IN THE UNITED STATES COURT OF APPEALS FOR VETERANS CLAIMS

No. 22-6676

REBECCA M. PEREIDA,

Appellant,

v.

DOUGLAS A. COLLINS,
Secretary of Veterans Affairs,

Appellee.

BRIEF OF NATIONAL VETERANS LEGAL SERVICES PROGRAM, VIETNAM VETERANS OF AMERICA, AND VETERANS OF FOREIGN WARS OF THE UNITED STATES AS *AMICI CURIAE* IN SUPPORT OF APPELLANT

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INTEREST OF *AMICI CURIAE*

The National Veterans Legal Services Program ("NVLSP") is a national nonprofit organization that has worked since 1981 to ensure that the federal government delivers on its promise to provide to the nation's veterans and active-duty personnel the benefits to which they are entitled because of disabilities resulting from their military service to our country. NVLSP provides *pro bono* representation to veterans and participates as *amicus curiae* in cases of importance to the veteran community. NVLSP also trains and mentors lawyer and non-lawyer advocates to represent veterans in claims for benefits, and publishes the *Veterans Benefits Manual*, a comprehensive guide for veterans' advocates.

Vietnam Veterans of America ("VVA") is a national nonprofit organization and is the only national veterans service organization congressionally chartered and exclusively dedicated to Vietnam-era veterans and their families. VVA has played a leading role in advocating for the creation of judicial review, championing the rights of veterans to challenge benefits decisions in court. VVA also founded Vietnam Veterans of America Legal Services to assist veterans seeking benefits and services from the government, which in the 1990s evolved into the current VVA Service Representative program that continues to represent and advocate for veterans today.

The Veterans of Foreign Wars of the United States ("VFW") is a congressionally chartered veterans service organization representing approximately 1.4 million members, veterans, service members, and supporters through its membership and the VFW Auxiliary. Since 1899, VFW has advocated on behalf of veterans, service members, their families, and survivors to ensure they receive the benefits, care, and recognition earned through

military service. VFW is recognized by the Department of Veterans Affairs (the "VA") as a national veterans service organization and regularly represents veterans and their families before the VA while advocating on their behalf before Congress and the federal courts. VFW has a longstanding interest in ensuring that veterans' benefits are administered fairly, consistently, and in accordance with law. The organization regularly advocates on matters affecting veterans' rights and benefits, including issues involving toxic exposures and disabilities resulting from military service.

Amici submit this brief in support of Appellant Rebecca M. Pereida, the daughter of a Vietnam veteran who was exposed to Agent Orange. Ms. Pereida suffers from numerous medical conditions, but the VA denied her monetary benefits solely for the sex-discriminatory reason that her father, not her mother, served in Vietnam. Under the governing statute, she and all other children of male Vietnam veterans, the substantial majority of veterans from that era, are categorically ineligible for monetary benefits for any medical condition, other than spina bifida, resulting from their fathers' Agent Orange exposure during service. *See* 38 U.S.C. § 1811(1)(A) (defining an "eligible child" as the child "of a woman Vietnam veteran"). *Amici* endorse the arguments in Ms. Pereida's brief for invalidating the discriminatory and unlawful denial of benefits to the children of veterans who suffer serious adverse health effects because their fathers rather than their mothers were exposed to toxins during wartime service to the nation.

This *amicus* brief aims to apprise the Court of recent developments in the scientific literature that reinforce Ms. Pereida's constitutional arguments. Those developments confirm that the VA cannot carry its demanding burden to demonstrate that the statute's

discriminatory classification is justified. Just under a decade ago, the VA commissioned the latest update in a series of reports on the effects of Agent Orange exposure, which concluded that insufficient evidence existed at the time to determine whether male Vietnam veterans' exposure to Agent Orange caused adverse health effects in their children. The report therefore called for additional research and identified two particularly important types of research: studies on the health of male veterans' children and studies on the mechanisms through which male veterans' exposure to Agent Orange could affect future generations. In the decade since, researchers have conducted both types of studies, and both have demonstrated that Agent Orange exposure causes adverse health effects in the children of male veterans. Moreover, those studies are only one facet of a developing scientific recognition that paternal exposure to toxins of all sorts can substantially affect children's health. Agent Orange did not discriminate between male and female veterans when causing birth defects and other inherited disease in their children, and the VA cannot discriminate between male and female veterans, either.

ARGUMENT

"[A] party seeking to uphold government action based on sex must establish an 'exceedingly persuasive justification' for the classification." *United States v. Virginia*, 518 U.S. 515, 524 (1996) (citation omitted). To do so, it "must show 'at least that the classification serves important governmental objectives and that the discriminatory means employed are substantially related to the achievement of those objectives.'" *Id.* (citation omitted). That burden is "demanding," and here it "rests entirely" on the VA. *Id.* at 533.

The VA cannot justify the exclusion of the children of male Vietnam veterans from eligibility for monetary benefits based solely on the gender of their veteran parent. As Ms. Pereida's brief explains, the VA has disregarded a decades-old consensus about the need for additional research into the effect of male veterans' Agent Orange exposure on their children's health. Appellant Br. 11-14. The VA can hardly make an "exceedingly persuasive" showing that it is appropriate to treat the children of male veterans worse than the children of female veterans, *Virginia*, 518 U.S. at 533, when it refuses to perform the studies required to test the reasonableness of such discriminatory treatment. Because the VA failed to conduct adequate research, it could carry its constitutional burden only by relying on other studies conducted outside its auspices. *Amici* submit this brief to provide an overview of that research, which shows that regardless of sex, a parent's exposure to Agent Orange can cause numerous adverse health effects in children.[1]

[1] The Court may take judicial notice of this research in reviewing the constitutionality of the statute. As a sitting judge on the U.S. Court of Appeals for the Federal Circuit has explained, "appellate courts, including the Supreme Court, regularly receive new factual material on appeal and engage in a form of factfinding, even where the facts are not clearly undisputed, to determine 'legislative facts.'" Timothy B. Dyk, *The Role of Non-Adjudicative Facts in Judicial Decisionmaking*, 76 Stan. L. Rev. Online 10, 11 (2023). Legislative facts "have relevance to legal reasoning and the lawmaking process," including to "the enactment of a legislative body." Fed. R. Evid. 201(a) adv. comm. notes. Facts about the effects of Agent Orange, which are relevant to the congressional enactment excluding male veterans' children from monetary benefits, plainly qualify. Because "the ordinary limits on judicial notice hav[e] no application to legislative facts," they "usually are not proved through trial evidence but rather by material set forth in the briefs." *Daggett v. Comm. on Gov't Ethics & Election Pracs.*, 172 F.3d 104, 112 (1st Cir. 1999); *accord* Fed. R. Evid. 201(a) ("This rule governs judicial notice of an adjudicative fact only, not a legislative fact."). Moreover, "a court of appeals can judicially notice a legislative fact in the first instance." *United States v. Perez*, 150 F.4th 237, 248 (4th Cir. 2025).

I. NEARLY A DECADE AGO, THE VA ACKNOWLEDGED THE NEED FOR ADDITIONAL RESEARCH ON HOW AGENT ORANGE EXPOSURE AFFECTS THE CHILDREN OF MALE VETERANS

The U.S. armed forces sprayed approximately 77 million liters of herbicides during the Vietnam War. Nat'l Acads. of Scis., Eng'g, & Med., *Veterans and Agent Orange: Update 11*, at 29-30 (2018) [hereinafter NAS, *VAO 2018*]. Known as "Agent Orange," the herbicides consisted primarily of different mixtures of four chemical compounds, but they also contained toxic contaminants that were unintentional byproducts of the production process. *Id.* at 17, 27.[2] Those contaminants included chemicals called dioxins, including a particularly concerning dioxin called 2,3,7,8-tetrachlorodibenzo-*p*-dioxin ("TCDD"). *Id.*

Starting in the 1990s, the VA commissioned the National Academies of Sciences, Engineering, and Medicine (and their predecessors) to produce a series of reports, called "Veterans and Agent Orange," assessing the evidence of the health effects of Agent Orange exposure, including on future generations. *Id.* at 18-19. For the final report in the series, released in 2018, the VA specifically requested an assessment of "possible generational effects on the descendants of male Vietnam veterans that may be the result of exposure to" Agent Orange or its toxic components. *Id.* at 19. The report's conclusion was simple: Not enough research had been done to determine whether such effects existed. The report explained that the "[t]ransgenerational effects" of exposure, which occur in children who were not themselves exposed in the womb, "are of great interest to veterans, but no

[2] Strictly speaking, "Agent Orange" refers only to the most commonly used such mixture, though NVLSP follows common parlance here in using the term to refer to all of the herbicide mixtures used by the U.S. armed forces. *See* NAS, *VAO 2018* at 17.

literature exists to evaluate whether the [chemicals of interest] might have an influence on outcomes." *Id.* at 11. Due to "these gaps in the knowledge base," the report expressed its "strong[] belie[f] that more work in this area is warranted." *Id.* Notably, the report did *not* indicate that any body of evidence showed the absence of a causal link between male veterans' Agent Orange exposure and adverse health effects in their children. Instead, the report explained that while some studies "find associations between exposures and various outcomes," those studies had "weaknesses . . . that limit their usefulness when assessing the risks for veterans," and "[f]ew studies address Vietnam veterans" directly. *Id.*

The report further identified two specific types of research that would be particularly important to any future conclusions about whether Agent Orange exposure causes adverse health effects in the children of male veterans. First, it noted that from their inception the Veterans and Agent Orange reports had consistently recommended that additional epidemiological studies be conducted on individuals exposed to Agent Orange or to its toxic components, but that those studies had not occurred.[3] Accordingly, the 2018 report "**recommend[ed] further specific study of the health of offspring of male Vietnam veterans**." *Id.* at 14 (emphasis in original). Second, the 2018 report concurred with the view expressed in the 2014 report that a "critical need" existed for research, including "animal studies," to "elucidate whether and which mechanisms" might produce health effects in the children of men exposed to Agent Orange. *Id.* at 11-12.

[3] Epidemiology explores "how often diseases occur in different groups of people and why." D. Coggon et al., *Epidemiology for the Uninitiated*, https://www.bmj.com/about-bmj/resources-readers/publications/epidemiology-uninitiated (accessed July 1, 2026).

II. ADDITIONAL STUDIES HAVE NOW SHOWN THAT AGENT ORANGE DOES CAUSE ADVERSE HEALTH EFFECTS IN THE CHILDREN OF EXPOSED MEN.

Despite the recommendations of prior reports in the Veterans and Agent Orange series, the VA has not commissioned any further reports since 2018, and it has not conducted the studies necessary to determine the effect of Agent Orange exposure on male veterans' children. But other researchers have begun to fill those knowledge gaps.

That new evidence shows that the children of male Vietnam veterans have suffered adverse health effects from their fathers' exposures to Agent Orange. Researchers have conducted the two key types of studies identified in the 2018 report: (*i*) epidemiological studies of veterans' children and (*ii*) animal studies elucidating the biological mechanisms through which men can transmit damage from Agent Orange exposure to their children. Each type supports a link between male veterans' exposure to Agent Orange and adverse health effects in their children. And other studies have sparked a more general recognition that paternal exposure to environmental factors of all sorts, including even diet or stress, can lead to adverse health effects in children, further supporting the conclusion that toxic chemicals in Agent Orange caused such effects in the children of male Vietnam veterans.

A. Studies Conducted Directly on Vietnam Veterans and Their Children Have Found a Link Between Paternal Exposure to the Toxins in Agent Orange and Adverse Health Effects in Children.

The 2018 report specifically recommended that further study be conducted on the health of male Vietnam veterans' children. NAS, *VAO 2018* at 14. Little such research existed other than one prominent exception: the Air Force Health Study ("AFHS"), which examined Air Force personnel who assisted with spraying Agent Orange from fixed-wing

aircraft (called Operation Ranch Hand) and who thus had a particularly high risk of exposure. *Id.* at 31-32. Because the AHFS "was designed to answer exactly the question that the [Veterans and Agent Orange] series is asking," it is "perceived by many to be the central piece of research for decision making by the [Veterans and Agent Orange] committees." *Id.* at 125. Based on data from the AFHS, the 1996 Veterans and Agent Orange report concluded that evidence suggested an association between male veterans' Agent Orange exposure and their children's spina bifida, a birth defect of the spinal cord. *Id.* at 397. Accordingly, in 1996 Congress granted monetary benefits to the children of male veterans who suffer from spina bifida—the sole exception to the otherwise sex-discriminatory criteria for eligibility. 38 U.S.C. § 1805. At the time, however, researchers believed that AFHS data did not support an association between male veterans' Agent Orange exposure and any other medical conditions in their children. George J. Knafl, *A Reassessment of Birth Defects for Children of Participants of the Air Force Health Study*, 8 Open J. Epidemiology 187, 188 (2018). That belief has now been refuted.

First, a study published in 2018 replicated the analysis initially performed in the 1990s and determined that the finding of no effect resulted from the researchers' statistical modeling choices, not from the underlying data. *Id.* at 197.[4] When the same data was reexamined without those arbitrary limitations, researchers reached the "opposite conclusion": men with higher levels of dioxin exposure had children with higher rates of

[4] That study was excluded from consideration in the 2018 report, which reviewed studies published before December 31, 2017. NAS, *VAO 2018* at 46, 48.

birth defects. *Id.* (finding "an adverse effect of paternal dioxin exposure on birth defects").[5] In subsequent studies, the same author conducted multiple new analyses using AFHS data, further showing that male veterans with high dioxin levels had children likelier to suffer birth defects and other developmental disorders. One study found that children born to Ranch Hand participants after their tours of duty suffered birth defects more often than children born to Ranch Hand participants before their tours, and that the "identified adverse effect to conception after the start of the tour . . . can be fully attributed to participants having a high dioxin exposure level." George J. Knafl, *Adaptive Regression for Nonlinear Interrupted Time Series Analyses with Application to Birth Defects in Children of Vietnam War Veterans*, 12 Open J. Stat. 789, 805 (2022). A subsequent study focused that analysis on specific categories of birth defects and other developmental disabilities. That study, too, confirmed the effects of male veterans' Agent Orange exposure: "Substantial adverse effects due to a high level of dioxin exposure were identified for 15 of the 16 specific categories of birth defects and developmental disabilities." George J. Knafl, *An Analysis of Specific Categories of Birth Defects and Developmental Disabilities for Children of Participants of the Air Force Health Study*, 14 Open J. Epidemiology 312, 325 (2024).

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[5] In 1999, the Government Accountability Office found that the earlier AFHS analysis had required "highly unusual and virtually unprecedented" verification of reported birth defects, leading to "concerns" that the researchers had sought "to suppress information." U.S. Gov't Accountability Off., GAO/NSAID-00-31, *Agent Orange: Actions Needed to Improve Communications of Air Force Ranch Hand Study Data and Results* 12 (1999). Notably, a preliminary version of that analysis, completed in 1984 using a different statistical methodology, *had* found a connection between birth defects and Agent Orange exposure. Charles Ornstein et al., *The Children of Agent Orange*, ProPublica (Dec. 16, 2016), https://www.propublica.org/article/the-children-of-agent-orange.

Thus, while in 2018 the VA's own commissioned report bemoaned the lack of epidemiological studies on Vietnam veterans and their offspring, in the years since researchers have produced the exact studies that the report insisted were necessary. Moreover, those studies have used the AFHS data that represents the "central piece of research for decision making" about Agent Orange and its effects. And those studies have concluded that the children of male veterans suffer a variety of birth defects and developmental disorders due to their fathers' Agent Orange exposure.

Congress has already recognized the importance of the AFHS data, which formed the basis for awarding benefits to the children of male veterans who suffer from spina bifida. And as studies using the exact same data show, the adverse health effects in children of male veterans exposed to Agent Orange extend well beyond spina bifida. Thus, the discriminatory rule that categorically prohibits the children of male veterans from receiving benefits if they suffer from any other medical condition, but makes those benefits available to the children of female veterans, cannot be justified under the Constitution.

B. Studies in Animals, Humans, and Vietnam Veterans Themselves Have Identified a Plausible Biological Mechanism for Paternal Agent Orange Exposure to Affect Future Generations.

In addition to epidemiological studies, the 2018 report noted the "critical need" for research on the "mechanisms" by which Agent Orange exposure could affect the health of male veterans' children. NAS, *VAO 2018* at 12. Studies of such mechanisms are generally important, the report explained, since "[t]he establishment of biologic plausibility through laboratory studies strengthens the case for a cause-effect relationship between herbicide exposure and health effects that has been reported in epidemiologic studies." *Id.* at 69.

Researchers had previously thought that dioxin could not cause inherited disease because it cannot mutate genes. *Id.* at 368. But by 2018 they had recognized a possible mechanism for dioxin to cause inheritable damage in men: epigenetics. *Id.* Epigenetic modifications to DNA and other cell proteins "control the function of genes without changing the coding sequence," *id.* at 101, since epigenetic mechanisms regulate "gene expression," the process by which the genetic code in DNA produces other molecules that influence cell behavior, *id.* at 105. Epigenetics explains how the body's different cell types, which all share the same DNA, can nonetheless perform very different functions and act in very different ways. The 2018 report recognized that epigenetic modifications to sperm "have the potential to contribute to permanent effects in offspring" and "may transmit chemical-induced alterations across generations," such that "an epigenetic pathway is plausible." *Id.* at 385-86. At the time, however, "[d]irect evidence of dioxin-mediated changes in the epigenome of mature sperm [was] not [yet] available." *Id.* at 386.

That evidence now exists. Scientists have conducted the "animal studies" that the 2018 report identified as crucial for elucidating biological mechanisms, *id.* at 12, which have found that epigenetic modifications (particularly changes in DNA methylation) occur in the sperm of animals exposed to TCDD, and they have linked these epigenetic changes to specific health conditions that those animals suffered. One study found that rats exposed to TCDD in utero had offspring with both increased risk of disease and epigenetic modifications in their sperm. Millissia Ben Maamar et al., *Transgenerational Disease Specific Epigenetic Sperm Biomarkers After Ancestral Exposure to Dioxin*, 192 Env't Rsch. 110278, 110279 (2021). Follow-up research then showed that those epigenetic

modifications affected specific gene regions linked to diseases that afflicted the exposed rats. *Id.* at 110278 ("[D]isease-specific epimutation DMRs exist for the transgenerational dioxin lineage rats that can potentially be used as epigenetic biomarkers for testis, kidney, prostate and obesity diseases. These disease-specific DMRs were associated with genes that have previously been shown to be linked with the specific diseases.").

Another study using mice found that reproductive disorders "frequently occur in association with a paternal history of developmental exposure to TCDD." Tianbing Ding et al., *Paternal Developmental Toxicant Exposure Is Associated with Epigenetic Modulation of Sperm and Placental* Pgr *and* Igf2 *in a Mouse Model*, 99 Biology Reprod. 864, 869 (2018). Those results indicate "stable and inheritable epigenetic modifications . . . within the male germline." *Id.* The researchers identified over two thousand epigenetic modifications, "many of which correspond to genes previously linked" to those reproductive disorders. *Id.* at 870-71. Other researchers have even identified the protein responsible for many biochemical interactions through which TCDD produces epigenetic modifications. Matti Viluksela & Raimo Pohjanvirta, *Multigenerational and Transgenerational Effects of Dioxins*, 20 Int'l J. Molecular Scis. 2947, at *4-5 (2019).

Moreover, while the 2018 report focused on the need for animal studies to demonstrate a plausible mechanism for inherited illness, researchers have surpassed that aim and have also identified epigenetic modifications in the sperm of humans exposed to TCDD, namely Vietnam veterans themselves. Participants in the AFHS provided blood and semen samples, which researchers have analyzed to identify epigenetic differences in

the sperm of veterans with high levels of dioxin in their blood. Those studies have found changes in DNA methylation in sperm from men with higher levels of dioxin.

In one study, for example, certain genes "showed loss of DNA methylation associated with dioxin exposure," and "36 gene regions . . . ha[d] altered DNA methylation associated with high exposure." Karl T. Kelsey et al., *Serum Dioxin and DNA Methylation in the Sperm of Operation Ranch Hand Veterans Exposed to Agent Orange*, 18 Env't Health 91, 91 (2019). Further confirming those results, certain epigenetic modifications found in that study to result from high dioxin also resulted from high dioxin in a separate study of Russian teenagers exposed to dioxin during childhood through the environment. *Id.*; *see also* J. Richard Pilsner et al., *Peripubertal Serum Dioxin Concentrations and Subsequent Sperm Methylome Profiles of Young Russian Adults*, 78 Reprod. Toxicology 40, 40 (2018) ("We found 52 [differentially methylated regions] that distinguished lowest and highest peripubertal serum TCDD concentrations."). Another study using AFHS data identified 437 genes that were epigenetically modified in individuals with higher blood dioxin levels. Luigi Corsaro et al., *A New Approach to Study Stochastic Epigenetic Mutations in Sperm Methylome of Vietnam War Veterans Directly Exposed to Agent Orange*, 10 Env't Epigenetics 1, 1 (2024). And yet another study found "that dioxin exposure is associated with increases in sperm methylation age." Jamaji C. Nwanaji-Enwerem et al., *Serum Dioxin Levels and Sperm DNA Methylation Age: Findings in Vietnam War Veterans Exposed to Agent Orange*, 96 Reprod. Toxicology 27, 31 (2020).

C. Numerous Additional Studies Have Highlighted the Importance of Paternal Epigenetics to Children's Health.

Beyond the two types of evidence that the VA's own 2018 report specifically called upon the VA to produce, numerous additional studies have established "the importance of paternal epigenetics in influencing the health and developmental path of offspring," Xiaojing Wu et al., *Multifaceted Paternal Exposures Before Conception and Their Epigenetic Impact on Offspring*, 41 J. Assisted Reprod. & Genetics 2931, 2931 (2024), overturning "the traditional view that only exposures during gestation can induce congenital defects," Michael C. Golding, *Teratogenesis and the Epigenetic Programming of Congenital Defects: Why Paternal Exposures Matter*, 115 Birth Defects Rsch. 1825, 1830 (2024). Many of these studies have focused on dioxins in both humans and animals, providing the "proof of principle" that dioxins "induce epigenetic alterations and related toxic effects across multiple generations." Viluksela & Pohjanvirta, *supra*, at *15. Others have shown more broadly that many factors can modify sperm epigenetics, including "the father's lifestyle, food, stress, and environmental contaminants," and thereby "produce a large number of pathological disease states." Wu et al., *supra*, at 2931-32. If even a father's diet can affect his children's health through sperm epigenetics, *id.* at 2938, exposure to highly toxic chemicals like TCDD would surely have such effects as well.

III. SCIENTIFIC RESEARCH INTO THE EFFECTS OF AGENT ORANGE EXPOSURE CANNOT JUSTIFY SEX-DISCRIMINATORY ELIGIBILITY CRITERIA FOR MONETARY BENEFITS.

Nearly a decade ago, the VA's own report analyzing the effects of veterans' exposure to Agent Orange explained that insufficient scientific evidence existed to exclude

adverse health effects in the children of male Vietnam veterans. It further identified the two types of research most important for investigating that question: studies analyzing the health of the children of male veterans, and studies identifying a plausible biological mechanism by which those children could inherit damage caused by Agent Orange to their fathers. Although the VA did not itself conduct that research, other scientists now have. Both types of evidence support a link between paternal Agent Orange exposure and adverse health effects in children: Those effects are more frequent in the children of male veterans with higher levels of dioxin exposure, and those dioxins produce epigenetic changes in sperm that are transmitted to future generations. Furthermore, scientists have recognized more generally that changes to paternal epigenetics both result from environmental toxins and critically affect the health of future generations. The harm caused by Agent Orange exposure in Vietnam is just one instance of this general phenomenon. This evidence all supports the conclusion that the medical conditions suffered by countless children of male veterans resulted from Agent Orange exposure during their fathers' service to our nation.

The VA alone bears the demanding burden to justify sex-discriminatory eligibility criteria for the children of Vietnam veterans; Ms. Pereida need not proactively disprove justifications for discrimination. *Virginia*, 518 U.S. at 533. But the scientific literature shows that the VA cannot justify its unequal treatment of male and female veterans' children on the grounds that Agent Orange exposure affected only the latter. The harm that Agent Orange causes can be transmitted to future generations by both men and women, and discrimination between the children of male and female veterans in awarding monetary benefits is therefore unjustifiable and unconstitutional.

CONCLUSION

This Court should reverse the Board's decision.

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