, & Glazier, 2012).

for schizophrenia) was considered to have SMI (Ministry of Health and Long-Term Care, 2007, 2014).

Expected gain in income due to switching from FHG to FHO was calculated based on the services that the physician provided for enrolled and non-enrolled patients during the fiscal year 2006/07 (when all physicians were practicing in the FHG model), using an algorithm used by the Ministry of Health and Long-Term Care (Kralj & Kantarevic, 2013). This algorithm uses the following assumptions to calculate what would be the income of a FHG physician if s/he were practicing under FHO given the number and the type of services provided to their patients in FHG: (1) a capitation rate of \$144.08 multiplied by the age-sex modifier for each enrolled patient; (2) 10% of FFS value for in-basket services to enrolled patients; (3) 100% of FFS value for in-basket services to non-enrolled patients up to the hard cap limit; (4) 100% of FFS value for out-of-basket services to any patient; and (5) special payments for hospital services, obstetrical care, home visits and prenatal care.

Data on ED visits for mental health reasons were obtained from the National Ambulatory Care Reporting System database. ED visits were stratified by regular-hours and after-hours periods. The list of diagnostic codes used to identify ED visits for mental health reasons can be found in Appendix Table A2.

### *2.3. Compliance with Ethical Standards*

The use of data in this paper was authorized under section 45 of Ontario's Personal Health Information Protection Act, which does not require review by a Research Ethics Board. However, use of the health administrative data at the ICES was subject to strict privacy approval process and strict adherence to confidentiality agreement signed by all authors. None of the authors have any conflicts of interest to declare. The funders have no influence in the data acquisition, analysis and interpretation of the results reported in this paper.

### *2.4. Statistical Analysis*

Given that Ontario FPs choose their remuneration model, there is the potential for selection bias: FPs who switched to FHO may be systematically different from FPs who remained in the FHG model in ways that may affect how they provide care. To address this issue, we employed a two-stage estimation strategy. In the first stage, we account for the differences between switchers and

non-switchers in terms of physicians' and their patients' observable characteristics using an inverse probability weighted technique based on a propensity score (PS) model using logistic regression. This approach ensures that switchers and non-switchers were comparable in terms of the expected gain in income, outcomes and covariates at baseline:

- Expected gain in income from switching to FHO in the previous fiscal year (2006/07).
- *Provision of mental health services*: number of mental health services provided, the number of enrolled patients with SMI;
- *Physician characteristics*: physicians' age and its square, sex, rurality, IMG status, group size;
- *Patient characteristics in FP's practice*: average age of enrolled patients, proportion of senior patients, proportion of female patients, average ADG score of patients, proportion of patients living in areas that were in the lowest two quintiles on the material deprivation score, proportion of patients living in areas that were the lowest two quintiles on the ethnic concentration score, proportion of patients living in rural areas, and the proportion of patients with chronic mental illness; and

In the second stage, we estimated the average treatment effect on the treated using inverse probability weighted regression models.

In the first stage, covariate balancing between two groups was checked using *t*-tests for equality of means, standardized bias (i.e. the difference of sample means as a percentage of the square root of the average of the sample variances), and percentage reduction in bias after matching. Although some have proposed that the standardized bias of less than 10% is reasonable (Austin, 2009; Stuart, Lee, & Leacy, 2013), covariate imbalance may still bias the estimated effects on outcomes. Therefore, we performed matching using the entropy balancing weighting, which is based on a maximum entropy reweighting scheme that ensures exact balancing on the moments of covariate distributions in both groups (Hainmueller, 2012). Entropy balancing weighting has been demonstrated to be doubly robust (Zhao & Percival, 2016).

### 2.5. Regression Models

In the second-stage, we estimated inverse probability weighted regression models to assess the effect of switching to FHO on the provision of mental health services (the number and value of

mental health services, the number of enrolled patients with SMI, and ED visits for mental health reasons and the corresponding number of patients) using the following equation at the physician-level:

$$\ln S_{it} = \alpha_i + \delta FHO_{it} + \beta' X_{it} + \lambda \tau + \varepsilon_{it},$$

where subscripts  $i$  and  $t$  represent physician and time, respectively;  $\ln S$  is the natural logarithm of the outcome (number/value of services provided by the FP, patients with SMI, and ED visits for mental health reasons; all outcomes were standardized to per 1000 patients), however, we added one to adjust for some zeros in the data (Zhang & Sweetman, 2018).  $\alpha_i$  is a physician-specific term representing time-invariant idiosyncratic factors;  $FHO$  is a dummy variable equal to 1 if the physician practices in the FHO and 0 if s/he practices in the FHG at time  $t$ ;  $X$  includes age, age squared, sex, rurality, IMG status, group size, average age of patients in the physician's practice, proportion of senior patients, proportion of female patients, average ADG score of patients, proportion of patients living in the least deprived areas (i.e. quintiles 1 or 2 on the material deprivation score), proportion of patients living in areas of low ethnic concentration (i.e. quintiles 1 or 2 on the ethnic concentration score), proportion of patients living in rural areas, and proportion of patients with chronic mental illness;  $\tau$  is a time trend; and  $\varepsilon$  is the error term. Regression models were estimated using a pooled ordinary least squares (OLS) regression ignoring  $\alpha_i$ , a fixed-effects (FE) regression, and a high-dimensional fixed-effects (HDFE) regression that allows for change in  $\alpha_i$  over time. Standard errors were clustered at the physician level in all regressions. The FE estimator does control for  $\alpha_i$  assuming these are time-invariant (Wooldridge, 2010), while the HDFE estimator not only controls for physician-specific time-invariant confounding as in the FE model, but also allows for each physician to have his/her own trend (Balazsi et al., 2018). Note the fixed effects approaches allow to control for both physicians' observed and unobserved characteristics at the second stage. All analyses were conducted in Stata 13.1.

### 3. Results

#### 3.1 Matching Results

Table 2 reports the difference in means for variables at baseline before and after matching, the  $p$  value for  $t$ -tests for equality of means between switchers and non-switchers, standardized bias between groups before and after matching, and the reduction in bias after matching. The  $t$ -tests

on the before matching data indicate statistically significant difference between switchers and non-switchers for all variables, with the standardized bias ranging from 3.9% to 49.8%. Physicians who switched tended to be younger, female, practicing in a rural area, have graduated from a Canadian medical school, have smaller physician group size, have fewer enrolled patients, and have a higher expected gain in income relative to non-switchers. On average, the patients of physicians who switched to FHO tended to be older and have a lower ADG score; had higher proportion of senior patients, female patients, patients living in the least-deprived areas, patients living in areas of low ethnic concentration, and patients living in rural areas. Switchers also tended to provide fewer mental health services and had fewer patients with SMI at baseline. Following matching and weighting, the non-switcher group was comparable to the switcher group: *t*-tests indicate that for all variables, the difference in means was no longer statistically significant, and the standardized bias was below 10% for all covariates. This indicates that the matching procedure was reasonably successful in eliminating the baseline covariate imbalance between switchers and non-switchers. Thus, any changes in outcomes over time are likely due to switching of FPs from blended FFS to blended capitation.

### *3.2 Regression Results*

#### *3.2.1 Mental health services in primary care*

Figure 1 presents the PS-weighted mean number and value of mental health services provided per 1,000 enrolled patients in each year for both switchers and non-switchers. As expected, switchers and non-switchers provided a similar number of services across the total, regular- and after-hours in the first year. For total and regular-hours services, non-switchers continued to provide a similar number of services, whereas switchers steadily decreased the number of services over time. During after-hours, both groups increased the number of services as well as the value of services over time.

The estimated impact of switching from blended FFS to blended capitation on the number and value of mental health services per 1000 enrolled patients is presented in Table 3. Switching from FHG to FHO was associated with a 12.4%, 14.0%, and 13.8% decrease in the number of mental health services provided to enrolled patients based on the OLS, FE, and HDFE estimates,

respectively.<sup>3</sup> A similar relationship was seen on the corresponding value of mental health services, with switching to FHO associated with a 14.9%, 17.9%, and 17.5% decrease in the value of mental health services.

Switching was associated with an increase in the number of mental health services provided during after-hours, with increases of 27.0%, 40.6%, and 20.3% for the OLS, FE, and HDFE estimates. Switching was also associated with an increase in the corresponding value of these services, with increases of 49.6%, 75.8%, and 34.6% respectively. The effect of switching on mental health services during regular-hours was very similar to the effect seen on total services: switching was associated with a decrease in the number of services by 12.8%, 15.2%, and 14.5% based on the OLS, FE, and HDFE estimates, and decrease in the corresponding value of services by 14.9%, 18.2%, and 17.6%. In summary, switching from FHG to FHO was associated with a decrease in mental health services during regular-hours and increase in after-hours.

### 3.2.2 Number of patients with serious mental illness (psychosis or bipolar disorder)

To determine whether switching from FHG to FHO was associated with reduced enrollment of patients with SMI, the number of these patients (standardized to per 1,000 enrolled patients) was assessed. Descriptive analyses using *t*-tests for each year were conducted, and significant differences for eight of the nine years were found (Appendix A, Table A19), so regression analyses were conducted. The estimated impact of switching from FHG to FHO on the number of enrolled patients with SMI per 1000 enrolled patients is presented in Table 3. PS-weighted OLS, FE, and HDFE estimates indicate a 5.3% increase, 8.2% decrease, and 4.1% decrease; however, only the FE estimate was statistically significant. This suggests that switching to FHO did not lead to a change in enrolling patients with SMI.

### 3.2.3 Referrals to psychiatrists

Analysis using *t*-tests of proportions of FPs who referred at least one patient to a psychiatrist suggested that in later years, non-switchers were more likely to refer at least one patient to a psychiatrist compared to switchers (Appendix Table A20). However, only two percent of FPs

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<sup>3</sup> This interpretation is based on the Halvorsen-Palmquist adjustment for interpreting a dummy variable in a semi-logarithmic model (Halvorsen & Palmquist, 1980).

made a referral, and the magnitude of the differences was very small. Our results do not support the hypothesis that blended capitation is associated with more referrals to psychiatrists compared to blended FFS.

### 3.2.4 Emergency department visits for mental health reasons

Figure 2 presents the PS-weighted mean number of ED visits for mental health reasons and number of patients who visited the ED for a mental health reason per 1,000 enrolled patients for each year, by group. The figures indicate that for non-switchers, the number of ED visits for mental health reasons increased slightly over time beginning around 2009, while remaining stable for switchers. Similar patterns were seen across total ED visits, regular-hours ED visits, and after-hours ED visits, as well as for unique patients presenting to the ED.

The estimated impact of switching from FHG to FHO on ED visits for mental health reasons is presented in Table 4. The results indicate that switching was associated with a decrease in the number of ED visits for mental health reasons by 5.6%, 7.5%, and 4.4% based on the OLS, FE, and HDFE estimates. There was a small decrease in the number of unique patients using the ED for mental health reasons (3.2%, 4.0%, and 2.2% respectively), and this was not statistically significant in the HDFE model.

During regular-hours, switching was associated with a decrease in ED visits by 6.3%, 5.8%, and 6.5% based on OLS, FE, and HDFE estimates. Switching was associated with a decrease in the number of patients by 3.8%, 2.0%, and 3.6%, but the FE model was not statistically significant. During after-hours, switching was associated with a decrease in after-hours ED visits by 5.4%, 7.0%, and 0.9% based on the OLS, FE, and HDFE estimates, and a decrease in the number of patients using the ED for mental health reasons by 3.4%, 3.8%, and 1.2%. Only the OLS and FE estimates were statistically significant. Overall, switching from FHG to FHO was associated with a slight decrease in ED visits for mental health reasons, and this seems to be driven largely by a decrease in regular-hours ED visits. However, switching does not impact the number of patients using the ED for mental health reasons.

## **4. Discussion**

We found that FPs who switched from blended FFS to blended capitation provide fewer mental health services compared to FPs who remained in blended FFS. Previous research documented

that physicians remunerated by blended capitation provide fewer capitated services compared to physicians in blended FFS (Somé et al., 2020; Zhang & Sweetman, 2018), and our results found that this holds true for mental health services. An earlier study found capitation was associated with lower provision of after-hours care compared to FFS (Glazier, Klein-Geltink, Kopp, & Sibley, 2009), which may have been due to that study having been conducted when capitation was relatively new. The additional payment that physicians received for providing mental health care after-hours, versus during regular hours, increased from 10% to 30% over time, resulting in a stronger incentive for after-hours care. Mental health services are within the capitated basket, and we found an overall decrease of 12% to 14%, but an increase in mental health services provided during after-hours by 21% to 40%.

Decreases in mental health services during regular-hours, with increases during after-hours, may be due to differences in incentives embodied in these models. FPs in blended capitation will only earn 15% of the FFS payment for providing capitated services during regular-hours, but can earn additional 20 to 30% more if they provide these same services after-hours: therefore, they may choose to provide greater quantity of those services after-hours. Previous research found that FPs under blended capitation have been found to be more responsive to incentives than FPs under blended FFS for other premiums, such as the diabetes management incentive (Kantarevic & Kralj, 2013; Thavam et al., 2020) and cancer screening (Kralj & Kantarevic, 2013). Differences in team composition may also play a factor, as some blended capitation practices are team-based and patients may be receiving mental health services from mental health/addictions professionals during regular-hours.

The analysis of enrolled patients with SMI found that switchers enrolled relatively fewer patients with SMI, though this finding was not statistically significant in our HDFE model. This is similar to a previous study by Steele *et al.* (2013), who found the proportion of patients with SMI in blended capitation to be slightly lower than blended FFS but was statistically non-significant (Steele, Durbin, Sibley, & Glazier, 2013). FPs in blended capitation may tend to enroll healthier patients, but this may be partially offset by a premium FPs receive for enrolling a minimum number of patients with SMI (Ministry of Health and Long-Term Care, 2007, 2014; Sweetman & Buckley, 2014). We also examined whether FPs in blended capitation were sending their patients to psychiatrists as a means of off-loading high-needs patients. Our results indicate that this is not occurring, which is in contrast to previous research on overall referrals to



specialists (Sarma et al., 2018). This may be due to a shortage of psychiatrists: in Ontario, the median wait time for a psychiatrist is 73 days, with a 75<sup>th</sup> percentile of 231.5 days (Jaakkimainen et al., 2014).

Finally, ED use for mental health reasons was also assessed, as an indirect measure of the adequacy and quality of mental health services in primary care. Despite FHO FPs providing fewer mental health services, their patients did not use the ED more frequently: in fact, there was a slight decrease in the number of ED visits, though only by a few percentage points. This is similar to the results of previous US studies (Morgan, Chang, Alqatari, & Pines, 2013). In comparison, studies assessing patients with SMI have found no difference in ED use for mental health reasons between capitation and FFS (Leff et al., 2005; Steele et al., 2014). It is possible that capitation may lead to better quality of care for patients with milder mental illnesses, leading to fewer visits to the ED; but this benefit may not apply to patients with SMI. We also found that decrease in ED visits primarily occurs during regular-hours. This may reflect improved access to mental health services in some blended capitation models, especially in team-based FHOs. Additionally, FHO FPs may provide better accessibility, such as allowing patients to come in on shorter notice and encourage patients to come to them first rather than visit to the ED.

We also conducted a before-after analysis for physicians who switched to FHO, and the results are qualitatively similar to our main results. Similarly, when we restricted the sample to physicians who had at least two years of pre- and post-switch data in our before-after analysis, the corresponding results are in the similar direction. The detailed before-after regression results are reported in Appendix C.

The addition of one to adjust for zeros may potentially lead to bias if there is a large proportion of zeros in the data. In our dataset, total mental health services, regular-hours mental health services, total ED visits, and total number of patients who used the ED had less than 1% of zero-observations. After-hours and regular hours ED visits had between 2.9% to 5.5% of zero-observations. However, after-hours mental health services had 38.5% of zero-observations. Thus, we ran analyses using a generalized estimating equation with a Poisson family, the results of which can be found in Appendix D. The results are in the similar direction to the linear models.

Our findings add to the growing literature assessing how reforms to payment models have impacted health services. It is consistent with previous studies from several countries that found payment models with a larger FFS component are associated with providing more services

(Helmchen & Lo Sasso, 2010; Kralj & Kantarevic, 2013; Sørensen & Grytten, 2003). While blended models with a smaller FFS component are associated with provision of fewer services, they are also associated with greater provision of incentivized services (Kantarevic & Kralj, 2013; Lee et al., 2012; Somé et al., 2019, 2020; Zhang & Sweetman, 2018). This implies that blended capitation models could help reduce overprovision of unnecessary services. Although volume of services provided is a useful metric, it does not indicate quality of care. Using ED usage for mental health reasons as a proxy for quality, we found blended capitation to be associated with a slight decrease in ED visits. This is consistent with a review of US studies that found capitation payments to be associated with reduced ED usage compared to FFS (Morgan et al., 2013). Overall, our findings provide empirical evidence supporting previous recommendations of blended payments for patients with mental illnesses (Frank et al., 2015). A decline in primary care service utilization without an increase in ED usage or referrals to psychiatrists may reflect a reduction in overprovision of unnecessary services and/or an improvement in efficiency under blended capitation.

#### *4.1 Strengths, limitations, and future research*

Our study adds to the literature on the relationship between blended physician remuneration models and provision of mental health services in a publicly funded health care system. This is the first study to use longitudinal data from Ontario and quasi-experimental design to investigate mental health services in blended FFS and blended capitation models. Our quasi-experimental design ensures that switchers and non-switchers were similar at baseline, and thus these findings provide stronger evidence for a direct relationship between blended remuneration models and provision of mental health services in primary care.

Our study has some limitations. Although baseline characteristics of patients and physicians as well as outcomes were included in our propensity score model, there may still be some residual confounding that could be impacting our results. Future work can explore unobservable factors influencing selection into remuneration and resultant outcomes. Our study is also unable to determine the efficiency and/or quality of the services provided by physicians in blended capitation model, which is an area for future research. Although we controlled for the proportion of patients with chronic mental illness and average ADG score in the practice in our propensity score model, as well as in the regressions, these may not be perfect for adjusting for

the patient complexity. In future work, it would be interesting to control for variables that indicate the level of complexity of patients' mental health problems, for example patient health questionnaire-9 (known as PHQ-9) score, which measure depression level. Unfortunately, our data do not have such variables. Our finding that there was no increase in ED visits for mental health reasons under capitation is promising, but further research on patient outcomes is needed to determine whether blended capitation leads to more efficient care for patients with mental illness. Another potential issue not addressed in our paper is the role of team-based practice. Approximately half of physicians in FHOs formed interdisciplinary practice setting known as Family Health Teams by 2016, and some teams include a mental health professional (Marchildon & Hutchison, 2016). It is possible that the decline in mental health services found in switchers during regular-hours is because some of the mental health services are provided by the mental health professionals instead of the FPs. Despite these limitations, our study provides evidence on how different blended remuneration models influence mental health services. Our results suggest that blended capitation of the type implemented in Ontario may be one way to reduce service overprovision without causing patients to turn to the ED as a source of care for mental health reasons.

#### *4.2 Conclusions*

Our findings suggest that the increase in the additional payment received by blended capitation physicians for providing after-hours care may have encouraged FPs in blended capitation to provide more mental health services during after-hours, but provide fewer mental health services during regular-hours, relative to FPs in blended FFS. Despite this decrease in service provision, FPs in blended capitation model are not referring their patients to psychiatrists more often, and their patients are not using the ED for mental health reasons relative to FPs in blended FFS. This indicates that their patients are not turning to psychiatrists or the ED as a substitute for primary care, which may reflect a reduction in service overprovision rather than a reduction in needed services.

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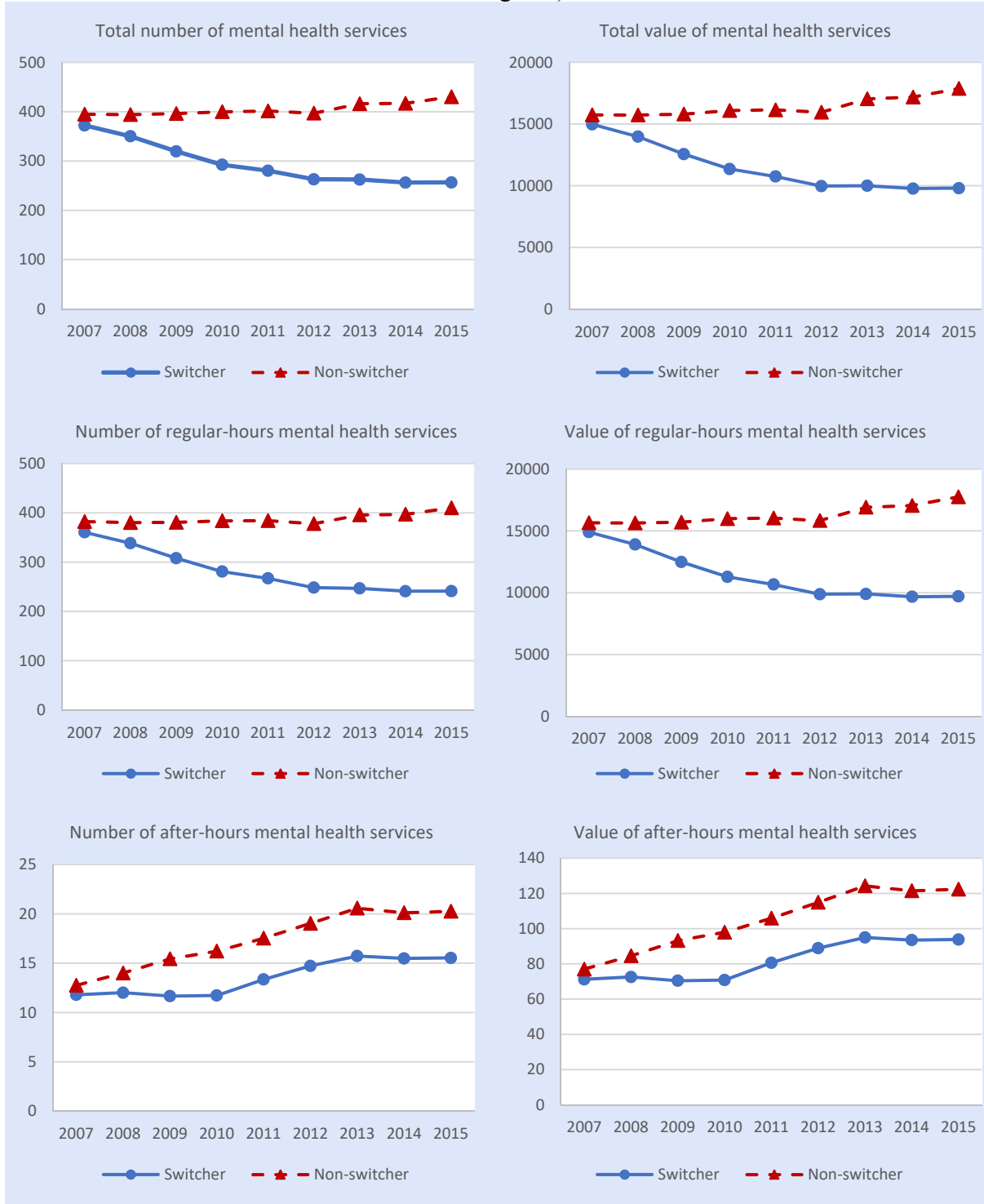
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## Figures and Tables

**Figure 1**

Average number and value of mental health services provided per 1,000 enrolled patients (PS-weighted)





**Figure 2**

Average number of ED visits for mental health reasons and number of patients who had an emergency department (ED) visit for a mental health reason per 1000 enrolled patients (PS-weighted)



**Table 1**  
Main Features of Family Health Groups and Family Health Organizations

	<b>Family Health Group</b>	<b>Family Health Organization</b>
Year introduced	2003	2006
Physician remuneration	Blended fee-for-service	Blended capitation
Formal patient enrolment	Yes	Yes
Minimum group size	3 physicians	3 physicians
Governance	Physician-led	Physician-led
Interprofessional team members	Yes, limited	Yes, limited unless part of the Family Health Team
After-hours care requirements	Yes	Yes
Preventative care codes (pap smear, mammogram, influenza vaccination, immunization, colorectal cancer screening)	Yes	Yes
Fecal occult blood testing fee	Yes	Yes
Chronic disease management (diabetes management incentive, smoking cessation counselling fee, heart failure management incentive)	Yes	Yes
Premiums for providing services to rostered patients diagnosed with serious mental illness (bipolar disorder or schizophrenia)	Yes	Yes

**Source:** Hutchison and Glazier (2013); Sweetman and Buckley (2014).

**Table 2**  
t-test and standardized bias before and after propensity score (PS) weighting

	Before PS weighting				After PS weighting				
	Switcher (FHO)	Non-switcher (FHG)	p value of t-test before PSM	% bias	Switcher (FHO)	Non-switcher (FHG)	p value of t-test after PSM	% bias	% reduction in  bias  after PSM
<b>Physician characteristics</b>									
Age	49.041	51.561	<0.001	-27.2	49.041	49.385	0.316	-3.7	86.3
Age <sup>2</sup>	2488.8	2745.8	<0.001	-27.2	2488.8	2522.6	0.328	-3.6	86.8
Sex (% female)	0.417	0.375	0.030	8.5	0.417	0.422	0.768	-1.1	86.8
Rural (%)	0.057	0.027	<0.001	15.2	0.057	0.074	0.070	-8.4	44.7
IMG (%)	0.130	0.270	<0.001	-35.4	0.130	0.125	0.686	1.3	96.4
Group size	50.390	63.967	<0.001	-16.6	50.390	54.316	0.167	-4.8	71.1
Expected gain in income (1000 \$)	110.060	67.230	<0.001	43.3	110.060	107.410	0.454	2.7	93.8
<b>Patient characteristics (averaged per FP)</b>									
Average age	46	45	<0.001	28.7	46	46	0.758	-1.1	96.1
Senior (%)	0.174	0.153	<0.001	25.5	0.174	0.174	0.915	0.4	98.4
Average ADG score	3.478	3.591	<0.001	-22.7	3.478	3.500	0.211	-4.4	80.7
Female (%)	56.655	55.205	0.010	10.1	56.655	56.906	0.643	-1.7	82.7
% in Q1 or Q2 of Deprivation Score (ONMARG)	48.708	44.320	<0.001	25.5	48.708	48.682	0.967	0.2	99.4
% in Q1 or Q2 of Ethnic Concentration Score (ONMARG)	33.728	22.237	<0.001	49.8	33.728	34.741	0.276	-4.4	91.2
% living in rural area	9.548	4.716	<0.001	28.2	9.548	10.347	0.320	-4.7	83.4
% with CMI	27.771	27.370	0.311	3.9	27.771	28.333	0.126	-5.5	-39.9
<b>Baseline services (2007/08) per 1000 enrolled patients</b>									
# of MH services	372.560	419.500	0.002	-11.7	372.560	394.890	0.074	-5.5	52.4
# enrolled patients with SMI	6.963	5.732	0.001	13.3	6.963	7.281	0.456	-3.5	74.1

ADG: Aggregated Diagnostic Groups from Johns Hopkins ACG Case-Mix System, version 10; IMG: international medical graduate; Q1: quintile 1 (lowest); Q2: quintile 2 (second lowest); ONMARG: Ontario Marginalization Index; CMI: chronic mental illness, defined as having had at least two outpatient or one inpatient visit for mental health reasons in the past two years; MH: mental health; SMI: serious mental illness, defined as psychosis or bipolar disorder

**Table 3**

Coefficient of FHO on the number and value of mental health services provided, and number of rostered patients with SMI, per 1000 enrolled patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
<b>Log of number of services</b>			
Total MH services	-0.133*** (-0.173, -0.093)	-0.151*** (-0.181, -0.121)	-0.149*** (-0.174, -0.123)
Regular-hours MH services	-0.138*** (-0.178, -0.097)	-0.164*** (-0.194, -0.135)	-0.157*** (-0.182, -0.131)
After-hours MH services	0.241*** (-0.121, -0.361)	0.342*** (0.241, 0.443)	0.186*** (0.097, 0.276)
<b>Log of value of services</b>			
Total MH services	-0.161*** (-0.213, -0.108)	-0.198*** (-0.239, -0.156)	-0.192*** (-0.224, -0.162)
Regular-hours MH services	-0.161*** (-0.214, -0.107)	-0.200*** (-0.242, -0.158)	-0.194*** (-0.225, -0.163)
After-hours MH services	0.471*** (0.297, 0.646)	0.567*** (0.416, 0.718)	0.299*** (0.162, 0.437)
<b>Log of number of patients with SMI</b>			
Number of patients with SMI	0.053 (-0.031, 0.137)	-0.085** (-0.150, -0.029)	-0.041 (-0.104, 0.021)

Observations = 23,886; Physicians = 2,654

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects; MH: mental health. 95% confidence intervals based on robust standard errors, adjusted for 2654 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

**Table 4**

Coefficient of FHO on ED visits for mental health reasons: total visits and number of patients per 1000 enrolled patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
<b>Log of number of visits</b>			
All ED visits	-0.0574** (-0.094, -0.021)	-0.078*** (-0.108, -0.048)	-0.045* (-0.086, -0.007)
Regular-hours ED visits	-0.065*** (-0.099, -0.030)	-0.061*** (-0.095, -0.027)	-0.067** (-0.112, -0.022)
After-hours ED visits	-0.055*** (-0.091, -0.019)	-0.072*** (-0.106, -0.038)	-0.009 (-0.053, 0.036)
<b>Log of number of patients</b>			
All ED visits	-0.033* (-0.062, -0.004)	-0.041** (-0.066, -0.017)	-0.022 (-0.054, 0.011)
Regular-hours ED visits	-0.039** (-0.068, -0.011)	-0.020 (-0.050, 0.011)	-0.037^ (-0.076, 0.003)
After-hours ED visits	-0.034* (-0.062, -0.007)	-0.039** (-0.068, -0.010)	0.012 (-0.028, 0.052)

Observations = 23,886; Physicians = 2,654

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

Tables present IRR and 95% confidence intervals.

All regressions include full set of control variables defined in Methods section.

## Appendix A0

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
<b>Title and abstract</b>	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	0	
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	0	
<b>Introduction</b>				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	1-3	
Objectives	3	State specific objectives, including any prespecified hypotheses	3	
<b>Methods</b>				
Study design	4	Present key elements of study design early in the paper	4	
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-7	
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5	
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed	4	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5-7, Appendix A	
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5-7	
Bias	9	Describe any efforts to address potential sources of bias	6-7	
Study size	10	Explain how the study size was arrived at	4-5	

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-7
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6-7
		(b) Describe any methods used to examine subgroups and interactions	7
		(c) Explain how missing data were addressed	4
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed	N/A
		(e) Describe any sensitivity analyses	7
<b>Results</b>			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	N/A
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8-9, 22
		(b) Indicate number of participants with missing data for each variable of interest	N/A
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	22
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time	8-9
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9-11, 24-25
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A

Continued on next page

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	11, Appendices A-C
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	12-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14-15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	15
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	6, Acknowledgement

\*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).

## Declarations

This manuscript follows the guidelines set out in the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies.



## Appendix A

### Billing and Diagnosis Codes

Table A1: Billing and diagnosis codes used to capture mental health services in primary care

The OHIP database was used to capture primary care service provision. Services provided by FPs were included if they fell into either of the following categories:

- Any of the listed A feecodes in combination with any of the listed diagnostic codes, OR
- Any of the listed K feecodes, regardless of diagnosis code.

Fee codes	Description
A001	Minor Assess. -F.P./G.P.
A003	Gen. Assess. -F.P./G.P.
A004	Gen.Re-Assess-F.P./G.P.
A007	Intermed.Assess/Well Baby Care-F.P./G.P./Paed.
A008	Mini Assessment-F.P./G.P.
A888	Partial Assessment Em.Dept Equivalent
A901	Individual Care per 1/2 hr
A005	Consultation -F.P./G.P.
A006	Re-consultation-F.P./G.P.
A905	General/family practice-limited consultation
A957	Focused practice assessment - addiction medicine
K005	Individual care per 1/2 hr
K007	Ind.Psychotherapy per half hour - GP
K623	Cert.mental.ill.appl.psych.assessment.history exam.form 1

Diagnostic code	Description
295	Schizophrenia
296	Manic depressive psychosis, involuntional melancholia
297	Paranoid states
298	Other psychoses
300	Anxiety neurosis, hysteria, neurasthenia, obsessive compulsive neurosis, reactive depression
301	Personality disorders (e.g., paranoid personality, schizoid personality, obsessive compulsive personality)
302	Sexual deviations
306	Psychosomatic disturbances

309	Adjustment reaction
311	Depressive or other non-psychotic disorders, not elsewhere classified
303	Alcoholism
304	Drug dependence, drug addiction
897	Economic problems
898	Marital difficulties
899	Parent-child problems (e.g., child-abuse, battered child, child neglect)
900	Problems with aged parents or in-laws
901	Family disruption, divorce
902	Educational problems
904	Social maladjustment
905	Occupational problems, unemployment, difficulty at work
906	Legal problems, litigation, imprisonment
909	Other problems of social adjustment

Table A2: Diagnosis codes used to capture emergency department visits for mental health reasons

The NACRS database was used to capture emergency department usage. A visit was included if:

- DX10CODE1 = F04 to F69, or F99, or
- X or Y codes in DX10CODE2 to DX10CODE10, and DX10CODE1 is not between F04 to F99 (captures self-harm visits)

Any codes ending with x indicate that all codes that begin with that prefix should be included; e.g. F1x includes F10, F100, F101, etc. up until F199. Visits with suspect diagnoses were included. Visits were excluded if they were scheduled visits or if they were transfers from another ED.

<b>DX10CODE1</b>	<b>Description</b>
F04x	Organic amnesic syndrome, not induced by alcohol and other psychoactive substances
F05x	Delirium, not induced by alcohol and other psychoactive substances
F06x	Other mental disorders due to brain damage and dysfunction and to physical disease
F07x	Personality and behavioural disorders due to brain disease, damage and dysfunction
F09x	Unspecified organic or symptomatic mental disorder
F1x	Mental and behavioural disorders due to use of substances
F2x	Schizophrenia, schizotypal disorder, psychotic disorders, schizoaffective disorders, other nonorganic psychotic disorders
F3x	Mania, bipolar, depressive disorders, other mood disorders
F4x	Anxiety disorders, obsessive-compulsive disorder, stress/adjustment disorders, dissociative disorders, somatoform disorders
F5x	Eating disorders, nonorganic sleep disorders, sexual dysfunctions, disorders associated with the puerperium, factors associated with other disorders classified elsewhere, abuse of non-dependence-producing substances
F6x	Personality disorders
F99	Mental disorder, not otherwise specified

<b>DX10CODE2 to DX10CODE10</b>	<b>Description</b>
X6x	Intentional self-poisoning
X7x	Intentional self-harm
X80	Intentional self-harm by jumping from a high place
X81	Intentional self-harm by jumping or lying before moving object
X82	Intentional self-harm by crashing of motor vehicle

X83	Intentional self-harm by other specified means
X84	Intentional self-harm by unspecified means
Y1x	Poisoning
Y28	Contact with sharp object, undetermined intent

## Unweighted, PS-weighted, and EB-weighted detailed results

Table A3a: Log of total number of mental health services (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.162*** (-0.199, -0.126)	-0.132*** (-0.157, -0.108)	-0.141*** (-0.166, -0.117)
Year	0.008*** (0.004, 0.012)	0.037*** (0.019, 0.054)	
Age	0.003 (-0.012, 0.018)		
Age <sup>2</sup>	-0.0001 (-0.000, 0.000)	-0.000*** (-0.000, -0.000)	0.000 (-0.001, 0.001)
Sex (Female)	0.120** (0.048, 0.193)		
Rurality	-0.119^ (-0.243, 0.005)	0.011 (-0.067, 0.089)	0.094 (-0.075, 0.263)
IMG	-0.179*** (-0.230, -0.129)		
Group size	0.0001 (-0.0005, 0.0001)	0.0003 (-0.0002, 0.0002)	0.0001 (-0.0003, 0.0001)
Avg. patient age	0.011 (-0.005, 0.027)	-0.005 (-0.021, 0.011)	-0.007 (-0.030, 0.016)
Prop. of patients >= 65	-0.880* (-1.740, -0.021)	0.256 (-0.543, 1.054)	1.180^ (-0.078, 2.439)
Avg. ADG score	0.075** (0.028, 0.122)	0.257*** (0.191, 0.322)	0.258*** (0.205, 0.312)
Prop. of female patients	-0.007*** (-0.009, -0.004)	-0.008* (-0.015, -0.000)	-0.010* (-0.019, -0.000)
Prop. in Q1 or Q2 on Deprivation Score	0.003*** (0.002, 0.004)	0.002 (-0.001, 0.006)	0.001 (-0.004, 0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	-0.002* (-0.004, -0.000)	-0.002* (-0.004, -0.000)
Prop. of rural patients	0.002^ (-0.000, 0.004)	0.005* (0.000, 0.010)	0.005 (-0.001, 0.011)
Prop. of patients with chronic mental illness	0.058*** (0.056, 0.061)	0.040*** (0.036, 0.044)	0.036*** (0.033, 0.039)
Constant	-12.905** (-20.683, -5.127)	-68.580*** (-103.408, -33.753)	
R <sup>2</sup>	0.617	0.352	0.218
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A3b: Log of total number of mental health services (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.133*** (-0.173, -0.093)	-0.151*** (-0.181, -0.121)	-0.149*** (-0.174, -0.123)
Year	0.012*** (0.008, 0.016)	0.052*** (0.031, 0.074)	
Age	0.017* (0.001, 0.034)		
Age <sup>2</sup>	-0.0002* (-0.0004, -0.00004)	-0.0004*** (-0.001, -0.0002)	-0.001 (-0.002, 0.000)
Sex (Female)	0.102** (0.027, 0.177)		
Rurality	-0.098 (-0.241, 0.045)	0.036 (-0.058, 0.131)	0.108 (-0.069, 0.285)
IMG	-0.163*** (-0.218, -0.108)		
Group size	0.00009 (-0.0004, 0.0002)	0.00007 (-0.0003, 0.0001)	0.00006 (-0.0003, 0.0001)
Avg. patient age	0.003 (-0.012, 0.018)	-0.005 (-0.021, 0.011)	-0.011 (-0.034, 0.012)
Prop. of patients >= 65	-0.69 (-1.563, 0.183)	0.036 (-0.882, 0.953)	1.180^ (-0.160, 2.519)
Avg. ADG score	0.122*** (0.068, 0.177)	0.291*** (0.192, 0.390)	0.262*** (0.196, 0.329)
Prop. of female patients	-0.006*** (-0.009, -0.003)	-0.005 (-0.012, 0.002)	-0.003 (-0.013, 0.008)
Prop. in Q1 or Q2 on Deprivation Score	0.003*** (0.002, 0.004)	0.003^ (-0.000, 0.007)	0.0008 (-0.004, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	-0.002* (-0.003, -0.000)	-0.002* (-0.003, -0.000)
Prop. of rural patients	0.001 (-0.001, 0.003)	0.002 (-0.005, 0.008)	0.002 (-0.005, 0.009)
Prop. of patients with chronic mental illness	0.055*** (0.052, 0.058)	0.038*** (0.034, 0.042)	0.034*** (0.031, 0.038)
Constant	-19.949*** (-27.871, -12.027)	-99.836*** (-142.963, -56.709)	
R <sup>2</sup>	0.619	0.348	0.212
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A3c: Log of total number of mental health services (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.141*** (-0.181, -0.102)	-0.147*** (-0.174, -0.120)	-0.143*** (-0.169, -0.118)
Year	0.011*** (0.007, 0.015)	0.052*** (0.032, 0.072)	
Age	0.011 (-0.007, 0.030)		
Age <sup>2</sup>	0.0001 (-0.0003, 0.00003)	-0.0004*** (-0.001, -0.0002)	0.0003 (-0.001, 0.001)
Sex (Female)	0.098* (0.016, 0.181)		
Rurality	-0.200^ (-0.437, 0.036)	0.017 (-0.061, 0.096)	0.104 (-0.071, 0.280)
IMG	-0.153*** (-0.207, -0.100)		
Group size	0.0001 (-0.0004, 0.0002)	0.0001 (-0.0003, 0.0001)	0.00009 (-0.0003, 0.0001)
Avg. patient age	0.004 (-0.013, 0.021)	-0.007 (-0.024, 0.010)	-0.007 (-0.031, 0.016)
Prop. of patients >= 65	-0.785 (-1.810, 0.239)	0.125 (-0.712, 0.961)	0.883 (-0.419, 2.185)
Avg. ADG score	0.132*** (0.078, 0.186)	0.304*** (0.233, 0.376)	0.292*** (0.236, 0.348)
Prop. of female patients	-0.006*** (-0.009, -0.003)	-0.006^ (-0.013, 0.001)	-0.004 (-0.015, 0.007)
Prop. in Q1 or Q2 on Deprivation Score	0.003*** (0.002, 0.004)	0.003 (-0.001, 0.006)	-0.001 (-0.005, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** (0.002, 0.005)	-0.001 (-0.003, 0.000)	-0.001^ (-0.003, 0.000)
Prop. of rural patients	0.003 (-0.001, 0.006)	0.004^ (-0.000, 0.009)	0.003 (-0.004, 0.010)
Prop. of patients with chronic mental illness	0.052*** (0.050, 0.055)	0.037*** (0.033, 0.041)	0.034*** (0.030, 0.038)
Constant	-18.611*** (-26.908, -10.314)	-99.271*** (-138.436, -60.107)	
R <sup>2</sup>	0.607	0.358	0.223
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A4a: Log of number of regular-hours mental health services (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.167*** (-0.204, -0.130)	-0.145*** (-0.170, -0.121)	-0.151*** (-0.175, -0.127)
Year	0.004* (0.000, 0.008)	0.034*** (0.017, 0.052)	
Age	0.003 (-0.012, 0.018)		
Age <sup>2</sup>	-0.0001 (-0.0002, 0.0001)	-0.0003*** (-0.0005, -0.0002)	0.0003 (-0.001, 0.001)
Sex (Female)	0.133*** (0.060, 0.206)		
Rurality	-0.138* (-0.262, -0.015)	0.021 (-0.050, 0.092)	0.094 (-0.068, 0.256)
IMG	-0.188*** (-0.240, -0.137)		
Group size	0.0001 (-0.0004, 0.0002)	0.00004 (-0.0002, 0.0002)	0.00004 (-0.0002, 0.0002)
Avg. patient age	0.017* (0.001, 0.033)	-0.004 (-0.020, 0.012)	-0.005 (-0.028, 0.018)
Prop. of patients >= 65	-1.022* (-1.897, -0.147)	0.230 (-0.571, 1.031)	1.105^ (-0.159, 2.368)
Avg. ADG score	0.051* (0.004, 0.099)	0.252*** (0.187, 0.318)	0.257*** (0.203, 0.311)
Prop. of female patients	-0.006*** (-0.009, -0.003)	-0.007^ (-0.014, 0.000)	-0.010^ (-0.019, 0.000)
Prop. in Q1 or Q2 on Deprivation Score	0.003*** (0.002, 0.004)	0.002 (-0.002, 0.005)	0.001 (-0.004, 0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	-0.002* (-0.003, -0.000)	-0.002^ (-0.003, 0.000)
Prop. of rural patients	0.002* (0.000, 0.004)	0.005* (0.000, 0.010)	0.005 (-0.001, 0.011)
Prop. of patients with chronic mental illness	0.059*** (0.056, 0.061)	0.040*** (0.037, 0.044)	0.036*** (0.033, 0.040)
Constant	-4.524 (-12.392, 3.343)	-64.296*** (-98.873, -29.718)	
R <sup>2</sup>	0.620	0.372	0.225
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.



Table A4b: Log of number of regular-hours mental health services (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.138*** (-0.178, -0.097)	-0.164*** (-0.194, -0.135)	-0.157*** (-0.182, -0.131)
Year	0.008*** (0.004, 0.012)	0.051*** (0.030, 0.073)	
Age	0.020* (0.003, 0.036)		
Age <sup>2</sup>	-0.0002** (-0.0004, -0.0001)	-0.0004*** (-0.001, -0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.119** (0.044, 0.195)		
Rurality	-0.122^ (-0.264, 0.020)	0.048 (-0.041, 0.136)	0.108 (-0.061, 0.277)
IMG	-0.174*** (-0.232, -0.117)		
Group size	0.00002 (-0.0003, 0.0003)	-1.67e-06 (-0.0002, 0.0002)	-1.68e-06 (-0.0002, 0.0002)
Avg. patient age	0.009 (-0.006, 0.024)	-0.003 (-0.020, 0.013)	-0.007 (-0.030, 0.016)
Prop. of patients >= 65	-0.846^ (-1.726, 0.034)	-0.005 (-0.925, 0.915)	1.051 (-0.282, 2.384)
Avg. ADG score	0.105*** (0.051, 0.160)	0.287*** (0.188, 0.385)	0.261*** (0.196, 0.327)
Prop. of female patients	-0.006*** (-0.009, -0.003)	-0.004 (-0.011, 0.003)	-0.003 (-0.013, 0.008)
Prop. in Q1 or Q2 on Deprivation Score	0.003*** (0.002, 0.004)	0.003^ (-0.001, 0.006)	0.0002 (-0.004, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	-0.002* (-0.003, -0.000)	-0.002^ (-0.003, 0.000)
Prop. of rural patients	0.001 (-0.001, 0.004)	0.002 (-0.005, 0.008)	0.002 (-0.005, 0.009)
Prop. of patients with chronic mental illness	0.055*** (0.053, 0.058)	0.038*** (0.035, 0.042)	0.035*** (0.031, 0.038)
Constant	-12.988** (-21.010, -4.966)	-97.974*** (-140.802, -55.147)	
R <sup>2</sup>	0.621	0.366	0.220
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A4c: Log of number of regular-hours mental health services (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.145*** (-0.184, -0.106)	-0.160*** (-0.186, -0.133)	-0.151*** (-0.177, -0.126)
Year	0.007*** (0.003, 0.011)	0.050*** (0.031, 0.069)	
Age	0.013 (-0.005, 0.031)		
Age <sup>2</sup>	-0.0002 <sup>^</sup> (-0.0003, 0.00001)	-0.0004*** (-0.001, -0.0002)	0.0002 (-0.001, 0.001)
Sex (Female)	0.112** (0.029, 0.194)		
Rurality	-0.213 <sup>^</sup> (-0.442, 0.016)	0.027 (-0.044, 0.098)	0.106 (-0.063, 0.274)
IMG	-0.162*** (-0.215, -0.108)		
Group size	0.0001 (-0.0004, 0.0002)	6.22e-06 (-0.0002, 0.0002)	0.00003 (-0.0002, 0.0002)
Avg. patient age	0.009 (-0.008, 0.026)	-0.005 (-0.022, 0.011)	-0.005 (-0.030, 0.019)
Prop. of patients >= 65	-0.920 <sup>^</sup> (-1.943, 0.104)	0.073 (-0.757, 0.902)	0.830 (-0.515, 2.175)
Avg. ADG score	0.114*** (0.061, 0.168)	0.298*** (0.228, 0.369)	0.289*** (0.233, 0.345)
Prop. of female patients	-0.006*** (-0.009, -0.003)	-0.006 (-0.013, 0.001)	-0.004 (-0.015, 0.007)
Prop. in Q1 or Q2 on Deprivation Score	0.003*** (0.001, 0.004)	0.003 (-0.001, 0.006)	0.0004 (-0.005, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	-0.001 (-0.003, 0.000)	-0.001 (-0.003, 0.001)
Prop. of rural patients	0.003 (-0.001, 0.006)	0.004* (0.000, 0.009)	0.003 (-0.004, 0.009)
Prop. of patients with chronic mental illness	0.053*** (0.050, 0.056)	0.038*** (0.034, 0.042)	0.034*** (0.030, 0.038)
Constant	-11.346** (-19.713, -2.978)	-95.705*** (-133.107, -58.303)	
R <sup>2</sup>	0.610	0.376	0.230
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A5a: Log of number of after-hours mental health services (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.230*** (0.124, 0.335)	0.369*** (0.278, 0.461)	0.223*** (0.138, 0.308)
Year	0.084*** (0.071, 0.098)	0.133*** (0.078, 0.189)	
Age	0.026 (-0.020, 0.071)		
Age <sup>2</sup>	0.0003 (-0.001, 0.0002)	-0.001** (-0.001, -0.000)	-0.003^ (-0.006, 0.000)
Sex (Female)	-0.094 (-0.305, 0.118)		
Rurality	0.364 (-0.082, 0.810)	-0.339 (-0.770, 0.093)	-0.088 (-0.569, 0.392)
IMG	0.107 (-0.031, 0.245)		
Group size	-0.001* (-0.002, -0.000)	-0.001** (-0.002, -0.000)	-0.001*** (-0.002, -0.001)
Avg. patient age	-0.083*** (-0.127, -0.039)	-0.063* (-0.111, -0.014)	-0.029 (-0.090, 0.032)
Prop. of patients >= 65	1.526 (-0.714, 3.766)	2.299^ (-0.189, 4.786)	0.769 (-2.241, 3.779)
Avg. ADG score	0.468*** (0.338, 0.598)	0.326*** (0.192, 0.459)	0.150* (0.029, 0.272)
Prop. of female patients	-0.014*** (-0.022, -0.007)	-0.022** (-0.039, -0.005)	-0.008 (-0.027, 0.012)
Prop. in Q1 or Q2 on Deprivation Score	0.006*** (0.002, 0.009)	0.008 (-0.003, 0.019)	0.003 (-0.010, 0.015)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.001 (-0.002, 0.004)	-0.002 (-0.007, 0.003)	-0.007* (-0.012, -0.001)
Prop. of rural patients	-0.012*** (-0.018, -0.006)	0.002 (-0.022, 0.025)	0.003 (-0.027, 0.033)
Prop. of patients with chronic mental illness	0.023*** (0.017, 0.029)	0.012** (0.003, 0.021)	0.015** (0.005, 0.025)
Constant	-167.0*** (-193.3, -140.7)	-262.4*** (-372.8, -152.0)	
R <sup>2</sup>	0.089	0.052	0.013
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A5b: Log of number of after-hours mental health services (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.241*** (0.121, 0.361)	0.342*** (0.241, 0.443)	0.186*** (0.097, 0.276)
Year	0.083*** (0.068, 0.099)	0.123*** (0.053, 0.193)	
Age	0.005 (-0.048, 0.057)		
Age <sup>2</sup>	-0.00002 (-0.0005, 0.0005)	-0.001^ (-0.001, 0.000)	-0.005** (-0.009, -0.002)
Sex (Female)	-0.279* (-0.517, -0.041)		
Rurality	0.328 (-0.216, 0.872)	-0.385^ (-0.829, 0.059)	-0.114 (-0.587, 0.358)
IMG	0.176* (0.025, 0.327)		
Group size	-0.002** (-0.003, -0.001)	-0.001** (-0.002, -0.000)	-0.002*** (-0.003, -0.001)
Avg. patient age	-0.101*** (-0.147, -0.055)	-0.074* (-0.133, -0.014)	-0.029 (-0.103, 0.046)
Prop. of patients >= 65	2.463* (0.103, 4.823)	2.549^ (-0.430, 5.528)	0.145 (-3.484, 3.774)
Avg. ADG score	0.449*** (0.296, 0.603)	0.364*** (0.209, 0.518)	0.195** (0.048, 0.342)
Prop. of female patients	-0.010* (-0.018, -0.002)	-0.023^ (-0.046, 0.000)	-0.006 (-0.029, 0.017)
Prop. in Q1 or Q2 on Deprivation Score	0.005** (0.002, 0.009)	0.0003 (-0.014, 0.014)	-0.004 (-0.019, 0.012)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.001 (-0.003, 0.005)	0.002 (-0.004, 0.008)	-0.007* (-0.013, -0.001)
Prop. of rural patients	-0.013*** (-0.021, -0.006)	0.007 (-0.024, 0.038)	0.009 (-0.023, 0.040)
Prop. of patients with chronic mental illness	0.023*** (0.016, 0.030)	0.013* (0.002, 0.024)	0.013* (0.001, 0.024)
Constant	-163.709*** (-194.835, -132.584)	-242.378*** (-380.869, -103.888)	
R <sup>2</sup>	0.100	0.058	0.015
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A5c: Log of number of after-hours mental health services (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.184* (0.034, 0.334)	0.327*** (0.212, 0.443)	0.185*** (0.088, 0.282)
Year	0.087*** (0.068, 0.107)	0.136** (0.043, 0.229)	
Age	-0.006 (-0.076, 0.064)		
Age <sup>2</sup>	0.0001 (-0.001, 0.001)	-0.001 (-0.001, 0.000)	-0.005* (-0.009, -0.001)
Sex (Female)	-0.263^ (-0.545, 0.018)		
Rurality	0.019 (-0.883, 0.921)	-0.359 (-0.811, 0.092)	-0.146 (-0.603, 0.311)
IMG	0.143 (-0.031, 0.316)		
Group size	-0.001* (-0.003, -0.000)	-0.001* (-0.002, -0.000)	-0.002*** (-0.003, -0.001)
Avg. patient age	-0.086** (-0.143, -0.028)	-0.084* (-0.157, -0.012)	-0.007 (-0.091, 0.077)
Prop. of patients >= 65	1.731 (-1.103, 4.566)	3.148^ (-0.413, 6.709)	-0.880 (-5.245, 3.485)
Avg. ADG score	0.427*** (0.261, 0.594)	0.368*** (0.184, 0.551)	0.227** (0.078, 0.377)
Prop. of female patients	-0.010^ (-0.020, 0.000)	-0.007 (-0.034, 0.020)	0.000 (-0.025, 0.025)
Prop. in Q1 or Q2 on Deprivation Score	0.008*** (0.004, 0.013)	-0.005 (-0.022, 0.012)	0.000 (-0.017, 0.017)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.0004 (-0.005, 0.005)	0.006^ (-0.001, 0.012)	-0.007* (-0.014, -0.000)
Prop. of rural patients	-0.006 (-0.018, 0.007)	0.003 (-0.031, 0.038)	0.017 (-0.021, 0.054)
Prop. of patients with chronic mental illness	0.025*** (0.016, 0.033)	0.013* (0.001, 0.025)	0.013* (0.001, 0.024)
Constant	-171.858*** (-211.259, -132.457)	-268.167** (-451.679, -84.655)	
R <sup>2</sup>	0.085	0.059	0.016
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A6a: Log of total value of mental health services (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.198*** (-0.243, -0.153)	-0.181*** (-0.211, -0.150)	-0.186*** (-0.215, -0.157)
Year	0.011*** (0.006, 0.015)	0.043*** (0.022, 0.065)	
Age	0.008 (-0.010, 0.026)		
Age <sup>2</sup>	0.0001 (-0.0003, 0.00004)	-0.0003*** (-0.001, -0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.237*** (0.150, 0.323)		
Rurality	-0.235** (-0.397, -0.073)	0.002 (-0.091, 0.094)	0.133 (-0.028, 0.294)
IMG	-0.241*** (-0.301, -0.181)		
Group size	0.0001 (-0.0005, 0.0003)	0.00003 (-0.0002, 0.0003)	0.00002 (-0.0002, 0.0003)
Avg. patient age	0.030** (0.011, 0.049)	0.004 (-0.015, 0.024)	0.001 (-0.029, 0.032)
Prop. of patients >= 65	-1.515** (-2.556, -0.473)	0.025 (-1.061, 1.111)	1.611 (-0.364, 3.587)
Avg. ADG score	0.063* (0.004, 0.122)	0.282*** (0.184, 0.381)	0.281*** (0.215, 0.348)
Prop. of female patients	-0.006*** (-0.010, -0.003)	-0.007 (-0.016, 0.002)	-0.008 (-0.020, 0.005)
Prop. in Q1 or Q2 on Deprivation Score	0.006*** (0.004, 0.007)	0.002 (-0.002, 0.007)	-0.001 (-0.007, 0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** (0.002, 0.005)	-0.002^ (-0.004, 0.000)	-0.002 (-0.004, 0.000)
Prop. of rural patients	0.004*** (0.002, 0.007)	0.006* (0.000, 0.012)	0.005 (-0.002, 0.012)
Prop. of patients with chronic mental illness	0.063*** (0.060, 0.066)	0.043*** (0.039, 0.047)	0.038*** (0.034, 0.041)
Constant	-15.148** (-24.383, -5.913)	-78.904*** (-122.414, -35.394)	
R <sup>2</sup>	0.581	0.319	0.202
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A6b: Log of total value of mental health services (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.161*** (-0.213, -0.108)	-0.198*** (-0.239, -0.156)	-0.193*** (-0.224, -0.162)
Year	0.015*** (0.010, 0.019)	0.062*** (0.031, 0.093)	
Age	0.024* (0.003, 0.046)		
Age <sup>2</sup>	-0.0003** (-0.001, -0.0001)	-0.0005*** (-0.001, -0.0002)	-0.001 (-0.003, 0.001)
Sex (Female)	0.210*** (0.120, 0.301)		
Rurality	-0.267** (-0.437, -0.096)	0.029 (-0.073, 0.130)	0.151^ (-0.019, 0.320)
IMG	-0.231*** (-0.297, -0.166)		
Group size	0.00008 (-0.0003, 0.0004)	0.00004 (-0.0003, 0.0002)	0.00005 (-0.0002, 0.0003)
Avg. patient age	0.021* (0.002, 0.039)	0.004 (-0.015, 0.024)	-0.001 (-0.030, 0.027)
Prop. of patients >= 65	-1.267* (-2.349, -0.185)	-0.292 (-1.578, 0.993)	1.553 (-0.393, 3.498)
Avg. ADG score	0.113** (0.039, 0.187)	0.335*** (0.170, 0.499)	0.286*** (0.202, 0.369)
Prop. of female patients	-0.006*** (-0.009, -0.002)	-0.004 (-0.013, 0.005)	0.001 (-0.014, 0.015)
Prop. in Q1 or Q2 on Deprivation Score	0.006*** (0.004, 0.007)	0.004^ (-0.000, 0.008)	-0.001 (-0.007, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.002, 0.005)	-0.001^ (-0.003, 0.000)	-0.002 (-0.003, 0.000)
Prop. of rural patients	0.004*** (0.002, 0.007)	0.003 (-0.005, 0.011)	0.002 (-0.007, 0.011)
Prop. of patients with chronic mental illness	0.059*** (0.056, 0.062)	0.040*** (0.036, 0.045)	0.036*** (0.032, 0.040)
Constant	-23.283*** (-32.864, -13.702)	-116.304*** (-177.951, -54.658)	
R <sup>2</sup>	0.575	0.309	0.196
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A6c: Log of total value of mental health services (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.169*** (-0.218, -0.119)	-0.193*** (-0.227, -0.160)	-0.187*** (-0.217, -0.156)
Year	0.014*** (0.009, 0.019)	0.060*** (0.035, 0.085)	
Age	0.024* (0.002, 0.045)		
Age <sup>2</sup>	-0.0003** (-0.0005, -0.00008)	-0.0005*** (-0.001, -0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.202*** (0.103, 0.301)		
Rurality	-0.350** (-0.609, -0.090)	0.007 (-0.080, 0.095)	0.143^ (-0.024, 0.310)
IMG	-0.215*** (-0.277, -0.153)		
Group size	0.00004 (-0.0004, 0.0004)	0.00001 (-0.0002, 0.0003)	0.00001 (-0.0003, 0.0003)
Avg. patient age	0.021^ (-0.002, 0.043)	0.003 (-0.017, 0.022)	0.0001 (-0.031, 0.031)
Prop. of patients >= 65	-1.334* (-2.622, -0.046)	-0.161 (-1.248, 0.927)	1.328 (-0.550, 3.205)
Avg. ADG score	0.117*** (0.048, 0.186)	0.337*** (0.227, 0.447)	0.317*** (0.249, 0.384)
Prop. of female patients	-0.006*** (-0.010, -0.003)	-0.005 (-0.014, 0.003)	-0.002 (-0.015, 0.012)
Prop. in Q1 or Q2 on Deprivation Score	0.005*** (0.004, 0.007)	0.003 (-0.001, 0.007)	-0.002 (-0.008, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** (0.002, 0.005)	-0.001 (-0.003, 0.001)	-0.001 (-0.003, 0.001)
Prop. of rural patients	0.005** (0.002, 0.008)	0.005* (0.000, 0.011)	0.003 (-0.004, 0.010)
Prop. of patients with chronic mental illness	0.056*** (0.052, 0.060)	0.040*** (0.036, 0.044)	0.036*** (0.032, 0.040)
Constant	-21.536*** (-31.513, -11.559)	-112.325*** (-161.675, -62.976)	
R <sup>2</sup>	0.565	0.325	0.208
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.



Table A7a: Log of value of regular-hours mental health services (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.199*** (-0.244, -0.153)	-0.183*** (-0.214, -0.153)	-0.187*** (-0.217, -0.158)
Year	0.010*** (0.005, 0.015)	0.043*** (0.021, 0.065)	
Age	0.008 (-0.010, 0.027)		
Age <sup>2</sup>	0.0001 (-0.0003, 0.00003)	-0.0003*** (-0.001, -0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.241*** (0.154, 0.328)		
Rurality	-0.242** (-0.405, -0.079)	0.003 (-0.090, 0.096)	0.133 (-0.027, 0.293)
IMG	-0.244*** (-0.306, -0.183)		
Group size	0.0001 (-0.0005, 0.0003)	0.00004 (-0.0002, 0.0003)	0.00003 (-0.0002, 0.0003)
Avg. patient age	0.031** (0.012, 0.051)	0.005 (-0.015, 0.025)	0.002 (-0.028, 0.033)
Prop. of patients >= 65	-1.547** (-2.595, -0.498)	0.024 (-1.063, 1.112)	1.588 (-0.390, 3.565)
Avg. ADG score	0.059* (0.000, 0.118)	0.282*** (0.183, 0.380)	0.281*** (0.214, 0.348)
Prop. of female patients	-0.006*** (-0.010, -0.003)	-0.007 (-0.016, 0.002)	-0.008 (-0.020, 0.005)
Prop. in Q1 or Q2 on Deprivation Score	0.006*** (0.004, 0.007)	0.002 (-0.002, 0.006)	-0.001 (-0.007, 0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** (0.002, 0.005)	-0.002 <sup>^</sup> (-0.004, 0.000)	-0.002 (-0.004, 0.000)
Prop. of rural patients	0.005*** (0.002, 0.007)	0.006* (0.000, 0.012)	0.005 (-0.002, 0.012)
Prop. of patients with chronic mental illness	0.063*** (0.060, 0.066)	0.043*** (0.039, 0.047)	0.038*** (0.034, 0.041)
Constant	-13.910** (-23.281, -4.538)	-78.012*** (-121.628, -34.396)	
R <sup>2</sup>	0.578	0.318	0.200
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A7b: Log of value of regular-hours mental health services (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.161*** (-0.214, -0.107)	-0.200*** (-0.242, -0.159)	-0.194*** (-0.225, -0.163)
Year	0.014*** (0.009, 0.019)	0.062*** (0.031, 0.092)	
Age	0.025* (0.003, 0.048)		
Age <sup>2</sup>	-0.0003** (-0.001, -0.0001)	-0.0005*** (-0.001, -0.0002)	-0.001 (-0.003, 0.001)
Sex (Female)	0.215*** (0.124, 0.306)		
Rurality	-0.275** (-0.447, -0.103)	0.030 (-0.072, 0.132)	0.151 <sup>^</sup> (-0.018, 0.319)
IMG	-0.236*** (-0.306, -0.167)		
Group size	0.0001 (-0.0003, 0.0005)	0.00003 (-0.0003, 0.0003)	0.0001 (-0.0002, 0.0003)
Avg. patient age	0.022* (0.003, 0.041)	0.005 (-0.014, 0.024)	0.00001 (-0.029, 0.029)
Prop. of patients >= 65	-1.303* (-2.391, -0.215)	-0.294 (-1.581, 0.993)	1.509 (-0.442, 3.461)
Avg. ADG score	0.111** (0.036, 0.185)	0.334*** (0.170, 0.499)	0.285*** (0.201, 0.369)
Prop. of female patients	-0.006*** (-0.009, -0.002)	-0.004 (-0.013, 0.005)	0.001 (-0.014, 0.015)
Prop. in Q1 or Q2 on Deprivation Score	0.006*** (0.004, 0.007)	0.004 <sup>^</sup> (-0.000, 0.008)	-0.001 (-0.007, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.002, 0.005)	-0.001 (-0.003, 0.000)	-0.002 (-0.003, 0.000)
Prop. of rural patients	0.005*** (0.002, 0.007)	0.003 (-0.005, 0.011)	0.002 (-0.007, 0.010)
Prop. of patients with chronic mental illness	0.059*** (0.056, 0.063)	0.041*** (0.036, 0.045)	0.036*** (0.032, 0.040)
Constant	-22.327*** (-32.091, -12.562)	-115.499*** (-177.259, -53.740)	
R <sup>2</sup>	0.572	0.307	0.193
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A7c: Log of value of regular-hours mental health services (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.169*** (-0.219, -0.120)	-0.196*** (-0.230, -0.162)	-0.188*** (-0.218, -0.158)
Year	0.013*** (0.008, 0.018)	0.060*** (0.035, 0.084)	
Age	0.024* (0.003, 0.046)		
Age <sup>2</sup>	-0.0003** (-0.001, -0.00008)	-0.0005*** (-0.001, -0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.205*** (0.106, 0.305)		
Rurality	-0.355** (-0.615, -0.095)	0.009 (-0.079, 0.097)	0.144^ (-0.022, 0.310)
IMG	-0.218*** (-0.280, -0.155)		
Group size	0.00005 (-0.0004, 0.0005)	0.00002 (-0.0002, 0.0003)	0.00002 (-0.0002, 0.0003)
Avg. patient age	0.022^ (-0.001, 0.044)	0.003 (-0.017, 0.023)	0.001 (-0.031, 0.032)
Prop. of patients >= 65	-1.361* (-2.653, -0.069)	-0.166 (-1.255, 0.923)	1.306 (-0.585, 3.198)
Avg. ADG score	0.114** (0.045, 0.183)	0.336*** (0.226, 0.447)	0.317*** (0.249, 0.384)
Prop. of female patients	-0.006** (-0.010, -0.002)	-0.005 (-0.014, 0.003)	-0.002 (-0.015, 0.012)
Prop. in Q1 or Q2 on Deprivation Score	0.005*** (0.004, 0.007)	0.003 (-0.001, 0.007)	-0.002 (-0.008, 0.004)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** (0.002, 0.005)	-0.001 (-0.003, 0.001)	-0.001 (-0.003, 0.001)
Prop. of rural patients	0.005** (0.002, 0.008)	0.005* (0.000, 0.011)	0.003 (-0.004, 0.010)
Prop. of patients with chronic mental illness	0.056*** (0.053, 0.060)	0.040*** (0.036, 0.044)	0.036*** (0.032, 0.040)
Constant	-20.393*** (-30.445, -10.341)	-111.829*** (-161.019, -62.639)	
R <sup>2</sup>	0.563	0.325	0.207
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A8a: Log of value of after-hours mental health services (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.463*** (0.310, 0.616)	0.602*** (0.468, 0.737)	0.355*** (0.225, 0.485)
Year	0.119*** (0.099, 0.138)	0.216*** (0.134, 0.298)	
Age	0.045 (-0.021, 0.112)		
Age <sup>2</sup>	0.0005 (-0.001, 0.000)	-0.001*** (-0.002, -0.001)	-0.005* (-0.010, -0.001)
Sex (Female)	-0.095 (-0.400, 0.209)		
Rurality	0.625^ (-0.063, 1.314)	-0.655^ (-1.403, 0.094)	-0.177 (-0.987, 0.633)
IMG	0.178^ (-0.021, 0.377)		
Group size	-0.001* (-0.003, -0.000)	-0.002** (-0.003, -0.000)	-0.002*** (-0.003, -0.001)
Avg. patient age	-0.101** (-0.164, -0.038)	-0.079* (-0.153, -0.006)	-0.028 (-0.124, 0.067)
Prop. of patients >= 65	1.465 (-1.749, 4.679)	3.002 (-0.740, 6.744)	0.800 (-3.871, 5.470)
Avg. ADG score	0.637*** (0.451, 0.823)	0.429*** (0.232, 0.626)	0.164^ (-0.019, 0.346)
Prop. of female patients	-0.021*** (-0.032, -0.010)	-0.031* (-0.056, -0.006)	-0.008 (-0.037, 0.020)
Prop. in Q1 or Q2 on Deprivation Score	0.008*** (0.004, 0.013)	0.010 (-0.006, 0.026)	0.003 (-0.015, 0.020)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004^ (-0.001, 0.009)	-0.002 (-0.010, 0.005)	-0.009* (-0.017, -0.001)
Prop. of rural patients	-0.023*** (-0.032, -0.013)	0.003 (-0.036, 0.041)	0.000 (-0.049, 0.048)
Prop. of patients with chronic mental illness	0.026*** (0.017, 0.035)	0.012* (0.000, 0.025)	0.020** (0.006, 0.035)
Constant	-234.669*** (-273.210, -196.127)	-425.199*** (-587.113, -263.286)	
R <sup>2</sup>	0.082	0.058	0.012
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A8b: Log of value of after-hours mental health services (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.471*** (0.297, 0.646)	0.567*** (0.416, 0.718)	0.299*** (0.162, 0.437)
Year	0.119*** (0.096, 0.141)	0.194*** (0.091, 0.297)	
Age	0.019 (-0.058, 0.095)		
Age <sup>2</sup>	0.0002 (-0.001, 0.001)	-0.001* (-0.002, -0.000)	-0.009*** (-0.015, -0.004)
Sex (Female)	-0.365* (-0.715, -0.015)		
Rurality	0.446 (-0.424, 1.315)	-0.761^ (-1.548, 0.027)	-0.237 (-1.029, 0.555)
IMG	0.278* (0.058, 0.497)		
Group size	-0.002** (-0.004, -0.001)	-0.002** (-0.003, -0.001)	-0.003*** (-0.004, -0.001)
Avg. patient age	-0.128*** (-0.196, -0.061)	-0.098* (-0.186, -0.009)	-0.030 (-0.140, 0.081)
Prop. of patients >= 65	2.824 (-0.640, 6.289)	3.352 (-1.064, 7.768)	-0.233 (-5.605, 5.139)
Avg. ADG score	0.609*** (0.389, 0.828)	0.477*** (0.249, 0.705)	0.234* (0.020, 0.447)
Prop. of female patients	-0.015* (-0.027, -0.003)	-0.031^ (-0.065, 0.003)	-0.006 (-0.040, 0.028)
Prop. in Q1 or Q2 on Deprivation Score	0.008** (0.003, 0.014)	0.001 (-0.020, 0.022)	-0.004 (-0.026, 0.019)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004 (-0.001, 0.010)	0.004 (-0.005, 0.013)	-0.011* (-0.021, -0.001)
Prop. of rural patients	-0.022*** (-0.035, -0.010)	0.016 (-0.040, 0.072)	0.013 (-0.041, 0.067)
Prop. of patients with chronic mental illness	0.027*** (0.017, 0.037)	0.016* (0.000, 0.031)	0.017* (0.001, 0.034)
Constant	-233.219*** (-279.171, -187.266)	-381.445*** (-585.774, -177.115)	
R <sup>2</sup>	0.097	0.062	0.015
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A8c: Log of value of after-hours mental health services (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.400*** (0.177, 0.622)	0.550*** (0.374, 0.726)	0.305*** (0.157, 0.452)
Year	0.123*** (0.094, 0.152)	0.208** (0.073, 0.342)	
Age	0.004 (-0.101, 0.110)		
Age <sup>2</sup>	4.92e-06 (-0.001, 0.001)	-0.001 <sup>^</sup> (-0.002, 0.000)	-0.008** (-0.015, -0.002)
Sex (Female)	-0.344 (-0.763, 0.075)		
Rurality	0.112 (-1.201, 1.425)	-0.711 <sup>^</sup> (-1.496, 0.074)	-0.285 (-1.063, 0.494)
IMG	0.221 <sup>^</sup> (-0.038, 0.480)		
Group size	-0.002* (-0.004, -0.000)	-0.002* (-0.003, -0.000)	-0.003*** (-0.004, -0.001)
Avg. patient age	-0.102* (-0.186, -0.019)	-0.113* (-0.217, -0.009)	0.006 (-0.119, 0.132)
Prop. of patients >= 65	1.627 (-2.559, 5.812)	4.289 (-0.866, 9.444)	-1.967 (-8.440, 4.506)
Avg. ADG score	0.569*** (0.327, 0.811)	0.458** (0.178, 0.737)	0.257* (0.034, 0.480)
Prop. of female patients	-0.015 <sup>^</sup> (-0.030, 0.000)	-0.010 (-0.049, 0.029)	0.004 (-0.033, 0.041)
Prop. in Q1 or Q2 on Deprivation Score	0.011*** (0.005, 0.018)	-0.006 (-0.030, 0.019)	0.002 (-0.022, 0.027)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.002 (-0.006, 0.010)	0.008 <sup>^</sup> (-0.002, 0.018)	-0.011* (-0.022, -0.000)
Prop. of rural patients	-0.013 (-0.031, 0.006)	0.009 (-0.048, 0.066)	0.024 (-0.039, 0.087)
Prop. of patients with chronic mental illness	0.029*** (0.018, 0.041)	0.015 <sup>^</sup> (-0.001, 0.032)	0.017 <sup>^</sup> (-0.001, 0.035)
Constant	-243.060*** (-300.5, -185.6)	-409.610** (-676.3, -142.9)	
R <sup>2</sup>	0.079	0.062	0.015
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A9a: Log of number of patients with SMI, per 1000 patients (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.129*** (0.059, 0.199)	-0.090*** (-0.142, -0.038)	-0.043 (-0.103, 0.016)
Year	-0.010* (-0.017, -0.002)	0.033* (0.004, 0.062)	
Age	0.035* (0.007, 0.064)		
Age <sup>2</sup>	-0.0004** (-0.001, -0.0002)	-0.0003* (-0.001, -0.00005)	0.001 (-0.001, 0.003)
Sex (Female)	0.101 (-0.039, 0.242)		
Rurality	0.326^ (-0.036, 0.688)	-0.121 (-0.468, 0.226)	0.241 (-0.111, 0.593)
IMG	-0.250*** (-0.336, -0.164)		
Group size	-0.001* (-0.001, -0.000)	0.0001 (-0.0003, 0.001)	0.001** (0.000, 0.001)
Avg. patient age	0.046*** (0.019, 0.073)	0.014 (-0.013, 0.042)	0.011 (-0.030, 0.051)
Prop. of patients >= 65	-1.222^ (-2.646, 0.203)	-0.883 (-2.211, 0.445)	-0.283 (-2.376, 1.811)
Avg. ADG score	0.002 (-0.080, 0.083)	0.192*** (0.117, 0.267)	0.140*** (0.062, 0.218)
Prop. of female patients	-0.007** (-0.012, -0.002)	-0.018*** (-0.028, -0.008)	-0.016* (-0.031, -0.002)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.009, -0.005)	-0.007* (-0.013, -0.000)	-0.006 (-0.015, 0.002)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.001 (-0.001, 0.003)	0.003* (0.001, 0.006)	0.004^ (-0.000, 0.007)
Prop. of rural patients	-0.006* (-0.010, -0.001)	-0.003 (-0.021, 0.015)	-0.016 (-0.035, 0.004)
Prop. of patients with chronic mental illness	0.021*** (0.017, 0.025)	0.009*** (0.004, 0.013)	0.005^ (-0.000, 0.011)
Constant	18.347* (3.275, 33.419)	-64.315* (-121.658, -6.973)	
R <sup>2</sup>	0.089	0.018	0.008
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A9b: Log of number of patients with SMI, per 1000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.053 (-0.031, 0.137)	-0.085** (-0.140, -0.029)	-0.041 (-0.104, 0.021)
Year	-0.005 (-0.014, 0.004)	0.032^ (-0.001, 0.066)	
Age	0.045* (0.011, 0.080)		
Age <sup>2</sup>	-0.001** (-0.001, -0.000)	-0.000^ (-0.001, 0.000)	0.001 (-0.001, 0.004)
Sex (Female)	0.114 (-0.055, 0.282)		
Rurality	0.246 (-0.335, 0.827)	-0.070 (-0.431, 0.292)	0.264 (-0.095, 0.622)
IMG	-0.213*** (-0.317, -0.108)		
Group size	-0.001* (-0.001, -0.000)	0.0001 (-0.0004, 0.001)	0.001*** (0.000, 0.002)
Avg. patient age	0.052** (0.016, 0.089)	0.017 (-0.015, 0.049)	0.013 (-0.042, 0.068)
Prop. of patients >= 65	-1.583 (-3.482, 0.315)	-1.099 (-2.586, 0.389)	-0.874 (-3.550, 1.802)
Avg. ADG score	0.041 (-0.064, 0.147)	0.198*** (0.110, 0.286)	0.158*** (0.066, 0.250)
Prop. of female patients	-0.008** (-0.014, -0.002)	-0.013* (-0.025, -0.001)	-0.013 (-0.032, 0.006)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.009, -0.004)	-0.012* (-0.022, -0.002)	-0.011^ (-0.024, 0.001)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.002 (-0.001, 0.005)	0.004* (0.001, 0.008)	0.005* (0.001, 0.009)
Prop. of rural patients	-0.004 (-0.011, 0.003)	-0.011 (-0.031, 0.009)	-0.021* (-0.042, -0.001)
Prop. of patients with chronic mental illness	0.024*** (0.018, 0.030)	0.008** (0.003, 0.014)	0.004 (-0.002, 0.010)
Constant	8.248 (-9.752, 26.247)	-63.076^ (-129.818, 3.667)	
R <sup>2</sup>	0.090	0.018	0.009
# of physicians	2654	2654	2654
# of observations	23886	23886	23886



Table A9c: Log of number of patients with SMI, per 1000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.028 (-0.075, 0.131)	-0.070* (-0.128, -0.013)	-0.040 (-0.105, 0.025)
Year	-0.011* (-0.020, -0.001)	0.024 (-0.013, 0.060)	
Age	0.050** (0.013, 0.087)		
Age <sup>2</sup>	-0.001** (-0.001, -0.000)	0.0002 (-0.001, 0.0001)	0.002 (-0.000, 0.004)
Sex (Female)	0.170^ (-0.018, 0.359)		
Rurality	0.124 (-0.346, 0.595)	-0.103 (-0.449, 0.242)	0.247 (-0.111, 0.605)
IMG	-0.196*** (-0.304, -0.089)		
Group size	-0.001^ (-0.001, 0.000)	0.0001 (-0.0004, 0.001)	0.001** (0.000, 0.002)
Avg. patient age	0.042* (0.007, 0.077)	0.013 (-0.019, 0.045)	0.005 (-0.043, 0.053)
Prop. of patients >= 65	-1.127 (-3.002, 0.748)	-0.855 (-2.444, 0.735)	-0.469 (-2.879, 1.940)
Avg. ADG score	0.054 (-0.067, 0.176)	0.177*** (0.087, 0.267)	0.152** (0.058, 0.246)
Prop. of female patients	-0.008* (-0.014, -0.002)	-0.010 (-0.023, 0.002)	-0.013 (-0.031, 0.004)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.010, -0.004)	-0.010* (-0.020, -0.001)	-0.008 (-0.020, 0.003)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003^ (-0.000, 0.006)	0.004* (0.000, 0.007)	0.004* (0.001, 0.008)
Prop. of rural patients	-0.005 (-0.011, 0.001)	-0.005 (-0.023, 0.013)	-0.018^ (-0.038, 0.001)
Prop. of patients with chronic mental illness	0.020*** (0.015, 0.026)	0.009** (0.004, 0.015)	0.005 (-0.001, 0.012)
Constant	19.920* (0.299, 39.542)	-46.017 (-118.280, 26.245)	
R <sup>2</sup>	0.076	0.018	0.009
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

Table A10a: Log of ED usage for mental health reasons per 1,000 patients (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.021 (-0.055, 0.013)	-0.092*** (-0.121, -0.064)	-0.047* (-0.085, -0.008)
Year	0.032*** (0.028, 0.036)	0.037*** (0.019, 0.055)	
Age	-0.015* (-0.029, -0.001)		
Age <sup>2</sup>	0.0001^ (-7.04e-06, 0.0003)	0.00003 (-0.0001, 0.0002)	0.0001 (-0.001, 0.001)
Sex (Female)	0.042 (-0.027, 0.111)		
Rurality	-0.109 (-0.252, 0.034)	-0.240** (-0.399, -0.081)	0.030 (-0.198, 0.259)
IMG	-0.098*** (-0.142, -0.054)		
Group size	-0.001*** (-0.001, -0.001)	-0.001*** (-0.001, -0.000)	0.0002 (-0.0005, 0.0001)
Avg. patient age	0.007 (-0.011, 0.024)	-0.047*** (-0.066, -0.029)	-0.046** (-0.076, -0.016)
Prop. of patients >= 65	-1.204** (-2.100, -0.308)	0.721 (-0.207, 1.649)	1.446^ (-0.141, 3.033)
Avg. ADG score	0.146*** (0.102, 0.191)	0.162*** (0.113, 0.212)	0.159*** (0.101, 0.218)
Prop. of female patients	-0.010*** (-0.012, -0.007)	-0.004 (-0.011, 0.003)	-0.003 (-0.014, 0.009)
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** (-0.009, -0.007)	-0.007** (-0.011, -0.002)	-0.014*** (-0.021, -0.007)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.006*** (0.005, 0.007)	0.006*** (0.004, 0.008)	0.003* (0.000, 0.006)
Prop. of rural patients	0.003** (0.001, 0.005)	0.008* (0.001, 0.014)	0.0001 (-0.007, 0.007)
Prop. of patients with chronic mental illness	0.012*** (0.010, 0.015)	0.006*** (0.004, 0.009)	0.003^ (-0.001, 0.007)
Constant	-61.217*** (-69.235, -53.200)	-70.559*** (-105.717, -35.401)	
R <sup>2</sup>	0.191	0.038	0.007
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A10b: Log of ED usage for mental health reasons per 1,000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.057** (-0.094, -0.021)	-0.078*** (-0.108, -0.048)	-0.045* (-0.085, -0.006)
Year	0.031*** (0.027, 0.036)	0.031** (0.009, 0.052)	
Age	-0.007 (-0.022, 0.009)		
Age <sup>2</sup>	0.0001 (-0.0001, 0.0002)	0.0001 (-0.0001, 0.0003)	0.001 (-0.001, 0.002)
Sex (Female)	0.030 (-0.042, 0.102)		
Rurality	-0.025 (-0.250, 0.201)	-0.247** (-0.403, -0.091)	0.027 (-0.201, 0.256)
IMG	-0.059* (-0.107, -0.010)		
Group size	-0.001*** (-0.001, -0.001)	-0.0005*** (-0.001, -0.0003)	0.0003 (-0.001, 0.0001)
Avg. patient age	0.008 (-0.013, 0.028)	-0.045*** (-0.065, -0.024)	-0.044** (-0.076, -0.012)
Prop. of patients >= 65	-1.276* (-2.348, -0.205)	0.545 (-0.571, 1.661)	1.429 (-0.276, 3.133)
Avg. ADG score	0.156*** (0.107, 0.205)	0.116*** (0.062, 0.169)	0.123*** (0.053, 0.193)
Prop. of female patients	-0.010*** (-0.013, -0.007)	-0.003 (-0.011, 0.004)	0.002 (-0.013, 0.016)
Prop. in Q1 or Q2 on Deprivation Score	-0.009*** (-0.010, -0.008)	-0.012*** (-0.017, -0.006)	-0.019*** (-0.030, -0.009)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.006*** (0.004, 0.009)	0.004** (0.001, 0.008)
Prop. of rural patients	0.002* (0.000, 0.005)	0.007* (0.001, 0.013)	-0.003 (-0.011, 0.006)
Prop. of patients with chronic mental illness	0.012*** (0.009, 0.015)	0.008*** (0.004, 0.011)	0.002 (-0.002, 0.006)
Constant	-60.381*** (-69.213, -51.548)	-57.468** (-100.009, -14.927)	
R <sup>2</sup>	0.223	0.036	0.007
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A10c: Log of ED usage for mental health reasons per 1,000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.061** (-0.103, -0.020)	-0.086*** (-0.118, -0.054)	-0.053* (-0.093, -0.012)
Year	0.033*** (0.028, 0.039)	0.039** (0.014, 0.064)	
Age	0.0001 (-0.017, 0.017)		
Age <sup>2</sup>	-9.32e-06 (-0.0002, 0.0002)	0.00002 (-0.0002, 0.0002)	0.0001 (-0.002, 0.002)
Sex (Female)	0.026 (-0.056, 0.108)		
Rurality	-0.243^ (-0.512, 0.026)	-0.239** (-0.394, -0.083)	0.027 (-0.209, 0.262)
IMG	-0.060* (-0.109, -0.010)		
Group size	-0.001*** (-0.001, -0.000)	-0.001*** (-0.001, -0.000)	-0.0004* (-0.001-1.90e-06)
Avg. patient age	0.001 (-0.020, 0.022)	-0.049*** (-0.072, -0.025)	-0.057** (-0.092, -0.021)
Prop. of patients >= 65	-0.980^ (-2.058, 0.098)	0.900 (-0.383, 2.182)	2.593** (0.705, 4.482)
Avg. ADG score	0.177*** (0.127, 0.227)	0.136*** (0.081, 0.191)	0.117** (0.044, 0.189)
Prop. of female patients	-0.010*** (-0.013, -0.007)	-0.005 (-0.014, 0.003)	-0.003 (-0.019, 0.013)
Prop. in Q1 or Q2 on Deprivation Score	-0.009*** (-0.010, -0.007)	-0.014*** (-0.019, -0.008)	-0.020*** (-0.030, -0.010)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.003, 0.006)	0.006*** (0.004, 0.009)	0.004* (0.000, 0.007)
Prop. of rural patients	0.004* (0.001, 0.008)	0.006 (-0.001, 0.012)	-0.003 (-0.013, 0.006)
Prop. of patients with chronic mental illness	0.009*** (0.007, 0.012)	0.008*** (0.004, 0.012)	0.002 (-0.003, 0.007)
Constant	-64.439*** (-75.290, -53.587)	-73.417** (-123.057, -23.777)	
R <sup>2</sup>	0.202	0.040	0.008
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A11a: Log of ED usage for mental health reasons during regular-hours per 1,000 patients  
(unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.028 <sup>^</sup> (-0.060, 0.005)	-0.073*** (-0.105, -0.042)	-0.070** (-0.114, -0.026)
Year	0.025*** (0.021, 0.028)	0.028** (0.009, 0.047)	
Age	-0.012 <sup>^</sup> (-0.026, 0.002)		
Age <sup>2</sup>	0.0001 (-0.00004, 0.0002)	0.00003 (-0.0001, 0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.024 (-0.040, 0.089)		
Rurality	-0.085 (-0.231, 0.061)	-0.209* (-0.411, -0.007)	-0.048 (-0.400, 0.304)
IMG	-0.093*** (-0.134, -0.053)		
Group size	-0.001*** (-0.001, -0.000)	-0.0004** (-0.001, -0.0002)	0.0002 (-0.001, 0.0002)
Avg. patient age	0.018* (0.002, 0.034)	-0.031** (-0.051, -0.012)	-0.027 (-0.061, 0.007)
Prop. of patients >= 65	-1.429*** (-2.240, -0.617)	0.461 (-0.501, 1.423)	0.658 (-1.107, 2.423)
Avg. ADG score	0.121*** (0.081, 0.161)	0.154*** (0.103, 0.206)	0.169*** (0.102, 0.237)
Prop. of female patients	-0.008*** (-0.010, -0.005)	-0.005 (-0.012, 0.003)	0.0005 (-0.013, 0.014)
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** (-0.009, -0.007)	-0.008*** (-0.012, -0.004)	-0.015*** (-0.023, -0.007)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.006*** (0.005, 0.007)	0.005*** (0.003, 0.008)	0.003 <sup>^</sup> (-0.000, 0.006)
Prop. of rural patients	0.003*** (0.001, 0.005)	0.010** (0.004, 0.015)	0.002 (-0.007, 0.011)
Prop. of patients with chronic mental illness	0.010*** (0.008, 0.012)	0.005** (0.001, 0.008)	0.003 (-0.002, 0.007)
Constant	-48.101*** (-55.930, -40.271)	-53.571** (-91.358, -15.784)	
R <sup>2</sup>	0.158	0.019	0.005
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A11b: Log of ED usage for mental health reasons during regular-hours per 1,000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.065*** (-0.099, -0.030)	-0.061*** (-0.095, -0.027)	-0.067** (-0.112, -0.022)
Year	0.025*** (0.021, 0.030)	0.022^ (-0.001, 0.045)	
Age	-0.005 (-0.020, 0.010)		
Age <sup>2</sup>	0.00003 (-0.0001, 0.0002)	0.0001 (-0.0001, 0.0003)	0.0001 (-0.002, 0.002)
Sex (Female)	0.020 (-0.048, 0.087)		
Rurality	-0.017 (-0.220, 0.187)	-0.216* (-0.422, -0.010)	-0.043 (-0.392, 0.306)
IMG	-0.055* (-0.102, -0.009)		
Group size	-0.001*** (-0.001, -0.001)	-0.0003** (-0.001, -0.0001)	0.0002 (-0.001, 0.0002)
Avg. patient age	0.018^ (-0.000, 0.037)	-0.029* (-0.051, -0.006)	-0.020 (-0.059, 0.019)
Prop. of patients >= 65	-1.461** (-2.413, -0.509)	0.321 (-0.840, 1.481)	0.277 (-1.727, 2.281)
Avg. ADG score	0.138*** (0.093, 0.184)	0.111*** (0.054, 0.167)	0.120** (0.037, 0.203)
Prop. of female patients	-0.008*** (-0.010, -0.005)	-0.003 (-0.011, 0.006)	0.009 (-0.008, 0.026)
Prop. in Q1 or Q2 on Deprivation Score	-0.009*** (-0.010, -0.007)	-0.011*** (-0.017, -0.006)	-0.021*** (-0.032, -0.009)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.006*** (0.003, 0.008)	0.004* (0.001, 0.008)
Prop. of rural patients	0.003** (0.001, 0.006)	0.010** (0.003, 0.017)	-0.003 (-0.012, 0.007)
Prop. of patients with chronic mental illness	0.010*** (0.007, 0.013)	0.007*** (0.003, 0.011)	0.002 (-0.002, 0.007)
Constant	-50.132*** (-59.021, -41.242)	-41.774^ (-86.357, 2.810)	
R <sup>2</sup>	0.196	0.019	0.005
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A11c: Log of ED usage for mental health reasons during regular-hours per 1,000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.071*** (-0.112, -0.030)	-0.073*** (-0.109, -0.037)	-0.068** (-0.115, -0.022)
Year	0.028*** (0.022, 0.034)	0.032* (0.006, 0.058)	
Age	0.0004 (-0.017, 0.018)		
Age <sup>2</sup>	0.00002 (-0.0002, 0.0001)	9.89e-06 (-0.0002, 0.0002)	0.0003 (-0.002, 0.002)
Sex (Female)	0.017 (-0.061, 0.095)		
Rurality	-0.202 (-0.470, 0.067)	-0.185 <sup>^</sup> (-0.383, 0.013)	-0.028 (-0.387, 0.331)
IMG	-0.056* (-0.105, -0.008)		
Group size	-0.001*** (-0.001, -0.000)	-0.0004** (-0.001, -0.0001)	0.0003 (-0.001, 0.0001)
Avg. patient age	0.012 (-0.008, 0.031)	-0.039** (-0.064, -0.014)	-0.036 (-0.083, 0.011)
Prop. of patients >= 65	-1.144* (-2.114, -0.174)	0.982 (-0.328, 2.292)	1.542 (-0.875, 3.958)
Avg. ADG score	0.155*** (0.109, 0.202)	0.130*** (0.070, 0.190)	0.116** (0.034, 0.198)
Prop. of female patients	-0.008*** (-0.010, -0.005)	-0.004 (-0.013, 0.005)	0.004 (-0.014, 0.022)
Prop. in Q1 or Q2 on Deprivation Score	-0.009*** (-0.010, -0.007)	-0.013*** (-0.019, -0.007)	-0.020*** (-0.031, -0.009)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.003, 0.006)	0.005*** (0.003, 0.008)	0.004 <sup>^</sup> (-0.000, 0.007)
Prop. of rural patients	0.005** (0.001, 0.008)	0.005 (-0.003, 0.013)	-0.006 (-0.018, 0.006)
Prop. of patients with chronic mental illness	0.008*** (0.005, 0.010)	0.006** (0.002, 0.010)	0.001 (-0.004, 0.006)
Constant	-55.262*** (-66.662, -43.863)	-61.307* (-112.112, -10.501)	
R <sup>2</sup>	0.174	0.022	0.005
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A12a: Log of ED usage for mental health reasons during after-hours per 1,000 patients  
(unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.021 (-0.054, 0.012)	-0.086*** (-0.118, -0.054)	-0.011 (-0.054, 0.032)
Year	0.032*** (0.028, 0.036)	0.046*** (0.026, 0.065)	
Age	-0.011 (-0.025, 0.003)		
Age <sup>2</sup>	0.0001 (-0.00004, 0.0002)	0.00003 (-0.0002, 0.0001)	0.0005 (-0.001, 0.002)
Sex (Female)	0.018 (-0.051, 0.086)		
Rurality	-0.089 (-0.239, 0.060)	-0.238^ (-0.500, 0.023)	0.047 (-0.152, 0.247)
IMG	-0.076*** (-0.118, -0.035)		
Group size	-0.001*** (-0.001, -0.000)	-0.001*** (-0.001, -0.000)	0.0002 (-0.001, 0.0002)
Avg. patient age	0.001 (-0.016, 0.019)	-0.053*** (-0.072, -0.033)	-0.059*** (-0.093, -0.026)
Prop. of patients >= 65	-1.106* (-2.014, -0.197)	0.733 (-0.249, 1.714)	2.272* (0.473, 4.070)
Avg. ADG score	0.138*** (0.095, 0.182)	0.154*** (0.100, 0.209)	0.137*** (0.071, 0.203)
Prop. of female patients	-0.009*** (-0.012, -0.007)	-0.002 (-0.010, 0.005)	-0.006 (-0.018, 0.006)
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** (-0.009, -0.007)	-0.006* (-0.011, -0.001)	-0.012** (-0.019, -0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.006*** (0.003, 0.008)	0.004* (0.001, 0.007)
Prop. of rural patients	0.002^ (-0.000, 0.004)	0.006 (-0.002, 0.014)	0.002 (-0.007, 0.012)
Prop. of patients with chronic mental illness	0.011*** (0.009, 0.014)	0.007*** (0.004, 0.009)	0.004^ (-0.001, 0.008)
Constant	-62.633*** (-70.882, -54.383)	-88.510*** (-126.892, -50.129)	
R <sup>2</sup>	0.144	0.028	0.004
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.



Table A12b: Log of ED usage for mental health reasons during after-hours per 1,000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.055** (-0.091, -0.019)	-0.072*** (-0.106, -0.038)	-0.009 (-0.053, 0.036)
Year	0.031*** (0.026, 0.036)	0.041** (0.016, 0.065)	
Age	-0.003 (-0.018, 0.013)		
Age <sup>2</sup>	0.00003 (-0.0001, 0.0002)	-7.62e-06 (-0.0002, 0.0002)	0.001 (-0.001, 0.003)
Sex (Female)	0.004 (-0.070, 0.077)		
Rurality	0.005 (-0.239, 0.248)	-0.245^ (-0.500, 0.009)	0.043 (-0.158, 0.243)
IMG	-0.041^ (-0.086, 0.005)		
Group size	-0.001*** (-0.001, -0.001)	-0.001*** (-0.001, -0.000)	0.0003 (-0.001, 0.0001)
Avg. patient age	0.003 (-0.018, 0.025)	-0.050*** (-0.072, -0.028)	-0.058** (-0.094, -0.022)
Prop. of patients >= 65	-1.256* (-2.374, -0.139)	0.531 (-0.704, 1.766)	2.363* (0.372, 4.354)
Avg. ADG score	0.141*** (0.092, 0.190)	0.109*** (0.047, 0.171)	0.112** (0.036, 0.189)
Prop. of female patients	-0.010*** (-0.013, -0.007)	-0.003 (-0.011, 0.005)	-0.006 (-0.021, 0.009)
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** (-0.009, -0.007)	-0.011*** (-0.017, -0.006)	-0.018*** (-0.028, -0.008)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	0.006*** (0.003, 0.008)	0.005** (0.001, 0.008)
Prop. of rural patients	0.001 (-0.002, 0.004)	0.005 (-0.003, 0.012)	0.000 (-0.012, 0.012)
Prop. of patients with chronic mental illness	0.011*** (0.008, 0.015)	0.007*** (0.003, 0.011)	0.002 (-0.003, 0.007)
Constant	-60.395*** (-69.617, -51.173)	-77.750** (-125.678, -29.823)	
R <sup>2</sup>	0.163	0.026	0.005
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A12c: Log of ED usage for mental health reasons during after-hours per 1,000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.054** (-0.094, -0.013)	-0.072*** (-0.108, -0.036)	-0.022 (-0.068, 0.023)
Year	0.032*** (0.026, 0.037)	0.048** (0.019, 0.077)	
Age	0.005 (-0.011, 0.022)		
Age <sup>2</sup>	0.0001 (-0.0002, 0.0001)	0.0001 (-0.0003, 0.0002)	0.0002 (-0.002, 0.002)
Sex (Female)	0.003 (-0.079, 0.085)		
Rurality	-0.236^ (-0.496, 0.024)	-0.264* (-0.518, -0.011)	0.023 (-0.184, 0.229)
IMG	-0.044^ (-0.091, 0.003)		
Group size	-0.001*** (-0.001, -0.000)	-0.001*** (-0.001, -0.000)	-0.0004^ (-0.001, 0.00004)
Avg. patient age	-0.004 (-0.025, 0.017)	-0.049*** (-0.075, -0.023)	-0.066** (-0.107, -0.025)
Prop. of patients >= 65	-0.928^ (-2.018, 0.162)	0.626 (-0.825, 2.077)	3.382** (1.270, 5.493)
Avg. ADG score	0.162*** (0.113, 0.212)	0.125*** (0.059, 0.190)	0.099* (0.008, 0.189)
Prop. of female patients	-0.010*** (-0.013, -0.007)	-0.005 (-0.014, 0.004)	-0.010 (-0.027, 0.007)
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** (-0.009, -0.007)	-0.012*** (-0.018, -0.006)	-0.018*** (-0.028, -0.008)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	0.006*** (0.003, 0.009)	0.004* (0.000, 0.007)
Prop. of rural patients	0.003 (-0.001, 0.006)	0.008* (0.000, 0.016)	0.004 (-0.007, 0.016)
Prop. of patients with chronic mental illness	0.009*** (0.006, 0.012)	0.008*** (0.005, 0.012)	0.004 (-0.002, 0.010)
Constant	-61.849*** (-72.780, -50.919)	-92.173** (-149.113, -35.234)	
R <sup>2</sup>	0.147	0.028	0.006
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A13a: Log of patients who used the ED for mental health reasons per 1,000 patients (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.002 (-0.025, 0.029)	-0.051*** (-0.074, -0.027)	-0.021 (-0.052, 0.011)
Year	0.024*** (0.020, 0.027)	0.031*** (0.017, 0.044)	
Age	-0.010^ (-0.022, 0.001)		
Age <sup>2</sup>	0.0001 (-0.00002, 0.0002)	6.44e-06 (-0.0001, 0.0001)	0.0003 (-0.001, 0.001)
Sex (Female)	0.039 (-0.015, 0.092)		
Rurality	-0.146* (-0.268, -0.024)	-0.197** (-0.337, -0.057)	-0.003 (-0.163, 0.157)
IMG	-0.081*** (-0.116, -0.045)		
Group size	-0.001*** (-0.001, -0.000)	-0.0004*** (-0.001, -0.0002)	0.0001 (-0.0004, 0.0001)
Avg. patient age	-0.004 (-0.018, 0.010)	-0.044*** (-0.059, -0.029)	-0.038** (-0.062, -0.014)
Prop. of patients >= 65	-0.634^ (-1.321, 0.054)	0.713^ (-0.004, 1.431)	0.830 (-0.418, 2.078)
Avg. ADG score	0.120*** (0.084, 0.155)	0.132*** (0.090, 0.174)	0.142*** (0.092, 0.191)
Prop. of female patients	-0.008*** (-0.010, -0.006)	-0.004 (-0.010, 0.002)	-0.002 (-0.011, 0.008)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.008, -0.006)	-0.005** (-0.009, -0.001)	-0.009** (-0.014, -0.003)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.006*** (0.005, 0.007)	0.005*** (0.003, 0.007)	0.002 (-0.000, 0.005)
Prop. of rural patients	0.004*** (0.002, 0.005)	0.010*** (0.005, 0.014)	0.004 (-0.001, 0.010)
Prop. of patients with chronic mental illness	0.010*** (0.008, 0.012)	0.005*** (0.003, 0.007)	0.003 (-0.001, 0.006)
Constant	-44.791*** (-51.049, -38.534)	-58.068*** (-85.257, -30.878)	
R <sup>2</sup>	0.212	0.033	0.006
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A13b: Log of patients who used the ED for mental health reasons per 1,000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.033* (-0.062, -0.004)	-0.041** (-0.066, -0.017)	-0.022 (-0.054, 0.011)
Year	0.024*** (0.020, 0.027)	0.024** (0.009, 0.040)	
Age	-0.005 (-0.017, 0.007)		
Age <sup>2</sup>	0.00005 (-0.0001, 0.0002)	0.0001 (-0.0001, 0.0001)	0.0003 (-0.001, 0.002)
Sex (Female)	0.035 (-0.021, 0.091)		
Rurality	-0.104 (-0.278, 0.070)	-0.200** (-0.339, -0.060)	-0.004 (-0.161, 0.154)
IMG	-0.048* (-0.086, -0.010)		
Group size	-0.001*** (-0.001, -0.001)	-0.0004*** (-0.001, -0.0002)	0.0002 (-0.0005, 0.0001)
Avg. patient age	-0.004 (-0.020, 0.012)	-0.044*** (-0.060, -0.029)	-0.039** (-0.065, -0.014)
Prop. of patients >= 65	-0.712^ (-1.509, 0.084)	0.626 (-0.146, 1.399)	0.798 (-0.567, 2.164)
Avg. ADG score	0.130*** (0.092, 0.169)	0.093*** (0.048, 0.137)	0.101*** (0.044, 0.159)
Prop. of female patients	-0.008*** (-0.010, -0.006)	-0.003 (-0.009, 0.003)	0.003 (-0.008, 0.013)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.008, -0.006)	-0.008*** (-0.012, -0.004)	-0.012*** (-0.019, -0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.005*** (0.003, 0.007)	0.003* (0.000, 0.006)
Prop. of rural patients	0.004*** (0.002, 0.006)	0.009*** (0.004, 0.014)	0.002 (-0.005, 0.010)
Prop. of patients with chronic mental illness	0.009*** (0.007, 0.012)	0.006*** (0.003, 0.008)	0.001 (-0.002, 0.005)
Constant	-45.253*** (-52.204, -38.302)	-45.035** (-76.072, -13.998)	
R <sup>2</sup>	0.249	0.031	0.005
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A13c: Log of patients who used the ED for mental health reasons per 1,000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.039* (-0.073, -0.005)	-0.048*** (-0.075, -0.021)	-0.029^ (-0.063, 0.005)
Year	0.025*** (0.021, 0.030)	0.030** (0.009, 0.051)	
Age	0.001 (-0.014, 0.017)		
Age <sup>2</sup>	0.00002 (-0.0002, 0.0001)	0.00001 (-0.0002, 0.0002)	0.0002 (-0.002, 0.001)
Sex (Female)	0.037 (-0.029, 0.102)		
Rurality	-0.248* (-0.468, -0.028)	-0.196** (-0.336, -0.056)	-0.011 (-0.171, 0.150)
IMG	-0.048* (-0.087, -0.009)		
Group size	-0.001*** (-0.001, -0.000)	-0.0004*** (-0.001, -0.0002)	-0.0003^ (-0.001, 0.00001)
Avg. patient age	-0.007 (-0.023, 0.009)	-0.049*** (-0.067, -0.031)	-0.049** (-0.079, -0.018)
Prop. of patients >= 65	-0.561 (-1.377, 0.256)	0.977* (0.103, 1.850)	1.770* (0.219, 3.321)
Avg. ADG score	0.147*** (0.106, 0.187)	0.106*** (0.060, 0.152)	0.092** (0.034, 0.151)
Prop. of female patients	-0.008*** (-0.010, -0.006)	-0.004 (-0.010, 0.003)	0.000 (-0.012, 0.011)
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** (-0.009, -0.006)	-0.010*** (-0.015, -0.006)	-0.014*** (-0.021, -0.007)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.005*** (0.003, 0.008)	0.003* (0.000, 0.006)
Prop. of rural patients	0.004** (0.002, 0.007)	0.008** (0.002, 0.014)	0.002 (-0.005, 0.010)
Prop. of patients with chronic mental illness	0.007*** (0.005, 0.010)	0.006*** (0.003, 0.008)	0.002 (-0.003, 0.006)
Constant	-48.727*** (-57.701, -39.754)	-57.012** (-98.515, -15.510)	
R <sup>2</sup>	0.228	0.034	0.005
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A14a: Log of patients who used the ED for mental health reasons during regular-hours per 1,000 patients (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.005 (-0.032, 0.021)	-0.031* (-0.059, -0.003)	-0.036^ (-0.075, 0.002)
Year	0.018*** (0.015, 0.021)	0.022** (0.006, 0.039)	
Age	-0.007 (-0.018, 0.004)		
Age <sup>2</sup>	0.00005 (-0.0001, 0.0001)	0.00002 (-0.0001, 0.0002)	-0.001 (-0.002, 0.001)
Sex (Female)	0.016 (-0.035, 0.068)		
Rurality	-0.134* (-0.265, -0.002)	-0.201 (-0.447, 0.046)	-0.119 (-0.343, 0.105)
IMG	-0.074*** (-0.107, -0.041)		
Group size	-0.001*** (-0.001, -0.000)	-0.0003** (-0.001, -0.0001)	0.0001 (-0.0005, 0.0002)
Avg. patient age	0.008 (-0.004, 0.020)	-0.027** (-0.044, -0.010)	-0.024 (-0.055, 0.006)
Prop. of patients >= 65	-0.916** (-1.543, -0.288)	0.367 (-0.454, 1.188)	0.389 (-1.167, 1.944)
Avg. ADG score	0.104*** (0.071, 0.137)	0.120*** (0.073, 0.166)	0.130*** (0.068, 0.192)
Prop. of female patients	-0.006*** (-0.008, -0.004)	-0.003 (-0.009, 0.004)	0.003 (-0.008, 0.014)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.007, -0.006)	-0.007*** (-0.011, -0.004)	-0.011*** (-0.017, -0.005)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.006*** (0.005, 0.007)	0.005*** (0.002, 0.007)	0.002 (-0.001, 0.005)
Prop. of rural patients	0.004*** (0.002, 0.006)	0.012*** (0.006, 0.018)	0.006 (-0.003, 0.016)
Prop. of patients with chronic mental illness	0.008*** (0.006, 0.010)	0.004** (0.001, 0.007)	0.003 (-0.001, 0.007)
Constant	-35.022*** (-41.669, -28.375)	-42.882* (-75.707, -10.057)	
R <sup>2</sup>	0.157	0.014	0.004
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A14b: Log of patients who used the ED for mental health reasons during regular-hours per 1,000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.039** (-0.068, -0.011)	-0.020 (-0.050, 0.011)	-0.037^ (-0.076, 0.003)
Year	0.019*** (0.015, 0.022)	0.013 (-0.006, 0.032)	
Age	-0.002 (-0.014, 0.010)		
Age <sup>2</sup>	5.19e-06 (-0.0001, 0.0001)	0.0001 (-0.0001, 0.0002)	0.0001 (-0.002, 0.001)
Sex (Female)	0.015 (-0.039, 0.069)		
Rurality	-0.099 (-0.265, 0.067)	-0.198 (-0.447, 0.051)	-0.111 (-0.329, 0.108)
IMG	-0.041* (-0.078, -0.003)		
Group size	-0.001*** (-0.001, -0.000)	-0.0002* (-0.0004, -1.54e-06)	0.0001 (-0.0005, 0.0003)
Avg. patient age	0.009 (-0.005, 0.023)	-0.028** (-0.047, -0.009)	-0.025 (-0.059, 0.010)
Prop. of patients >= 65	-0.986** (-1.704, -0.269)	0.414 (-0.487, 1.314)	0.322 (-1.408, 2.052)
Avg. ADG score	0.117*** (0.080, 0.154)	0.069* (0.017, 0.122)	0.071^ (-0.000, 0.142)
Prop. of female patients	-0.006*** (-0.008, -0.004)	0.000 (-0.007, 0.007)	0.010 (-0.002, 0.023)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.008, -0.006)	-0.008*** (-0.013, -0.004)	-0.014*** (-0.021, -0.006)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.005*** (0.003, 0.007)	0.004* (0.001, 0.007)
Prop. of rural patients	0.004*** (0.002, 0.006)	0.011*** (0.005, 0.018)	0.002 (-0.007, 0.011)
Prop. of patients with chronic mental illness	0.007*** (0.005, 0.009)	0.006*** (0.003, 0.009)	0.003 (-0.001, 0.007)
Constant	-36.397*** (-43.990, -28.803)	-24.042 (-61.682, 13.598)	
R <sup>2</sup>	0.199	0.013	0.003
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A14c: Log of patients who used the ED for mental health reasons during regular-hours per 1,000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.044* (-0.080, -0.009)	-0.028 (-0.062, 0.006)	-0.039^ (-0.079, 0.002)
Year	0.020*** (0.015, 0.025)	0.016 (-0.005, 0.037)	
Age	0.002 (-0.013, 0.018)		
Age <sup>2</sup>	0.00003 (-0.0002, 0.0001)	0.0001 (-0.0001, 0.0003)	0.0001 (-0.002, 0.002)
Sex (Female)	0.019 (-0.045, 0.083)		
Rurality	-0.216^ (-0.434, 0.002)	-0.172 (-0.408, 0.064)	-0.101 (-0.322, 0.120)
IMG	-0.043* (-0.082, -0.004)		
Group size	-0.001*** (-0.001, -0.000)	0.0002 (-0.0005, 0.0001)	0.0002 (-0.001, 0.0002)
Avg. patient age	0.005 (-0.009, 0.020)	-0.035*** (-0.056, -0.015)	-0.033 (-0.074, 0.008)
Prop. of patients >= 65	-0.802* (-1.534, -0.071)	0.897^ (-0.111, 1.905)	1.163 (-0.889, 3.214)
Avg. ADG score	0.130*** (0.092, 0.169)	0.081** (0.024, 0.138)	0.061 (-0.015, 0.137)
Prop. of female patients	-0.006*** (-0.008, -0.004)	-0.001 (-0.008, 0.007)	0.008 (-0.006, 0.021)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.009, -0.006)	-0.010*** (-0.015, -0.006)	-0.014*** (-0.022, -0.007)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.005*** (0.002, 0.007)	0.004* (0.000, 0.007)
Prop. of rural patients	0.005*** (0.002, 0.007)	0.007^ (-0.001, 0.014)	-0.001 (-0.011, 0.010)
Prop. of patients with chronic mental illness	0.006*** (0.004, 0.008)	0.005** (0.002, 0.009)	0.002 (-0.002, 0.007)
Constant	-39.816*** (-49.989, -29.642)	-29.323 (-71.378, 12.731)	
R <sup>2</sup>	0.177	0.014	0.003
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.



Table A15a: Log of patients who used the ED for mental health reasons during after-hours per 1,000 patients (unweighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.001 (-0.027, 0.025)	-0.046*** (-0.073, -0.019)	0.010 (-0.028, 0.049)
Year	0.023*** (0.020, 0.027)	0.040*** (0.024, 0.056)	
Age	-0.005 (-0.017, 0.006)		
Age <sup>2</sup>	0.00005 (-0.00005, 0.0002)	0.0001 (-0.0002, 0.0001)	0.0003 (-0.001, 0.002)
Sex (Female)	0.014 (-0.038, 0.066)		
Rurality	-0.115 <sup>^</sup> (-0.238, 0.009)	-0.176 (-0.399, 0.048)	0.043 (-0.175, 0.261)
IMG	-0.060*** (-0.092, -0.028)		
Group size	-0.001*** (-0.001, -0.000)	-0.0004*** (-0.001, -0.0002)	0.0001 (-0.0004, 0.0002)
Avg. patient age	-0.009 (-0.023, 0.004)	-0.049*** (-0.065, -0.033)	-0.049*** (-0.078, -0.020)
Prop. of patients >= 65	-0.534 (-1.221, 0.154)	0.776* (0.001, 1.550)	1.458 <sup>^</sup> (-0.084, 2.999)
Avg. ADG score	0.104*** (0.070, 0.138)	0.119*** (0.073, 0.166)	0.128*** (0.070, 0.187)
Prop. of female patients	-0.007*** (-0.009, -0.005)	-0.004 (-0.011, 0.003)	-0.006 (-0.016, 0.005)
Prop. in Q1 or Q2 on Deprivation Score	-0.006*** (-0.007, -0.006)	-0.003 (-0.008, 0.001)	-0.007* (-0.013, -0.001)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** (0.004, 0.006)	0.004*** (0.002, 0.007)	0.003 <sup>^</sup> (-0.000, 0.005)
Prop. of rural patients	0.002* (0.000, 0.004)	0.008** (0.002, 0.014)	0.006 (-0.002, 0.014)
Prop. of patients with chronic mental illness	0.009*** (0.007, 0.011)	0.005*** (0.003, 0.008)	0.003 (-0.001, 0.007)
Constant	-44.879*** (-51.314, -38.445)	-76.309*** (-107.584, -45.034)	
R <sup>2</sup>	0.140	0.021	0.003
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A15b: Log of patients who used the ED for mental health reasons during after-hours per 1,000 patients (PS-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.034* (-0.062, -0.007)	-0.039** (-0.068, -0.010)	0.012 (-0.028, 0.052)
Year	0.023*** (0.020, 0.027)	0.039*** (0.020, 0.058)	
Age	0.00003 (-0.013, 0.013)		
Age <sup>2</sup>	0.00001 (-0.0001, 0.0001)	0.0001 (-0.0002, 0.0001)	0.001 (-0.001, 0.002)
Sex (Female)	0.013 (-0.043, 0.070)		
Rurality	-0.068 (-0.249, 0.113)	-0.184 (-0.403, 0.036)	0.039 (-0.181, 0.258)
IMG	-0.031^ (-0.067, 0.004)		
Group size	-0.001*** (-0.001, -0.000)	-0.0004*** (-0.001, -0.0002)	-0.0002 (-0.001, 0.0001)
Avg. patient age	-0.009 (-0.025, 0.007)	-0.050*** (-0.068, -0.031)	-0.049** (-0.081, -0.017)
Prop. of patients >= 65	-0.650 (-1.467, 0.166)	0.644 (-0.264, 1.553)	1.354 (-0.408, 3.116)
Avg. ADG score	0.111*** (0.074, 0.149)	0.096*** (0.044, 0.148)	0.113** (0.044, 0.182)
Prop. of female patients	-0.008*** (-0.010, -0.006)	-0.005 (-0.012, 0.002)	-0.005 (-0.017, 0.007)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.007, -0.006)	-0.007** (-0.012, -0.002)	-0.010** (-0.017, -0.002)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	0.004*** (0.002, 0.007)	0.003^ (-0.000, 0.006)
Prop. of rural patients	0.002^ (-0.000, 0.004)	0.007* (0.001, 0.013)	0.005 (-0.006, 0.017)
Prop. of patients with chronic mental illness	0.008*** (0.006, 0.011)	0.004** (0.001, 0.007)	0.001 (-0.003, 0.006)
Constant	-45.074*** (-52.303, -37.845)	-74.095*** (-112.023, -36.167)	
R <sup>2</sup>	0.158	0.019	0.003
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A15c: Log of patients who used the ED for mental health reasons during after-hours per 1,000 patients (EB-weighted)

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.038* (-0.069, -0.006)	-0.041** (-0.072, -0.010)	-0.003 (-0.045, 0.039)
Year	0.024*** (0.020, 0.029)	0.047*** (0.022, 0.071)	
Age	0.007 (-0.007, 0.022)		
Age <sup>2</sup>	0.0001 (-0.0002, 0.0001)	0.0001 (-0.0004, 0.0001)	0.0005 (-0.002, 0.001)
Sex (Female)	0.017 (-0.048, 0.081)		
Rurality	-0.231* (-0.439, -0.023)	-0.205^ (-0.423, 0.012)	0.015 (-0.206, 0.237)
IMG	-0.032^ (-0.068, 0.004)		
Group size	-0.001*** (-0.001, -0.000)	-0.001*** (-0.001, -0.000)	-0.0003^ (-0.001, 0.00002)
Avg. patient age	-0.013 (-0.029, 0.003)	-0.050*** (-0.071, -0.030)	-0.055** (-0.094, -0.017)
Prop. of patients >= 65	-0.494 (-1.312, 0.324)	0.796 (-0.187, 1.780)	2.296* (0.340, 4.253)
Avg. ADG score	0.127*** (0.087, 0.166)	0.105*** (0.050, 0.160)	0.096* (0.019, 0.172)
Prop. of female patients	-0.008*** (-0.010, -0.006)	-0.006^ (-0.014, 0.001)	-0.007 (-0.021, 0.006)
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** (-0.008, -0.006)	-0.008** (-0.013, -0.003)	-0.011** (-0.019, -0.003)
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** (0.003, 0.005)	0.004** (0.002, 0.007)	0.002 (-0.001, 0.006)
Prop. of rural patients	0.003* (0.000, 0.006)	0.010** (0.003, 0.018)	0.009^ (-0.001, 0.020)
Prop. of patients with chronic mental illness	0.007*** (0.004, 0.009)	0.005*** (0.003, 0.008)	0.002 (-0.004, 0.008)
Constant	-46.918*** (-55.765, -38.070)	-89.415*** (-138.053, -40.777)	
R <sup>2</sup>	0.147	0.022	0.004
# of physicians	2654	2654	2654
# of observations	23886	23886	23886

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

## Detailed Results of Subgroup Analyses

Table A16a: Coefficient of FHO on the log of the number of mental health services per 1000 enrolled patients, by physician sex

	Male physicians			Female physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Total MH services</b>						
Unweighted	-0.167*** (-0.218, -0.118)	-0.139*** (-0.172, -0.106)	-0.137*** (-0.170, -0.105)	-0.155*** (-0.206, -0.104)	-0.120*** (-0.157, -0.083)	-0.145*** (-0.182, -0.107)
PS-weighted	-0.139*** (-0.195, -0.083)	-0.147*** (-0.190, -0.104)	-0.139*** (-0.174, -0.104)	-0.123*** (-0.174, -0.072)	-0.155*** (-0.193, -0.118)	-0.158*** (-0.195, -0.121)
EB-weighted	-0.162*** (-0.217, -0.106)	-0.149*** (-0.188, -0.111)	-0.128*** (-0.163, -0.094)	-0.107*** (-0.158, -0.055)	-0.142*** (-0.178, -0.106)	-0.160*** (-0.198, -0.122)
<b>MH services during regular-hours</b>						
Unweighted	-0.172*** (-0.223, -0.121)	-0.151*** (-0.183, -0.119)	-0.145*** (-0.177, -0.113)	-0.161*** (-0.212, -0.111)	-0.135*** (-0.172, -0.097)	-0.156*** (-0.194, -0.118)
PS-weighted	-0.141*** (-0.199, -0.084)	-0.159*** (-0.201, -0.116)	-0.147*** (-0.182, -0.112)	-0.132*** (-0.183, -0.082)	-0.171*** (-0.209, -0.134)	-0.167*** (-0.204, -0.130)
EB-weighted	-0.164*** (-0.219, -0.110)	-0.160*** (-0.197, -0.123)	-0.136*** (-0.170, -0.101)	-0.113*** (-0.165, -0.063)	-0.157*** (-0.193, -0.121)	-0.169*** (-0.207, -0.131)
<b>MH services during after-hours</b>						
Unweighted	0.147* (0.012, 0.283)	0.303*** (0.181, 0.424)	0.149** (0.037, 0.260)	0.354*** (0.186, 0.521)	0.472*** (0.336, 0.608)	0.333*** (0.202, 0.464)
PS-weighted	0.1099 (-0.057, 0.255)	0.263*** (0.127, 0.400)	0.127* (0.009, 0.244)	0.459*** (0.278, 0.641)	0.452*** (0.310, 0.595)	0.276*** (0.138, 0.415)
EB-weighted	0.061 (-0.131, 0.253)	0.254** (0.100, 0.408)	0.120^ (-0.011, 0.252)	0.426*** (0.223, 0.630)	0.439*** (0.286, 0.592)	0.278*** (0.134, 0.422)
Observations	14,391	14,391	14,391	9,495	9,495	9,495
Physicians	1,599	1,599	1,599	1,055	1,055	1,055

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,601 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A16b: Coefficient of FHO on the log of the value of mental health services per 1000 enrolled patients, by physician sex

	Male physicians			Female physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Total MH services</b>						
Unweighted	-0.197*** (-0.261, -0.133)	-0.185*** (-0.227, -0.142)	-0.182*** (-0.222, -0.141)	-0.197*** (-0.256, -0.137)	-0.174*** (-0.217, -0.130)	-0.191*** (-0.235, -0.147)
PS-weighted	-0.156*** (-0.233, -0.079)	-0.185*** (-0.250, -0.119)	-0.185*** (-0.230, -0.139)	-0.158*** (-0.220, -0.096)	-0.216*** (-0.258, -0.174)	-0.202*** (-0.245, -0.159)
EB-weighted	-0.187*** (-0.254, -0.119)	-0.188*** (-0.238, -0.137)	-0.172*** (-0.213, -0.130)	-0.130*** (-0.196, -0.065)	-0.202*** (-0.243, -0.161)	-0.205*** (-0.249, -0.162)
<b>MH services during regular-hours</b>						
Unweighted	-0.197*** (-0.261, -0.132)	-0.187*** (-0.230, -0.145)	-0.183*** (-0.223, -0.143)	-0.198*** (-0.258, -0.138)	-0.176*** (-0.220, -0.133)	-0.193*** (-0.237, -0.148)
PS-weighted	-0.155*** (-0.233, -0.077)	-0.187*** (-0.253, -0.122)	-0.185*** (-0.230, -0.140)	-0.159*** (-0.222, -0.097)	-0.219*** (-0.261, -0.176)	-0.2014** (-0.247, -0.161)
EB-weighted	-0.187*** (-0.254, -0.119)	-0.190*** (-0.240, -0.139)	-0.173*** (-0.215, -0.131)	-0.131*** (-0.197, -0.066)	-0.204*** (-0.245, -0.163)	-0.207*** (-0.250, -0.163)
<b>MH services during after-hours</b>						
Unweighted	0.338** (0.141, 0.534)	0.502*** (0.325, 0.679)	0.248** (0.078, 0.417)	0.646*** (0.403, 0.889)	0.755*** (0.550, 0.959)	0.512*** (0.311, 0.714)
PS-weighted	0.257* (0.031, 0.483)	0.450*** (0.246, 0.655)	0.207* (0.027, 0.386)	0.797*** (0.530, 1.063)	0.729*** (0.513, 0.945)	0.437*** (0.224, 0.650)
EB-weighted	0.209 (-0.077, 0.496)	0.437*** (0.203, 0.672)	0.199^ (-0.0002, 0.398)	0.760*** (0.459, 1.061)	0.717*** (0.487, 0.948)	0.453*** (0.232, 0.674)
Observations	14,391	14,391	14,391	9,495	9,495	9,495
Physicians	1,599	1,599	1,599	1,055	1,055	1,055

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,601 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A16c: Coefficient of FHO on the log of ED usage for mental health reasons per 1,000 patients: by physician sex

	Male physicians			Female physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of total ED visits</b>						
Unweighted	-0.023 (-0.069, 0.022)	-0.112*** (-0.146, -0.077)	-0.057* (-0.102, -0.013)	-0.038 (-0.089, 0.013)	-0.071** (-0.121, -0.021)	-0.036 (-0.103, 0.031)
PS	-0.075** (-0.125, -0.026)	-0.105*** (-0.141, -0.070)	-0.053* (-0.099, -0.007)	-0.053^ (-0.107, 0.002)	-0.049^ (-0.102, 0.005)	-0.038 (-0.106, 0.030)
EB	-0.080** (-0.136, -0.024)	-0.109*** (-0.147, -0.071)	-0.061* (-0.109, -0.013)	-0.054^ (-0.112, 0.003)	-0.061* (-0.117, -0.006)	-0.044 (-0.113, 0.025)
<b>Log of total visits during regular-hours</b>						
Unweighted	-0.025 (-0.068, 0.018)	-0.097*** (-0.135, 0.059)	-0.079** (-0.129, -0.029)	-0.044^ (-0.093, 0.006)	-0.041 (-0.098, 0.015)	-0.058 (-0.014, 0.002)
PS	-0.074** (-0.121, -0.027)	-0.093*** (-0.133, -0.053)	-0.080** (-0.131, -0.029)	-0.062* (-0.113, -0.011)	-0.021 (-0.080, 0.038)	-0.052 (-0.132, 0.027)
EB	-0.080** (-0.137, -0.022)	-0.103*** (-0.146, -0.060)	-0.087** (-0.141, -0.033)	-0.067* (-0.120, -0.014)	-0.031 (-0.094, 0.031)	-0.045 (-0.124, 0.035)
<b>Log of total visits during after-hours</b>						
Unweighted	-0.030 (-0.074, 0.014)	-0.103*** (-0.141, -0.065)	-0.021 (-0.074, 0.031)	-0.033 (-0.084, 0.017)	-0.068* (-0.124, -0.013)	-0.0003 (-0.073, 0.073)
PS	-0.078** (-0.127, -0.029)	-0.095*** (-0.135, -0.056)	-0.015 (-0.069, 0.039)	-0.049^ (-0.103, 0.005)	-0.048 (-0.110, 0.014)	-0.002 (-0.078, 0.073)
EB	-0.078** (-0.131, -0.025)	-0.091*** (-0.134, -0.048)	-0.023 (-0.078, 0.032)	-0.043 (-0.103, 0.017)	-0.057^ (-0.119, 0.006)	-0.023 (-0.102, 0.055)
Observations	14,391	14,391	14,391	9,495	9,495	9,495
Physicians	1,599	1,599	1,599	1,055	1,055	1,055

Observations = 14,409; Physicians = 1,601

ED: emergency department; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,601 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A16d: Coefficient of FHO on the number of patients who used the ED for mental health reasons, per 1,000 patients: Male physicians only

	Male physicians			Female physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of total patients to ED</b>						
Unweighted	0.007 (-0.028, 0.043)	-0.065*** (-0.091, -0.039)	-0.021 (-0.056, 0.014)	-0.024 (-0.065, 0.017)	-0.034 (-0.076, 0.009)	-0.022 (-0.078, 0.034)
PS	0.038^ (-0.076, 0.0004)	-0.057*** (-0.088, -0.031)	-0.016 (-0.053, 0.021)	-0.043^ (-0.087, 0.002)	-0.020 (-0.064, 0.024)	-0.029 (-0.086, 0.028)
EB	-0.045^ (-0.091, 0.0005)	-0.067*** (-0.098, -0.036)	-0.024 (-0.065, 0.016)	-0.046^ (-0.092, 0.0007)	-0.024 (-0.071, 0.022)	-0.035 (-0.093, 0.022)
<b>Log of number of patients who had an ED visit during regular-hours</b>						
Unweighted	0.0005 (-0.034, 0.036)	-0.056** (-0.089, -0.023)	-0.045^ (-0.089, 0.001)	-0.023 (-0.063, 0.018)	0.003 (-0.047, 0.053)	-0.024 (-0.092, 0.044)
PS	-0.041* (-0.079, -0.003)	-0.050** (-0.085, -0.015)	-0.044^ (-0.090, 0.001)	-0.043* (-0.086, -0.0001)	0.019 (-0.034, 0.072)	-0.026 (-0.096, 0.043)
EB	-0.045^ (-0.094, 0.004)	-0.061** (-0.098, -0.025)	-0.055* (-0.104, -0.006)	-0.049* (-0.094, -0.004)	0.021 (-0.039, 0.081)	-0.015 (-0.084, 0.055)
<b>Log of number of patients who had an ED visit during after-hours</b>						
Unweighted	-0.0003 (-0.033, 0.033)	-0.056*** (-0.086, -0.027)	0.015 (-0.029, 0.059)	-0.025 (-0.066, 0.016)	-0.036 (-0.086, 0.014)	-0.002 (-0.066, 0.070)
PS	-0.042* (-0.079, -0.006)	-0.052** (-0.085, -0.019)	-0.022 (-0.024, 0.069)	-0.045* (-0.090, -0.001)	-0.025 (-0.078, 0.029)	-0.0003 (-0.074, 0.068)
EB	-0.048* (-0.088, -0.007)	-0.053** (-0.090, -0.016)	0.015 (-0.034, 0.064)	-0.044^ (-0.092, 0.005)	-0.030 (-0.084, 0.023)	-0.027 (-0.100, 0.046)
Observations	14,391	14,391	14,391	9,495	9,495	9,495
Physicians	1,599	1,599	1,599	1,055	1,055	1,055

ED: emergency department; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 2,656 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A17a: Coefficient of FHO on the log of the number of mental health services per 1000 enrolled patients, by physician age

	Younger physicians			Older physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Total MH services</b>						
Unweighted	-0.181*** (-0.230, -0.133)	-0.143*** (-0.171, -0.115)	-0.132*** (-0.163, -0.101)	-0.146*** (-0.199, -0.092)	-0.127*** (-0.169, -0.087)	-0.158*** (-0.198, -0.119)
PS-weighted	-0.0168*** (-0.217, -0.118)	-0.182*** (-0.213, -0.150)	-0.144*** (-0.175, -0.112)	-0.097** (-0.157, -0.037)	-0.126*** (-0.175, -0.076)	-0.162*** (-0.205, -0.119)
EB-weighted	-0.148*** (-0.197, -0.099)	-0.172*** (-0.204, -0.140)	-0.138*** (-0.170, -0.106)	-0.126*** (-0.182, -0.069)	-0.128*** (-0.172, -0.085)	-0.157*** (-0.200, -0.114)
<b>MH services during regular-hours</b>						
Unweighted	-0.189*** (-0.238, -0.140)	-0.157*** (-0.186, -0.129)	-0.142*** (-0.173, -0.111)	-0.150*** (-0.204, -0.097)	-0.141*** (-0.180, -0.102)	-0.167*** (-0.206, -0.128)
PS-weighted	-0.178*** (-0.227, -0.128)	-0.194*** (-0.226, -0.163)	-0.153*** (-0.185, -0.122)	-0.098** (-0.159, -0.040)	-0.139*** (-0.187, -0.091)	-0.168*** (-0.211, -0.125)
EB	-0.159*** (-0.208, -0.111)	-0.184*** (-0.215, -0.153)	-0.149*** (-0.181, -0.117)	-0.123*** (-0.180, -0.067)	-0.140*** (-0.182, -0.098)	-0.161*** (-0.204, -0.118)
<b>MH services during after-hours</b>						
Unweighted	0.325*** (0.0181, 0.469)	0.398*** (0.029, 0.511)	0.273*** (0.159, 0.387)	0.175* (0.025, 0.326)	0.304*** (0.157, 0.452)	0.161* (0.034, 0.290)
PS-weighted	0.368*** (0.207, 0.529)	0.381*** (0.254, 0.508)	0.250*** (0.133, 0.368)	0.132 (-0.039, 0.303)	0.261** (0.098, 0.424)	0.102 (-0.036, 0.240)
EB-weighted	0.389*** (0.203, 0.575)	0.384*** (0.236, 0.533)	0.281*** (0.157, 0.405)	0.017 (-0.190, 0.223)	0.221* (0.041, 0.402)	0.061 (-0.091, 0.213)
Observations	12,294	12,294	12,294	11,592	11,592	11,592
Physicians	1,366	1,366	1,366	1,288	1,288	1,288

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,288 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.



Table A17b: Coefficient of FHO on the log of the value of mental health services per 1000 enrolled patients: by physician age

	Younger physicians			Older physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Total MH services</b>						
Unweighted	-0.222*** (-0.279, -0.164)	-0.201*** (-0.232, -0.169)	-0.176*** (-0.212, -0.140)	-0.178*** (-0.245, -0.111)	-0.173*** (-0.225, -0.121)	-0.207*** (-0.257, -0.157)
PS-weighted	-0.203*** (-0.264, -0.141)	-0.238*** (-0.273, -0.202)	-0.188*** (-0.224, -0.153)	-0.119** (-0.199, 0.039)	-0.168*** (-0.241, -0.095)	-0.210*** (-0.267, -0.151)
EB-weighted	-0.186*** (-0.246, -0.126)	-0.227*** (-0.262, -0.192)	-0.184*** (-0.221, -0.148)	-0.143*** (-0.216, -0.070)	-0.170*** (-0.227, -0.114)	-0.200*** (-0.253, -0.147)
<b>MH services during regular-hours</b>						
Unweighted	-0.223*** (-0.281, -0.165)	-0.203*** (-0.234, -0.171)	-0.178*** (-0.214, -0.141)	-0.178*** (-0.246, -0.111)	-0.176*** (-0.228, -0.125)	-0.208*** (-0.258, -0.158)
PS-weighted	-0.205*** (-0.266, -0.143)	-0.240*** (-0.275, -0.205)	-0.190*** (-0.226, -0.154)	-0.118** (-0.199, -0.036)	-0.171*** (-0.244, -0.098)	-0.210*** (-0.267, -0.152)
EB	-0.188*** (-0.248, -0.128)	-0.229*** (-0.264, -0.194)	-0.186*** (-0.223, -0.150)	-0.142*** (-0.215, -0.069)	-0.172*** (-0.229, -0.116)	-0.201*** (-0.254, -0.148)
<b>MH services during after-hours</b>						
Unweighted	0.609*** (0.401, 0.817)	0.647*** (0.477, 0.816)	0.421*** (0.247, 0.594)	0.374** (0.154, 0.593)	0.500*** (0.286, 0.714)	0.275** (0.079, 0.471)
PS-weighted	0.655*** (0.420, 0.890)	0.634*** (0.440, 0.830)	0.386*** (0.205, 0.566)	0.311* (0.062, 0.560)	0.432*** (0.194, 0.669)	0.186^ (-0.025, 0.396)
EB-weighted	0.688*** (0.409, 0.967)	0.644*** (0.413, 0.876)	0.432*** (0.242, 0.623)	0.159 (-0.146, 0.463)	0.377** (0.115, 0.639)	0.139 (-0.091, 0.368)
Observations	12,294	12,294	12,294	11,592	11,592	11,592
Physicians	1,366	1,366	1,366	1,288	1,288	1,288

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,368 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A17c: Coefficient of FHO on the log of ED usage for mental health reasons per 1,000 patients, by physician age

	Younger physicians			Older physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of total ED visits</b>						
Unweighted	-0.019 (-0.067, 0.030)	-0.096*** (-0.137, -0.055)	-0.043 (-0.097, 0.010)	-0.018 (-0.066, 0.030)	-0.087*** (-0.128, -0.047)	-0.053^ (-0.108, 0.001)
PS	-0.029 (-0.081, 0.022)	-0.077** (-0.121, -0.033)	-0.033 (-0.086, 0.022)	-0.090** (-0.142, -0.038)	-0.082*** (-0.123, -0.041)	-0.064* (-0.119, -0.008)
EB	-0.028 (-0.083, 0.027)	-0.090*** (-0.137, -0.043)	-0.040 (-0.100, 0.015)	-0.086** (-0.142, -0.029)	-0.081*** (-0.124, -0.039)	-0.069* (-0.128, -0.010)
<b>Log of total visits during regular-hours</b>						
Unweighted	-0.029 (-0.076, 0.017)	-0.079** (-0.125, -0.034)	-0.061^ (-0.123, -0.001)	-0.021 (-0.067, 0.024)	-0.068** (-0.113, -0.024)	-0.082** (-0.143, -0.021)
PS	-0.041 (-0.090, 0.008)	-0.058* (-0.107, -0.009)	-0.048 (-0.112, 0.017)	-0.091*** (-0.140, -0.042)	-0.069** (-0.115, -0.023)	-0.095** (-0.157, -0.034)
EB	-0.041 (-0.095, 0.014)	-0.073** (-0.125, -0.020)	-0.051 (-0.116, 0.014)	-0.092** (-0.146, -0.037)	-0.076** (-0.125, -0.027)	-0.090** (-0.151, -0.025)
<b>Log of total visits during after-hours</b>						
Unweighted	-0.017 (-0.065, -0.030)	-0.091*** (-0.137, -0.045)	-0.011 (-0.071, 0.049)	-0.020 (-0.066, 0.027)	-0.079*** (-0.123, -0.035)	-0.013 (-0.075, 0.049)
PS	-0.030 (-0.081, 0.020)	-0.077** (-0.127, -0.026)	-0.003 (-0.065, 0.059)	-0.084** (-0.137, -0.032)	-0.068** (-0.115, -0.022)	-0.019 (-0.084, 0.046)
EB	-0.023 (-0.077, 0.031)	-0.085** (-0.138, -0.033)	-0.015 (-0.078, 0.048)	-0.075** (-0.1312 -0.019)	-0.057* (-0.107, -0.007)	-0.035 (-0.104, 0.034)
Observations	12,294	12,294	12,294	11,592	11,592	11,592
Physicians	1,366	1,366	1,366	1,288	1,288	1,288

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,368 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A17d: Coefficient of FHO on the Log of patients who used the ED for mental health reasons per 1,000 patients: by physician age

	Younger physicians			Older physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of total patients to ED</b>						
Unweighted	0.007 (-0.031, 0.045)	-0.046** (-0.079, -0.013)	-0.010 (-0.054, 0.033)	0.001 (-0.037, 0.039)	-0.053** (-0.086, -0.021)	-0.034 (-0.079, 0.010)
PS	-0.010 (-0.051, 0.031)	-0.035^ (-0.071, 0.002)	-0.009 (-0.054, 0.037)	-0.057** (-0.097, -0.017)	-0.050** (-0.082, -0.017)	-0.038 (-0.084, 0.008)
EB	-0.012 (-0.057, 0.033)	-0.041* (-0.082, -0.001)	-0.018 (-0.065, 0.029)	-0.056* (-0.100, -0.011)	-0.055** (-0.089, -0.021)	-0.040 (-0.089, 0.009)
<b>Log of number of patients who had an ED visit during regular-hours</b>						
Unweighted	-0.002 (-0.040, 0.036)	-0.025 (-0.066, 0.016)	-0.014 (-0.068, 0.040)	-0.004 (-0.041, 0.033)	-0.040* (-0.078, -0.001)	-0.065* (-0.119, -0.011)
PS	-0.020 (-0.061, 0.021)	-0.008 (-0.052, 0.036)	-0.012 (-0.067, 0.044)	-0.058** (-0.098, -0.019)	-0.038^ (-0.077, 0.002)	-0.069* (-0.123, -0.014)
EB	-0.021 (-0.069, 0.027)	-0.012 (-0.062, 0.038)	-0.017 (-0.074, 0.040)	-0.058* (-0.104, -0.013)	-0.050* (-0.091, -0.008)	-0.062* (-0.119, -0.005)
<b>Log of number of patients who had an ED visit during after-hours</b>						
Unweighted	0.006 (-0.031, 0.043)	-0.042* (-0.082, -0.003)	0.013 (-0.049, 0.067)	-0.002 (-0.038, 0.033)	-0.049* (-0.086, -0.012)	0.006 (-0.048, 0.061)
PS	-0.015 (-0.054, 0.025)	-0.038^ (-0.081, 0.005)	0.017 (-0.039, 0.073)	-0.056** (-0.095, -0.017)	-0.041* (-0.081, -0.001)	0.004 (-0.053, 0.061)
EB	-0.014 (-0.057, 0.030)	-0.045* (-0.091, -0.0003)	-0.0002 (-0.058, 0.058)	-0.052* (-0.095, -0.010)	-0.036 (-0.080, 0.008)	-0.006 (-0.069, 0.057)
Observations	12,294	12,294	12,294	11,592	11,592	11,592
Physicians	1,366	1,366	1,366	1,288	1,288	1,288

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,368 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A18a: Coefficient of FHO on the log of the number of mental health services per 1000 enrolled patients by time of switch

	Early switchers			Late switchers		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Total MH services</b>						
Unweighted	-0.185*** (-0.235, -0.135)	-0.151*** (-0.187, -0.115)	-0.124*** (-0.160, -0.083)	-0.153*** (-0.194, -0.111)	-0.132*** (-0.164, -0.101)	-0.159*** (-0.190, -0.128)
PS-weighted	-0.141*** (-0.193, -0.088)	-0.175*** (-0.216, -0.134)	-0.137*** (-0.174, -0.099)	-0.125*** (-0.169, -0.082)	-0.154*** (-0.194, -0.114)	-0.164*** (-0.197, -0.131)
EB-weighted	-0.153*** (-0.206, -0.101)	-0.173*** (-0.212, -0.133)	-0.129*** (-0.168, -0.089)	-0.132*** (-0.172, -0.091)	-0.148*** (-0.183, -0.114)	-0.158*** (-0.191, -0.125)
<b>MH services during regular-hours</b>						
Unweighted	-0.188*** (-0.238, -0.137)	-0.156*** (-0.192, -0.121)	-0.134*** (-0.171, -0.098)	-0.162*** (-0.204, -0.120)	-0.147*** (-0.178, -0.116)	-0.166*** (-0.197, -0.136)
PS-weighted	-0.141*** (-0.195, -0.088)	-0.181*** (-0.222, -0.141)	-0.145*** (-0.183, -0.108)	-0.135*** (-0.179, -0.091)	-0.169*** (-0.209, -0.130)	-0.171*** (-0.204, -0.138)
EB	-0.153*** (-0.205, -0.100)	-0.177*** (-0.216, -0.139)	-0.137*** (-0.176, -0.097)	-0.141*** (-0.181, -0.100)	-0.163*** (-0.196, -0.129)	-0.165*** (-0.198, -0.132)
<b>MH services during after-hours</b>						
Unweighted	0.176* (0.039, 0.313)	0.268*** (0.142, 0.394)	0.204** (0.073, 0.336)	0.342*** (0.213, 0.471)	0.421*** (0.305, 0.537)	0.245*** (0.138, 0.352)
PS-weighted	0.181* (0.032, 0.330)	0.240** (0.103, 0.377)	0.147* (0.004, 0.289)	0.353*** (0.213, 0.494)	0.401*** (0.276, 0.527)	0.212*** (0.099, 0.325)
EB-weighted	0.112 (-0.074, 0.299)	0.217** (0.068, 0.368)	0.148^ (-0.012, 0.307)	0.317*** (0.156, 0.478)	0.386*** (0.241, 0.531)	0.212*** (0.092, 0.333)
Observations	17,082	17,082	17,082	17,928	17,928	17,928
Physicians	1,898	1,898	1,898	1,992	1,992	1,992

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,994 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A18b: Coefficient of FHO on the log of the value of mental health services per 1000 enrolled patients, by time of switch

	Early switchers			Late switchers		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Total MH services</b>						
Unweighted	-0.158*** (-0.227, -0.089)	-0.196*** (-0.242, -0.149)	-0.160*** (-0.204, -0.115)	-0.192*** (-0.245, -0.140)	-0.180*** (-0.221, -0.139)	-0.202*** (-0.239, -0.164)
PS-weighted	-0.158*** (-0.227, -0.089)	-0.215*** (-0.272, -0.157)	-0.172*** (-0.218, -0.126)	-0.154*** (-0.212, -0.097)	-0.199*** (-0.258, -0.140)	-0.208*** (-0.250, -0.166)
EB-weighted	-0.171*** (-0.235, -0.107)	-0.215*** (-0.265, -0.164)	-0.163*** (-0.209, -0.116)	-0.161*** (-0.213, -0.109)	-0.193*** (-0.238, -0.148)	-0.200*** (-0.239, -0.162)
<b>MH services during regular-hours</b>						
Unweighted	-0.210*** (-0.271, -0.148)	-0.197*** (-0.243, -0.159)	-0.161*** (-0.206, -0.116)	-0.193*** (-0.246, -0.141)	-0.183*** (-0.224, -0.142)	-0.203*** (-0.241, -0.165)
PS-weighted	-0.157*** (-0.226, -0.087)	-0.216*** (-0.273, -0.158)	-0.172*** (-0.219, -0.126)	-0.155*** (-0.213, -0.0967)	0.202*** (-0.261, -0.143)	-0.209*** (-0.251, -0.167)
EB	-0.170*** (-0.234, -0.106)	-0.215*** (-0.266, -0.164)	-0.164*** (-0.210, -0.117)	-0.161*** (-0.215, -0.110)	-0.196*** (-0.241, -0.151)	-0.201*** (-0.240, -0.163)
<b>MH services during after-hours</b>						
Unweighted	0.421*** (0.224, 0.618)	0.485*** (0.294, 0.676)	0.304** (0.102, 0.505)	0.604*** (0.417, 0.792)	0.678*** (0.508, 0.847)	0.405*** (0.241, 0.568)
PS-weighted	0.412*** (0.194, 0.629)	0.457*** (0.248, 0.667)	0.221* (-0.002, 0.440)	0.615*** (0.410, 0.820)	0.654*** (0.466, 0.842)	0.351*** (0.178, 0.524)
EB-weighted	0.325* (0.047, 0.603)	0.428* (0.199, 0.656)	0.238^ (-0.006, 0.482)	0.573*** (0.337, 0.809)	0.637*** (0.419, 0.856)	0.357*** (0.174, 0.541)
Observations	17,082	17,082	17,082	17,928	17,928	17,928
Physicians	1,898	1,898	1,898	1,992	1,992	1,992

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,898 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A18c: Coefficient of FHO on the log of ED usage for mental health reasons per 1,000 patients: Early switchers vs non-switchers

	Early switchers			Late switchers		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of total ED visits</b>						
Unweighted	-0.040 <sup>^</sup> (-0.081, 0.0004)	-0.110*** (-0.154, -0.065)	-0.67* (-0.126, -0.007)	0.003 (-0.040, 0.047)	-0.087*** (-0.121, -0.052)	-0.033 (-0.080, 0.014)
PS	-0.070** (-0.112, -0.027)	-0.091*** (-0.138, -0.044)	-0.054 <sup>^</sup> (-0.116, 0.008)	-0.038 <sup>^</sup> (-0.084, 0.007)	-0.073*** (-0.109, -0.037)	-0.039 <sup>^</sup> (-0.087, 0.009)
EB	-0.074** (-0.123, -0.025)	-0.093*** (-0.143, -0.044)	-0.061 <sup>^</sup> (-0.126, 0.003)	-0.044 <sup>^</sup> (-0.092, 0.004)	-0.085*** (-0.123, -0.047)	-0.053* (-0.101, -0.004)
<b>Log of total visits during regular-hours</b>						
Unweighted	-0.050* (-0.090, -0.010)	-0.096*** (-0.147, -0.045)	-0.087* (-0.152, -0.021)	-0.002 (-0.042, 0.039)	-0.059** (-0.097, -0.021)	-0.052 <sup>^</sup> (-0.109, 0.004)
PS	-0.078*** (-0.120, -0.037)	-0.077** (-0.130, -0.024)	-0.072* (-0.141, -0.003)	-0.042 <sup>^</sup> (-0.085, 0.0004)	-0.046* (-0.087, 0.006)	-0.057 <sup>^</sup> (-0.115, 0.0003)
EB	-0.085** (-0.134, -0.036)	-0.090** (-0.145, -0.034)	-0.068 <sup>^</sup> (-0.141, 0.004)	-0.050* (-0.097, -0.003)	-0.063** (-0.106, -0.020)	-0.064* (-0.122, -0.006)
<b>Log of total visits during after-hours</b>						
Unweighted	-0.041* (-0.081, -0.002)	-0.104*** (-0.153, -0.055)	-0.041 (-0.109, 0.028)	-0.0002 (-0.043, 0.043)	-0.086*** (-0.124, -0.048)	-0.004 (-0.049, 0.057)
PS	-0.070** (-0.112, -0.028)	-0.086** (-0.139, -0.033)	-0.026 (-0.098, 0.046)	-0.039 (-0.085, 0.006)	-0.075*** (-0.116, -0.033)	-0.002 (-0.056, 0.052)
EB	-0.069** (-0.117, -0.021)	-0.077** (-0.132, -0.022)	-0.045 (-0.119, 0.030)	-0.037 (-0.084, 0.010)	-0.076** (-0.120, -0.032)	-0.022 (-0.077, 0.034)
Observations	17,082	17,082	17,082	17,928	17,928	17,928
Physicians	1,898	1,898	1,898	1,992	1,992	1,992

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

Table A18d: Coefficient of FHO on the Log of patients who used the ED for mental health reasons per 1,000 patients, by time of switch

	Early switchers			Late switchers		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of patients to ED</b>						
Unweighted	-0.015 (-0.048, 0.018)	-0.075*** (-0.1112, -0.038)	-0.043^ (-0.092, 0.007)	0.020 (-0.014, 0.054)	-0.043** (-0.070, -0.017)	-0.009 (-0.046, 0.028)
PS	-0.042* (-0.077, -0.008)	-0.067** (-0.106, -0.028)	-0.040 (-0.092, 0.012)	-0.018 (-0.053, 0.018)	-0.034* (-0.063, -0.006)	-0.014 (-0.052, 0.025)
EB	-0.048* (-0.088, -0.008)	-0.072** (-0.115, -0.031)	-0.048^ (-0.104, 0.008)	-0.026 (-0.064, -0.013)	-0.045** (-0.077, -0.013)	-0.027 (-0.067, 0.013)
<b>Log of ED patients during regular-hours</b>						
Unweighted	-0.025 (-0.058, 0.009)	-0.062** (-0.108, -0.017)	-0.056^ (-0.114, 0.003)	0.016 (-0.016, 0.049)	-0.014 (-0.047, 0.019)	-0.021 (-0.069, 0.028)
PS	-0.053** (-0.087, -0.018)	-0.048* (-0.096, -0.003)	-0.054^ (-0.115, 0.007)	-0.017 (-0.051, 0.017)	-0.002 (-0.038, 0.034)	-0.025 (-0.074, 0.025)
EB	-0.057** (-0.099, -0.015)	-0.061** (-0.111, -0.011)	-0.054 (-0.118, 0.011)	-0.024 (-0.064, 0.016)	-0.014 (-0.055, 0.027)	-0.031 (-0.082, 0.020)
<b>Log of ED patients during after-hours</b>						
Unweighted	-0.019 (-0.050, 0.013)	-0.066** (-0.110, -0.022)	-0.015 (-0.077, 0.046)	0.013 (-0.019, 0.046)	-0.048** (-0.079, -0.016)	0.020 (-0.027, 0.066)
PS	-0.045** (-0.078, -0.011)	-0.064** (-0.110, -0.017)	-0.006 (-0.071, 0.058)	-0.024 (-0.058, 0.010)	-0.042* (-0.076, -0.007)	0.017 (-0.031, 0.065)
EB	-0.049* (-0.086, -0.011)	-0.060* (-0.109, -0.011)	-0.026 (-0.096, 0.043)	-0.028 (-0.064, 0.008)	-0.045* (-0.082, -0.007)	-0.004 (-0.053, 0.046)
Observations	17,082	17,082	17,082	17,928	17,928	17,928
Physicians	1,898	1,898	1,898	1,992	1,992	1,992

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for 1,898 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

## Results on Analysis of Patients with SMI

Table A19: Number of enrolled patients with SMI per 1000 patients

Fiscal year	Unweighted means		PS-weighted means		t-test p-value (weighted)
	Switcher	Non-switcher	Switcher	Non-switcher	
<b>2007/2008</b>	6.963	5.732	6.963	7.281	0.456
<b>2008/2009</b>	6.904	5.884	6.904	7.628	0.083
<b>2009/2010</b>	6.595	5.984	6.595	7.441	0.040
<b>2010/2011</b>	6.390	6.062	6.390	7.738	0.002
<b>2011/2012</b>	6.014	6.163	6.014	7.905	<0.001
<b>2012/2013</b>	6.618	5.925	6.618	7.487	<0.001
<b>2013/2014</b>	6.046	6.253	6.046	7.888	<0.001
<b>2014/2015</b>	6.159	6.253	6.159	7.867	<0.001
<b>2015/2016</b>	6.040	6.178	6.040	7.905	<0.001



Table A20: Proportion of FPs who referred at least one patient to a psychiatrist that fiscal year

Fiscal year	Unweighted means		PS-weighted means		t-test p-value (weighted)
	Switcher	Non-switcher	Switcher	Non-switcher	
<b>2007/2008</b>	0.0169	0.0162	0.0169	0.162	0.884
<b>2008/2009</b>	0.0205	0.0170	0.0205	0.0135	0.150
<b>2009/2010</b>	0.0205	0.0170	0.0205	0.0208	0.941
<b>2010/2011</b>	0.0216	0.0251	0.0216	0.0293	0.168
<b>2011/2012</b>	0.0176	0.0218	0.0176	0.0280	0.064
<b>2012/2013</b>	0.0162	0.0218	0.0162	0.0334	0.003
<b>2013/2014</b>	0.0205	0.0307	0.0205	0.0537	<0.001
<b>2014/2015</b>	0.0190	0.0243	0.0190	0.0429	<0.001
<b>2015/2016</b>	0.0176	0.0324	0.0176	0.0520	<0.001

Observations = 23,886; Physicians = 2,654

Table A21. Percentage (%) of patients with chronic mental illness.

Fiscal year	Unweighted means		PS-weighted means		t-test p-value (weighted)
	Switcher	Non-switcher	Switcher	Non-switcher	
<b>2007/2008</b>	27.8	27.4	27.8	28.3	0.126
<b>2008/2009</b>	26.9	26.8	26.9	26.8	0.016
<b>2009/2010</b>	26.0	26.6	26.0	27.6	< 0.001
<b>2010/2011</b>	24.9	26.2	24.9	27.3	< 0.001
<b>2011/2012</b>	24.1	26.0	24.1	27.2	< 0.001
<b>2012/2013</b>	23.4	25.8	23.4	27.1	< 0.001
<b>2013/2014</b>	23.0	25.8	23.0	27.2	< 0.001
<b>2014/2015</b>	22.7	25.9	22.7	27.3	< 0.001
<b>2015/2016</b>	22.7	26.0	22.7	27.5	< 0.001

Observations = 23,886; Physicians = 2,654

## Appendix B

### B1. Findings from other covariates

Detailed regression results, including coefficients from the covariates, can be found in Appendix A. Some covariates were significantly associated with the outcomes. Covariates that were consistently associated with outcomes in FE and HD FE regressions are discussed below.

***Mental health service provision in primary care.*** FPs were likely to provide a higher quantity of mental health services (total, as well as during regular-hours and after-hours) if they were female, Canadian medical graduates, their patients were on average sicker (as measured by the average ADG score in the practice), and if they had more patients with chronic mental illness. After-hours service provision tended to be higher with smaller group sizes. The value of mental health services provided followed the same trends as the results of number of mental health services.

Female FPs may be more comfortable with treating mental illnesses, particularly in providing counselling services, compared to male FPs who may prefer treating solely through pharmacotherapy (1). International medical graduates may be provided less training regarding mental illness, or be less comfortable in treating mental illnesses due to cultural differences. As physical illnesses often are accompanied by mental illness and vice-versa, it is possible that the higher ADG score also reflects a higher proportion of patients with co-morbid mental illness. Lower after-hours service provision in larger physician groups may be due to fewer members providing most of the after-hours care. Each physician group is expected to provide a minimum number of after-hours care; however, it is not necessary for all FPs within the group to work after-hours.

***Enrolling patients with SMI.*** FPs were more likely to have a greater number of patients with SMI if they had a higher average ADG score among their patients, more patients in the bottom two quintiles on the Ethnic Concentration Score, and had a greater

proportion of patients with chronic mental illness. Mental disorders are included in ADG scores and patients with SMI are also more likely to have physical health illnesses, so it is unsurprising that higher average ADG score was associated with more enrolled patients with SMI. Interpretation of the ethnic concentration score is slightly difficult, as it is based on area-level measures. One interpretation could be that having more patients in the bottom two quintiles of the Ethnic Concentration Score indicates having fewer ethnic minorities as enrolled patients. Different ethnic groups have been found to have different rates of incidence for schizophrenia: for example, Canadian migrants from East Asia tend to have lower incidence rates compared to the general population. However, this trend is not consistent for other ethnic groups, such as migrants from the Caribbean and Bermuda who tend to have a higher incidence. Furthermore, refugees from certain groups tend to have a higher rate of psychotic disorders (2). Since the ethnic concentration variable is a broad composite measure based on area-level data, it is unclear if this finding is due to minority groups' differences in incidence of serious mental illnesses. A study found that immigrant status, particularly those living in an area with a high ethnic concentration score was associated with lower incidence of mental illnesses, including schizophrenia (3).

***ED visits for mental health reasons.*** ED visits for mental health reasons was higher among FPs with: smaller group sizes, with a younger average patient age, higher average ADG scores, patients in the bottom two quintiles of the Material Deprivation Score, patients in the bottom two quintiles of the Ethnic Concentration Score, and patients with chronic mental illness. This was consistent across analyses of total, regular-hours and after-hours, with one exception: the proportion of patients with chronic mental illness was not statistically significant in the HDFE for after-hours ED visits. When the number of patients was assessed, the covariates were significant in the same directions. In addition, FPs with a greater proportion of patients over 65 years old also tended to have more patients who used the ED for mental health reasons. Proportion of patients over 65 was not significant for the regular-hours ED visit regression, but was significant for the after-hours ED visit regression.

Previous research on ED visits has also found that non-ethnic minorities, as well as sicker patients, tend to use the ED more frequently, which aligns with the results of our study (4). It is not clear why ethnic minorities tend to less likely use the ED; some potential reasons could be stigma, worries about language barrier, or the cultural acceptability of ED care. Having a smaller physician group size may suggest access to relatively fewer FPs in the practice, which may lead to increased use of the ED for mental health reasons. Greater material deprivation was associated with lower use of the ED for mental health reasons, which aligns with previous research on overall ED usage (5). These patients may be using the ED, rather than primary care, for a variety of reasons, such as lack of having a FP or real or perceived difficulties in accessing their FP. In general, older patients tend to use the ED more than younger patients (6). In an Australian study that interviewed older patients who used the ED, 59% expressed difficulties accessing after-hours primary care without using the ED (7). It is possible that Canadian seniors also have a real or perceived difficulty in seeing their FP during after-hours, and thus turn to the ED.

## B2. Results of Subgroup Analysis

Subgroup analyses were conducted to determine whether provision of mental health services in primary care or ED visits for mental health reasons differ based on physician sex, physician age ( $\leq 50$  or  $> 50$  years old as of April 1<sup>st</sup> 2007), or timing of switch (April 1<sup>st</sup> 2007 to March 31<sup>st</sup> 2009, or April 1<sup>st</sup> 2009 to March 31<sup>st</sup> 2016). The PS-weighted results are presented in percentage ranges in Tables B2.1 –B2.6. Unweighted and entropy-weighted results are available in Appendix A. No statistically significant differences were found between subgroups, based on overlapping 95% confidence intervals, but some differences in magnitude of the effects were found and are discussed here.

**Sex.** The PS-weighted estimates on switching from FHG to FHO for male and female physicians are presented in Tables 5 and 6. Overall, male and female switchers, compared to the respective non-switchers, have comparable changes in the provision of overall mental health services and regular-hours mental health services. Female switchers tended to have a larger increase in the number of services provided during after-hours (31.5% to 57.6%) compared to male switchers (10.1% to 29.8%). This gap was also seen for the value of mental health services provided during after-hours (female physicians: 53.8% to 119.8%; male physicians: 22.4% to 56.0%). As previously discussed, switchers may provide more after-hours care because they are more incentivized by the premium than non-switchers. It is possible that female switchers are responding to incentives to a greater extent than male switchers, given that female switchers were providing slightly fewer after-hours services at baseline (in 2007/08) compared to male switchers. As seen in Table 6, switching to FHO was associated with a slightly larger decrease in ED visits for male switchers (5.2% to 10.0%) compared to female switchers (3.8% to 5.2%), with similar differences seen in regular-hours and after-hours ED visits.

**Age.** Younger physicians who switch had a slightly larger change in the number and the value of mental health services provided compared to older physicians, though the ranges overlap and thus this difference is likely non-significant (see Tables 7 and 8). On average, younger switchers provided 13.4% to 16.6% fewer total mental health services compared to younger non-switchers; for older

physicians, switchers provided 9.3% to 15.0% fewer total mental health services. Similar differences were seen for after-hours and regular-hours services, as well as the value of mental health services. Younger FPs may be more likely to drastically change their practice patterns upon switching, whereas older FPs may be less prone to such changes. They did not differ substantially in overall or after-hours ED visits for mental health reasons by patients, although older physicians who switch had a larger decrease in number of patients who present to the ED during regular-hours (3.7% to 6.7%), compared to younger physicians who switch (0.8% to 2.0%). One possible explanation may be that older switchers may be relatively more motivated and may work more hours compared to older non-switchers who may have chosen to not switch because they are preparing for retirement and thus choose to work fewer hours. In comparison, younger switchers may not differ as much from younger non-switchers in this regard, and hence have a smaller difference.

***Timing of switch.*** In this subgroup analysis, all non-switchers were compared to either those who switched in the first two fiscal years (early switchers; N = 662) or those who switched in the last seven years (late switchers; N = 756) to determine whether the effect sizes were different between the groups. Early switchers appeared to be largely comparable to later switchers in total and regular-hours mental health services; however, the increase in number of after-hours services was smaller for early switchers (19.5% to 26.8%) compared to late switchers (23.4% to 49.1%), with value following a similar pattern. It is possible that later switchers may be more responsive to incentives to provide after-hours care compared to early switchers. Both groups have similar coefficients for ED visits, as seen in Table 10; early switchers having slightly larger decreases in the number of patients using the ED during regular-hours (4.7% to 5.3%) compared to late switchers (0.3% to 2.5%).

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**Table B 2.1**  
Coefficient of FHO on MH services per 1000 enrolled patients, by physician sex (PS-weighted)

	Male physicians			Female physicians		
	OLS	FE	HDFE	OLS	FE	HDFE
<b>Log of number of services</b>						
Total MH services	-0.139*** (-0.195, -0.083)	-0.147*** (-0.190, -0.104)	-0.139*** (-0.174, -0.104)	-0.123*** (-0.174, -0.072)	-0.155*** (-0.193, -0.118)	-0.158*** (-0.195, -0.121)
MH services during regular-hours	-0.141*** (-0.199, -0.084)	-0.159*** (-0.201, -0.116)	-0.147*** (-0.182, -0.112)	-0.132*** (-0.183, -0.082)	-0.171*** (-0.209, -0.134)	-0.167*** (-0.204, -0.130)
MH services during after-hours	0.1099 (-0.057, 0.255)	0.263*** (0.127, 0.400)	0.127* (0.009, 0.244)	0.459*** (0.278, 0.641)	0.452*** (0.310, 0.595)	0.276*** (0.138, 0.415)
<b>Log of value of services</b>						
Total MH services	-0.156*** (-0.233, -0.079)	-0.185*** (-0.250, -0.119)	-0.185*** (-0.230, -0.139)	-0.158*** (-0.220, -0.096)	-0.216*** (-0.258, -0.174)	-0.202*** (-0.245, -0.159)
MH services during regular-hours	-0.155*** (-0.233, -0.077)	-0.187*** (-0.253, -0.122)	-0.185*** (-0.230, -0.140)	-0.159*** (-0.222, -0.097)	-0.219*** (-0.261, -0.176)	-0.2014** (-0.247, -0.161)
MH services during after-hours	0.257* (0.031, 0.483)	0.450*** (0.246, 0.655)	0.207* (0.027, 0.386)	0.797*** (0.530, 1.063)	0.729*** (0.513, 0.945)	0.437*** (0.224, 0.650)
Observations	14,391	14,391	14,391	9,495	9,495	9,495
Physicians	1,599	1,599	1,599	1,055	1,055	1,055

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for clusters (number of physicians).

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

**Table B 2.2**

Coefficient of FHO on the log of ED usage for mental health reasons per 1,000 patients, by physician sex (PS-weighted)

	Male physicians			Female physicians	
	OLS	FE	HDFE	OLS	FE
<b>Log of number of visits</b>					
All ED visits	-0.075** (-0.125, -0.026)	-0.105*** (-0.141, -0.070)	-0.053* (-0.099, -0.007)	-0.053^ (-0.107, 0.002)	-0.049^ (-0.102, 0.005)
Regular-hours ED visits	-0.074** (-0.121, -0.027)	-0.093*** (-0.133, -0.053)	-0.080** (-0.131, -0.029)	-0.062* (-0.113, -0.011)	-0.021 (-0.080, 0.038)
After-hours ED visits	-0.078** (-0.127, -0.029)	-0.095*** (-0.135, -0.056)	-0.015 (-0.069, 0.039)	-0.049^ (-0.103, 0.005)	-0.048 (-0.110, 0.014)
<b>Log of number of patients</b>					
All ED visits	0.038^ (-0.076, 0.0004)	-0.057*** (-0.088, -0.031)	-0.016 (-0.053, 0.021)	-0.043^ (-0.087, 0.002)	-0.020 (-0.064, 0.024)
Regular-hours ED visits	-0.041* (-0.079, -0.003)	-0.050** (-0.085, -0.015)	-0.044^ (-0.090, 0.001)	-0.043* (-0.086, -0.0001)	0.019 (-0.034, 0.072)
After-hours ED visits	-0.042* (-0.079, -0.006)	-0.052** (-0.085, -0.019)	-0.022 (-0.024, 0.069)	-0.045* (-0.090, -0.001)	-0.025 (-0.078, 0.029)
Observations	14,391	14,391	14,391	9,495	9,495
Physicians	1,599	1,599	1,599	1,055	1,055

ED: emergency department; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for clusters (number of physicians).

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

**Table B 2.3**

Coefficient of FHO on MH services, by physician age (PS-weighted)

	Younger physicians ( $\leq 50$ in 2007)			Older physicians ( $> 50$ )	
	OLS	FE	HDFE	OLS	FE
<b>Number of services</b>					
Total MH services	-0.168*** (-0.217, -0.118)	-0.182*** (-0.213, -0.150)	-0.144*** (-0.175, -0.112)	-0.097** (-0.157, -0.037)	-0.126*** (-0.175, -0.076)
MH services during regular-hours	-0.178*** (-0.227, -0.128)	-0.194*** (-0.226, -0.163)	-0.153*** (-0.185, -0.122)	-0.098** (-0.159, -0.040)	-0.139*** (-0.187, -0.091)
MH services during after-hours	0.368*** (0.207, 0.529)	0.381*** (0.254, 0.508)	0.250*** (0.133, 0.368)	0.132 (-0.039, 0.303)	0.261** (0.098, 0.424)
<b>Value of services</b>					
Total MH services	-0.203*** (-0.264, -0.141)	-0.238*** (-0.273, -0.202)	-0.188*** (-0.224, -0.153)	-0.119** (-0.199, 0.039)	-0.168*** (-0.241, -0.095)
MH services during regular-hours	-0.205*** (-0.266, -0.143)	-0.240*** (-0.275, -0.205)	-0.190*** (-0.226, -0.154)	-0.118** (-0.199, -0.036)	-0.171*** (-0.244, -0.098)
MH services during after-hours	0.655*** (0.420, 0.890)	0.634*** (0.440, 0.830)	0.386*** (0.205, 0.566)	0.311* (0.062, 0.560)	0.432*** (0.194, 0.669)
Observations	12,294	12,294	12,294	11,592	11,592
Physicians	1,366	1,366	1,366	1,288	1,288

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for clusters (number of physicians).

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

**Table B 2.4**

Coefficient of FHO on the log of ED usage for mental health reasons per 1,000 patients, by physician age (PS-weighted)

	Younger physicians ( $\leq 50$ in 2007)			Older physicians ( $> 50$ in 2007)	
	OLS	FE	HDFE	OLS	FE
<b>Log of number of visits</b>					
All ED visits	-0.029 (-0.081, 0.022)	-0.077** (-0.121, -0.033)	-0.033 (-0.086, 0.022)	-0.090** (-0.142, -0.038)	-0.082*** (-0.123, -0.041)
Regular-hours ED visits	-0.041 (-0.090, 0.008)	-0.058* (-0.107, -0.009)	-0.048 (-0.112, 0.017)	-0.091*** (-0.140, -0.042)	-0.069** (-0.115, -0.023)
After-hours ED visits	-0.030 (-0.081, 0.020)	-0.077** (-0.127, -0.026)	-0.003 (-0.065, 0.059)	-0.084** (-0.137, -0.032)	-0.068** (-0.115, -0.022)
<b>Log of number of patients</b>					
All ED visits	-0.010 (-0.051, 0.031)	-0.035 <sup>^</sup> (-0.071, 0.002)	-0.009 (-0.054, 0.037)	-0.057** (-0.097, -0.017)	-0.050** (-0.082, -0.017)
Regular-hours ED visits	-0.020 (-0.061, 0.021)	-0.008 (-0.052, 0.036)	-0.012 (-0.067, 0.044)	-0.058** (-0.098, -0.019)	-0.038 <sup>^</sup> (-0.077, 0.002)
After-hours ED visits	-0.015 (-0.054, 0.025)	-0.038 <sup>^</sup> (-0.081, 0.005)	0.017 (-0.039, 0.073)	-0.056** (-0.095, -0.017)	-0.041* (-0.081, -0.001)
Observations	12,294	12,294	12,294	11,592	11,592
Physicians	1,366	1,366	1,366	1,288	1,288

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects; ED: emergency department.

95% confidence intervals based on robust standard errors, adjusted for 1,368 clusters.

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

**Table B 2.5**

Coefficient of FHO on MH services per 1000 enrolled patients, by time of switch (PS-weighted)

	Early switchers (switched before April 2009)			Late switchers (switched during	
	OLS	FE	HDFE	OLS	FE
<b>Number of services</b>					
Total MH services	-0.141*** (-0.193, -0.088)	-0.175*** (-0.216, -0.134)	-0.137*** (-0.174, -0.099)	-0.125*** (-0.169, -0.082)	-0.154*** (-0.194, -0.114)
MH services during regular-hours	-0.141*** (-0.195, -0.088)	-0.181*** (-0.222, -0.141)	-0.145*** (-0.183, -0.108)	-0.135*** (-0.179, -0.091)	-0.169*** (-0.209, -0.130)
MH services during after-hours	0.181* (0.032, 0.330)	0.240** (0.103, 0.377)	0.147* (0.004, 0.289)	0.353*** (0.213, 0.494)	0.401*** (0.276, 0.527)
<b>Value of services</b>					
Total MH services	-0.158*** (-0.227, -0.089)	-0.215*** (-0.272, -0.157)	-0.172*** (-0.218, -0.126)	-0.154*** (-0.212, -0.097)	-0.199*** (-0.258, -0.140)
MH services during regular-hours	-0.157*** (-0.226, -0.087)	-0.216*** (-0.273, -0.158)	-0.172*** (-0.219, -0.126)	-0.155*** (-0.213, -0.0967)	0.202*** (-0.261, -0.143)
MH services during after-hours	0.412*** (0.194, 0.629)	0.457*** (0.248, 0.667)	0.221* (-0.002, 0.440)	0.615*** (0.410, 0.820)	0.654*** (0.466, 0.842)
Observations	17,082	17,082	17,082	17,928	17,928
Physicians	1,898	1,898	1,898	1,992	1,992

MH: mental health; OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects.

95% confidence intervals based on robust standard errors, adjusted for clusters (number of physicians).

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

**Table B 2.6**

Coefficient of FHO on the log of ED usage for mental health reasons per 1,000 patients: Early switchers vs non-switchers (PS-weighted)

	Early switchers (switched before April 2009)			Late switchers (switched during April 2009)	
	OLS	FE	HDFE	OLS	FE
<b>Log of number of visits</b>					
All ED visits	-0.070** (-0.112, -0.027)	-0.091*** (-0.138, -0.044)	-0.054^ (-0.116, 0.008)	-0.038^ (-0.084, 0.007)	-0.073*** (-0.109, -0.037)
Regular-hours ED visits	-0.078*** (-0.120, -0.037)	-0.077** (-0.130, -0.024)	-0.072* (-0.141, -0.003)	-0.042^ (-0.085, 0.0004)	-0.046* (-0.087, 0.0006)
After-hours ED visits	-0.070** (-0.112, -0.028)	-0.086** (-0.139, -0.033)	-0.026 (-0.098, 0.046)	-0.039 (-0.085, 0.006)	-0.075*** (-0.116, -0.033)
<b>Log of number of patients</b>					
All ED visits	-0.042* (-0.077, -0.008)	-0.067** (-0.106, -0.028)	-0.040 (-0.092, 0.012)	-0.018 (-0.053, 0.018)	-0.034* (-0.063, -0.005)
Regular-hours ED visits	-0.053** (-0.087, -0.018)	-0.048* (-0.096, -0.003)	-0.054^ (-0.115, 0.007)	-0.017 (-0.051, 0.017)	-0.002 (-0.038, 0.034)
After-hours ED visits	-0.045** (-0.078, -0.011)	-0.064** (-0.110, -0.017)	-0.006 (-0.071, 0.058)	-0.024 (-0.058, 0.010)	-0.042* (-0.076, -0.008)
Observations	17,082	17,082	17,082	17,928	17,928
Physicians	1,898	1,898	1,898	1,992	1,992

OLS: Ordinary Least Squares; FE: Fixed-effects; HDFE: High-dimensional fixed-effects; ED: emergency department.

95% confidence intervals based on robust standard errors, adjusted for clusters (number of physicians).

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

All regressions include full set of control variables defined in Methods section.

## Appendix C: Before-after analyses

Table A23: Log of total number of mental health services

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.130*** [-0.168, -0.091]	-0.128*** [-0.153, -0.104]	-0.140*** [-0.166, -0.113]
Year	0.007* [0.000, 0.013]	0.042*** [0.018, 0.066]	
Age	0.009 [-0.007, 0.025]		
Age <sup>2</sup>	0.0001 [-0.0002, 0.0001]	-0.0003** [-0.001, -0.0001]	-0.001 [-0.002, 0.001]
Sex (Female)	0.115* [0.027, 0.202]		
Rurality	-0.053 [-0.174, 0.068]	0.040 [-0.045, 0.126]	0.097 [-0.074, 0.268]
IMG	-0.162*** [-0.232, -0.092]		
Group size	-0.0001 [-0.0005, 0.0003]	-0.0001 [-0.0003, 0.0002]	-0.000 [-0.0003, 0.0001]
Avg. patient age	-0.007 [-0.025, 0.012]	-0.012 [-0.033, 0.010]	-0.016 [-0.045, 0.014]
Prop. of patients >= 65	-0.29 [-1.267, 0.687]	0.357 [-0.655, 1.368]	1.406^ [-0.076, 2.887]
Avg. ADG score	0.088** [0.025, 0.150]	0.297*** [0.230, 0.364]	0.292*** [0.222, 0.362]
Prop. of female patients	-0.006*** [-0.010, -0.003]	-0.006 [-0.016, 0.003]	-0.008 [-0.020, 0.004]
Prop. in Q1 or Q2 on Deprivation Score	0.004*** [0.002, 0.005]	0.003 [-0.002, 0.007]	0.00003 [-0.006, 0.006]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** [0.003, 0.005]	-0.002 [-0.004, 0.000]	-0.001 [-0.003, 0.001]
Prop. of rural patients	0.001 [-0.001, 0.003]	0.002 [-0.003, 0.006]	0.005 [-0.002, 0.011]
Prop. of patients with chronic mental illness	0.055*** [0.051, 0.058]	0.041*** [0.036, 0.046]	0.039*** [0.034, 0.043]
Constant	-9.229 [-21.582, 3.123]	-79.167*** [-126.260, -32.073]	
R <sup>2</sup>	0.588	0.411	0.263
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A24: Log of number of regular-hours mental health services

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.134*** [-0.172, -0.095]	-0.144*** [-0.168, -0.120]	-0.149*** [-0.176, -0.123]
Year	0.002 [-0.004, 0.009]	0.043*** [0.020, 0.067]	
Age	0.010 [-0.006, 0.026]		
Age <sup>2</sup>	-0.0001 [-0.0003, 0.0001]	-0.0003** [-0.001, -0.0001]	-0.001 [-0.002, 0.001]
Sex (Female)	0.122** [0.032, 0.211]		
Rurality	-0.068 [-0.188, 0.051]	0.048 [-0.029, 0.125]	0.099 [-0.066, 0.264]
IMG	-0.167*** [-0.237, -0.097]		
Group size	-0.0001 [-0.0004, 0.0003]	0.00003 [-0.000, 0.000]	0.00004 [-0.0002, 0.0002]
Avg. patient age	-0.001 [-0.020, 0.018]	-0.012 [-0.033, 0.010]	-0.015 [-0.045, 0.015]
Prop. of patients >= 65	-0.455 [-1.431, 0.522]	0.362 [-0.654, 1.378]	1.335^ [-0.145, 2.815]
Avg. ADG score	0.072* [0.009, 0.135]	0.297*** [0.232, 0.363]	0.297*** [0.227, 0.367]
Prop. of female patients	-0.006** [-0.009, -0.002]	-0.006 [-0.015, 0.004]	-0.008 [-0.021, 0.004]
Prop. in Q1 or Q2 on Deprivation Score	0.003*** [0.002, 0.005]	0.003 [-0.002, 0.008]	0.000 [-0.005, 0.006]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** [0.003, 0.006]	-0.001 [-0.003, 0.001]	-0.001 [-0.003, 0.001]
Prop. of rural patients	0.001 [-0.000, 0.003]	0.002 [-0.003, 0.007]	0.005 [-0.002, 0.011]
Prop. of patients with chronic mental illness	0.055*** [0.052, 0.059]	0.041*** [0.037, 0.046]	0.039*** [0.034, 0.044]
Constant	-0.878 [-13.363, 11.608]	-81.507*** [-128.101, -34.914]	
R <sup>2</sup>	0.591	0.432	0.272
# of physicians	1418	1418	1418
# of observations	12762	12762	12762



Table A25: Log of number of after-hours mental health services

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.100 [-0.042, 0.242]	0.377*** [0.284, 0.470]	0.234*** [0.141, 0.327]
Year	0.099*** [0.079, 0.119]	0.073^ [-0.003, 0.150]	
Age	0.035 [-0.026, 0.096]		
Age <sup>2</sup>	-0.0003 [-0.001, 0.0003]	-0.0003 [-0.001, 0.0004]	-0.001 [-0.005, 0.003]
Sex (Female)	0.001 [-0.239, 0.240]		
Rurality	0.524* [0.058, 0.989]	-0.295 [-0.723, 0.134]	-0.108 [-0.583, 0.367]
IMG	0.057 [-0.122, 0.236]		
Group size	-0.002** [-0.003, -0.001]	-0.001** [-0.002, -0.000]	-0.001** [-0.002, -0.000]
Avg. patient age	-0.106*** [-0.156, -0.055]	-0.043 [-0.108, 0.023]	-0.030 [-0.109, 0.048]
Prop. of patients >= 65	2.925* [0.402, 5.448]	1.477 [-1.741, 4.694]	2.187 [-1.758, 6.131]
Avg. ADG score	0.368*** [0.205, 0.531]	0.228* [0.039, 0.418]	0.025 [-0.138, 0.189]
Prop. of female patients	-0.016*** [-0.025, -0.007]	-0.024* [-0.048, -0.000]	0.001 [-0.025, 0.026]
Prop. in Q1 or Q2 on Deprivation Score	0.007** [0.003, 0.011]	0.0004 [-0.018, 0.017]	0.00004 [-0.015, 0.015]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.000 [-0.004, 0.005]	-0.003 [-0.009, 0.004]	-0.005 [-0.011, 0.001]
Prop. of rural patients	-0.014*** [-0.020, -0.007]	-0.009 [-0.031, 0.014]	0.001 [-0.032, 0.034]
Prop. of patients with chronic mental illness	0.028*** [0.020, 0.036]	0.009 [-0.005, 0.023]	0.016* [0.000, 0.031]
Constant	-195.254*** [-235.257, -155.251]	-143.311^ [-294.623, 8.000]	
R <sup>2</sup>	0.104	0.069	0.017
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A26: Log of total value of mental health services

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.177*** [-0.223, -0.132]	-0.178*** [-0.206, -0.150]	-0.189*** [-0.222, -0.157]
Year	0.006^ [-0.001, 0.014]	0.047** [0.018, 0.075]	
Age	0.019^ [-0.002, 0.039]		
Age <sup>2</sup>	-0.0002* [-0.0004, -0.00002]	-0.0004* [-0.001, -0.0001]	-0.001 [-0.004, 0.001]
Sex (Female)	0.213*** [0.108, 0.319]		
Rurality	-0.113 [-0.280, 0.055]	0.035 [-0.058, 0.128]	0.139^ [-0.025, 0.304]
IMG	-0.209*** [-0.290, -0.127]		
Group size	-0.0002 [-0.001, 0.0003]	-0.00004 [-0.0003, 0.0002]	-0.00002 [-0.0003, 0.0002]
Avg. patient age	0.012 [-0.010, 0.034]	-0.005 [-0.032, 0.021]	-0.014 [-0.052, 0.024]
Prop. of patients >= 65	-0.855 [-1.997, 0.287]	0.380 [-0.880, 1.640]	2.213^ [-0.159, 4.585]
Avg. ADG score	0.045 [-0.031, 0.120]	0.306*** [0.226, 0.386]	0.318*** [0.237, 0.399]
Prop. of female patients	-0.005** [-0.009, -0.001]	-0.005 [-0.017, 0.007]	-0.007 [-0.023, 0.009]
Prop. in Q1 or Q2 on Deprivation Score	0.006*** [0.005, 0.008]	0.004 [-0.002, 0.010]	-0.003 [-0.011, 0.005]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** [0.002, 0.005]	-0.001 [-0.004, 0.001]	-0.001 [-0.003, 0.001]
Prop. of rural patients	0.003** [0.001, 0.006]	0.002 [-0.004, 0.008]	0.004 [-0.003, 0.011]
Prop. of patients with chronic mental illness	0.058*** [0.054, 0.063]	0.044*** [0.039, 0.050]	0.041*** [0.035, 0.046]
Constant	-6.163 [-20.938, 8.612]	-85.312** [-141.611, -29.013]	
R <sup>2</sup>	0.546	0.382	0.254
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A27: Log of value of regular-hours mental health services

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.179*** [-0.225, -0.133]	-0.181*** [-0.209, -0.153]	-0.191*** [-0.224, -0.159]
Year	0.006 [-0.002, 0.013]	0.047** [0.019, 0.075]	
Age	0.019^ [-0.001, 0.039]		
Age <sup>2</sup>	-0.0002* [-0.0004, -0.000]	-0.0004** [-0.001, -0.0001]	-0.002 [-0.004, 0.001]
Sex (Female)	0.215*** [0.109, 0.322]		
Rurality	-0.116 [-0.284, 0.052]	0.036 [-0.057, 0.129]	0.140^ [-0.024, 0.304]
IMG	-0.210*** [-0.292, -0.128]		
Group size	-0.0002 [-0.001, 0.0003]	-0.00002 [-0.0003, 0.0003]	-0.000005 [-0.0003, 0.0002]
Avg. patient age	0.013 [-0.009, 0.035]	-0.006 [-0.032, 0.021]	-0.014 [-0.052, 0.024]
Prop. of patients >= 65	-0.881 [-2.026, 0.263]	0.387 [-0.874, 1.649]	2.206^ [-0.163, 4.575]
Avg. ADG score	0.041 [-0.035, 0.117]	0.307*** [0.227, 0.386]	0.319*** [0.238, 0.400]
Prop. of female patients	-0.005* [-0.009, -0.001]	-0.005 [-0.017, 0.007]	-0.007 [-0.023, 0.009]
Prop. in Q1 or Q2 on Deprivation Score	0.006*** [0.005, 0.008]	0.004 [-0.002, 0.010]	-0.003 [-0.011, 0.005]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** [0.002, 0.005]	-0.001 [-0.004, 0.001]	-0.001 [-0.003, 0.001]
Prop. of rural patients	0.003** [0.001, 0.006]	0.002 [-0.004, 0.008]	0.004 [-0.003, 0.011]
Prop. of patients with chronic mental illness	0.058*** [0.054, 0.063]	0.044*** [0.039, 0.050]	0.041*** [0.036, 0.046]
Constant	-4.728 [-19.571, 10.115]	-86.164** [-142.518, -29.811]	
R <sup>2</sup>	0.545	0.384	0.254
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A28: Log of value of after-hours mental health services

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.239* [0.031, 0.447]	0.592*** [0.454, 0.729]	0.380*** [0.238, 0.521]
Year	0.143*** [0.114, 0.173]	0.134* [0.022, 0.246]	
Age	0.061 [-0.028, 0.149]		
Age <sup>2</sup>	-0.001 [-0.001, 0.000]	-0.001 [-0.002, 0.000]	-0.002 [-0.009, 0.004]
Sex (Female)	0.008 [-0.349, 0.365]		
Rurality	0.916* [0.193, 1.639]	-0.588 [-1.332, 0.156]	-0.195 [-1.006, 0.617]
IMG	0.111 [-0.151, 0.373]		
Group size	-0.003** [-0.004, -0.001]	-0.002** [-0.003, -0.000]	-0.002** [-0.003, -0.001]
Avg. patient age	-0.124*** [-0.197, -0.050]	-0.05 [-0.149, 0.049]	-0.033 [-0.154, 0.089]
Prop. of patients >= 65	3.101^ [-0.591, 6.793]	1.849 [-3.004, 6.702]	3.075 [-3.010, 9.160]
Avg. ADG score	0.489*** [0.251, 0.728]	0.271^ [-0.010, 0.553]	-0.021 [-0.271, 0.228]
Prop. of female patients	-0.022*** [-0.035, -0.009]	-0.037* [-0.073, -0.000]	0.002 [-0.036, 0.040]
Prop. in Q1 or Q2 on Deprivation Score	0.010*** [0.004, 0.016]	-0.001 [-0.027, 0.026]	0.001 [-0.022, 0.025]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004 [-0.002, 0.010]	-0.002 [-0.012, 0.008]	-0.006 [-0.016, 0.003]
Prop. of rural patients	-0.026*** [-0.036, -0.015]	-0.014 [-0.050, 0.022]	-0.006 [-0.058, 0.046]
Prop. of patients with chronic mental illness	0.034*** [0.023, 0.046]	0.008 [-0.011, 0.026]	0.022^ [-0.000, 0.044]
Constant	-283.519*** [-342.761, -224.277]	-262.073* [-483.658, -40.487]	
R <sup>2</sup>	0.100	0.080	0.017
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A29: Log of patients with SMI

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	0.174*** [0.085, 0.262]	-0.074* [-0.133, -0.014]	-0.013 [-0.078, 0.051]
Year	-0.019** [-0.032, -0.006]	0.038^ [-0.005, 0.081]	
Age	0.033^ [-0.006, 0.071]		
Age <sup>2</sup>	-0.0004* [-0.001, -0.00002]	-0.0004^ [-0.001, 0.00002]	0.003* [0.000, 0.006]
Sex (Female)	0.155^ [-0.024, 0.335]		
Rurality	0.323^ [-0.040, 0.686]	-0.149 [-0.499, 0.202]	0.218 [-0.129, 0.566]
IMG	-0.248*** [-0.375, -0.122]		
Group size	0.0004 [-0.001, 0.0002]	0.0004 [-0.0002, 0.001]	0.001*** [0.001, 0.002]
Avg. patient age	-0.002 [-0.041, 0.037]	-0.005 [-0.044, 0.034]	-0.018 [-0.074, 0.037]
Prop. of patients >= 65	0.269 [-1.689, 2.228]	-0.374 [-2.304, 1.555]	1.269 [-1.593, 4.131]
Avg. ADG score	0.043 [-0.077, 0.162]	0.149** [0.038, 0.260]	0.111^ [-0.003, 0.225]
Prop. of female patients	-0.010** [-0.016, -0.003]	-0.019* [-0.033, -0.004]	-0.006 [-0.026, 0.013]
Prop. in Q1 or Q2 on Deprivation Score	-0.004** [-0.007, -0.001]	-0.008^ [-0.017, 0.001]	0.001 [-0.011, 0.012]
Prop. in Q1 or Q2 on Ethnic Concentration Score	-0.002 [-0.005, 0.001]	0.005* [0.001, 0.009]	0.003 [-0.002, 0.008]
Prop. of rural patients	-0.003 [-0.009, 0.002]	-0.002 [-0.020, 0.016]	-0.013 [-0.033, 0.008]
Prop. of patients with chronic mental illness	0.020*** [0.014, 0.026]	0.005 [-0.003, 0.012]	0.001 [-0.007, 0.009]
Constant	39.480** [13.054, 65.907]	-72.656^ [-157.751, 12.439]	
R <sup>2</sup>	0.056	0.018	0.009
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A30: Log of total number of mental health ED visits

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.057** [-0.100, -0.015]	-0.069*** [-0.103, -0.035]	-0.044* [-0.087, -0.001]
Year	0.034*** [0.027, 0.041]	0.040** [0.016, 0.065]	
Age	-0.018^ [-0.037, 0.002]		
Age <sup>2</sup>	-0.0001 [-0.00004, 0.0003]	0.000004 [-0.0002, 0.0002]	0.0005 [-0.002, 0.001]
Sex (Female)	0.023 [-0.065, 0.111]		
Rurality	-0.086 [-0.228, 0.056]	-0.235** [-0.392, -0.078]	0.022 [-0.204, 0.247]
IMG	-0.098*** [-0.153, -0.043]		
Group size	-0.001*** [-0.002, -0.001]	-0.0005*** [-0.001, -0.0002]	0.0001 [-0.0004, 0.0003]
Avg. patient age	0.009 [-0.012, 0.030]	-0.050*** [-0.073, -0.027]	-0.059** [-0.100, -0.018]
Prop. of patients >= 65	-1.444** [-2.522, -0.367]	0.577 [-0.618, 1.773]	1.651 [-0.467, 3.768]
Avg. ADG score	0.186*** [0.127, 0.245]	0.173*** [0.113, 0.233]	0.185*** [0.111, 0.259]
Prop. of female patients	-0.010*** [-0.013, -0.006]	-0.001 [-0.010, 0.009]	0.005 [-0.008, 0.019]
Prop. in Q1 or Q2 on Deprivation Score	-0.009*** [-0.010, -0.007]	-0.008** [-0.013, -0.002]	-0.014** [-0.022, -0.005]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** [0.003, 0.005]	0.005** [0.002, 0.008]	0.002 [-0.002, 0.006]
Prop. of rural patients	0.003** [0.001, 0.005]	0.007^ [-0.000, 0.014]	0.002 [-0.005, 0.009]
Prop. of patients with chronic mental illness	0.011*** [0.007, 0.014]	0.005* [0.001, 0.008]	0.001 [-0.004, 0.006]
Constant	-65.908*** [-79.336, -52.481]	-76.630** [-125.077, -28.183]	
R <sup>2</sup>	0.181	0.022	0.008
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A31: Log of number of mental health ED visits during regular hours

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.060** [-0.103, -0.017]	-0.072*** [-0.110, -0.033]	-0.078** [-0.127, -0.029]
Year	0.029*** [0.022, 0.035]	0.022 [-0.005, 0.049]	
Age	-0.015 [-0.034, 0.003]		
Age <sup>2</sup>	0.0001 [-0.0001, 0.0003]	0.0001 [-0.0002, 0.0003]	-0.002 [-0.004, 0.000]
Sex (Female)	0.006 [-0.077, 0.090]		
Rurality	-0.053 [-0.200, 0.094]	-0.195^ [-0.392, 0.002]	-0.049 [-0.400, 0.301]
IMG	-0.099*** [-0.153, -0.045]		
Group size	-0.001*** [-0.001, -0.001]	-0.0004** [-0.001, -0.0001]	0.0001 [-0.0005, 0.0004]
Avg. patient age	0.019^ [-0.000, 0.038]	-0.033* [-0.059, -0.007]	-0.046^ [-0.093, 0.002]
Prop. of patients >= 65	-1.653*** [-2.635, -0.672]	0.432 [-0.847, 1.710]	1.207 [-1.200, 3.614]
Avg. ADG score	0.160*** [0.103, 0.216]	0.137*** [0.067, 0.206]	0.145** [0.058, 0.233]
Prop. of female patients	-0.008*** [-0.011, -0.005]	-0.001 [-0.012, 0.009]	0.014^ [-0.001, 0.029]
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** [-0.009, -0.007]	-0.008** [-0.014, -0.002]	-0.017** [-0.027, -0.007]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** [0.003, 0.005]	0.005** [0.002, 0.008]	0.003 [-0.002, 0.007]
Prop. of rural patients	0.003** [0.001, 0.005]	0.007* [0.000, 0.014]	0.001 [-0.009, 0.011]
Prop. of patients with chronic mental illness	0.008*** [0.005, 0.011]	0.003 [-0.001, 0.007]	0.001 [-0.005, 0.007]
Constant	-55.961*** [-69.082, -42.840]	-40.858 [-94.312, 12.596]	
R <sup>2</sup>	0.143	0.011	0.006
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A32: Log of number of mental health ED visits during after-hours

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.039 <sup>^</sup> [-0.083, 0.004]	-0.042* [-0.080, -0.003]	0.005 [-0.043, 0.052]
Year	0.032*** [0.025, 0.039]	0.053*** [0.026, 0.079]	
Age	-0.016 [-0.035, 0.004]		
Age <sup>2</sup>	0.0001 [-0.0001, 0.0003]	0.0001 [-0.0004, 0.0001]	0.001 [-0.002, 0.003]
Sex (Female)	0.009 [-0.079, 0.096]		
Rurality	-0.084 [-0.236, 0.067]	-0.249 <sup>^</sup> [-0.508, 0.010]	0.036 [-0.160, 0.232]
IMG	-0.072** [-0.124, -0.020]		
Group size	-0.001*** [-0.001, -0.001]	-0.0005*** [-0.001, -0.0002]	-0.0001 [-0.001, 0.0003]
Avg. patient age	0.001 [-0.021, 0.022]	-0.060*** [-0.084, -0.035]	-0.071** [-0.119, -0.024]
Prop. of patients >= 65	-1.213* [-2.326, -0.099]	0.759 [-0.554, 2.071]	2.365 <sup>^</sup> [-0.152, 4.882]
Avg. ADG score	0.172*** [0.113, 0.230]	0.169*** [0.099, 0.239]	0.189*** [0.099, 0.279]
Prop. of female patients	-0.010*** [-0.013, -0.006]	-0.002 [-0.012, 0.008]	-0.007 [-0.022, 0.008]
Prop. in Q1 or Q2 on Deprivation Score	-0.008*** [-0.010, -0.007]	-0.007* [-0.013, -0.001]	-0.010* [-0.019, -0.002]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** [0.001, 0.004]	0.003* [0.000, 0.006]	0.001 [-0.003, 0.005]
Prop. of rural patients	0.002* [0.000, 0.005]	0.007 <sup>^</sup> [-0.001, 0.015]	0.007 [-0.003, 0.016]
Prop. of patients with chronic mental illness	0.011*** [0.007, 0.014]	0.006** [0.002, 0.010]	0.002 [-0.003, 0.007]
Constant	-61.776*** [-75.931, -47.620]	-101.994*** [-154.545, -49.443]	
R <sup>2</sup>	0.136	0.017	0.005
# of physicians	1418	1418	1418
# of observations	12762	12762	12762



Table A33: Log of number of patients who visited the ED for a mental health reason

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.028 [-0.062, 0.006]	-0.030* [-0.057, -0.002]	-0.018 [-0.053, 0.017]
Year	0.026*** [0.021, 0.031]	0.035*** [0.016, 0.054]	
Age	-0.010 [-0.026, 0.006]		
Age <sup>2</sup>	0.0001 [-0.0001, 0.0002]	0.00004 [-0.0002, 0.0001]	0.0004 [-0.002, 0.001]
Sex (Female)	0.011 [-0.058, 0.080]		
Rurality	-0.097 [-0.218, 0.023]	-0.191** [-0.329, -0.054]	-0.009 [-0.170, 0.152]
IMG	-0.071** [-0.117, -0.025]		
Group size	-0.001*** [-0.001, -0.001]	-0.0004*** [-0.001, -0.0002]	0.0001 [-0.0004, 0.0002]
Avg. patient age	-0.005 [-0.020, 0.011]	-0.050*** [-0.069, -0.031]	-0.059*** [-0.092, -0.026]
Prop. of patients >= 65	-0.769^ [-1.569, 0.030]	0.870^ [-0.051, 1.792]	1.358 [-0.311, 3.028]
Avg. ADG score	0.162*** [0.115, 0.209]	0.158*** [0.109, 0.208]	0.164*** [0.100, 0.228]
Prop. of female patients	-0.007*** [-0.010, -0.005]	-0.001 [-0.009, 0.007]	0.004 [-0.007, 0.016]
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** [-0.008, -0.006]	-0.005* [-0.010, -0.001]	-0.007^ [-0.014, 0.000]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.004*** [0.003, 0.005]	0.004** [0.001, 0.007]	0.001 [-0.003, 0.005]
Prop. of rural patients	0.003*** [0.001, 0.005]	0.010*** [0.005, 0.015]	0.006^ [-0.000, 0.013]
Prop. of patients with chronic mental illness	0.008*** [0.006, 0.011]	0.004* [0.001, 0.007]	0.001 [-0.004, 0.005]
Constant	-49.614*** [-60.363, -38.866]	-67.206*** [-105.026, -29.386]	
R <sup>2</sup>	0.200	0.022	0.007
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A34: Log of number of patients who visited the ED for a mental health reason during regular hours

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.032 <sup>^</sup> [-0.069, 0.004]	-0.033 <sup>^</sup> [-0.066, 0.000]	-0.041 <sup>^</sup> [-0.084, 0.001]
Year	0.022*** [0.017, 0.028]	0.018 [-0.006, 0.041]	
Age	-0.008 [-0.024, 0.008]		
Age <sup>2</sup>	0.0001 [-0.0001, 0.0002]	0.0001 [-0.0001, 0.0003]	-0.001 [-0.003, 0.001]
Sex (Female)	-0.011 [-0.078, 0.057]		
Rurality	-0.081 [-0.215, 0.052]	-0.187 [-0.426, 0.052]	-0.12 [-0.344, 0.104]
IMG	-0.071** [-0.117, -0.026]		
Group size	-0.001*** [-0.001, -0.001]	-0.0003** [-0.001, -0.0001]	0.00002 [-0.0004, 0.0004]
Avg. patient age	0.008 [-0.008, 0.023]	-0.036** [-0.059, -0.013]	-0.051* [-0.093, -0.008]
Prop. of patients >= 65	-1.066** [-1.825, -0.306]	0.726 [-0.381, 1.833]	1.189 [-0.937, 3.315]
Avg. ADG score	0.141*** [0.094, 0.187]	0.112*** [0.049, 0.175]	0.110* [0.026, 0.194]
Prop. of female patients	-0.006*** [-0.008, -0.003]	0.001 [-0.009, 0.010]	0.012 <sup>^</sup> [-0.001, 0.026]
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** [-0.008, -0.006]	-0.006** [-0.011, -0.002]	-0.011** [-0.019, -0.003]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.005*** [0.004, 0.006]	0.005** [0.002, 0.008]	0.002 [-0.002, 0.006]
Prop. of rural patients	0.003** [0.001, 0.005]	0.010** [0.003, 0.016]	0.006 [-0.005, 0.017]
Prop. of patients with chronic mental illness	0.006*** [0.003, 0.008]	0.003 <sup>^</sup> [-0.001, 0.007]	0.002 [-0.004, 0.007]
Constant	-43.225*** [-54.562, -31.888]	-33.489 [-80.255, 13.276]	
R <sup>2</sup>	0.141	0.010	0.004
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A35: Log of number of patients who visited the ED for a mental health reason during after-hours

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
FHO	-0.014 [-0.049, 0.021]	-0.005 [-0.038, 0.028]	0.022 [-0.020, 0.065]
Year	0.023*** [0.018, 0.029]	0.049*** [0.028, 0.071]	
Age	-0.007 [-0.023, 0.010]		
Age <sup>2</sup>	0.0001 [-0.0001, 0.0002]	-0.0002* [-0.0004, -0.00001]	0.0005 [-0.001, 0.002]
Sex (Female)	0.000 [-0.068, 0.068]		
Rurality	-0.084 [-0.210, 0.042]	-0.186 [-0.409, 0.038]	0.036 [-0.182, 0.254]
IMG	-0.046* [-0.088, -0.003]		
Group size	-0.001*** [-0.001, -0.001]	-0.0004*** [-0.001, -0.0002]	0.0002 [-0.001, 0.0002]
Avg. patient age	-0.013 [-0.029, 0.003]	-0.055*** [-0.075, -0.034]	-0.068** [-0.109, -0.027]
Prop. of patients >= 65	-0.526 [-1.332, 0.280]	1.004^ [-0.043, 2.051]	1.971^ [-0.186, 4.128]
Avg. ADG score	0.141*** [0.095, 0.187]	0.152*** [0.091, 0.212]	0.174*** [0.094, 0.254]
Prop. of female patients	-0.007*** [-0.010, -0.005]	-0.005 [-0.014, 0.004]	-0.008 [-0.021, 0.006]
Prop. in Q1 or Q2 on Deprivation Score	-0.007*** [-0.008, -0.006]	-0.004 [-0.009, 0.002]	-0.003 [-0.011, 0.005]
Prop. in Q1 or Q2 on Ethnic Concentration Score	0.003*** [0.002, 0.004]	0.002 [-0.001, 0.005]	0.000 [-0.004, 0.004]
Prop. of rural patients	0.002* [0.000, 0.004]	0.010*** [0.004, 0.016]	0.010* [0.001, 0.018]
Prop. of patients with chronic mental illness	0.008*** [0.005, 0.010]	0.005** [0.001, 0.008]	0.001 [-0.004, 0.006]
Constant	-44.235*** [-55.560, -32.910]	-94.728*** [-137.721, -51.734]	
R <sup>2</sup>	0.131	0.014	0.005
# of physicians	1418	1418	1418
# of observations	12762	12762	12762

Table A36. Coefficient of FHO on the number and value of mental health services provided, and number of rostered patients with SMI, per 1000 enrolled patients, for physicians with at least two years of pre-switch and two years of post-switch data

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
<b>Log of number of services</b>			
Total MH services	-0.148*** (-0.201, -0.095)	-0.145*** (-0.176, -0.113)	-0.151*** (-0.183, -0.118)
Regular-hours MH services	-0.147*** (-0.200, -0.095)	-0.154*** (-0.185, -0.123)	-0.158*** (-0.191, -0.126)
After-hours MH services	0.0314 (-0.162, 0.225)	0.316*** (0.195, 0.436)	0.255*** (0.130, 0.379)
<b>Log of value of services</b>			
Total MH services	-0.186*** (-0.249, -0.124)	-0.191*** (-0.229, -0.154)	-0.194*** (-0.231, -0.156)
Regular-hours MH services	-0.187*** (-0.249, -0.124)	-0.193*** (-0.231, -0.155)	-0.195*** (-0.233, -0.157)
After-hours MH services	0.120 (-0.162, 0.402)	0.505*** (0.327, 0.684)	0.428*** (0.240, 0.617)
<b>Log of number of patients with SMI</b>			
Number of patients with SMI	0.025 (-0.099, 0.148)	-0.116** (-0.196, -0.036)	-0.022 (-0.112, 0.069)

Observations = 6, 669; Physicians = 741

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

Tables present IRR and 95% confidence intervals.

All regressions include full set of control variables defined in Methods section.

Table A37. Coefficient of FHO on ED visits for mental health reasons: total visits and number of patients per 1000 enrolled patients, for physicians with at least two years of pre-switch and two years of post-switch data

	<b>OLS</b>	<b>FE</b>	<b>HDFE</b>
<b>Log of number of visits</b>			
All ED visits	-0.021 (-0.082, 0.040)	-0.043 <sup>^</sup> (-0.087, 0.0005)	-0.025 (-0.079, 0.028)
Regular-hours ED visits	-0.035 (-0.097, 0.027)	-0.050 <sup>^</sup> (-0.101, 0.001)	-0.050 (-0.110, 0.018)
After-hours ED visits	0.010 (-0.053, 0.073)	-0.011 (-0.061, 0.039)	0.020 (-0.040, 0.079)
<b>Log of number of patients</b>			
All ED visits	-0.008 (-0.055, 0.039)	-0.011 (-0.045, 0.023)	-0.0007 (-0.043, 0.042)
Regular-hours ED visits	-0.016 (-0.066, 0.034)	-0.0127 (-0.057, 0.031)	-0.0075 (-0.062, 0.047)
After-hours ED visits	0.013 (-0.036, 0.062)	0.012 (-0.030, 0.055)	0.033 (-0.021, 0.086)

Observations = 6, 669; Physicians = 741

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; ^:  $p < 0.1$

Tables present IRR and 95% confidence intervals.

All regressions include full set of control variables defined in Methods section.

### Appendix D

Effect of switching to FHO on the number of after-hours mental health services (standardized to per 1000 rostered patients) using generalized estimating equation with a Poisson family (IRR)

	Unweighted	PS-weighted
FHO	0.222*** [0.101,0.343]	0.130^ [-0.001,0.260]
Year	0.190* [0.043,0.336]	0.269** [0.106,0.431]
Age	-0.176* [-0.321,-0.032]	-0.231*** [-0.366,-0.096]
Age <sup>2</sup>	0.000 [-0.000,0.001]	0.000 [-0.000,0.001]
Sex (Female)	0.332 [-0.246,0.909]	0.195 [-0.258,0.648]
Rurality	0.101 [-0.215,0.417]	0.130 [-0.197,0.456]
IMG	-0.039 [-0.259,0.181]	-0.120 [-0.372,0.133]
Group size	0.000 [-0.001,0.001]	-0.001 [-0.002,0.000]
Avg. patient age	-0.078* [-0.140,-0.017]	-0.104* [-0.191,-0.017]
% of patients ≥65	3.162^ [-0.094,6.418]	4.407* [0.759,8.055]
Avg. ADG score	0.245* [0.040,0.451]	0.249* [0.019,0.479]
% of female patients	-0.014 [-0.036,0.008]	-0.010 [-0.042,0.021]
% in Q1 or Q2 on Deprivation Score	0.004 [-0.014,0.021]	-0.005 [-0.023,0.013]
% in Q1 or Q2 on Ethnic Concentration Score	-0.001 [-0.009,0.008]	0.003 [-0.007,0.012]
% of rural patients	-0.023 [-0.051,0.006]	-0.030^ [-0.065,0.004]
% of patients with CMI	0.031*** [0.018,0.043]	0.030*** [0.014,0.045]
FP-averaged coefficients		
Age <sup>2</sup>	0.001* [0.000,0.003]	0.002** [0.001,0.004]
Rurality	0.457 [-0.462,1.375]	1.344* [0.256,2.432]
Group size	0.002 [-0.000,0.004]	-0.001 [-0.003,0.001]
Avg. patient age	0.101 [-0.023,0.224]	0.080 [-0.039,0.199]
% of patients ≥65	-8.975* [-16.752,-1.198]	-7.833* [-14.504,-1.163]
Avg. ADG score	0.251*	0.203

	[0.010,0.492]	[-0.108,0.514]
% of female patients	-0.014 [-0.037,0.010]	-0.010 [-0.044,0.024]
% in Q1 or Q2 on Deprivation Score	-0.011 [-0.029,0.006]	0.003 [-0.018,0.023]
% in Q1 or Q2 on Ethnic Concentration Score	0.011 <sup>^</sup> [-0.001,0.022]	0.005 [-0.007,0.016]
% of rural patients	0.004 [-0.024,0.033]	0.005 [-0.032,0.042]
% of patients with CMI	0.019** [0.006,0.032]	0.020* [0.004,0.037]
# physicians	2654	2654
# observations	23,886	23,886

\*\*\*:  $p < 0.001$ ; \*\*:  $p < 0.01$ ; \*:  $p < 0.05$ ; <sup>^</sup>:  $p < 0.1$

Tables present IRR and 95% confidence intervals.