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Mapping patient distributions informs community-oriented primary care

in four Community Health Centers in Central Massachusetts

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Background

Based on the philosophy that family medicine training should occur in community-based practices and hospitals, the Worcester Family Medicine Residency (WFMR) training program was structured to combine learning opportunities in an academic medical center with outpatient care training in three unique community-based practices: the *Barre Family Health Center*, a rural site thirty miles west of Worcester, the *Family Health Center of Worcester*, a federally funded community health center serving a poor and culturally diverse urban population, and the *Hahnemann Family Health Center*, a hospital-owned health center serving a socioeconomically diverse population in the northeast part of Worcester.

The WFMR received an AAMC “Regional Medicine-Public Health Education Centers-Graduate Medical Education (RMPHEC-GME)” grant to further integrate public health training into the clinical training experience. As part of the effort, collaboration was begun between the department of Family Medicine and Community Health at UMASS Medical School, the academic home of the WFMR, and geographers at Clark University, a local resource providing expertise in mapping of data using Geographic Information Systems (GIS).

Mapping patient distribution

A series of thematic maps were generated from actual practice data on the patients being served by each residency site and also by Fitchburg Community Health Center. Faculty champions from each site attended two training sessions to learn more about the capabilities of mapping. They were then asked to lead faculty at their site in discussion to define five maps they would like to see made from their own patient data. Most sites chose a map showing the distribution of the entire patient population, some requested a map of their pediatric patients, and then the rest were designed to depict the spread of certain chronic diseases, including asthma, hypertension, coronary disease, and diabetes. Maps were generated using geocoding and point density tools in ArcGIS Desktop software. The main goal of this mapping activity was to educate physicians in training about where their patients live and facilitate discussion about environmental factors that impact health. These maps can also be used by practitioners to communicate important information to their patients about available community resources such as gyms, parks, health clinics, and supermarkets (as shown on some maps).

Making maps available online

One element of the grant initiative was to build an online resource to aid faculty in teaching about population health concepts. This portal, the Community Health Toolkit (<http://www.umassmed.edu/fmch/toolkit.aspx>), provides three types of information to aid clinicians in both their teaching and their practice. The “Data on Communities” section was developed as part of the UMMS/Clark University collaboration. In total, 24 thematic maps were generated by the GIS team at Clark University and uploaded to the “Data on Communities” web section of the Community Health Toolkit. Other sections of the Community Health Toolkit include “Learning about Populations” which provides links to a variety of local, regional and national health indicators, and a “Community Resources” section which provides links to community resources for patients. The Toolkit is presented to learners along the continuum of medical education, including second year students in the Population Health Clerkship, first year residents in the Family Medicine and Community Health rotation, then used as a resource by residents as they complete presentations and research projects.

