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Body Armor for Law Enforcement Officers: In Brief

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Summary

Firearms are one of the leading causes of deaths for law enforcement officers feloniously killed in the line of duty. Since FY1999, Congress has provided funding to state and local law enforcement agencies to help them purchase armor vests for their officers. The Matching Grant Program for Law Enforcement Armor Vests (hereinafter, "BPV program") provides grants to state, local, and tribal governments to purchase armor vests for use by law enforcement officers and court officers. The BPV program was first authorized by the Bulletproof Vest Partnership Grant Act of 1998 (P.L. 105-181). It has been subsequently reauthorized four times. The most recent reauthorization expired in FY2012. Between FY1999 and FY2012, annual appropriations for the program generally ranged between $25 million and $30 million. However, over the past four fiscal years, annual appropriations for the program were less than $23 million.

Armor vests can only save lives when they are actually worn. Data from the Bureau of Justice Statistics indicate that an increasing percentage of police departments have instituted "mandatory wear" policies. Several factors can affect whether a law enforcement officer will wear an armor vest. Safety concerns are the most significant, followed by whether the officer's department has a mandatory wear policy. Comfort and fit are also a factor.

While armor vests can only save lives when they are worn, there is also a limit on how long they can be worn and still be effective. No definitive data exist on how long an armor vest will last before it needs to be replaced. Many manufacturers offer a five-year warranty on their vests, but this is not necessarily indicative of their useful lifespan. The age of an armor vest alone does not cause its ballistic resistance to deteriorate. Vest care and maintenance have been shown to have a greater impact than age.

Similarly, no definitive data exist on the number of law enforcement officers whose lives have been saved by vests paid for, in part, with funds from the BPV program. A frequently cited statistic is that armor vests have saved the lives of more than 3,000 law enforcement officers over the past 30 years, but it is not known how many of those vests were purchased in part with funds from the BPV program.

While there is no such thing as a totally bulletproof vest, research has shown that armor vests do save lives. The risk of dying from a gunshot wound to the torso is 3.4 times higher for law enforcement officers who do not wear armor vests.

Should Congress consider legislation to reauthorize the BPV program, policymakers may consider several issues, including (1) what role the federal government should play, if any, in providing armor vests for state and local law enforcement, (2) whether Congress should invest in developing new technology for armor vests, and (3) whether Congress should require law enforcement agencies to provide training on the care and maintenance of body armor as a condition of receiving funding under the BPV program.

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Firearms are one of the leading causes of deaths for law enforcement officers feloniously killed in the line of duty. According to data published by the Federal Bureau of Investigation (FBI), approximately 92% of the 505 non-federal law enforcement officers feloniously killed in the line of duty between 2005 and 2014 were killed by a firearm.[1] Law enforcement officers who are shot in the torso are more likely to die as a result of their injury if they are not wearing a vest.[2]

Since FY1999, Congress has provided funding to state, local, and tribal law enforcement agencies to help them purchase armor vests for their officers through the Matching Grant Program for Law Enforcement Armor Vests (also referred to as the Bulletproof Vest Partnership Initiative, hereinafter "the BPV program").

This report provides an overview of the BPV program. It also provides a discussion of

- data on law enforcement agencies that require their officers to wear armor vests while on duty,
- research on why officers may choose to wear armor vests,
- research on the life cycle for armor vests,
- data on the use of body armor by law enforcement officers who were killed with a firearm, and
- research on the effectiveness of armor vests.

The report concludes with a survey of congressional issues policymakers might consider should they take up legislation to reauthorize the BPV program.

Background

The BPV program was first authorized by the Bulletproof Vest Partnership Grant Act of 1998 (P.L. 105-181). The BPV program provides grants to state, local, and tribal governments to help purchase armor vests for use by law enforcement officers and court officers. Grants under the program cannot pay for more than 50% of the cost of purchasing a new armor vest.

The Bureau of Justice Assistance (BJA), starting with FY2011 grant awards, required all law enforcement agencies applying for funding under the BPV program to have a "mandatory wear" policy in effect. The BJA put this requirement into place as a way to reduce line of duty deaths and to ensure that armor vests purchased with funds provided by the program are used.[3]

Armor vests purchased by law enforcement agencies with BPV program funds must comply with standards published by the National Institute of Justice (NIJ).[4] The NIJ has set voluntary body

[1] U.S. Department of Justice, Federal Bureau of Investigation, *Law Enforcement Officers Killed and Assaulted, 2014*, Table 29.

[2] Tom LaTourrette, "The Life-Saving Effectiveness of Body Armor for Police Officers," *Journal of Occupational and Environmental Hygiene*, vol. 7 (2010), pp. 557-562.

[3] U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance, *Updated Frequently Asked Questions (FAQs) for the BVP Program Mandatory Wear Requirement*, April 1, 2014, http://ojp.gov/bvpbasi/docs/FAQsBVPMandatoryWearPolicy.pdf.

[4] Under the authorizing legislation for the BPV program, "armor vest" is defined as "body armor, no less than Type I, which has been tested through the voluntary compliance testing program operated by the National Law Enforcement and Corrections Technology Center of the National Institute of Justice (NIJ), and found to meet or exceed the requirements of NIJ Standard 0101.03, or any subsequent revision of such standard; or ... body armor that has been tested through the voluntary compliance testing program, and found to meet or exceed the requirements of NIJ

armor standards since 1972.[5] The NIJ's performance standards classify body armor by levels of ballistic performance.[6] At any performance level, NIJ's standards require that the bullet does not perforate the body armor and that it protects against blunt trauma. The NIJ also administers a program to test commercially available body armor for compliance with the NIJ's performance standards to make sure the armor works as expected.[7] In order for a piece of body armor to be certified as compliant by the NIJ, the manufacturer must register with the NIJ's compliance testing program, submit an armor model sample to a NIJ-approved laboratory for testing, agree to a period of follow-up inspection and testing,[8] and declare a period of ballistics warranty.

Current law specifies the minimum and maximum amounts law enforcement agencies can receive under the program.[9] No state, *together with* other grantees in the state (other than Indian tribes), can receive less than 0.5% of the annual appropriation, unless all eligible applications have been funded.[10] No state, unit of local government, or Indian tribe can receive more than 5% of the annual appropriation. No state, *together with* the other grantees in the state, may receive more than 20% of the annual appropriation.

Funding under the program is required to be awarded to each qualifying unit of local government with a population of less than 100,000. Remaining funds can be awarded to other jurisdictions.[11]

Current law also allows the BJA to give preferential consideration to law enforcement agencies applying for grants under the following circumstances:[12]

- the agency has the greatest need for armor vests based on the percentage of law enforcement officers in the department who do not have access to a vest;
- the agency has, or will institute, a mandatory wear policy that requires on-duty law enforcement officers to wear armor vests whenever feasible;[13] and
- the agency has a violent crime rate at or above the national average as determined by the FBI; or

Standard 0115.00, or any revision of such standard." 42 U.S.C. §3796ll-2(1).

[5] U.S. Department of Justice, Office of Justice Programs, National Institute of Justice, *Body Armor Performance Standards*, http://www.nij.gov/topics/technology/body-armor/Pages/standards.aspx.

[6] Body armor is classified in one of five categories: Type IIA, Type II, Type IIIA, Type III, and Type IV. The higher the classification type the greater the level of protection it provides. For example, an armor vest classified as Type III would protect against a larger caliber bullet than an armor vest classified as Type II. See, U.S. Department of Justice, Office of Justice Programs, *Ballistic Resistance of Body Armor, NIJ Standard-0101.06*, NCJ 223054, July 2008, https://www.ncjrs.gov/pdffiles1/nij/223054.pdf.

[7] U.S. Department of Justice, Office of Justice Programs, National Institute of Justice, *Body Armor Compliance Testing*, http://www.nij.gov/topics/technology/body-armor/Pages/testing.aspx.

[8] The NIJ conducts follow-up inspection and testing of certified body armor. Manufacturers that produce NIJ-certified body armor are subject to six follow-up inspections and testing over a five-year period. The follow-up inspection and testing consists of inspections of recently manufactured body armor to determine whether it is constructed in the same way as the original samples and follow-up ballistic testing.

[9] 42 U.S.C. §3796ll(d) and (e).

[10] The minimum allocation for the U.S. Virgin Islands, American Samoa, Guam, and the Northern Mariana Islands is 0.25%.

[11] 42 U.S.C. §3796ll(g).

[12] 42 U.S.C. §3796ll(c).

[13] As noted above, the BJA made this requirement mandatory for all grantees who apply for funding after FY2011.

- the agency has not received a grant under the Edward Byrne Memorial Justice Assistance Grant (JAG) program.[14]

According to the BJA, since 1999, the Bulletproof Vest Partnership Initiative has awarded a total of $393 million in grants to purchase nearly 1.2 million armor vests (as of December 2014).[15]

State and local governments can also use funds they receive under the JAG program to purchase armor vests for law enforcement officers.[16] However, state and local governments cannot use JAG funds to cover the match requirement under the BPV program.[17]

Authorizations and Appropriations

The BPV program was first authorized by the Bulletproof Vest Partnership Grant Act of 1998 (P.L. 105-181).[18] The act initially authorized $25 million per fiscal year for the grant program for FY1999 to FY2001. The Bulletproof Vest Partnership Grant Act of 2000 (P.L. 106-517) authorized appropriations for the program of $50 million per fiscal year for FY2002-FY2004. This authorization of appropriations was extended by the State Justice Institute Reauthorization Act of 2004 (P.L. 108-372), the Violence Against Women and Department of Justice Reauthorization Act of 2005 (P.L. 109-162), and the Bulletproof Vest Partnership Grant Act of 2008 (P.L. 110-421). The authorization of appropriations for the program expired at the end of FY2012.

As shown in **Table 1**, in the early years of the program Congress appropriated the full amount authorized (Congress actually appropriated more than was authorized for FY2001). From FY2002 to FY2012, Congress appropriated approximately 50%-60% of the amount authorized for the program. Congress has continued to fund the program even though authorized appropriations expired at the end of FY2012.

[14] Current law makes reference to "the Local Law Enforcement Block Grant program described under the heading 'Violent Crime Reduction Programs, State and Local Law Enforcement Assistance' of the Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998 (Public Law 105–119)." However, 42 U.S.C. §3750(b) states that "[a]ny reference in a law, regulation, document, paper, or other record of the United States to ... the Local Government Law Enforcement Block Grants program, shall be deemed to be a reference to [the JAG program]."

[15] U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance, *Bulletproof Vest Partnership/Body Armor Safety Initiative*, http://ojp.gov/bvpbasi/home.html.

[16] JAG provides funding to state, local, and tribal governments for state and local initiatives, technical assistance, training, personnel, equipment, supplies, contractual support, and criminal justice information systems in one or more of seven program purpose areas. The program purpose areas are (1) law enforcement programs; (2) prosecution and court programs; (3) prevention and education programs; (4) corrections and community corrections programs; (5) drug treatment and enforcement programs; (6) planning, evaluation, and technology improvement programs; and (7) crime victim and witness programs (other than compensation). For more information on the JAG program see CRS Report RS22416, *Edward Byrne Memorial Justice Assistance Grant (JAG) Program: In Brief*, by Nathan James.

[17] U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance, *Edward Byrne Memorial Justice Assistance Grant (JAG) Program, Frequently Asked Questions*, updated September 2015, p. 10, https://www.bja.gov/Funding/JAGFAQ.pdf.

[18] Currently codified at 42 U.S.C. §3796ll et seq.

Table 1. Authorized and Appropriated Funding for the Matching Grant Program for Law Enforcement Armor Vests, FY1999-FY2016

Authorizations and appropriations in thousands of dollars

Fiscal Year	Authorization	Appropriation
1999	$25,000	$25,000
2000	25,000	25,000
2001	25,000	25,444
2002	50,000	25,444
2003	50,000	25,279
2004	50,000	24,737
2005	50,000	24,666
2006	50,000	29,617
2007	50,000	29,617
2008	50,000	25,850
2009	50,000	25,000
2010	50,000	30,000
2011	50,000	24,850
2012	50,000	24,000
2013	—	19,993
2014	—	22,500
2015	—	22,250
2016	—	22,500

Source: The FY1999-FY2010 appropriations were provided by the U.S. Department of Justice, Community Oriented Policing Services Office. The FY2011 appropriation is based on a CRS analysis of P.L. 112-10. The FY2012 appropriation was taken from H.Rept. 112-284. The FY2013 appropriation was provided by the Department of Justice. The FY2014 appropriation was taken from the explanatory statement to accompany P.L. 113-76, printed in the January 15, 2014, *Congressional Record* (pp. H507-H532). The FY2015 appropriation was taken from the joint explanatory statement to accompany P.L. 113-235, printed in the December 12, 2014, *Congressional Record* (pp. H9342-H9363). The FY2016 appropriation was taken from the joint explanatory statement to accompany P.L. 114-113, printed in the December 17, 2015, *Congressional Record* (pp. H9732-H9759). Authorized appropriations were taken from P.L. 105-181, P.L. 106-517, P.L. 108-372, P.L. 109-162, and P.L. 110-421.

Notes: All appropriations reflect rescissions of current year budget authority. The FY2013 appropriation reflects the amount sequestered pursuant to the Budget Control Act of 2011 (P.L. 112-25).

The Use of Armor Vests by Law Enforcement

The ability of an armor vest to protect a law enforcement officer is based on whether the officer is wearing the vest and the level of effectiveness and performance of the vest.[19] The Bureau of Justice Statistics' (BJS's) survey of local police departments found that 71% of police

[19] U.S. Government Accountability Office (GAO), *Law Enforcement Body Armor: DOJ Could Enhance Grant Management Controls and Better Ensure Consistency in Grant Program Requirements*, GAO-12-353, February 2012, p. 32, hereinafter "GAO body armor report."

departments in 2013 required their officers to wear armor vests at all times and another 8% require their officers to wear armor vests in some circumstances.[20] In comparison, in 2003, 59% of police departments required their officers to wear armor vests all of the time and another 12% required them to wear armor vests part of the time.[21]

There are several factors that affect whether a law enforcement officer will wear an armor vest. A survey of law enforcement officers conducted by the Police Executive Research Forum (PERF) found that agency policy was the second most cited reason for why officers wore armor vests.[22] The first reason was safety concerns. The PERF survey also found that law enforcement officers comply with their agency's body armor policy either all (88%) or most (11%) of the time.[23] Comfort and fit is another factor that effects whether law enforcement officers wear armor vests. Law enforcement officers might not wear their vests because they cause discomfort through reduced mobility, increased weight, heat build-up under the vest, and chafing.[24] Ill-fitting body armor can especially be a problem for female law enforcement officers.

The Life Cycle of Armor Vests

There are no definitive data on how long an armor vest will last before it needs to be replaced.[25] Many manufacturers offer a five-year warranty on their armor vests, but this is not indicative of the useful lifespan of an armor vest.[26] Most armor vests are necessarily replaced several times over a law enforcement officer's career. There are several factors that can lead to the deterioration of an armor vest's effectiveness: (1) wear and tear, (2) the use of dry cleaning solvents, harsh detergents, bleach, and accumulated soap residue, and (3) improper storage and exposure to environmental conditions (such as excessive moisture).[27] Law enforcement agencies also sometimes upgrade vests if they determine that the ammunition threat they face has increased and now exceeds the capacity of the vests issued to their officers.[28] Sometimes an armor vest might have to be replaced if an officer's weight has changed and the vest no longer fits properly.

The age of an armor vest alone does not cause its ballistic resistance to deteriorate.[29] The level of care and maintenance for the vest has been shown to have a greater impact than age.[30] An unused

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[20] Brian A. Reaves, *Local Police Departments, 2013: Equipment and Technology*, Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, NCJ 248767, Washington, July 2015, p. 2, http://www.bjs.gov/content/pub/pdf/lpd13et.pdf.

[21] Matthew J. Hickman and Brain A. Reaves, *Local Police Departments, 2003*, Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, NCJ 210118, Washington, May 2006, p. 25, http://www.bjs.gov/content/pub/pdf/lpd03.pdf.

[22] Heath Grant, Bruce Kubu, and Bruce Taylor, et al., *Body Armor Use, Care, and Performance in Real World Conditions: Findings from a National Survey*, Executive Summary, Police Executive Research Forum, Washington, November 1, 2012, p. vi, https://www.ncjrs.gov/pdffiles1/nij/grants/240222.pdf, hereinafter "PERF, *Body Armor Use, Care, and Performance in Real World Conditions*."

[23] Ibid.

[24] GAO body armor report, p. 33.

[25] U.S. Department of Justice, Office of Justice Programs, National Institute of Justice, *Selection and Application Guide to Personal Body Armor*, NIJ Guide 100-01, NCJ 189633, November 2001, p. 60, https://www.ncjrs.gov/pdffiles1/nij/189633.pdf, hereinafter, "NIJ, *Selection and Application Guide to Personal Body Armor*."

[26] GAO body armor report, p. 34.

[27] GAO body armor report, p. 34.

[28] NIJ, *Selection and Application Guide to Personal Body Armor*, p. 60.

[29] Ibid., p. 61.

[30] Ibid.

armor vest that is 10 years old may be perfectly acceptable for use. However, an armor vest that is only two or three years old, but has been worn regularly and poorly maintained might need to be replaced. Some law enforcement agencies have policies in place under which armor vests are automatically replaced after five years, but the NIJ warns that a replacement policy should be consistent with the way officers use their vests.[31]

Data from a survey of law enforcement officers conducted by PERF in 2012 suggest that law enforcement officers may not be properly caring for and maintaining their body armor and that law enforcement agencies may need to do more to ensure that their officers properly care for their armor vests. Notable findings from the study include the following:

- Nearly 60% of law enforcement officers surveyed by PERF reported that they stored their body armor by hanging it on a clothes hanger, despite the fact that many manufacturers and department policies recommend that body armor should be stored flat to best sustain its performance in the long run.[32]
- A majority (65%) of surveyed law enforcement officers did not know that moisture reduces the ballistic protection afforded by body armor.[33] Only 9% of law enforcement officers reported that their agency conducts inspections for proper maintenance of body armor.[34]
- Approximately 28% of law enforcement officers reported not receiving any training about care and maintenance of their body armor.[35]
- A majority of officers (59%) reported that they learned about how to care for and maintain their vests from manufacturer-provided literature and manuals.

Effectiveness of Armor Vests

There are no definitive data on the number of law enforcement officers whose lives have been saved by vests paid for, in part, with funds from the BPV program. A frequently cited statistic is that armor vests have saved the lives of more than 3,000 law enforcement officers over the past 30 years,[36] but it is impossible to determine how many of those vests were purchased with funds from the BPV program. The BJA reports that, based on data it collected in FY2012, armor vests were directly attributable to saving the lives of at least 33 law enforcement and corrections officers, an increase of 14% over FY2011.[37] At least 14 of those 33 vests had been purchased, in part, with funds from the BPV program.

However, as the NIJ notes, there is no such thing as bulletproof armor. Ballistic-resistant body armor provides protection against penetrating bullets and the blunt trauma associated with bullet impacts, but it will not stop all bullets. Some armor vests only protect against handgun bullets, while some others protect against rifle bullets. Armor vests help protect against death that could result from sustaining a gunshot to the torso, but they will not protect against gunshots to the

[31] Ibid.

[32] PERF, *Body Armor Use, Care, and Performance in Real World Conditions*, p. 46.

[33] Ibid., p. 59.

[34] Ibid., p. 51.

[35] Ibid., p. 58.

[36] U.S. Department of Justice, Office of Justice Programs, National Institute of Justice, *Body Armor*, http://www.nij.gov/topics/technology/body-armor/Pages/welcome.aspx.

[37] U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance, *Bulletproof Vest Partnership/Body Armor Safety Initiative*, http://ojp.gov/bvpbasi/home.html.

neck, head, or thigh. In some cases an officer might be killed even if he or she is wearing an armor vest, because the officer was shot with ammunition larger than the type the vest was rated to stop or because the officer was shot in the torso where there was a gap in the vest.

Data from the FBI indicate that 67% (338) of the 505 non-federal law enforcement officers feloniously killed in the line of duty between 2005 and 2014 were wearing body armor when they were killed. **Figure 1** shows how many law enforcement officers were wearing body armor at the time of their deaths.

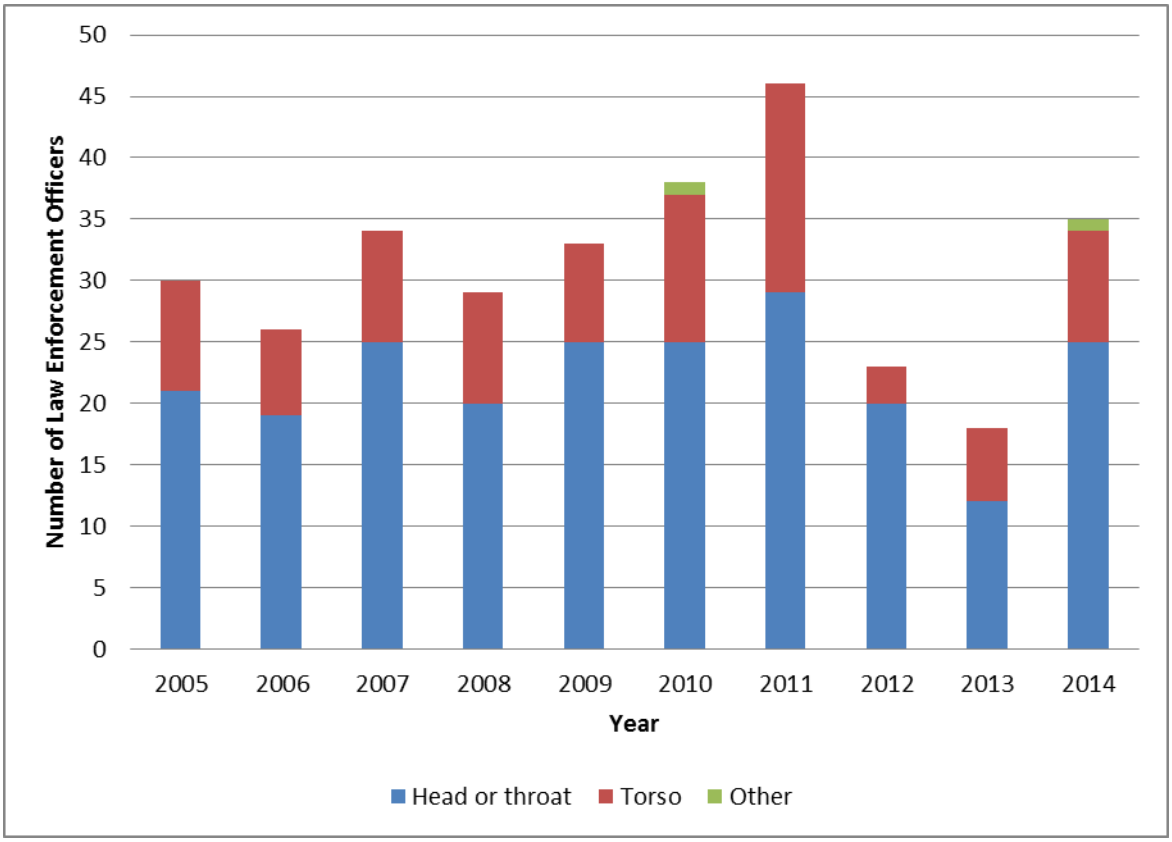
Figure 1. Law Enforcement Officers Feloniously Killed in the Line of Duty Who Were Wearing Body Armor

Source: CRS presentation of data from U.S. Department of Justice, Federal Bureau of Investigation, *Law Enforcement Officers Killed and Assaulted, 2014*, Table 40.

Figure 2 indicates that most law enforcement officers who were killed with a firearm while wearing body armor were shot in the head or throat rather than the torso. Between 2005 and 2014,

approximately 29% of the officers killed with a firearm while wearing body armor were shot in the torso.

Figure 2. Location of Fatal Wound for Law Enforcement Officers Killed with a Firearm While Wearing Body Armor



Source: CRS presentation of data from U.S. Department of Justice, Federal Bureau of Investigation, *Law Enforcement Officers Killed and Assaulted, 2014*, Table 41.

Notes: The data provided by the FBI is more specific than what is presented in **Figure 2**. "Head or throat" includes "front head," "rear head," "side head," and "neck/throat." "Torso" includes "front upper torso/chest," "rear upper torso/back," "front lower torso/stomach," and "rear lower torso/back." "Other" includes "front below waist," "rear below waist," "arms/hands," and "location not reported."

Even though about one-third of the law enforcement officers who were killed with a firearm while wearing an armor vest between 2005 and 2014 were shot in the torso, data from the FBI indicate that in only one instance was a death the result of the vest failing (i.e., the vest did not stop a bullet it was designed to stop).[38] About 20% of law enforcement officers who died while wearing body armor after being shot in the torso died because the officer was shot with ammunition that was more powerful than the vest's capability to stop it. In another 75% of cases, the law enforcement officer was killed because he or she was struck in a part of the torso that was not protected by the vest (e.g., the bullet entered through the side panels of the vest, the armhole, or the shoulder area).

[38] U.S. Department of Justice, Federal Bureau of Investigation, *Law Enforcement Officers Killed and Assaulted, 2014*, Table 43.

While there are limits on how much protection armor vests can provide, the risk of dying from a gunshot wound to the torso is 3.4 times higher for law enforcement officers who do not wear armor vests.[39] It has been estimated that the marginal benefit that would result from universal use of body armor by law enforcement officers is nearly double the cost, and universal use would save at least an additional 8.5 lives per year.[40]

Selected Issues for Congress

How much support, if any, should the federal government provide for something that is a prerogative of state and local governments? This is a perpetual question relating to any federal assistance for state and local law enforcement. On the one hand, there is an argument to be made that police officers are state and local employees who are enforcing state and local laws, and hence it is the responsibility of state and local governments to provide the resources necessary, including armor vests, for them to do their jobs safely and effectively. A number of Department of Justice (DOJ) grant programs provide "seed" money for state and local governments to get a program up and running, or to expand an existing program, but the grant recipient will eventually be responsible for taking on the cost and continuing the program. This might not be the case for a program that provides money to help law enforcement agencies purchase body armor for officers. As previously discussed, armor vests are not a one-time purchase; they need to be replaced in order to ensure their effectiveness. This fact may raise doubts about whether the federal government will ever be able to stop providing funding for the purchase of armor vests. On the other hand, law enforcement officers face a higher risk of suffering a fatality while at work than the average American worker.[41] Some policymakers might argue that Congress has an interest in helping law enforcement agencies ensure the safety of their employees to the extent practicable. Even though Congress appropriates tens of millions of dollars each fiscal year for the BPV program, it is still a relatively small amount compared to what Congress appropriates for some other DOJ grant programs. Finally, as discussed previously, a cost-benefit analysis has shown that investment in armor vests provides a substantial "bang for the buck."

Another issue policymakers might consider should they take up legislation to reauthorize the BPV program is whether to invest additional funding in advancing body armor technology. An armor vest is only effective when the law enforcement officer is wearing it. Some law enforcement officers might stop wearing their armor vests if they find them to be uncomfortable or cumbersome. Armor vests that are designed to protect against larger-caliber rifle bullets can be more uncomfortable because they are made with hard components, unlike vests that are designed to stop smaller caliber bullets from handguns, which are made with soft components. Also, as previously discussed, there have been instances where law enforcement officers have been killed while wearing body armor because the officer was struck in the torso in an area not covered by the vest or the bullet went through the vest's side panels. Policymakers might consider whether to provide additional funding to the NIJ to do more research into developing new technology in ballistic material that could provide a higher level of protection while also being lighter and more comfortable, or new designs in armor vests that provide more protective coverage. Congress

[39] Tom LaTourrette, "The Life-Saving Effectiveness of Body Armor for Police Officers," *Journal of Occupational and Environmental Hygiene*, vol. 7 (2010), pp. 557-562.

[40] The author assumed that armor vests would have to be purchased for 236,000 law enforcement officers at a cost of $112 per officer-year (i.e., one year worked by one officer). The author assumed that the value of one statistical life was $6 million and that 8.5 lives per year would be saved by universal used of body armor. Ibid.

[41] The fatality risk for a law enforcement officer in the United States is 15.6 per 100,000 workers, which is nearly four times greater than the average American worker. Ibid., p. 557.

could also consider providing funding for the NIJ to do more research into armor vests that provide a better fit for female officers.

Policymakers might also consider whether additional steps should be taken to help ensure that law enforcement officers properly maintain their body armor. As previously discussed, some law enforcement officers do not properly store their armor vests, and some officers are not aware that moisture can reduce their vests' effectiveness. In addition, most law enforcement agencies do not regularly inspect officers' vests for proper maintenance, and some agencies do not have training for officers about how to care for and maintain their vests. Congress might consider whether making formal care and maintenance training requirements should be a condition of receiving funds under the BPV program, much like the mandatory wear policy the BJA put in place. Congress could also consider allowing the BJA to give preference for awards to law enforcement agencies that have procedures in place to train their officers on how to properly care for and maintain body armor and provide a space for their officers to properly store their vests when they are not wearing them.

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