A hidden hazard of rural living

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ay “rural living,” and it summons up an image of ruddy-cheeked
good health. Could it be that living in the country is actually haz-
ardous to your health? “Could be,” says Dartmouth’s Timothy Lahey,
M.D., “if you also happen to be infected with HIV.”

He and colleagues in the Section of Infectious Diseases identified
two cohorts of HIV-positive patients in New England—317 in locales
with a mean population of about 79,000 people (meeting the defini-
tion of urban set in 2004 by the federal government) and 327 in lo-
cales of less than 10,000 (areas considered rural). The two groups were
followed from 1995 to 2005. All 644 patients were seen more than
once in Dartmouth-Hitchcock clinics by clinicians in the same multi-
disciplinary group, which included infectious disease physicians and
a full support staff of HIV-AIDS specialists.

Adjustments: Yet despite the fact that all received the same care, mor-
tality was clearly higher in the rural group. Adjustments for age, sex,
race, HIV risk factors, year of diagnosis, travel time, lack of insurance,
and treatment regimen had no effect on the result. The investigators,
who published their findings in AIDS Research and Human Retro-
viruses, are at a loss regarding the reasons why.

But they believe it’s reasons—plural—rather than a single expla-
nation. Their data does help to separate the more likely from the less
likely contributing causes. It is possible, for example, that living in a
remote area might limit patients’ access to high-quality health care.
Or that the stigma associated with AIDS might impel HIV-positive
patients to seek a distant provider for privacy reasons. Some vari-
ables—such as frequency of appointments, patient migration patterns,
and patient income—were not evaluated but might also play important roles.

However, Lahey suspects the urban-rural differential may not necessarily be disease-
specific. He speculates that the same result might be found for any disease with high mortality and a complicat-
ed treatment regimen, such as cancer or heart disease. If that is the
case, then identifying the exact causes of the increased mortality in
rural HIV patients would make it possible to design appropriate in-
terventions that might apply to a wide variety of diseases. In other
words, says Lahey, his rural HIV patients may be like canaries in a
coal mine in their vulnerability to poor health outcomes.

Future studies: Lahey also points out that “in New England, there are
often vast differences between two communities that might both be
considered ‘rural’ by the government criterion—such as the differ-
ce between Hanover, N.H., and Colebrook, N.H. It is very difficult
to capture such differences in a study of this kind.” But, he says, there
are more sophisticated tools—such as the Rural-Urban Commuting
Area system, a 10-point scale—that the group may use in future stud-
ies to try to refine such distinctions.

Reducing risk in the CABG patch

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ne of the most common surgeries in the U.S. is a coronary artery
coronary artery bypass graft (CABG). If the arteries supplying the heart are
blocked, healthy blood vessels can be harvested from elsewhere in the
body and grafted onto the heart. But though half a million CABGs
are performed each year, the procedure carries a risk of kidney failure.
There have long been ways to predict renal failure in patients who al-
ready had kidney problems. Dartmouth researchers have now devel-
oped a way to predict post-CABG renal failure in patients whose kid-
neys were working just fine before surgery.

Function: “Three percent of [patients] with normal kidney function
go into surgery are walking out with severe renal dysfunction,” ex-
plains Jeremiah Brown, Ph.D., lead author of the paper in Circulation
that reported the method. “It’s a problem we need to address.”

Brown’s team—which included cardiologist David Malenka, M.D.;
epidemiologist Gerald O’Connor, Ph.D., Sc.D.; and others—collected
data on 11,301 patients. All had had CABGs between 2001 and
2005 at hospitals in the Northern New England Cardiovascular Dis-
ease Study Group, a consortium cofounded by O’Connor in 1987.

The new renal failure model calculates risk based on the sum of
point values assigned to various patient characteristics. The team
identified two key risk factors: congestive heart failure and the use
during the CABG of an emergency intra-aortic balloon pump—a tiny
balloon inserted in the aorta to help the heart pump blood. Other risk
factors include being over 70 and female, having had a prior CABG,
and having an elevated white-blood-cell count, diabetes, peripheral
vascular disease, or hypertension. “The unfortunate issue,” says Brown,
“is that very few of these variables aremodifiable.”

Nevertheless the prediction tool is expected to help. “When we
recognize that a patient is at increased risk for post-procedural renal
dysfunction, there are a variety of changes we can make in their care
to minimize that risk,” says Malenka, including carefully monitoring
the patient’s kidneys after surgery.

Roger P. Smith, Ph.D.