

## Social Determinants Affecting Patient Care in Radiology

- One fourth of the US population lives in rural areas, but only 10% of physicians practice in these areas.
- Missed radiology appointments result in delayed diagnosis and treatment, adversely affecting care; ethnic minorities and low socioeconomic status patients account for the majority of these events.
- The term "no shows" in reference to missed appointments puts responsibility solely on the patient.
- The term "missed care opportunity" (MCO) considers provider responsibility in patient engagement, emphasizing the need to reach out to patients and bridge the healthcare disparities gap.

Disparities in health among different social strata, racial, and ethnic groups are well documented. Studies have shown that African-American women have the highest rate of breast cancer death compared to other ethnicities and are twice as likely to die from cervical cancer compared to Caucasian women. The rate of diabetes is almost double in Hispanics and African Americans compared to Caucasians. However, the causes of such disparities transcend race and ethnicity to include factors both inside and outside the healthcare system such as socioeconomic variables. Patients in lower socioeconomic strata are less likely to obtain the care they need. They are more likely to have a lower education level, speak a primary language other than English, and experience greater financial challenges in taking time off work. They may also have disabilities that limit their access to public transportation. These factors negatively influence patient engagement with the healthcare system, which can result in delayed diagnosis and treatment and poor medical outcomes.

**Table 1. Scheduled Outpatient Radiology Appointments at Mass General, Feb 2014 to Feb 2015**

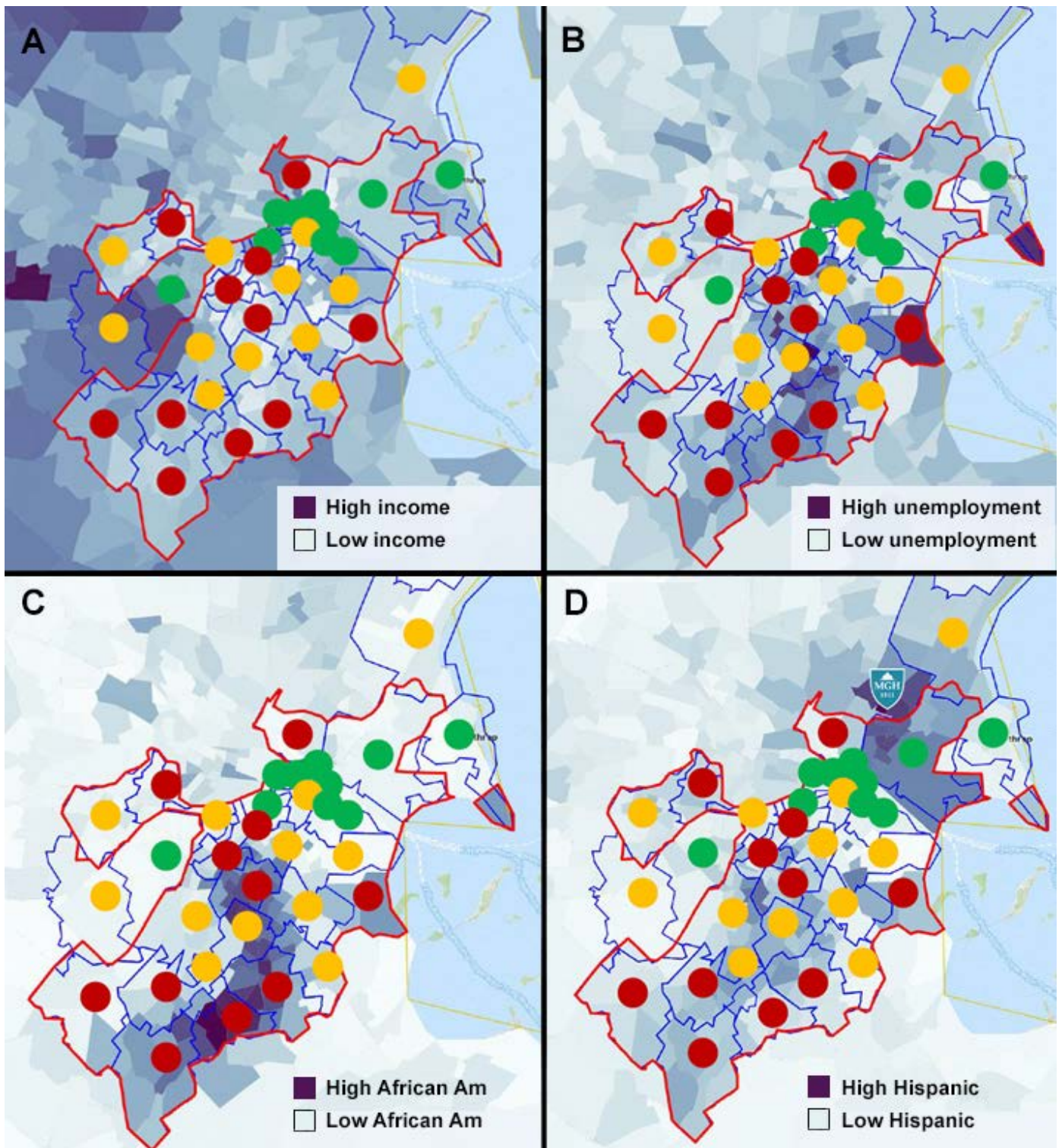
551,903 outpatient diagnostic (OPD) studies scheduled
245,347 individual patients
42,733 MCO events (8% scheduled OPDs)
5,985 ≥ 2 MCO
788 ≥ 3 MCO
258 ≥ 4 MCO
27,534 individual MCO patients (12% scheduled OPDs)

In radiology, missed care opportunities (MCOs) are a measure for low patient engagement. Defined as scheduled but not attended healthcare encounters, the term MCO considers healthcare providers' responsibility in patient engagement. Traditionally, patients who miss an appointment are labeled "no shows" or "non-compliant," putting the responsibility of attendance solely on them. By labeling missed appointments as MCOs and examining the reasons they occur, healthcare providers can begin to address the problem.

### The Scope of the Problem

Mass General Imaging schedules over half a million outpatient diagnostic examinations each year. From February 2014 to February 2015, 8% of scheduled examinations were not performed, which amounted to 44,000 MCOs and 12% of individual patients (Table 1). The largest number of MCOs involved radiography, followed by mammography and ultrasound.

Sixty-four percent of MCOs (26,532 appointments) were not rescheduled within 90 days and were considered lost to follow-up. Many patients missed two, three, or even four or more appointments. These numbers illustrate the extent of MCOs and their potential to adversely affect healthcare.



**Figure 1.** Maps of percentile distribution of MCOs compared to (A) Income distribution, (B) Unemployment, (C) African-American population density, and (D) Hispanic population density. The red dots denote the top 33%ile, the yellow dots denote the middle 33%ile, and the green dots denote the lowest 33%ile of MCOs. The red outline is the boundary of the City of Boston, and the blue lines indicate other municipalities in the survey.

### Factors Associated with MCOs

Several factors were shown to be statistically significantly associated with MCOs ( $p < 0.01$ ) including non-English primary language (OR: 1.2), African American (OR relative to Caucasian: 1.8), and Hispanic (OR relative to Caucasian: 1.5). Women were more likely than men to miss appointments, which may be primarily due to the large numbers of mammography MCOs. Analysis on the geographic distribution of MCO patients at Mass General Imaging indicate that they are more likely to reside in low-income neighborhoods, regions with high unemployment, and locations with high proportions of African-American and Hispanic patients (Figure 1).

In a survey of MCO patients who were scheduled for ultrasound at Mass General Imaging, the majority stated that they did not remember the appointment or did not get a reminder call. A substantial number said that they did not understand the phone messages in English that reminded them of their appointment. Other MCOs were caused by lack of compliance with exam preparation, such as not following premedication instructions. This factor may be associated with inadequate understanding of the instructions due to low literacy levels in English.

Transportation issues can also be a factor. For example, a wheelchair-bound patient who is dependent on a ride service may not be able to wait for an appointment in a practice that is running behind schedule. Transportation issues due to poor weather can also be a factor. A disproportionately high number of MCOs occurred during February 2015, which was a historically snowy month in Boston.

Those in lower income brackets are generally paid for the hours they work and lose income if their appointment is scheduled during work hours. Notably, the rate of MCOs is lower for weekend appointments, which are less likely to conflict with work.

## Programs and Solutions to Decrease the Rate of MCOs

A significant amount of information about patients in their medical records can be leveraged to address their needs. For example, if a patient is known to have limited English, but is proficient in Spanish, written instructions or voicemail messages can be provided in Spanish. While it may not be possible to leave voicemails in every language spoken by patients at Mass General, text messages may be an alternative way to remind patients about their appointments. Patients have reported that it is easier to translate a text message than a voicemail and, in a recent survey, 40% of MCO patients said that they would prefer a text message appointment reminder over voicemail.

Healthcare navigators may also help address the issue of MCOs by providing additional assistance to patients to ensure that instructions are followed and needs are met. In particular, navigators may benefit patients with low literacy skills by clarifying any necessary preparations for scheduled appointments to reduce prep errors. Navigators can also help arrange transportation and aid in scheduling to minimize work conflicts. These types of intervention have been shown to significantly improve adherence rates to follow-up recommendations in ethnic minority women with abnormal mammograms.

Mass General Imaging has initiated the Patient Engagement for Equity in Radiology (PEER) project, which combines collaborative efforts in education and research to understand our patients' needs and provide them with solutions designed to improve healthcare access to radiology services while decreasing MCOs. The goals include providing culturally sensitive and equitable healthcare delivery to improve the quality of patient care. PEER strategies include: sending reminder text messages in preferred languages; developing a predictive model to identify patients at risk for MCO; providing clear educational materials in various languages; allocating healthcare navigators to assist patients; and educating healthcare professionals on the importance of culturally sensitive healthcare delivery.

## Further Information

For further information on socioeconomic and demographic factors in radiology care and the PEER project, please contact [Efren J. Flores, MD](#), Director of Radiology Community Health Improvement, Massachusetts General Hospital, at 617-724-4254.

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