

Shutdown of National Institutes of Health imperils critical medical research

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Among the many critically important services that have been devastated by the ongoing federal government shutdown, closure of the National Institutes of Health (NIH) is one that is likely to have severe long-term effects.

The NIH is the federal government's primary agency for biomedical and health-related research. It encompasses 27 separate institutes and research centers. The agency both conducts research with its own facilities and staff and funds the efforts of thousands of outside researchers. It has been responsible, directly or through sponsored research, for many important medical discoveries. Among other areas, it is a major force in cancer research.

Collectively, the NIH is the largest medical research organization in the world. The shutdown has forced the furlough of 73 percent of the NIH's staff, over 13,000 people, with repercussions that extend far beyond the organization itself.

The NIH's Clinical Center hospital specializes in conducting research into new, experimental treatments which are often the last resort for patients who have not been helped by standard procedures. The center is currently engaged in more than 1,430 studies and nearly 500 clinical trials.

Normally, the hospital admits about 200 new patients a week. Typically about 30 are children, and a third of these have cancer. However, because of the federal shutdown, admissions have been reduced nearly to zero, restricted only to those with immediately life-threatening conditions. For many, such as those with advanced cancer, even a short delay in the commencement of treatment may ultimately mean the difference between life and death.

Among furloughed staff are personnel who maintain critical NIH databases that keep track of admissions to clinical trials and patient status. Due to the shutdown, the

NIH is also unable to accept new research grant applications. Meetings, phone conferences, and indeed any communication between NIH staff and outside researchers engaged in ongoing studies have been suspended. Access to NIH databases, on which many researchers rely to obtain information for their studies, is cut off as well.

Critically important medical research conducted by the NIH will be increasingly impaired the longer the shutdown lasts. Some may be totally ruined. Just one of the classes of activity that will be affected is research on diseases such as diabetes, cancer and Alzheimer's research using genetically engineered rodents (currently totaling about 1.4 million).

These animals, the product of careful breeding to carry specific genetic characteristics, are kept under tightly controlled conditions that must be constantly monitored and maintained. Only skeleton crews of technicians are currently allowed access.

Without adequate staff to support these colonies, large numbers may have to be euthanized. Thousands of dollars will then be spent to replace them when operations resume. That is in addition to the cost in time and money lost due to experiments that have to be restarted.

Similar factors will impact research employing cell cultures that also require constant attention.

NIH employees report that they will soon run out of supplies needed simply to keep animals alive and experiments on hold. During the shutdown no new orders can be placed. As a result, even once the shutdown ends the lack of supplies on hand will cause severe difficulties.

Previous government shutdowns, which lasted only a few days, totally ruined important research. The effects of the current closure are likely to be much more substantial, setting back experiments for months, or even years.

While some grant money for research at universities and private firms that was previously approved will continue

to be disbursed, for others it will not, and no new grant applications will be processed during the shutdown. The effect is compounded by the fact that October 1 was the beginning of the fiscal year when a new funding cycle was to begin.

Government funds for the NIH and the National Science Foundation, another principal source of funds for scientific research, have been stagnant or on the decline for nine years, leading to a progressive decrease in research activities. Last year's sequester resulted in a 5.1 percent or \$1.5 billion across-the-board cut in NIH research funding. The agency will lose another \$600 million this year due to the second round of the sequester. In the fiscal year just ended, the NIH was able to fund only 16 percent of the grant applications it received. That is down from approximately one third of applications a decade ago.

Researchers who depend on NIH support have been speaking out about the impact of the shutdown, sequestration, and the general decline in funding for scientific research, not only on

their work but on the next generation of scientists.

Rebecca Burdine, PhD, associate professor in the Department of Molecular Biology at Princeton University, said "My generation has been feeling the strain of the NIH budget for over a decade. You're fighting for a pool of money with people who are just as brilliant, just as ambitious, and have just as good ideas," she said. "This prevents really good science from being done. I've seen many of my peers spiraling down the drain. They are slowly shutting down their labs and leaving science." (Quoted in *Drug Discovery & Development* magazine). Capitalism, which in its ascendancy fostered scientific research, including great advances in medicine, has now become the enemy of progress, stifling the struggle to overcome disease, and consigning millions of people to sickness and premature death.



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