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guest commentary

Medical science reveals its progress in fits and starts

By Jim Spencer

Posted: 08/04/2009 01:00:00 AM MDT

The Proceedings of the National Academy of Sciences recently published a study. It claims that research funded by the National Institutes of Health from 1938 to 2004 helps prevent 1.35 million deaths per year from cardiovascular disease, stroke, cancer and diabetes.

The report tries to make a case for quadrupling funding to the NIH in the next 10 years to improve public health while stimulating the economy. The results have set off a furious debate among academics and policy makers because the NIH funded the study, led by a Duke University mathematician, and because the relationship between research, prevention and treatment in health care is inexact.

The fury misses the study's two most important points — one explicit and indisputable, the other implied and not so well understood.

The explicit, indisputable point is that funding biomedical research produces jobs with livable wages and benefits that eventually produce a healthier society where people live longer, more productive lives and, hopefully, spend less on health care.

The implicit, often misunderstood point is that you can't cure cancer overnight, no matter how much money you throw at it.

People must grasp both concepts to see how public investment in basic science pays off.

This is no easy task in a world that increasingly demands instant information and gratification. We live where those with Twitter can "tweet" their every movement to friends in something approaching real time. Basic science will never work like that.

Recently, I sat in a meeting with U.S. Sen. Michael Bennet of Colorado. He talked about how the staff of the Congressional Budget Office couldn't figure out how to quantify the long-term savings that will accrue decades from now from investing in health care reform today. So the CBO staff counted only the short-term expenses. The result has been mind-boggling, trillion-dollar cost estimates for the health care reform packages that Congress now considers.

The same difficulty comes when trying to measure the impact of increased funding to the National Institutes of Health and others who pay for biomedical research.

In 2009, physician researcher Charles Dinarello has won a share of two of the world's biggest medical awards: the Albany Medical Center Prize in Medicine and Biomedical Research; and the Royal Swedish Academy of Sciences Crafoord Prize. In each case, he split \$500,000 with two other winners. Dinarello, a professor at the University of Colorado Denver School of Medicine, is up for another big international award. Yet all of the recognition comes from work he did more than two decades ago, much of it with NIH funding. Besides establishing Dinarello among the world's elite biomedical researchers, the awards establish the maddeningly slow pace of science.

For his work in the 1970s and 1980s isolating and cloning a molecule that causes fever without infection, Dinarello now enjoys credit for finding information that, among other things, led to improved treatments of diabetes and cancer. Diabetes and cancer, you will recall, are two of the diseases mentioned in the new study that advocates increased NIH funding.

So far this year, Dinarello has donated nearly \$300,000 in prize money to the Interleukin Foundation, which he started to help fund biomedical researchers with good ideas but no source of money.

Dinarello is not a rich man. Still, he chose not to use his prize money to pay off his home mortgage or replace his 13-year-old Volvo. That's because he knows how lucky he was to discover a path to enlightenment on the unexplored edges of science.

For every Nobel laureate, Dinarello will tell you, thousands of brilliant scientists labor in obscurity, testing hypotheses that don't provide the data needed to change the world.

Real science isn't exactly a crap shoot, but it is definitely a gamble.

"Some scientists are fortunate in that their work is translated into improved clinical medicine, but not all projects have that spin-off," Dinarello explains. "To succeed, pure research demands time. It requires patience. It involves risks and frustration. It induces anxiety and invites peer pressure. Still, at the end of it all, nothing beats the feeling you get when you prove a concept. More than any prize, that is the scientist's dream."

This kind of thinking ultimately benefits mankind, but it also defies traditional cost-benefit analyses. What needs to drive the government's investment policy in the NIH and other biomedical research is not a fight over precisely how many lives that research saves each year or exactly how fast more research money can produce cures. What needs to drive the decision to

invest is a better understanding of how basic biomedical research moves in fits and starts to finally help society.

Jim Spencer is communications director for the University of Colorado Denver School of Medicine and a former Denver Post columnist.