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Biden's Cancer Moonshot: Money Isn't Everything ...Especially With The Backing Of Silicon Valley

Findings:

- **Annual government spending on all science, space, and technology is just $29 billion, or 0.79 percent of the budget. During the race to the moon, annual spending on the space program alone was $30 billion, or 3 percent of the budget**
- **The government's moonshot is just one of three cancer moonshots happening; two others are led by Silicon Valley billionaires**
- **Vice President Biden has racked up some early success through his convening power**

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Eight years after John F. Kennedy boldly said America would put a man on the moon, U.S. citizens watched Neil Armstrong take a giant leap for mankind and cheered as we beat a common enemy.

In the coming years, will America celebrate an even more difficult achievement against a more insidious enemy? That's the hope after President Barack Obama announced—and Vice President Joe Biden began spearheading—the "Cancer Moonshot."

It doesn't take a political expert to tell you that getting Congressional approval for moonshot-like funding is unlikely

The barriers to finding a cure to cancer make the space moonshot seem simple by comparison, as cancer takes hundreds of forms and kills close to 600,000 Americans annually.

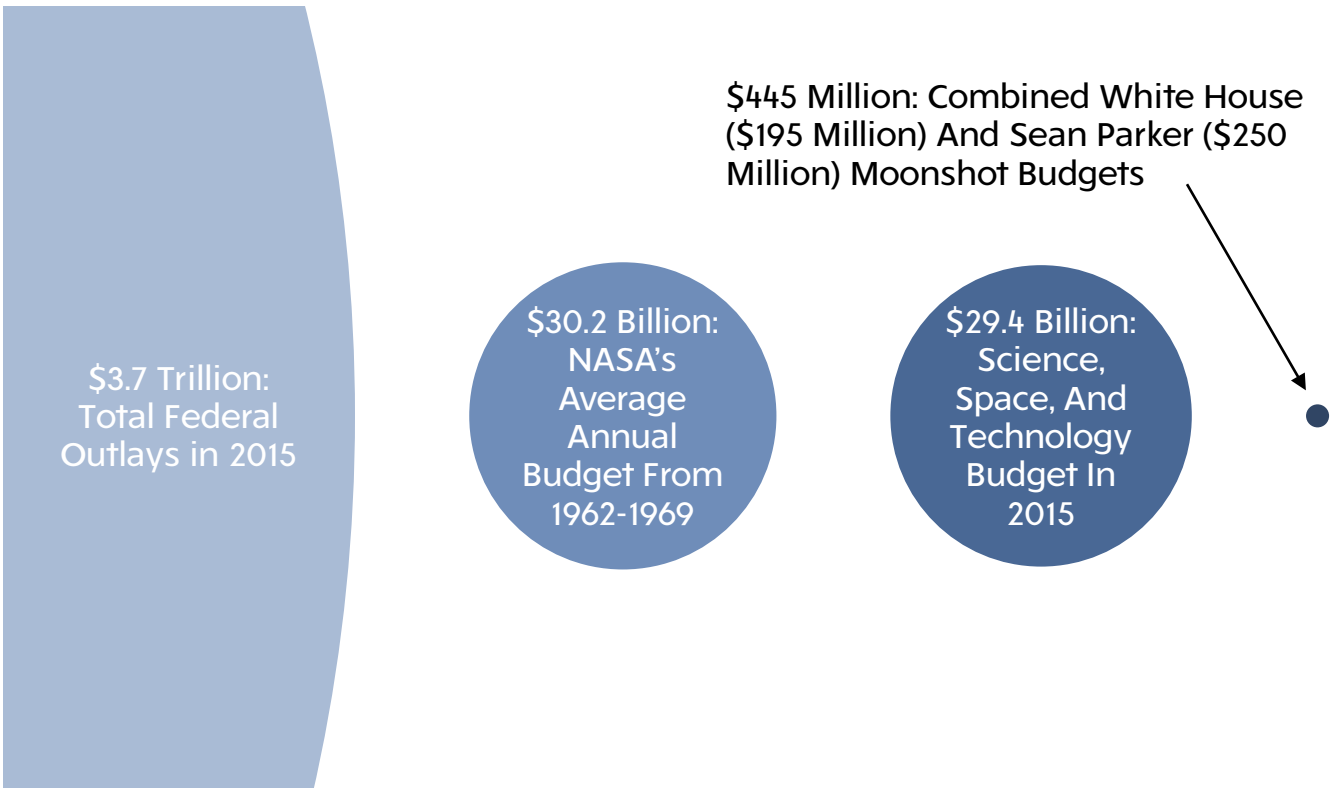
Math, for one, is the clearest obstacle. Annual government spending on all science, space, and technology represents just 0.79 percent of the budget, or $29 billion. From 1962 to 1969, America spent on average 3 percent each year, or $30 billion in today's dollars, of its budget on space programs alone.

It doesn't take a political expert to tell you that getting Congressional approval for moonshot-like funding is unlikely. But that doesn't mean getting us closer to a cure is unachievable.

There are several factors in America's favor, including the dramatic increase in computing power since the 1960s, unparalleled access to big data, the revolutionary possibilities of immunology, and the power of Silicon Valley.

It would be a mistake to think the "Cancer Moonshot" is some lone government effort where the private sector is merely tapped for expertise. There are at least

Fig. 1: NASA's Budget During The Moonshot Is Equal To The Entire Current Science, Space, And Technology Budget In Real Terms



Note: Data from OMB Historical Budget Data and The Parker Foundation. Current moonshot funding does not include requested funds in the President's FY2017 budget and Dr. Soon-Shiong's moonshot (for which no data is available)

two other cancer moonshots going on simultaneously. One is led by biotechnology billionaire Dr. Patrick Soon-Shiong, and the other by Silicon Valley idol Sean Parker, famous for his roles in Napster and Facebook.

Instead, the cancer moonshots should be viewed as the first test of whether the "Third Wave" in the internet's revolution will successfully marry government and Silicon Valley toward common good. The "Third Wave,"as espoused by AOL co-founder Steve Case, says Silicon Valley's disruptive power can be brought to bear on many areas traditionally led by the government but only if disruptors and regulators work together.

And not to be discounted is Vice President Biden, whose son, former Delaware state attorney general Beau Biden, died of brain cancer in 2015. The vice president isn't alone in having lost a loved one to cancer. But he is in the rarefied position of having lost his son on the national stage and of having powerful friends on both sides of the political aisle, in and out of Congress.

The Goal Of The Government's Cancer Moonshot

The goal of the government's cancer moonshot is unclear. When President Obama announced the cancer moonshot during the State of the Union address he said, "with a new moonshot, America can cure cancer."

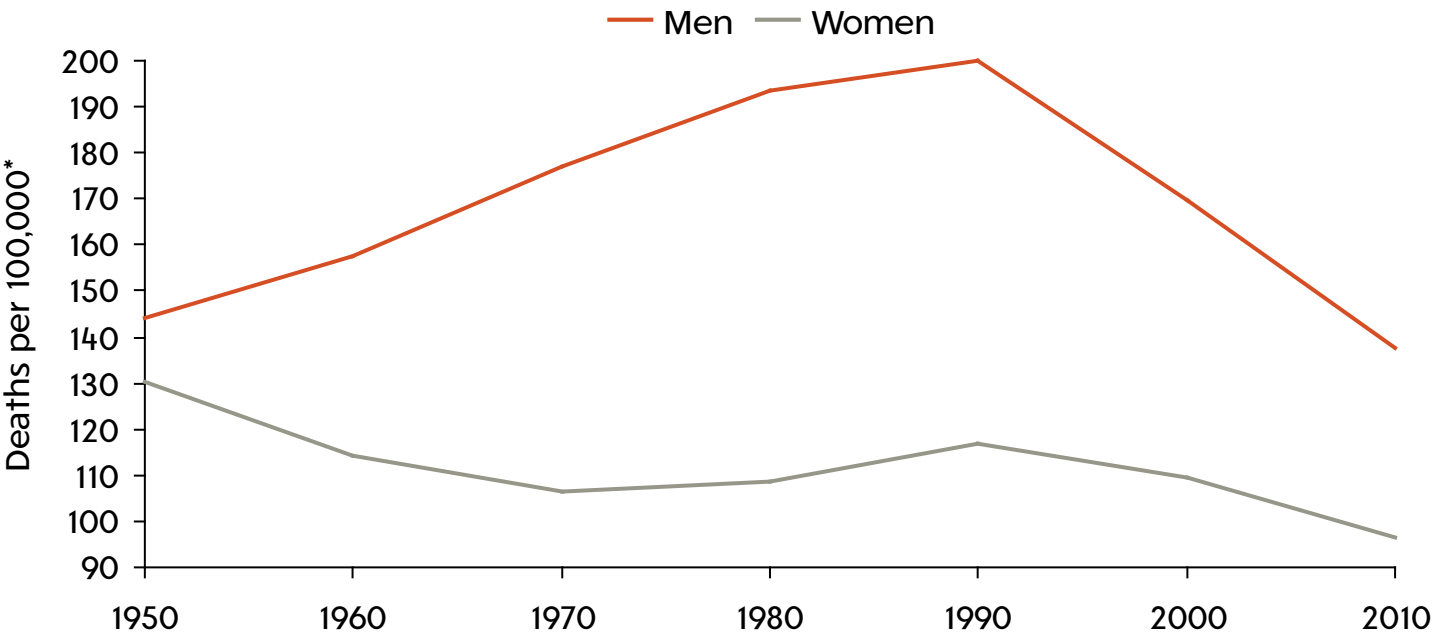
But the goal of what is formally called the "National Cancer Moonshot" is, as the White House said, "to bring about a decade's worth of advances in five years."

It's not clear how to measure those advances.

Funding has been limited. The White House said $195 million in new cancer activities will begin at the National Institutes of Health (NIH) this year and the president's budget request to Congress

Fig. 2: Cancer Mortality Rates Have Steadily Declined Since The 1990s

Trends In Age-Adjusted Cancer Death Rates**, US, 1950-2010



*Age-adjusted to the 2000 U.S. standard population
**Deaths from stomach, colon & rectum, pancreas, lung & bronchus, liver, breast (only female), uterus (only female), prostate (only male), & leukemia (only male) cancer sites included

American Cancer Society, *Cancer Facts & Figures 2016*

includes $755 million for new research.

By comparison, when President Kennedy called for putting a man on the moon NASA funding jumped 100 percent in one year, or about $9.9 billion in today's dollars. This funding gap explains why Vice President Biden recently quipped that his effort was "probably inappropriately named."

Various materials from the White House suggest getting America on a path to a cure is focused on two tactics:

- Harnessing computing power and big data
- Boosting information sharing and accessibility among federal agencies, drug companies, and universities

In the 1970s, the five-year survival rate for adults with cancer was 50 percent; today it's 79.3 percent

Computing power and research data have grown exponentially since the Apollo program. As others have noted, Apollo's guidance computer had about as much computing power as two Nintendo Entertainment Systems.

A Presidential History Of Cancer

The Cancer Moonshot isn't the first time, or even the second time, that a president has likened a major initiative to cure cancer to the moon landing.

"The time has come in America when the same kind of concentrated effort that split the atom and took man to the moon should be turned toward conquering this dread disease," President Richard Nixon said in his State of the Union address in 1971.

In 2000, when he was campaigning in Florida, George W. Bush told Florida retirees

that he'd double the budget of the NIH and launch a "medical moonshot" to cure cancer and other age-related diseases.

These efforts haven't been for nothing. In the 1970s, the five-year survival rate for adults with cancer was 50 percent, today it's 79.3 percent, according to data from the American Cancer Society.

Despite these advances, too much talk of finding a cure can give patients false hope. Siddhartha Mukherjee, author of the Pulitzer Prize-winning history of cancer, "The Emperor of All Maladies," said while the moonshot helps focus the country's attention, it "creates an unhelpful hype circle that will lead to a backlash" when a cure isn't found.

Still, it's hard not to have hope. Just months before the government's Cancer Moonshot was announced, former President Jimmy Carter told a Sunday school that the cancer in his liver and brain was gone.

Mr. Carter underwent several treatments, including taking an immunotherapy drug. Immunotherapy drugs are so named because they help a patient's own immune system fight back against diseases.

Measuring Successes

Given that it will take years before we see any meaningful change in survival rates, preventive measures, or new therapies to treat cancer, how should we judge the success of the Cancer Moonshot?

The vice president's own measurements for success include breaking siloes and getting competitors to work together toward a common goal. On the latter point, he's racked up some early success.

For one, his efforts have gotten the attention of Pope Francis and the Catholic Church, which has had an at-times contentious relationship with the scientific community.

Another indicator of his success can be seen in the panel of experts he recently formed at the NIH to help provide guidance for the moonshot. It includes academics, oncologists, and pharmaceutical and biotechnology companies—in other words, groups that often compete against each other.

Among those on the panel, in addition to a vice president from Pfizer Inc., multiple hospital researchers, medical association professionals, and a data-computing manager at Amazon Web Services, is biotechnology billionaire Patrick Soon-Shiong.

Mr. Soon-Shiong's participation is unique because he launched his own initiative called the "Cancer MoonShot 2020" to identify a vaccine-based immunotherapy to combat cancer by 2020.

Not on the panel, however, is Sean Parker. Mr. Parker, known for his roles in founding the music-file sharing service Napster and Facebook, recently pledged $250 million to create the Parker Institute for Cancer Immunotherapy.

The Institute is a collaboration of the nation's top cancer centers, and brings together six centers, 40 labs, and more than 300 researchers. It will be overseen by a steering committee to help ensure data is shared among researchers. The Institute will also lead in bringing any new therapies to market.

But that's not to say the vice president won't be able to easily get Mr. Parker's attention. Leading Mr. Parker's institute is Jeff Bluestone, the former University of California, San Francisco provost.

Why does this matter? Mr. Bluestone is on the vice president's blue-ribbon panel.

It's unclear to what degree these moonshots will bring us closer to a cure. What's clear is that cancer's complexity will require the best of government and the best of Silicon Valley, and any progress toward a cure is worth celebrating. []