

# Recalculating Cancer

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This year, 562,340 people – more than 1,500 each day – will die from cancer in the United States, and 1.5 million will be diagnosed.

Cancer is often described by very large numbers like these. But such figures obscure a fundamental shift in thinking that has taken place in cancer research, one that needs wider understanding by the public and policymakers.

There is no one denominator for cancer; it is hundreds of different diseases and each must be evaluated – and treated – on its own. One early example of this was our success in treating childhood leukemia. This condition represents a small fraction of all cancer patients – only 3,540 cases were diagnosed in the U.S. in 2008 – but within this, the cure rate is 90 percent, up from 40 percent 25 years earlier. When the denominator includes all cancers, however, the cure rate amounts to less than a quarter of one percent.

Much of this gain against childhood leukemia came from aggressive chemotherapy, a treatment that galvanized a new beginning in cancer treatment when it was first developed 60 years ago. We are now at another watershed moment in cancer research. Combination therapies and new enzyme-targeting treatments have turned many deadly cancers – certain adult leukemias and gastrointestinal stromal cell tumors among them – into chronic diseases.

Genetic research has also put us on the path to targeted therapies that could have significant success. Consider that DNA decoding has identified a certain gene mutation in 10 percent of people with lung cancer, which accounts for a third of all cancer deaths. Nearly 100

percent of these patients respond to a small-molecule drug that focuses on the mutation. This is a clear victory over one disease, but a smaller achievement when the denominator expands to all lung cancers, and all cancers.

Developing vaccines to prevent cancers is another attainable goal that requires more emphasis. Cancer cells evade detection by the immune system – and the most sensitive diagnostic tools – in many insidious ways. We are working on ways to engage the patient's immune defenses to recognize and withstand these stealthy cells. Early data indicates that vaccines could have considerable impact on renal cancer and melanoma, which is on the rise.

There is great need to build an arsenal of targeted approaches. Certain diseases, such as ovarian and lung cancers, are rarely detected early. And our nation's increase

in life expectancy – 79 years for people born today, up from 63 in 1940 – further expands the pool of vulnerable populations since cancer risk increases with age.

Even as the nation faces other health challenges – from H1N1 flu virus to health care reform – we must strengthen our commitment to cancer research. The pledge to increase federal funding for cancer research is encouraging, but of the \$10 billion in stimulus money allocated for health care, only \$1.3 billion will go to cancer, and this must be spent in two years. Already, the number of grant applications has far outstripped the available funding. To capitalize on the promise of targeted treatments, we must recalculate budgets for the hundreds of diseases we call cancer.

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