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# DEPARTMENT OF ENERGY VETERANS' HEALTH INITIATIVE ACT

AUGUST 16, 2019.—Ordered to be printed

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Ms. MURKOWSKI, from the Committee on Energy and Natural Resources, submitted the following

# R E P O R T

[To accompany S. 143]

[Including cost estimate of the Congressional Budget Office]

The Committee on Energy and Natural Resources, to which was referred the bill (S. 143), to authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States, and for other purposes, having considered the same, reports favorably thereon without amendment and recommends that the bill do pass.

## PURPOSE

The purpose of S. 143 is to authorize the Department of Energy (DOE or Department) to conduct collaborative research with the Department of Veterans Affairs (VA) in order to improve healthcare services for veterans in the United States.

## BACKGROUND AND NEED

DOE funds basic research in high performance computing, artificial intelligence, modeling and simulation, machine learning, and large-scale data analytics across the national laboratory system. The Department also owns research infrastructure, including the world's fastest supercomputers, and can provide tools and technical expertise in support of industry, academia, and other federal agencies' efforts to solve complex technology challenges.

The VA healthcare system offers one example of a complex data set that could benefit from support and analysis provided through the DOE national laboratory system. Through its voluntary data collection program, entitled the Million Veterans Program (MVP), the VA has collected detailed health information and genomic data on over 600,000 veterans. The MVP was established in order to examine how genomic variation influences the progression of disease and response to different treatments.

The VA, however, lacks the tools to analyze this complex data effectively. In order to maximize the potential for analysis, DOE and the VA have partnered to plan a joint research venture that will benefit both agencies. The partnership combines the healthcare and genomic data generated through the MVP with DOE's world class leadership in high-performance computing and data analytics capabilities.

The combined MVP CHAMPION (Million Veterans Program Computational Health Analytics for Medical Precision to Improve Outcomes Now) initiative will allow DOE and the VA to establish a scientific computing environment that will not only house, protect, and provide MVP data to researchers within the DOE national laboratory system, but also facilitate the development of big data analytical tools to foster transformational science across the Department's mission. Through the development and application of complex computer models that detect patterns in the VA's data, DOE will be able to identify potential causes and warning signs of various diseases. This analysis could lead to information that could transform the healthcare the VA offers to veterans, particularly through early diagnoses or developing more effective treatment mechanisms.

Further, the MVP will provide enhanced health data through the collection of genetic, lifestyle, military exposure, and health information about veterans that can be used to understand how genes and environment affect health and illness.

This program will also benefit DOE basic research needs by providing a large data set from which to develop computing tools, technologies, and techniques that can be applied to DOE's core mission research. In order to further the capabilities achieved through the partnership with the VA, DOE has also established a standalone artificial intelligence and big data initiative to explore broader applications of these computing techniques within the DOE core mission.

## LEGISLATIVE HISTORY

S. 143 was introduced by Senator Ernst (for herself and Senators Hassan, Portman, Gardner, King, and Heinrich on January 16, 2019. Senator Rounds was added as a cosponsor on May 1, 2019. The Subcommittee on Energy held a legislative hearing on S. 143 on July 9, 2019.

During the 115th Congress, Senator Ernst introduced similar legislation, S. 3656, (for herself and Senators King, Gardner, on November 26, 2018. Senators Portman and Hassan were later added as cosponsor. Similar legislation, H.R. 6398, was introduced in the House of Representatives on July 17, 2018, by Representative Norman, and referred to the Committee on Science, Space, and Technology. H.R. 6398 was reported by the Science, Space, and

Technology Committee with an amendment on September 25, 2018 (H. Rept. 115–974), and passed the House, as amended, on September 25, 2018, by voice vote. The Senate Energy and Natural Resources Committee held a hearing on H.R. 6398 on November 29, 2018.

The Senate Committee on Energy and Natural Resources met in open business session on July 16, 2019, and ordered S. 143 favorably reported.

## COMMITTEE RECOMMENDATION

The Senate Committee on Energy and Natural Resources, in open business session on July 16, 2019, by a majority voice vote of a quorum present, recommends that the Senate pass S. 143.

## SECTION-BY-SECTION ANALYSIS

*Section 1. Short title*

Section 1 sets forth the short title of the bill as the "Department of Energy Veterans' Health Initiative Act."

*Sec. 2. Definitions*

Section 2 provides for definitions of relevant terms.

*Sec. 3. Purposes*

Section 3 sets forth the purposes of the bill, including to advance DOE expertise in artificial intelligence and high-performance computing in order to improve health outcomes for veteran populations by supporting basic research; maximizing the impacts of the VA health and genomics data housed at the national laboratories; establishing partnerships to improve data sharing; establishing multiple scientific computing user facilities; and driving technology improvements in artificial intelligence, computing, and networking.

*Sec. 4. Department of Energy veterans health research and development*

Section 4(a) requires the Secretary of Energy (Secretary) to establish and carry out a research program in artificial intelligence and high-performance computing, focused on the development of tools to solve big data challenges associated with veteran's healthcare.

Subsection (b) includes components the Secretary may use when establishing the program.

Subsection (c) authorizes the Secretary to enter into memoranda of understanding with the VA and other Federal agencies as appropriate.

Subsection (d) directs the Secretary to submit a report to Congress detailing the effectiveness of the program not later than two years after the date of the enactment.

Subsection (f) directs the Secretary of the VA to allocate up to $27 million during the period of fiscal years (FY) 2019 through 2023 to carry out this section, subject to the availability of appropriations.

Section 5(a) directs the Secretary to carry out a pilot program to develop tools for big data analytics in order to advance artificial intelligence technologies to solve complex, big data challenges.

Subsection (b) includes components the Secretary may use in carrying out the pilot program.

Subsection (c) requires the Secretary to submit a report to the House Committee on Science, Space, and Technology and the Senate Energy and Natural Resources Committee evaluating the effectiveness of the pilot program.

Subsection (d) directs the Secretary to allocate up to $26 million for each of FYs 2019 and 2020 to carry out this section, subject to the availability of appropriations.

COST AND BUDGETARY CONSIDERATIONS

The following estimate of the costs of this measure has been provided by the Congressional Budget Office:

**At a Glance**

**S. 143, Department of Energy Veterans' Health Initiative Act**

**As ordered reported by the Senate Committee on Energy and Natural Resources on July 16, 2019**

| By Fiscal Year, Millions of Dollars | 2019 | 2019-2024 | 2019-2029 |
|---|---|---|---|
| Direct Spending (Outlays) | 0 | 0 | 0 |
| Revenues | 0 | 0 | 0 |
| Increase or Decrease (-) in the Deficit | 0 | 0 | 0 |
| Spending Subject to Appropriation (Outlays) | 0 | 53 | not estimated |

| | | | |
|---|---|---|---|
| Statutory pay-as-you-go procedures apply? | No | **Mandate Effects** | |
| Increases on-budget deficits in any of the four consecutive 10-year periods beginning in 2030? | No | Contains intergovernmental mandate? | No |
| | | Contains private-sector mandate? | No |

The bill would

- Direct the Department of Energy (DOE) and the Department of Veterans Affairs (VA) to conduct collaborative research on veterans' health care issues
- Require DOE to carry out a pilot program on big data analytics
- Direct DOE and VA to allocate up to $53 million in appropriated funds for those purposes

Estimated budgetary effects would primarily stem from

- Spending of allocations authorized for DOE and VA

Bill summary: S. 143 would require the Department of Energy and the Department of Veterans Affairs to allocate $53 million over the 2020–2023 period for collaborative research on veterans' health care issues and for a pilot program by DOE on big data analytics.

Estimated Federal Cost: The estimated budgetary effect of S. 143 is shown in Table 1. The costs of the legislation fall within budget functions 250 (general science, space, and technology) and 700 (veterans benefits and services).

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER S. 143

| | By fiscal year, millions of dollars— | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2019–2024 |
| Department of Veterans Affairs: | | | | | | | |
| Estimated Authorization | 0 | 7 | 7 | 7 | 6 | 0 | 27 |
| Estimated Outlays | 0 | 6 | 7 | 7 | 6 | 1 | 27 |
| Department of Energy: | | | | | | | |
| Authorization | 26 | 26 | 0 | 0 | 0 | 0 | 26 |
| Estimated Outlays | 0 | 14 | 8 | 4 | 0 | 0 | 26 |
| Total Changes: | | | | | | | |
| Estimated Authorization | 26 | 33 | 7 | 7 | 6 | 0 | 53 |
| Estimated Outlays | 0 | 20 | 15 | 11 | 6 | 1 | 53 |

S. 143 would direct the Department of Energy to allocate $26 million in 2019 from appropriated funds. CBO does not estimate any outlays for 2019 because appropriations for 2019 have already been provided.

Basis of estimate: For this estimate, CBO assumes that S. 143 will be enacted in late 2019 and that the authorized and necessary amounts will be available each year. Estimated outlays are based on historical spending patterns for the affected activities. CBO estimates that implementing S. 143 would cost $53 million over the 2020–2024 period.

Department of Veterans Affairs: Section 4 of the bill would authorize appropriations of $27 million to be used by VA and DOE to implement a collaborative research program to analyze large-scale health and genomic data over the 2019–2023 period. The bill does not specify the amount for each year, so CBO assumes that between $6 million and $7 million would be used each year beginning in 2020. VA has spent $15 million since 2017 for similar efforts.

Under the bill, VA would reimburse DOE for research expenses associated with the program. The bill also would require DOE to report to the Congress on those collaborative efforts. CBO estimates that implementing section 4 would cost $27 million over the 2020–2024 period.

Department of Energy: Section 5 of the bill would direct DOE to allocate $26 million annually over the 2019–2020 period for the department to carry out a pilot program to advance the use of artificial intelligence for big data analytics. CBO does not estimate any outlays for 2019 because appropriations for 2019 have already been provided.

S. 143 also would direct DOE to evaluate and report to the Congress on the effectiveness of that pilot program. CBO estimates that implementing section 5 would cost $26 million over the 2020–2024 period.

Pay-As-You-Go considerations: None.

Increase in long-term deficits: None.

Mandates: None.

Estimate prepared by: Federal Costs: Janani Shankaran (Department of Energy); Ann Futrell (Department of Veterans Affairs); Mandates: Brandon Lever.

Estimate reviewed by: Kim P. Cawley, Chief, Natural and Physical Resources Cost Estimates Unit; David Newman, Chief, Defense, International Affairs & Veterans' Affairs Cost Estimates Unit; Leo Lex, Deputy Assistant Director for Budget Analysis; H. Samuel Papenfuss, Deputy Assistant Director for Budget Analysis.

## REGULATORY IMPACT EVALUATION

In compliance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee makes the following evaluation of the regulatory impact which would be incurred in carrying out S. 143. The bill is not a regulatory measure in the sense of imposing Government-established standards or significant economic responsibilities on private individuals and businesses.

No personal information would be collected in administering the program. Therefore, there would be no impact on personal privacy.

Little, if any, additional paperwork would result from the enactment of S. 143, as ordered reported.

## CONGRESSIONALLY DIRECTED SPENDING

S. 143, as ordered reported, does not contain any congressionally directed spending items, limited tax benefits, or limited tariff benefits as defined in rule XLIV of the Standing Rules of the Senate.

## EXECUTIVE COMMUNICATIONS

The testimony provided by the Department of Energy at the July 9, 2019, Subcommittee on Energy hearing on S. 143 follows:

TESTIMONY OF THE HONORABLE BRUCE J. WALKER, ASSISTANT SECRETARY, OFFICE OF ELECTRICITY, U.S. DEPARTMENT OF ENERGY

### INTRODUCTION

Chairman Cassidy, Ranking Member Heinrich, and Members of the Subcommittee, it is an honor and a privilege to serve at the Department of Energy (DOE or the Department), as Assistant Secretary for the Office of Electricity. DOE is charged with, among other important responsibilities, providing our Nation with premier energy research and development (R&D) activities. The work being conducted by DOE is setting the course for various advancements in the energy field and beyond. Issues like energy storage, improving energy efficiency, creating breakthroughs in how we extract and utilize our Nation's fossil fuels, and Artificial Intelligence are just some of the important areas of DOE research. These are also the topics being covered at today's hearing.

Thank you for the opportunity to testify today on behalf of the Department regarding these various pieces of legislation. The Administration continues to review all eleven of these bills. Below are some highlights and perspectives regarding the legislation being discussed today.

*S.143—DOE Veteran's Health Initiative Act*

The DOE Veteran's Health Initiative Act authorizes DOE to establish and carry out a research program in artificial intelligence and high performance computing, focused on the development of tools and technology to solve big data and large scale analytics challenges in partnership and coordination with the Department of Veterans Affairs. The bill also requires DOE to carry out a pilot program to

develop tools for big data analytics in order to advance artificial intelligence technologies to solve complex big data challenges.

This bill is strongly aligned with the Administration's stated R&D budget priorities including: American Leadership in Artificial Intelligence, Maximizing Interagency Coordination, and a Workforce for the 21st Century Economy. The Administration continues to review the bill.

## CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee notes that no changes in existing law are made by S. 143 as ordered reported.

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