

# Predictive Modeling

## NEWS

## Disease Registries Fuel Alzheimer's Research, Show Value of Data to Prognosis Determination

**Predicting the true course of disease using new risk score calculator and new database**

by Russell A. Jackson

**P**redictive analytics and disease registries would seem to be a natural match. And two recent developments show that they are. In the first, a new database of more than 4,000 Alzheimer's disease patients who have participated in 11 industry-sponsored clinical trials was recently released by the Coalition Against Major Diseases. It is, a statement says, the first database of combined clinical trials to be openly shared by pharmaceutical companies and made available to qualified researchers around the world. It is also the first effort of its kind to create a voluntary industry data standard that will, the statement says, "help accelerate new treatment research on brain disease, as patients with other related brain diseases are expected to be added. The level of detail and scope of this database will enable researchers to more accurately predict the true course of Alzheimer's, Parkinson's, Huntington's and other neuro-degenerative diseases, thereby enabling the design of more efficient clinical trials."

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## Commonwealth Fund Paper Shows 'Predictive Modeling in Action'

**Researcher Geraint Lewis MA MSc FRCP FFPH is a public health physician and a senior fellow at the Nuffield Trust in London. In an August paper published by The Commonwealth Fund – from its "Issues in International Health Policy" series – he details a program that uses predictive modeling to identify patients at high risk of emergency hospitalizations. It's called "Predictive Modeling in Action: How 'Virtual Wards' Help High-Risk Patients Receive Hospital Care at Home." Here are excerpts.**

**A** model of home-based coordinated care deployed in the United Kingdom offers promise in reducing hospital admissions in a relatively low-cost manner. "Virtual wards," as the model is known, provide multi-disciplinary case management services to people who have been identified, using a predictive model, as high risks for future emergency hospitalization. Virtual wards use the systems, staffing and daily routine of a hospital ward to deliver preventive care to patients in their own homes, rather than waiting for them to come to the hospital as costly emergencies. The first virtual wards opened in the London borough of Croydon in 2004, where there are now 10, with the capacity to care for 1,000 high-risk patients. What distinguishes them from other programs designed to prevent hospitalizations is they couple predictive modeling with a virtual "hospital at home." Predictive modeling aims to ensure that the intervention is targeted at those patients who are most at risk for emergency hospitalization in the next 12 months, while the hospital at home offers a way for staff to deliver highly coordinated, collaborative care to those carefully selected patients in an ideal setting -- their own homes.

Emergency hospitalization rates are highly skewed across populations, such that a small number of patients typically account for a very large proportion of admissions. In theory, the healthcare system could make substantial net savings if it could reduce emergency hospitalizations by offering preventive care to those costly individuals. However, for hospital-avoidance programs to be successful, they must account for what is known as "regression to the mean" -- that is, those patients who are experiencing repeated hospital admissions will, on average, have markedly fewer hospital admissions in the future, even without intervention. So a hospital-avoidance program that selects patients for preventive care based on their current risk will appear to be successful in reducing the number of admissions, when in fact most of the reduction would have occurred anyway.

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