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## **Geography's Influence on Chronic Disease Diagnosis**

### ***JAMA Study Finds Inverse Relationship between Diagnosis Frequency and Risk of Death among Medicare Patients***

**Lebanon, N.H. (March 16, 2011)** – The likelihood of Medicare patients being diagnosed with one or more of nine chronic diseases may depend on where they live and the doctors they see, in addition to how healthy or sick they actually are, according to a new study by Dartmouth investigators published in the *Journal of the American Medical Association*. This geographic variation raises important questions about the methods used to adjust risk for the severity of illness in comparative effectiveness research, the evaluation of hospital readmissions, and paying insurance plans under the Medicare Advantage program and elsewhere, including academic research into the extent of variations in medical care across America.

The researchers from the Dartmouth Atlas Project found that in the country as a whole, the risk of death increased as the number of diagnoses increased across the entire population of 5,153,877 Medicare beneficiaries in 2007 included in the study. However, as the average number of diagnoses per patient increased across geographically-defined populations of patients, the mortality rate for patients with these conditions paradoxically decreased.

The study also looked at relationships between the frequencies of diagnoses and how often these patients saw physicians, how many physicians they saw, and how many imaging tests and lab tests they received. The frequency of a diagnosis for one or more of the nine conditions increased with the intensity of observation.

“This study suggests that disease diagnosis is associated with the intensity of health care that is delivered in a region. For example, if people living in one region see lots of doctors, have lots of visits to doctors, and get lots of lab tests, it could be because there is a perfect relationship between illness and the amount of care that is delivered. But it could be that the more doctors you see, the more diagnoses you get,” said John E. Wennberg, M.D., M.P.H., report co-author and founder and director emeritus of the Dartmouth Institute for Health Policy and Clinical Practice.

In order to determine the association between frequency of diagnoses for chronic conditions in geographic areas and fatality rates among Medicare patients, researchers studied the frequency with which nine chronic conditions were diagnosed among Medicare patients in the 306 U.S. hospital referral regions. Researchers found that the frequency of diagnosis varied substantially

across regions; for example, the mean number of chronic conditions diagnosed per Medicare patient ranged from 0.58 in Grand Junction, Colo., and Idaho Falls, Idaho, to 1.23 in Miami, Fla., and McAllen, Texas.

Disease diagnoses are considered a fundamental input for adjusting comparisons of health outcomes and health care spending across hospitals and regions, so as not to penalize systems that care for patients who are sicker than average. Ideally, a diagnosis would be solely an attribute of the patient, unaffected by the process of observation. This study suggests that patients who see doctors in high-intensity health care regions are more likely to be diagnosed with a chronic illness even when they are less sick.

If diagnosis is not solely an attribute of underlying disease burden, adjustments based on frequency of diagnosis may introduce bias into efforts to compare outcomes, pay for health care, and assess the extent of geographic variation in health care delivery. On the other hand, if more diagnoses improve outcomes, then standard methods of risk adjustment may provide a more accurate comparison of effectiveness and efficiency. The researchers conclude that future research must further evaluate the contribution of the process of observation to diagnosis frequency and explore mechanisms to better measure disease burden.

Led by H. Gilbert Welch, M.D., M.P.H., of the Department of Veterans Affairs Medical Center in White River Junction, Vt. and the Dartmouth Institute for Health Policy and Clinical Practice, the study's additional authors include Sandra M. Sharp, S.M., Dartmouth Institute for Health Policy and Clinical Practice; Dan J. Gottlieb, M.S.; Dartmouth Institute for Health Policy and Clinical Practice; and Jonathan S. Skinner, Ph.D., Department of Economics, Dartmouth College.

An abstract of the *JAMA* study, "Geographic Variation in Diagnosis Frequency and Risk of Death Among Medicare Beneficiaries," can be found at <http://jama.ama-assn.org/content/305/11/1113.abstract>.

The Dartmouth Atlas Project is run by the Dartmouth Institute for Health Policy and Clinical Practice and principally funded by the Robert Wood Johnson Foundation.

#### **About the Dartmouth Atlas Project**

For more than 20 years, the Dartmouth Atlas Project has documented glaring variations in how medical resources are distributed and used in the United States. The project uses Medicare data to provide information and analysis about national, regional, and local markets, as well as hospitals and their affiliated physicians. This research has helped policymakers, the media, health care analysts and others improve their understanding of our health care system and forms the foundation for many of the ongoing efforts to improve health and health systems across America.

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