Report refutes primary assumption

It sounds simple: to improve health outcomes, increase the number of primary-care doctors and make sure people have access to them. But it turns out there's not a simple relationship between the number of primary-care providers in a region, the use of primary care by patients, and the health outcomes of those patients, according to a recent report from the Dartmouth Atlas Project.

Level: A compilation of findings already published in peer-reviewed journals, the report used Medicare data from 2003 to 2007 to analyze regional and racial variations in primary-care supply, use, and quality. The number of primary-care providers in a community probably does influence outcomes at a "very fine, local level," says lead author David Goodman, M.D. But at the regional level, where most workforce policies are set, he found no correlation.

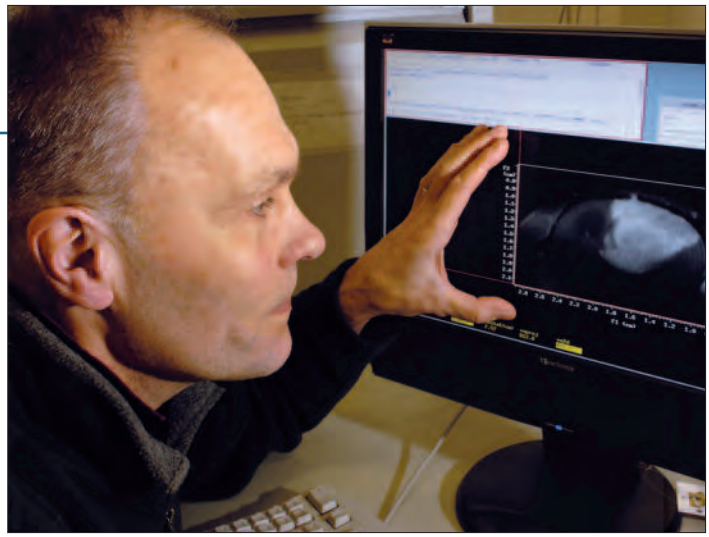
The report drew several surprising conclusions. First, the overall supply of primary-care clinicians in a region is not related to how frequently Medicare beneficiaries use primary care. For example, in some regions, the supply of primary-care physicians was low, yet a relatively high proportion of beneficiaries had at least one visit per year with a primary-care provider. But in some regions with a higher supply of providers, fewer beneficiaries had a primary-care visit.

Second, access to a primary-care clinician (as measured by having at least one annual visit) is by itself no guarantee that patients will receive recommended care. For example, there was no relationship between the percentage of beneficiaries in a region having at least one annual visit and several indicators of quality care—such as the percentage of diabetic beneficiaries receiving an annual eye exam, the rate of leg amputations among diabetic beneficiaries, and the rate of hospitalizations that result from poorly controlled chronic conditions.

Blacks were less likely than whites to see a primary-care clinician.

Care: Third, in general within a region, blacks were much less likely than whites to see a primary-care clinician and much more likely to be hospitalized. Given previous research on racial disparities in care, that may not be too surprising. More surprising was that where beneficiaries lived had more influence on their health outcomes than the color of their skin. Differences among regions were much greater than differences between blacks and whites. For example, blacks were four times as likely as whites to have a leg amputated as a result of poorly controlled diabetes or peripheral vascular disease, but there was a tenfold regional variation in leg amputations.

These findings complicate the argument that simply producing more primary-care physicians will improve the nation's health. Primary-care supply can be "influential at a very local level," says Goodman. But "physicians don't tend to settle where needs are greater," he adds. "What doctors and nurses do . . . makes a huge difference, but the sheer number of physicians is not very powerful." JENNIFER DURGIN



JON GILBERT FOX

Risto Kauppinen is devising a method to determine the time a stroke took place.

Stroke study may prove very timely

Every second counts in treating a stroke, but watching the clock isn't just a matter of administering treatment quickly. Doctors must first determine what kind of stroke a patient suffered. Then, in the case of an ischemic stroke—one caused by a blood clot—they need to pin down *when* the blockage occurred. A new technique being studied by DMS radiology researcher Risto Kauppinen, M.D., Ph.D., may help with that crucial step. He's using magnetic resonance imaging (MRI) to examine post-stroke changes in the brains of rats; the rate of change appears to yield a timeline showing when the stroke began.

Onset: This is important because the medications currently available for ischemic strokes can only be used within several hours of the onset of the stroke. Otherwise, the risks of bleeding caused by the drugs outweigh their potential benefits. If it's not possible to determine whether a patient is within that time window, the potentially life-saving drugs can't be used.

In the hope of solving this problem, Kauppinen and colleagues induced ischemic strokes in rats and used MRI to examine the rats' brains up to six hours later, comparing tissue in two parts of the brain affected by the strokes to tissue in an unaffected part of the brain. They found that a measurement called $T_{1\rho}$ relaxation time increased steadily in the affected tissue as time passed after the onset of a stroke, but it stayed the same in unaffected tissue. So, given specific $T_{1\rho}$ values from similar rats that had suffered a stroke, the researchers could arrive at a fairly precise estimate of when the stroke began.

Flow: They did encounter one complication. One affected area of the rats' brains maintained some residual blood flow for a few minutes after the onset of a stroke, so for about 10 minutes its $T_{1\rho}$ values appeared to be the same as those of unaffected tissue.

There would be still other difficulties to overcome before this technique could be considered for use in humans, because, Kauppinen says, "the human brain is much more complicated in terms of anatomy than the rat brain." But he hopes next to try the technique in larger animals, and, eventually, in humans as well. AMOS ESTY