

**The Dartmouth research group was invited by *Health Affairs* to respond to Richard Cooper's findings. A summary of the Dartmouth rebuttal is below:**

Richard Cooper finds that states with more specialists have greater levels of quality. He notes that more generalists are also correlated with greater levels of quality. In his second paper, Dr. Cooper finds that while Medicare spending is negatively correlated with quality (a finding that replicates the earlier paper by Baicker and Chandra), non-Medicare spending is positively associated with Medicare quality. As we note below, there are several fundamental problems with Cooper's analysis.

**1. Confuses Correlations with Magnitude of Effects**

Cooper argues that because the correlation between quality and the number of generalists is similar to the correlation between quality and the number of specialists, both types of physicians contribute equally to quality. This is incorrect—correlations don't tell us anything about the magnitude of effects. Cooper's own graphs demonstrate that to move up 10 spots in the quality ranking you would have to add roughly 10 specialists per capita, but you would only have to add 1 generalist per capita. In other words, generalists improve quality much more than specialists—an argument completely consistent with Baicker and Chandra's research showing higher quality in states where generalists comprised a larger fraction of the physician workforce.

**2. Ignores the Role of Confounding Factors**

Because the number of specialists and the number of generalists in a state are related, examining their effects separately does not measure the relative contribution of each to quality. Baicker and Chandra use a standard statistical method—regression analysis—to measure *the independent effects* of generalists and specialists. They demonstrate that if we compare two areas with the same total number of physicians, the area with a greater share of generalists will have higher quality and lower spending. Because Cooper neglects to use regression analysis, he cannot account for confounding factors, and therefore arrives at incorrect conclusions regarding the importance of generalists and specialists in affecting quality.

**3. Ignores Rules of Inference in Science**

Cooper's own data fail to show a statistically significant association between specialists and quality rank, but demonstrate a statistically significant relationship between generalists and quality rank. The lack of a significant association between specialists and quality means that it could have occurred simply by chance. But Cooper ignores this inconvenience and writes "Quality is better in states with more physicians, both specialists and family physicians." He then magnifies this half-truth by making it his title and main conclusion. This is unfortunate, because if he had interpreted his results more carefully, he would have realized that his analyses supports the findings of Baicker and Chandra paper that generalists are associated with greater quality but specialists are not.

#### **4. Cooper's finding that quality is better in states with more generous payments to health care providers (instead of in states with more hospital beds or doctors) is also entirely consistent with published Dartmouth research.**

Cooper introduces a new measure of health care spending at the state level, which is affected by factors such as the generosity of the Medicaid programs, support for community health centers, and the price at which employers and the state government compensate health care providers. In contrast, the Dartmouth research measures only the quantity of healthcare utilized in an area. Cooper's analyses do not account for the fact that states with older people have more health care spending. Simply controlling for age eliminates the association between quality and non-Medicare spending. Ultimately, his results are entirely consistent with the published research of the Dartmouth group: health care quality is not about more hospital beds, stents, or physicians per capita, but other organizational and social factors such as the generosity of reimbursement and the degree to which the citizens of a state care about those who are less fortunate.

#### **Summary**

In the past three decades the Dartmouth group has conducted dozens of studies examining the causal links between health care resources, utilization and patient outcomes. These studies have been conducted at the level of states, large and small service areas, and individual patients. It has examined effects in many different types of patients: aged, newborn, medical, surgical, and the chronically and acutely ill. More than 100 peer-reviewed publications support the basic Dartmouth finding that more health care spending does not automatically translate into better outcomes.

By ignoring much of this research, including research published in journals such as the *New England Journal of Medicine*, Cooper may imagine that he has challenged the basic scientific findings of the Dartmouth group—that greater health care intensity and more specialists are not associated with better outcomes.<sup>1</sup> He has, however, circuitously provided another piece of evidence supporting the Dartmouth view. His own exhibits demonstrate that the association between generalists and quality is 10 times stronger than for specialists and quality. And in acknowledging that a third-factor—other than spending—may also be responsible for the quality of healthcare, he has stumbled upon another theme in the Dartmouth group's research: that health system and social organizational factors may be better determinants of quality than simply building more hospitals and hiring more physicians.

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<sup>1</sup> Goodman, David C., Fisher, Elliott S., Little, George A., Stukel, Therese A., Chang, Chiang-hua, Schoendorf, Kenneth S. The Relation between the Availability of Neonatal Intensive Care and Neonatal Mortality. *N Engl J Med* 2002 346: 1538-1544.

Goodman, D. C., Fisher, E. S. (2008). Physician Workforce Crisis? Wrong Diagnosis, Wrong Prescription. *NEJM* 358: 1658-1661.