

# **Re-evaluation of positive depression screen prevalence and documentation of intervention in a family medicine residency and at UnityPoint Methodist Peoria sites.**

A Retrospective Study

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**Potential Conflicts of Interest:** None disclosed

**Background:** By 2020, major depressive disorder is projected to become the second leading cause of disability globally. In the U.S., associated medical care costs are estimated at \$43 billion, with an additional \$17 billion in lost productivity every single year.<sup>(12)</sup> Most adults in the U.S. see their primary care physician (PCP), not a psychiatrist, for depression, but a large number of clinically depressed patients in the primary care setting were not identified as being depressed in U.S. meta-analyses. Treatment rates have been reported to be low with often inadequate provision of treatment.<sup>(9)</sup> It has been shown that use of screening tools improves the recognition of depression by physicians.<sup>(5)</sup> The United States Preventative Services Task Force (USPSTF) recommended in 2009 that adults be screened for depression when care-supports via staff assistance are in place (Grade B).<sup>(13)</sup>

**Objectives:** First, re-evaluate the rate of annual depression screening at the UnityPoint Clinic Family Medical Center (FMC) ambulatory residency clinic, determine prevalence of positive depression screens at FMC, and appraise provider documentation of intervention for these patients. Second, compare findings to a 2013 pilot study at FMC. We hypothesized improvement of screening and intervention documentation rates (post-mandated medical staff education and mandated screening after go-live of new electronic health record (EHR) software). Third, evaluate screening rates across all UnityPoint Methodist-Proctor ambulatory sites after above mandates.

**Design:** Retrospective chart review

**Setting:** 56 ambulatory clinical sites including primary care and specialty offices that are part of UnityPoint Health Methodist-Proctor (UPHMP) health system, including FMC. FMC houses a family medicine residency program under the University Of Illinois College Of Medicine at Peoria.

**Methods:** EPIC electronic health record data was queried utilizing data acquisition software regarding all office visits of patients 12 years of age or older that occurred at the 56 UPHMP sites between the implementation date of EPIC (5/4/2014) and 12/31/14. This included flow sheet data of Patient Health Questionnaire (PHQ)-2 and PHQ-9 scores. Retrospective chart review was utilized for FMC data to assess correct fulfillment of protocol for initial screenings and documentation of intervention for positive screens. Initial screening protocol requires PHQ-2 score documentation with follow up PHQ-9 documentation for scores of 3 or 6. There were 167,210 office visits across all sites, 80,530 visits when repeat visits were excluded. FMC had 8,243 office visits, 3,614 with repeats excluded.

**Results:** *FMC:* 2,839 of 3,614 patients (78.5%) were screened for depression at least once during the study period (pilot study 87%). Positive screen prevalence was estimated at 14.3% (pilot study 25.87%). Of those screening positive, 70% had a follow up PHQ-9 performed. 57.5% of positive screens had provider documentation of intervention (pilot study 34.34%). Documented intervention was performed in 70.5% of those with a follow up PHQ-9 performed and 27% of those without follow up PHQ-9 performed.

*Other 55 UPHMP sites:* 68,786 of 76,916 patients (89.42%) were screened for depression at least once during the study period.

**Conclusion:** The estimated prevalence of positive depression screens at FMC, an ambulatory family medicine residency clinic, is 14.3%, much lower than the pilot study prevalence estimate of 25.87%. However, our sample size was much larger with a longer study period. As noted in the pilot study, this seems to be more similar to the average national depression prevalence in primary care settings.<sup>(2)</sup> Analysis of screening implementation shows that screening rates at FMC fell well short of the 90% goal, but were very nearly at goal across the 55 other sites. Protocol PHQ-9 documentation for positive PHQ-2 score was inadequate, 30% lower than the expected 100% rate. Documentation of intervention for positive depression screens at FMC improved greatly. However, a large cohort of patients remained without known provider recognition of positive screening. These results highlight the need for periodic re-assessment of appropriate screening and intervention at UPHMP sites as a quality improvement metric, particularly in light of the inadequacy of recognition and treatment in national statistics, the significant morbidity and mortality of depression, and the movement toward national quality metric based reimbursement. The limitations of this study are discussed at length here. We recommend further retrospective chart review utilizing a date range that does not include the first several months after EHR go-live. This would provide a higher quality evaluation of the trend of screening rates, appropriate screening, and documentation of intervention for positive screens.

## *INTRODUCTION*

By 2020, major depressive disorder is projected to become the second leading cause of disability globally. Depressive disorders account for approximately 40% of 183.9 million disability-adjusted life years associated with global mental and substance use disorders.<sup>(12)</sup> In the U.S. general population during 2009-2012, 7.6% aged 12 or older had depression, with increased prevalence in ages 40-59, females, and the impoverished. Three percent of all Americans were reported to have severe symptoms.<sup>(11)</sup> The 12-month and lifetime prevalence of depression in the U.S. was the highest out of 10 countries in one epidemiologic study, at 10% and 16.9% respectively.<sup>(1)</sup> A U.S. epidemiologic study in 2005 reported 12-month and lifetime prevalence of 5.28 and 13.23% respectively.<sup>(6)</sup> A 2015 meta-analysis on worldwide prevalence of mental disorders in children and adolescents revealed a 2.6% prevalence of depressive disorders.<sup>(10)</sup>

Meta-analyses in the U.S. revealed most adults see their PCP, not a psychiatrist, for depression. Approximately 50% of diagnoses were made by general practitioners, but a large number of clinically depressed patients in primary care were not identified as being depressed. Treatment rates have been reported to be low with often inadequate provision of treatment.<sup>(9)</sup>

The role of the PCP in diagnosis and treatment has become increasingly important, however, having protocols for detecting depressive disorders in all outpatient healthcare settings may help reduce the burden of this medical condition on the healthcare system. The impact of depression on our healthcare system is pervasive with increased susceptibility to general medical conditions and the complications associated with them. This includes risks of falls in elderly, total cardiovascular mortality in adults, and even homicide in the general population.<sup>(12)</sup>

In the U.S., associated medical care costs are estimated at \$43 billion, with an additional \$17 billion in lost productivity every single year.<sup>(12)</sup> Medical costs of chronic illness increase approximately 50% with co-morbid depression after controlling for illness severity. Literature clearly indicates an association with increased prevalence of smoking, sedentary lifestyle, over-eating, symptom burden, functional impairment, decreased quality of life, and reduced adherence to self care recommendations.<sup>(7)</sup> One study of elderly primary care patients followed 2 years found that depression contributed to mortality as much as diabetes or myocardial infarction.<sup>(4)</sup>

There is data supporting significant reduction in morbidity, mortality, and cost when depression treatment is initiated, particularly reduced risk of MI and all cause mortality.<sup>(12)</sup> Effective treatment initiation for depression requires adequate screening measures to identify clinically depressed patients. The USPSTF depression screening recommendation for adults was updated in 2009, suggesting a B recommendation for screening when depression care supports via staff-assistance were in place.<sup>(13)</sup>

The Patient Health Questionnaire-2 (PHQ-2) and PHQ-9 depression screening tools are well validated, as are many others, and evidence has not supported that one screening tool be utilized above another.<sup>(3,5,6,12,13,15)</sup> However, it has been shown that use of screening tools improves the recognition of depression by physicians.<sup>(5)</sup> The PHQ-2 has been shown to be advantageous in elderly, low income primary care patients due to its simplicity and high negative predictive value. It does have a low positive predictive value that substantiates use of a follow up instrument for positive PHQ-2 screens such as the PHQ-9.<sup>(8)</sup>

The end of 2012 marked the initiation of a policy for nurse administered PHQ-2 screening of all adult patients at FMC in Peoria, Illinois (formerly The Methodist Family Medical Center). Resident physicians Taariq Khan, MD and Aditya Birbal-Jain, MD performed a one month pilot study retrospective chart review of adult depression screenings in January 2013. For those that screened positive, they evaluated how effectively follow up was set up for these patients. They reviewed 1118 charts, found an 87% screening rate with 25.87% screening positive for depression, and only 34.34% with documented intervention.<sup>(2)</sup>

In May 2014, UPHMP instituted a mandated Joint Commission quality metric depression screening program within the new EHR system EPIC. UPH clinical staff involved in rooming patients received education regarding PHQ-2 screening, recognition of positive screens, and appropriate follow up PHQ-9 screening. There was an attempt to monitor documentation of intervention by providers for positive screens. The goal of this quality metric was 90% screening rate (every patient to be screened once yearly) and 90% compliance with documented intervention for positive screens.

In our follow up study to the pilot performed in 2013, we performed a retrospective chart review of FMC and all UPHMP clinic sites to determine compliance with depression screening. At FMC, we also evaluated prevalence of positive screens, appropriate administration of screening, and compliance with documented intervention by providers for positive screens. Overall, we attempted to evaluate the effectiveness of the education and implementation of mandated screening.

## *METHODS*

### *Setting*

Study was conducted at the UPH FMC Clinic and 55 other UPHMP clinics in central Illinois. The 56 outpatient sites provide multi-specialty care from primary care, prompt care, urgent care, to specialty clinics. FMC is affiliated with the University of Illinois College of Medicine at Peoria Residency in Family Medicine, and is a community-based program. During the time of the study, there were 29 residents in training and 12 faculty. Two faculty were filling roles specifically in behavioral health. FMC has approximately 25,000 patient visits per year. The 56 outpatient sites have approximately 260,000 patient visits per year.

### *Data*

EPIC electronic health record data was queried utilizing data acquisition software regarding all office visits of patients 12 years of age or older that occurred at the 56 UPHMP sites between the implementation date of EPIC (5/4/2014) and 12/31/14. All visits with completed PHQ-2 and PHQ-9 questionnaires (documented as flowsheet data in EPIC) were subsequently queried. Primary and secondary investigator EHR chart review was performed to investigate documented intervention for positive depression screen results at FMC. In order to gather representative data of the screening goal of once per year, we analyzed the first depression screen that was performed for each patient during the study dates at FMC. We assessed for correct fulfillment of the protocol for initial screenings. Initial screening protocol requires PHQ-2 score documentation with follow up PHQ-9 documentation for scores of 3 or 6. There were 167,210 office visits across all sites, 76,916 visits when repeat visits were excluded. FMC had 8,243 office visits, 3,614 with repeats excluded.

### *Participants*

Retrospective chart review provided data for 2839 initial office visits at FMC where the screening was performed and 68,786 initial office visits across all other sites. Inclusion criteria: all patients  $\geq 12$  years old who had an office visit during the specified time frame and were administered the PHQ-2 and/or PHQ-9 questionnaire. Exclusion criteria: All patient office visits subsequent to noted first administration of PHQ-2.

### *Outcomes and Measurements*

As a part of the mandated Joint Commission quality metric depression screening program initiated in May 2014 at UPHMP, the EHR system EPIC was set up so that nursing staff had a template in the rooming section of the EHR for the PHQ-2 administration, and subsequently for PHQ-9 if the PHQ-2 was positive. Positive PHQ-2 is signified by “yes” response to either “Have

you felt little interest or pleasure in doing things over the past 2 weeks?” or “Have you felt down, depressed or hopeless over the past 2 weeks?” Nursing and clinical staff were educated across all clinic locations to place an alert to the clinician of the positive screen prior to entrance in to the room. The goal of this quality metric was 90% screening rate (every patient to be screened yearly) and 90% compliance with documented intervention for positive screens.

We collected non-identifiable information on screening compliance according to the above metric requirements, including documentation of intervention for positive screening results at FMC. An adequate intervention for a positive screen was signified by documentation of physician acknowledgement and subsequent plan of care including scheduled follow up, new diagnosis, new antidepressant medication, referral to a behavioral health specialist, or provision of local behavioral health resources.

## *RESULTS*

As in the data flowchart in Figure 1 and graphs in Tables 1-3, there were 80,530 patients that had an office visit once during the study time frame. Out of these patients, 3,614 were seen at FMC while the other 76,916 were seen at the other 55 ambulatory sites. Depression screening across the 55 ambulatory sites was very near the goal of 90% with 68,786 patients screened (89.5%). At FMC, 2,839 patients were screened (78.5%), 11.5% less than the goal. Compared to the pilot study screening percentage, our data revealed a decrease in the screening rate of 9.5%. Positive PHQ-2 screens were found in 407 patients (14.3%), but only 70% of those patients had appropriate PHQ-9 follow up screening performed. Overall, 57% of patients with positive screens had provider documentation of intervention, a large increase from the pilot study, which found only 34.34%. When PHQ-9 screening was properly performed, the documentation of intervention was higher, 70.5% compared to 27%.

## *CONCLUSION*

UPHMP has an active and ongoing protocol for screening patients yearly for depression in the ambulatory setting across all clinic sites. The mandated initiation of this protocol for all patients ages 12 and older at the go live date of EPIC EHR (5/4/15) enabled our investigation as outlined above including follow up to the 2013 pilot study at FMC. Depression screening is extremely important for the family physician office, where most patients with depression are recognized and treated. However, in recognition of data that points to underdiagnosis, under-treatment, and the significant cost, morbidity, and mortality associated with depression, UPHMP has taken an important step in fighting this trend by screening in all ambulatory clinics.

Advantages of our study over the pilot study include longer study period (1 month versus 7 months), inclusion of adolescent patients ages 12-18, including follow up PHQ-9 for positive PHQ-2 in screening protocol, and expansion of screening compliance review to involve all UPHMP ambulatory sites. Key points noted in our study included a decrease in the screening rate at FMC compared to the pilot study with a rate 11.5% less than the 90% goal, inadequate follow up administration of the PHQ-9 for positive PHQ-2, over 20% higher rate of provider

documentation of intervention for positive screens, and noted increase in compliance with documentation of intervention when PHQ-9 was completed. It was also notable that the other 55 ambulatory sites averaged screening rates nearly at the established goal of 90%.

The prevalence of positive screens in our study was similar to national prevalence data whereas the pilot study prevalence was much higher. This is likely due to the pilot study being performed in January, a time of higher prevalence of depressive symptoms, and the significantly smaller cohort of patient charts reviewed. Documentation of intervention for positive depression screens at FMC improved greatly. However, a large cohort of patients remained without known provider recognition of positive screening. These results highlight the need for periodic re-assessment of appropriate screening and intervention at UPHMP sites as a quality improvement metric, particularly in light of the inadequacy of recognition and treatment in national statistics, the significant morbidity and mortality of depression, and the movement toward national quality metric based reimbursement. We recommend further retrospective chart review utilizing a date range that does not include the first several months after EHR go-live. This would provide a higher quality evaluation of the trend of screening rates, appropriate screening, and documentation of intervention for positive screens. It would also be beneficial to isolate the adolescent age group and expand the evaluation of provider documentation to a representative sample of all the other 55 ambulatory sites.

#### *Limitations*

One 2014 systematic review reported that the USPSTF guideline for depression screening was based on data from programs with patients already depressed and no randomized controlled trials support the USPSTF recommendation for screening (14). Although we assessed screening rates across all clinics, we were not able to assess prevalence data or documentation of intervention on this scale. As in the pilot study, we gathered data that included visits closely associated with the “go-live” date of a new EHR system. This is potentially limiting as it is likely that everyone experienced initial difficulties with appropriate documentation and administration of screening by staff as well as documentation of interventions by providers. EHR implementation is associated with a learning curve for all individuals involved in office visit documentation.

In addition, only the initial screening performed was counted in our study. Many patients had multiple screenings during our study period, and there were many cases where the initial screen was negative but repeat screenings had positive results. Although seemingly superfluous, repeat screenings during our study time interval may have been initiated due to the patient presenting with complaint of depression that was not present or expressed at the initial screen visit. Thus initial screenings at yearly interval will not pick up all cases of depression as onset can be at any time depending on many factors in patient’s life. The first screening performed in our time frame was likely to be nearer to the go-live date and thus was more likely to be negatively affected by the learning curve of new EHR. The patient population at FMC is largely covered by Medicare and Medicaid plans and a large cohort have multiple chronic medical conditions which increase the likelihood of positive screen results.

Figure 1: Data flowchart

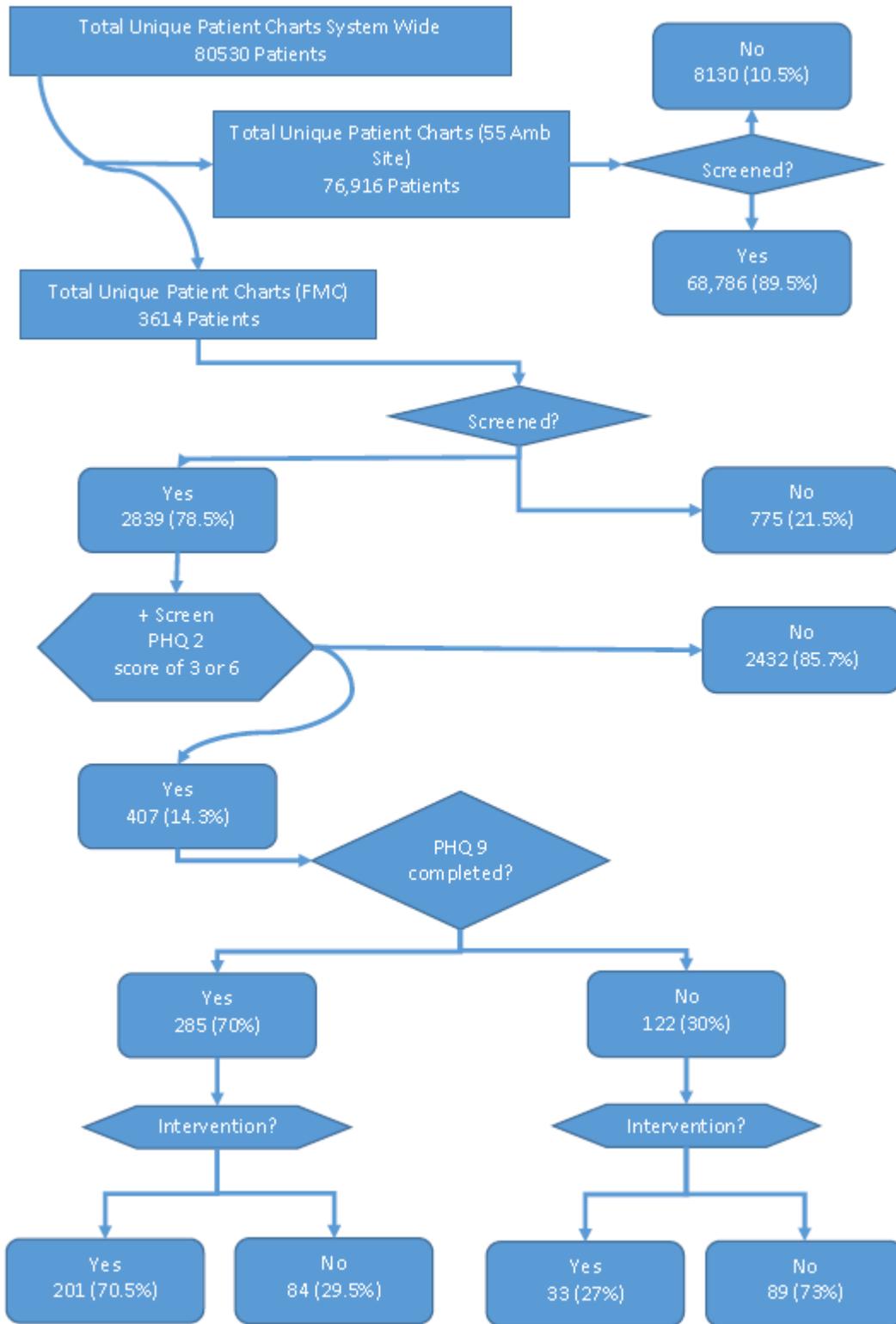


Table 1: Comparison of depression screening rates

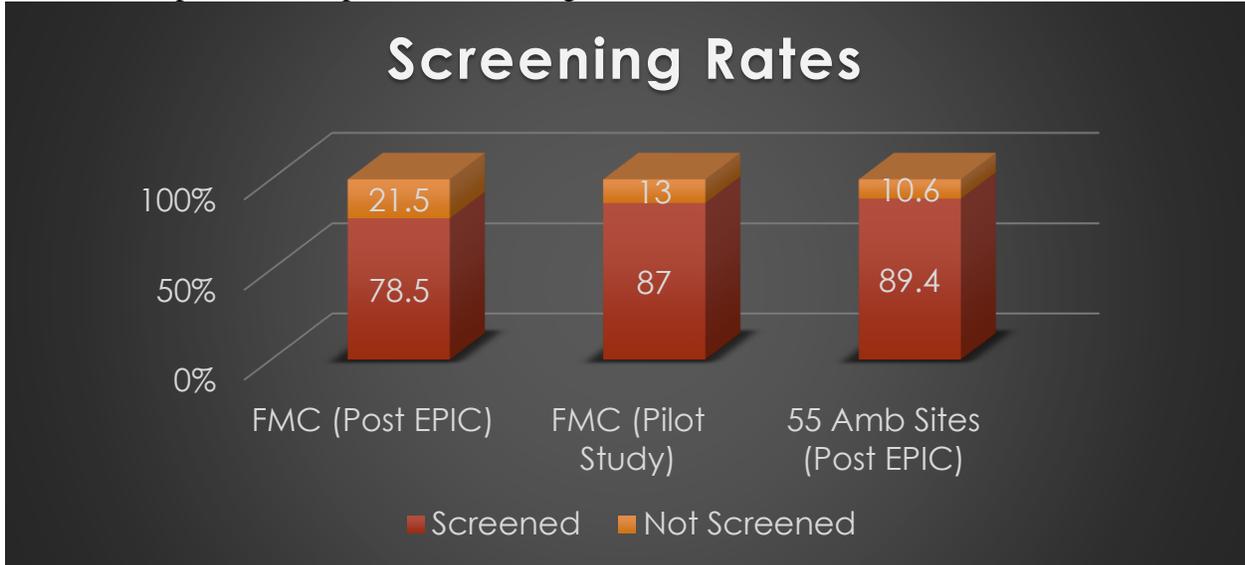


Table 2: Prevalence of positive depression screens

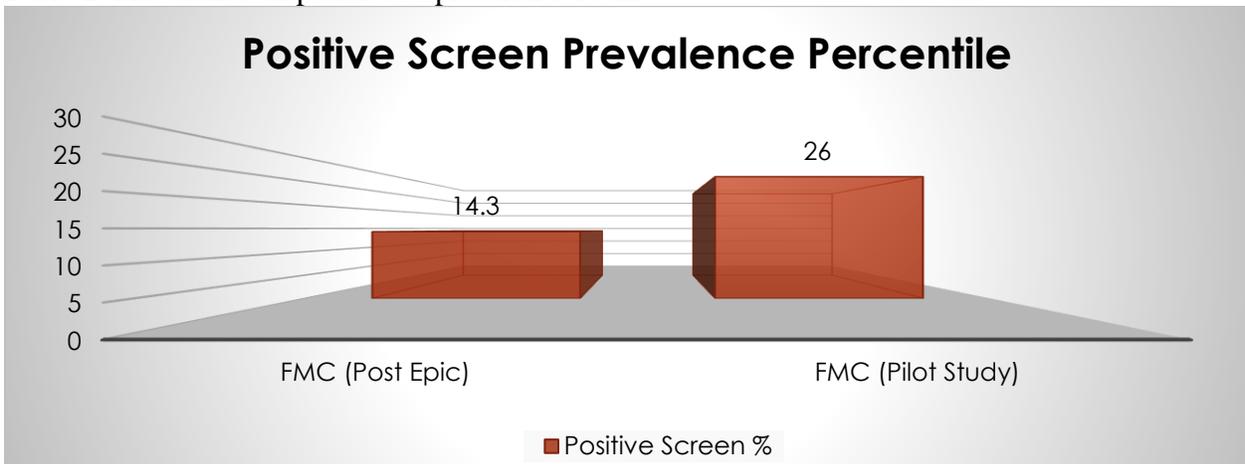
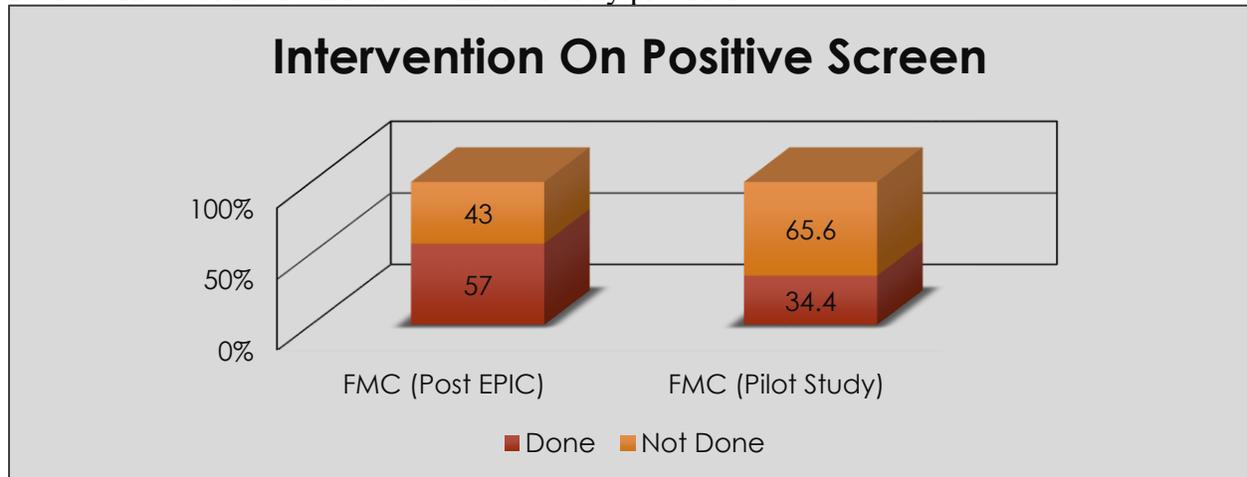


Table 3: Rates of intervention documentation by provider



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