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Introduction

Rural populations experience a significant burden of chronic pain, but are less likely than urban populations to receive specialty care for pain management [1-3]. Primary care providers (PCPs) in a rural community may be less likely to refer patients to specialists for chronic pain management than PCPs in an urban setting due to the location of pain management specialists, their patients’ lower socioeconomic status, higher likelihood of being uninsured, lack of resources for non-pharmacologic treatment, and transportation barriers. Our study aimed to compare the probability of referral to a specialty pain management clinic between rural and non-rural practices within the same academic health system. The secondary aim of our study was to compare the likelihood of PCP referral to orthopedic surgery, neurology, and rheumatology for chronic pain care between patients referred from rural as compared to non-rural practices.

Discussion

In one academic health system serving a predominantly rural region, primary care clinics in rural locations were less likely to refer patients with chronic pain to a pain clinic compared to urban primary care clinics, but more likely to refer patients to orthopedics. This difference may reflect differences in the type and etiology of pain between urban and rural patients, and may contribute to population-level rural-urban differences in utilization of specialty care for chronic pain.

Results

Among 777 patients, 549 met eligibility criteria (mean age 55±13, 66% female, 65% seen by rural primary care provider). During the follow-up period, 16% were referred to the pain clinic, 26% were referred to orthopedics, 5% were referred to neurology, and 3% were referred to rheumatology. On unadjusted Cox proportional hazards regression, visiting a rural as compared to urban clinic for the index primary care visit was associated with lower hazard of referral to the pain clinic (hazard ratio [HR]: 0.57; 95% confidence interval [CI]: 0.37, 0.87) and rheumatology (HR: 0.40; 95%CI: 0.16, 0.995), but higher hazard of referral to orthopedics (HR: 1.51; 95%CI: 1.05, 2.18) and no difference in hazard of referral to neurology (HR: 0.59; 95%CI: 0.29,1.23). Differences in referral to the pain clinic and orthopedics were primarily driven by the different likelihood of referral at the index primary care visit (**Figures 1 and 2**).

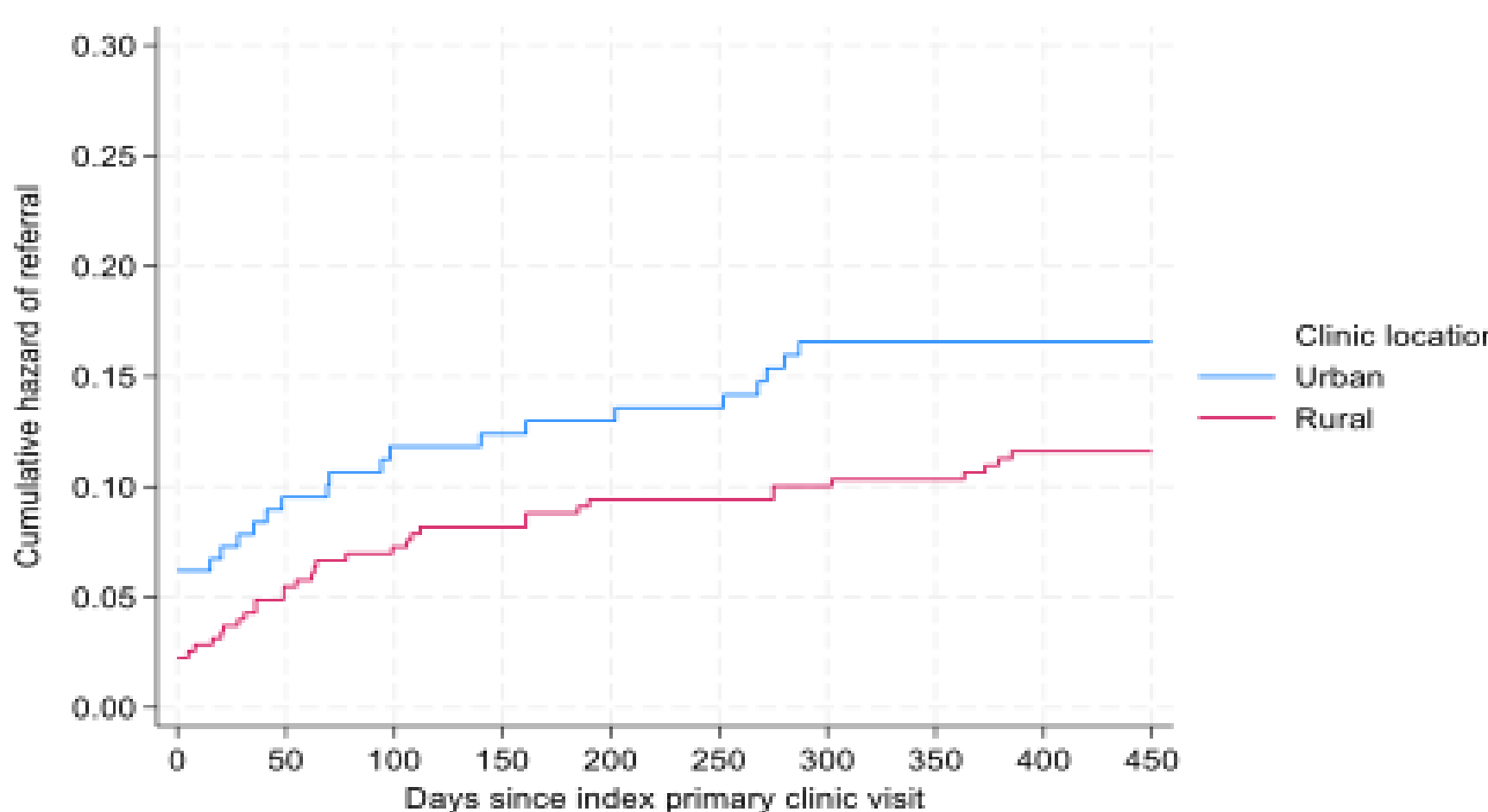


Figure 1. Cumulative hazard functions of referral to pain clinic among patients with chronic pain seen in rural as compared to urban primary care clinics.

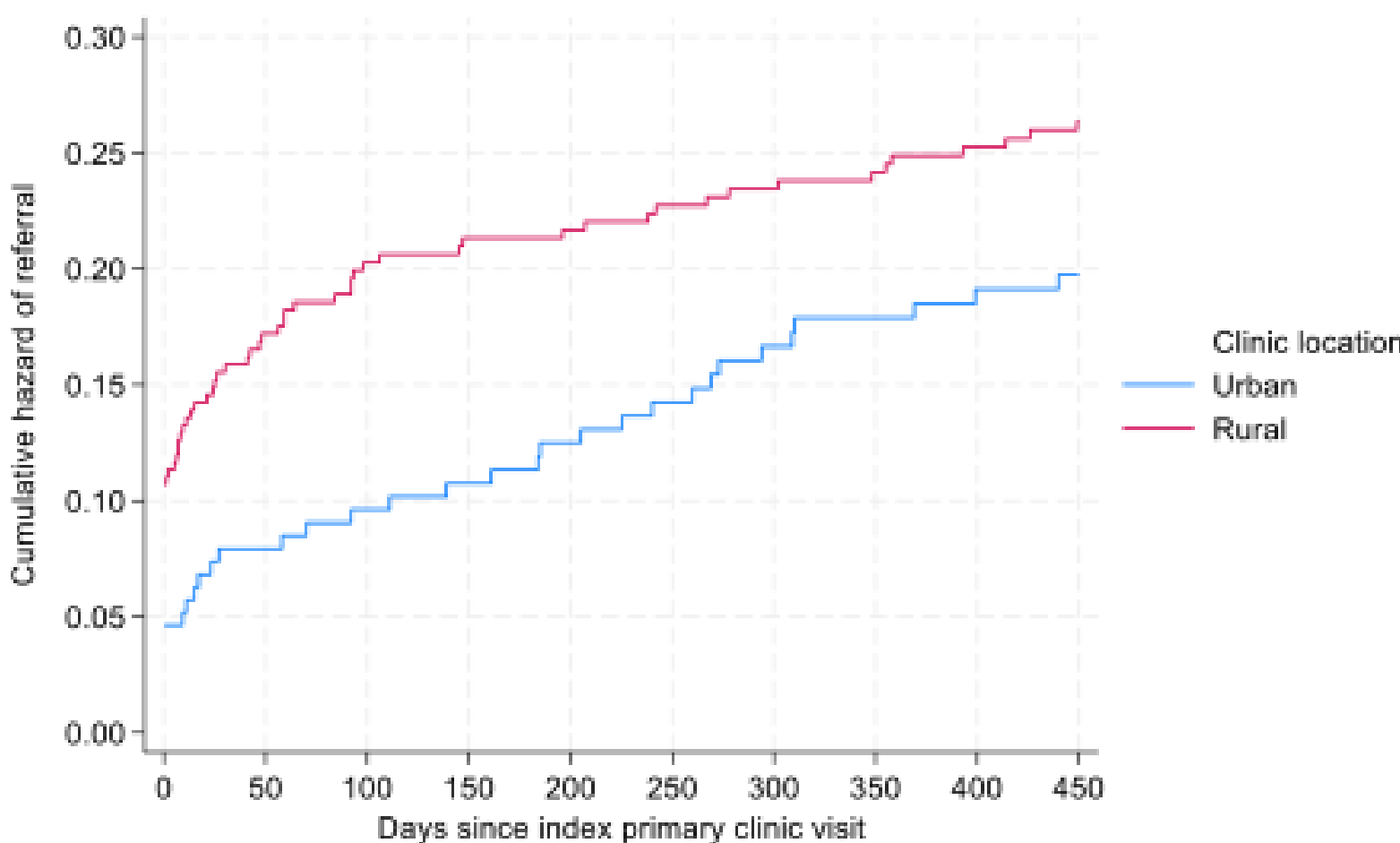


Figure 2. Cumulative hazard functions of referral to orthopedics among patients with chronic pain seen in rural as compared to urban primary care clinics.

Materials and Methods

After receiving IRB approval, we queried primary care visits in 2022 with ICD-10 diagnosis codes commonly associated with chronic pain (**Table 1**), and manually reviewed charts to exclude pain present < 3 months, postoperative pain, substance use disorder, and patients who were advised to go immediately to the emergency department; or had already received a referral to the pain clinic in the prior 12 months [4,5]. The study was conducted at an academic health system serving 29 counties in a rural region, including eight community-based hospitals and a diverse range of outpatient specialty clinics. The health system’s Pain Management clinics include 3 locations and provide various treatment options. Patients were stratified based on clinic location in a rural vs. urban community in our region of the US Southeast. Referrals were tracked through June 2024, and each type of referral was analyzed using Cox proportional hazards regression.

ICD-10 codes identifying chronic pain	Associated problem
G89.2	Chronic pain, not elsewhere specified
G89.21	Chronic pain due to trauma
G89.22	Chronic post-thoracotomy pain
G89.28	Other chronic postprocedural pain
G89.29	Other chronic pain
G89.4	Chronic pain syndrome
M25.5	Pain in joint
M54.1	Radiculopathy
M54.2	Cervicalgia
M54.5	Low back pain
M79.1	Myalgia
M79.2	Neuralgia and neuritis, unspecified
M79.6	Pain in limb
M79.7	Fibromyalgia
R10.4	Other and unspecified abdominal pain
R10.2	Pelvic and perineal pain

Table 1. ICD-10 Codes with Related Pain Conditions Included in Retrospective Analysis

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