

# Trends in Department of Defense Disability Evaluation System Ratings and Awards for Posttraumatic Stress Disorder and Traumatic Brain Injury, 2002–2017

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Appendixes C–H

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Prepared for the U.S. Department of Defense Psychological Health  
Center of Excellence  
Approved for public release; distribution unlimited



NATIONAL DEFENSE RESEARCH INSTITUTE

For more information on this publication, visit [www.rand.org/t/RR3174](http://www.rand.org/t/RR3174)

**Library of Congress Cataloging-in-Publication Data** is available for this publication.

ISBN: 978-1-9774-0494-7

Published by the RAND Corporation, Santa Monica, Calif.

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## Characteristics of the Diagnosis Cohorts

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This appendix contains a series of tables describing the diagnosis and disability cohorts. In particular, Tables C.1 through C.6 contain descriptive statistics (e.g., years of service, demographic characteristics, Department of Defense [DoD] occupation) of the posttraumatic stress disorder (PTSD), traumatic brain injury (TBI), PTSD+TBI, and comparison condition diagnosis cohorts. Tables C.7 through C.9 show the share of the PTSD, TBI, and PTSD+TBI diagnosis cohorts that *also* have one of the other studied conditions. For example, Table C.7 shows the share of each PTSD cohort that also has a TBI diagnosis, that has a back pain diagnosis, that has a sleep apnea diagnosis, and that has a major depressive disorder (MDD) diagnosis. Tables C.10 through C.15 contain descriptive statistics of all of the disability cohorts. Finally, Tables C.16 through C.18 show the share of the PTSD, TBI, and PTSD+TBI disability cohorts that also has a Veterans Affairs Scheduled for Rating Disabilities (VASRD) code for one of the other studied conditions.

**Table C.1**  
**Characteristics of the Posttraumatic Stress Disorder Diagnosis Cohorts, 2002–2017**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First diagnosis (count)	2,975	2,656	4,806	8,418	9,182	12,562	17,144	17,003	17,642	18,753	20,283	18,248	16,586	15,837	15,624	13,709
Age (mean)	27.06	26.77	26.98	27.19	27.84	28.02	28.45	29.14	29.77	30.18	30.58	31.13	31.83	32.49	33.31	33.68
Years of service (mean)	6.37	6.19	6.19	6.49	7.12	7.22	7.64	8.21	8.76	9.03	9.33	9.87	10.65	11.32	12.14	12.58
Characteristics of cohort (percentage of cohort)																
Ever deployed	23	40	69	80	82	85	87	86	88	87	89	87	85	82	80	75
Deployed in FY of diagnosis or prior FY	7	32	64	69	63	68	68	66	64	58	56	45	34	24	17	12
Male	49	55	73	81	82	85	86	85	85	84	85	82	80	79	78	76
White, non-Hispanic	66	65	67	66	66	67	66	65	65	64	62	61	57	55	51	49
Black, non-Hispanic	17	18	15	15	15	14	15	16	16	17	18	19	21	23	25	26
Hispanic	8	10	10	11	11	12	12	12	12	11	12	13	13	14	14	15
Other, non-Hispanic	7	7	7	7	7	7	7	7	7	7	7	8	8	9	9	9
Army	35	42	58	62	63	65	69	69	68	66	69	67	64	63	62	58
Air Force	22	21	13	9	10	8	7	8	8	10	9	11	13	13	14	17

**Table C.1—Continued**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Marine Corps	10	11	12	16	16	16	15	14	15	15	13	13	12	12	11	10
Navy	33	26	17	12	11	11	9	9	9	9	9	10	11	12	13	15
Paygrade																
E01	7	7	4	4	5	5	4	4	3	3	2	2	2	1	1	1
E02	9	8	5	4	4	4	4	4	3	3	2	2	2	2	2	1
E03	23	23	18	15	12	12	10	10	10	10	8	7	7	7	6	7
E04	24	26	33	35	30	31	31	30	30	30	31	27	23	20	17	16
E05	14	16	19	22	24	22	23	22	22	22	23	23	23	22	19	17
E06	9	8	9	10	12	12	13	13	13	13	14	15	17	17	18	18
E07	5	4	4	4	6	6	7	8	8	9	9	10	11	13	15	16
E08	1	1	1	1	2	2	2	3	3	3	3	3	4	5	5	6
E09	1	0	0	0	1	1	1	1	1	1	1	1	2	2	2	3
Commissioned officer or warrant officer	7	6	6	5	6	6	5	6	7	7	7	9	10	11	13	14

Table C.1—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DOD occupation																
Infantry/combat/ artillery	10	13	23	29	28	29	31	27	26	26	25	23	21	20	17	16
Communication/ navigation	8	7	5	5	4	4	3	4	4	4	4	4	4	5	5	5
Combat operations/ intelligence/analyst	7	8	8	9	8	9	9	9	9	8	9	8	9	9	9	9
Medical	12	14	12	12	13	12	10	11	11	11	10	11	12	12	11	11
Supply/personnel/ operators/admin	15	13	11	9	10	9	9	10	10	11	11	12	14	14	15	16
Automotive/aircraft/ ammunition	14	14	12	11	11	10	11	11	11	11	12	12	12	12	12	13
Food service/police/ fuel drivers	11	13	12	13	13	14	15	15	16	16	16	15	14	13	12	12
Ground naval arms/ pilots	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Other occupation	12	13	10	9	9	10	10	10	11	10	10	11	12	13	14	14

**Table C.2**  
**Characteristics of the TBI Diagnosis Cohorts**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First diagnosis (count)	11,585	10,772	11,482	12,190	13,192	15,975	24,198	23,024	23,202	25,318	24,604	23,220	21,200	20,224	16,130	14,741
Age (mean)	25.2	25.3	25.4	25.6	25.7	25.9	26.7	27.0	27.1	27.5	27.8	28.2	28.5	28.5	29.7	30.1
Years of service (mean)	5.0	5.3	5.0	5.2	5.2	5.3	6.0	6.2	6.3	6.6	6.8	7.2	7.5	7.5	8.7	9.1
Characteristics of cohort (percentage of cohort)																
Ever deployed	27	42	49	53	57	64	76	72	73	76	75	71	64	58	58	54
Deployed in FY of diagnosis or prior FY	14	34	41	42	43	53	66	59	58	58	54	45	31	23	17	12
Male	87	86	87	87	88	89	91	89	89	89	89	88	87	85	86	85
White, non-Hispanic	67	68	67	68	69	70	69	69	69	68	67	65	63	61	60	59
Black, non-Hispanic	17	16	16	15	14	13	12	13	13	13	14	15	16	17	18	18
Hispanic	9	10	10	10	10	11	12	11	11	12	12	12	12	13	14	15
Other, non-Hispanic	6	6	7	8	7	7	7	7	7	7	8	8	9	9	9	8
Army	39	38	40	42	45	52	68	62	60	59	60	60	57	55	58	60
Air Force	20	22	22	19	17	15	9	11	12	12	12	13	14	14	11	13

Table C.2—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Marine Corps	17	16	16	17	17	17	13	15	16	18	16	15	15	16	15	14
Navy	23	24	23	21	20	16	10	12	11	11	12	12	14	15	16	13
Paygrade																
E01	5	4	4	4	4	4	4	3	3	3	2	2	2	2	2	1
E02	10	9	8	8	9	8	5	6	5	4	4	4	4	5	4	3
E03	26	25	25	23	21	20	15	16	18	17	15	14	15	16	14	14
E04	25	26	28	27	27	28	31	30	31	31	33	30	27	27	23	25
E05	15	16	16	17	18	18	21	19	18	19	19	19	19	17	16	15
E06	7	7	7	8	9	10	11	11	10	10	11	11	11	11	12	12
E07	3	3	3	3	4	4	5	5	5	6	6	6	7	7	9	10
E08	1	1	1	1	1	1	1	1	1	2	2	2	3	3	4	5
E09	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2
Commissioned officer or warrant officer	7	7	8	8	8	7	7	8	7	8	8	10	11	11	14	13



**Table C.2—Continued**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DOD occupation																
Infantry/combat/ artillery	16	16	18	20	22	28	33	28	29	28	28	27	24	22	22	22
Communication/ navigation	8	8	8	8	7	6	4	5	5	5	6	5	6	6	5	5
Combat operations/ intelligence/analyst	7	7	8	8	9	9	10	9	9	9	9	9	10	9	9	9
Medical	6	6	7	6	6	6	6	7	6	7	7	7	8	8	8	9
Supply/personnel/ operators/admin	11	12	11	10	10	9	8	9	9	9	9	9	10	11	10	11
Automotive/aircraft/ ammunition	20	21	20	20	18	16	13	14	14	14	14	14	15	15	13	15
Food service/police/ fuel drivers	11	12	11	11	11	11	13	13	14	14	13	12	12	11	11	11
Ground naval arms/ pilots	2	2	3	3	3	3	3	3	3	3	3	3	4	3	4	4
Other occupation	14	13	14	13	13	11	10	12	10	12	12	12	13	14	15	13

**Table C.3**  
**Characteristics of the Posttraumatic Stress Disorder plus Traumatic Brain Injury Diagnosis Cohorts, 2002–2017**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First diagnosis (count)	1,192	1,191	1,651	2,589	3,364	5,568	9,059	7,777	7,394	7,368	6,804	5,417	4,243	3,508	2,685	1,349
Age (mean)	25.9	25.9	26.1	26.5	26.9	27.1	27.9	28.5	28.9	29.3	29.8	30.7	31.7	32.5	34.4	35.0
Years of service (mean)	5.5	5.8	5.6	6.0	6.3	6.3	7.0	7.5	7.8	8.1	8.6	9.4	10.4	11.3	13.2	14.0
Characteristics of cohort (percentage)																
Ever deployed	27	51	67	76	81	88	92	89	91	92	92	90	87	83	84	82
Deployed in FY of diagnosis or prior FY	13	43	62	66	69	78	81	75	75	73	68	56	41	28	19	13
Male	81	83	85	89	91	93	94	91	91	91	91	88	87	85	87	88
White, non-Hispanic	66	66	66	67	69	70	69	68	68	67	65	62	60	57	55	55
Black, non-Hispanic	17	15	16	14	14	12	13	14	14	14	16	17	19	21	22	21
Hispanic	10	12	12	12	11	12	12	12	12	13	12	12	13	15	15	15
Other, non-Hispanic	6	7	6	7	6	6	6	6	6	7	7	8	8	8	8	9
Army	55	57	64	67	72	75	82	79	75	73	75	73	70	70	71	68
Air Force	14	13	10	7	6	5	3	4	5	5	5	6	7	6	6	6

**Table C.3—Continued**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Marine Corps	14	16	15	17	16	15	12	13	16	17	15	15	15	15	13	13
Navy	17	14	10	9	7	6	3	4	4	5	5	6	8	9	10	13
Paygrade																
E01	2	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1
E02	9	7	5	5	4	4	2	3	2	2	1	1	2	2	1	1
E03	23	21	19	19	15	14	8	10	11	12	9	7	7	6	5	5
E04	24	28	31	30	29	32	34	32	32	32	32	27	21	18	13	14
E05	21	20	22	23	24	22	25	23	22	22	23	24	23	21	17	16
E06	11	11	11	13	14	14	15	15	14	13	15	16	18	20	20	17
E07	3	3	4	4	5	5	7	7	8	8	9	10	12	13	16	19
E08	1	1	1	1	1	1	2	2	2	3	2	4	5	7	7	9
E09	0	0	0	0	0	0	0	1	1	1	1	2	2	2	4	4
Commissioned officer or warrant officer	6	5	5	5	5	4	4	5	6	6	6	8	10	10	15	16

Table C.3—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DOD occupation																
Infantry/combat/ artillery	25	25	31	35	37	42	41	36	37	35	36	32	29	29	26	27
Communication/ navigation	6	4	5	4	3	2	2	3	3	3	3	3	4	4	3	4
Combat operations/ intelligence/analyst	6	8	8	10	10	11	10	10	10	8	9	9	10	9	9	9
Medical	9	10	10	11	9	9	7	9	8	8	8	9	9	8	8	7
Supply/personnel/ operators/admin	10	12	10	7	8	5	6	8	7	8	9	9	11	13	12	11
Automotive/aircraft/ ammunition	15	14	13	11	11	9	9	10	9	10	10	11	10	10	10	12
Food service/police/ fuel drivers	13	14	12	12	12	12	14	15	16	16	14	14	13	12	12	10
Ground naval arms/ pilots	2	1	2	2	2	2	1	2	2	2	2	2	3	2	4	6
Other occupation	10	10	10	9	8	7	8	9	8	9	10	11	12	12	16	14

**Table C.4**  
**Characteristics of the Back Pain Diagnosis Cohorts, 2002–2017**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First diagnosis (count)	159,195	110,697	104,720	97,390	89,884	87,650	85,402	87,262	88,384	87,940	86,870	84,261	81,207	80,732	86,831	78,260
Age (mean)	29.9	29.4	29.2	28.9	28.8	28.4	28.2	28.1	28.2	28.3	28.3	28.1	28.0	27.7	27.6	27.8
Years of service (mean)	9.1	9.2	8.3	8.1	7.3	7.4	7.1	6.9	6.9	6.9	6.8	6.7	6.6	6.4	6.2	6.5
Characteristics of cohort (percentage)																
Ever deployed	27	40	47	51	53	55	57	59	61	63	63	60	56	52	46	43
Deployed in FY of diagnosis or prior FY	11	29	35	34	34	37	39	42	43	43	41	35	28	23	18	12
Male	78	78	79	79	80	80	81	81	81	81	82	82	82	82	80	81
White, non-Hispanic	62	62	63	63	63	64	64	64	63	63	63	62	61	59	57	56
Black, non-Hispanic	24	22	21	20	19	18	17	17	17	17	17	17	18	18	18	18
Hispanic	8	9	9	9	10	10	10	11	11	11	11	11	12	12	15	16
Other, non-Hispanic	6	6	7	8	8	8	8	8	9	9	9	9	10	10	10	10
Army	47	44	43	43	44	47	49	50	49	50	50	48	47	47	46	44
Air Force	24	27	28	27	26	24	22	21	21	22	21	22	23	22	23	24

Table C.4—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Marine Corps	9	10	9	10	10	10	11	12	12	12	12	13	13	13	13	14
Navy	19	20	20	20	20	19	18	17	17	17	17	17	17	18	18	18
Paygrade																
E01	3	4	4	4	5	5	5	4	3	3	3	3	3	3	3	1
E02	5	6	6	6	8	8	8	8	6	6	5	5	5	5	5	2
E03	14	15	15	15	14	16	17	18	19	18	17	16	17	16	17	17
E04	20	19	20	20	20	20	22	24	25	27	29	28	28	30	29	30
E05	17	17	17	17	17	17	16	16	16	16	17	17	17	17	17	19
E06	14	13	13	12	12	11	10	10	9	9	9	9	9	9	9	9
E07	10	9	9	8	8	7	7	6	6	6	6	5	5	5	5	5
E08	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
E09	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Commissioned officer or warrant officer	12	13	13	13	13	13	12	12	12	13	13	14	14	14	14	14

**Table C.4—Continued**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DOD occupation																
Infantry/combat/ artillery	10	10	10	12	12	13	14	14	15	15	15	15	15	15	14	14
Communication/ navigation	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7
Combat operations/ intelligence/analyst	7	7	7	8	8	8	8	8	8	8	9	9	9	9	9	9
Medical	9	10	10	9	10	9	9	9	9	9	9	10	10	10	10	10
Supply/personnel/ operators/admin	17	16	16	15	14	14	14	13	13	12	11	11	12	12	12	12
Automotive/aircraft/ ammunition	16	16	17	17	17	16	16	16	16	16	16	16	16	17	17	17
Food service/police/ fuel drivers	10	11	11	10	11	12	13	13	13	13	13	12	11	12	12	12
Ground naval arms/ pilots	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5
Other occupation	14	14	15	15	15	15	15	15	14	14	14	14	14	14	13	13

**Table C.5**  
**Characteristics of the Sleep Apnea Diagnosis Cohorts, 2002–2017**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First diagnosis (count)	9,913	8,036	9,105	11,984	15,207	17,992	21,855	26,594	30,693	35,290	36,953	34,818	33,346	32,953	33,734	32,827
Age (mean)	35.4	35.1	35.4	36.0	36.4	36.6	36.8	36.7	36.6	36.3	35.8	36.0	36.0	35.9	35.9	36.1
Years of service (mean)	14.4	14.1	14.4	15.0	15.4	15.5	15.7	15.5	15.4	15.0	14.3	14.5	14.5	14.3	14.3	14.5
Characteristics of cohort (percentage)																
Ever deployed	32	42	50	56	63	69	73	78	81	83	85	85	84	83	81	78
Deployed in FY of diagnosis or prior FY	11	25	30	28	29	34	36	40	41	39	38	33	27	23	17	12
Male	92	91	91	91	91	91	92	91	91	91	92	92	92	91	91	91
White, non-Hispanic	64	63	61	60	58	57	56	56	57	57	58	58	57	56	55	54
Black, non-Hispanic	22	23	23	24	25	26	26	25	24	23	22	22	22	22	22	22
Hispanic	7	7	8	8	8	9	9	9	10	10	11	11	11	12	13	14
Other, non-Hispanic	6	6	7	8	8	9	10	9	9	9	9	9	9	10	10	11
Army	27	28	30	33	36	39	43	45	46	47	49	51	51	53	52	49
Air Force	36	37	36	34	32	30	25	23	24	23	20	21	24	22	22	23



Table C.5—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Marine Corps	5	4	5	5	6	6	6	8	8	8	9	9	9	8	8	7
Navy	32	30	29	28	27	26	26	24	22	21	22	19	16	16	18	20
Paygrade																
E01	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0
E02	1	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0
E03	6	6	5	5	4	4	3	4	4	4	4	3	3	3	3	3
E04	11	12	12	11	10	11	11	12	13	15	16	16	15	15	15	14
E05	17	16	16	15	15	14	14	15	15	16	18	17	17	17	16	16
E06	21	21	21	20	20	19	18	18	17	17	18	18	19	19	18	18
E07	17	17	18	20	21	22	22	22	21	19	18	17	18	17	18	18
E08	5	5	5	7	6	8	8	8	8	7	7	7	6	6	6	7
E09	2	3	3	3	4	4	4	4	4	3	3	3	3	3	3	3
Commissioned officer or warrant officer	18	18	18	18	19	18	17	17	17	17	16	18	19	19	20	20

Table C.5—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DOD occupation																
Infantry/combat/ artillery	6	7	7	8	8	10	11	12	12	12	13	13	13	13	12	11
Communication/ navigation	10	11	9	9	9	8	8	7	7	7	7	7	7	7	7	7
Combat operations/ intelligence/analyst	6	6	7	7	7	7	7	7	7	7	7	7	7	8	8	8
Medical	11	12	12	11	12	12	11	10	10	10	10	10	10	10	11	11
Supply/personnel/ operators/admin	15	15	16	17	16	17	17	17	15	15	14	14	14	14	14	14
Automotive/aircraft/ ammunition	19	19	18	18	17	17	17	16	17	17	17	16	16	15	16	16
Food service/police/ fuel drivers	8	8	9	9	9	10	10	11	11	12	12	12	11	10	10	10
Ground naval arms/ pilots	5	5	4	5	5	5	5	5	5	5	5	5	5	6	6	6
Other occupation	15	15	16	16	16	16	15	15	16	15	15	16	16	17	17	17

**Table C.6**  
**Characteristics of the Major Depressive Disorder Diagnosis Cohorts, 2002–2017**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
First diagnosis (count)	13,318	10,941	11,182	12,018	12,011	13,058	14,187	15,205	15,211	15,817	15,252	14,488	13,783	14,725	16,587	15,591
Age (mean)	28.7	27.6	27.4	27.1	27.2	27.0	27.2	27.5	28.3	28.3	28.8	29.1	29.3	29.2	29.6	29.6
Years of service (mean)	7.7	6.9	6.5	6.2	6.2	6.0	6.1	6.4	7.1	7.1	7.4	7.8	8.1	7.9	8.4	8.5
Characteristics of cohort (percentage)																
Ever deployed	21	30	41	47	48	51	56	59	64	66	68	66	63	58	56	51
Deployed in FY of diagnosis or prior FY	8	22	31	32	31	34	39	41	42	40	38	31	24	18	13	9
Male	61	62	65	68	69	70	73	74	74	75	76	75	73	73	70	70
White, non-Hispanic	72	69	69	69	68	67	67	67	64	63	62	60	58	56	53	52
Black, non-Hispanic	15	16	15	15	14	15	15	15	16	17	17	18	19	21	22	23
Hispanic	7	8	8	9	10	10	11	10	11	11	12	12	12	12	15	15
Other, non-Hispanic	5	6	7	7	8	8	8	8	8	8	9	9	10	10	10	10
Army	37	38	38	43	44	48	54	54	53	53	55	54	53	52	49	47
Air Force	32	33	30	24	23	19	16	15	16	17	16	16	18	18	21	23

Table C.6—Continued

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Marine Corps	8	7	11	11	11	11	13	13	13	13	12	12	10	10	10	10
Navy	23	22	22	22	22	21	17	17	18	18	17	18	19	20	21	21
Paygrade																
E01	6	5	5	6	8	8	8	6	5	4	4	4	3	3	3	2
E02	8	8	8	8	9	10	9	9	6	6	5	5	4	4	3	4
E03	19	21	21	20	18	19	18	18	18	18	15	14	14	14	14	14
E04	21	23	25	25	24	24	25	27	28	29	31	29	26	27	27	25
E05	15	16	17	17	18	17	17	17	18	19	20	20	20	19	19	18
E06	12	10	10	9	10	10	9	10	10	10	11	12	12	13	13	13
E07	7	6	5	5	5	5	5	5	6	6	6	7	7	7	8	9
E08	2	1	1	1	1	1	1	1	2	1	2	2	2	2	2	3
E09	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Commissioned officer or warrant officer	10	9	8	8	7	7	6	7	7	7	7	8	9	9	10	10

**Table C.6—Continued**

	Fiscal Year of First Diagnosis															
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DOD occupation																
Infantry/combat/ artillery	8	9	9	12	13	14	17	17	16	17	17	16	15	14	11	11
Communication/ navigation	8	8	8	8	8	7	6	6	7	8	7	7	7	8	8	7
Combat operations/ intelligence/analyst	6	7	7	8	8	7	8	8	8	8	9	8	9	10	9	10
Medical	14	14	13	13	13	13	13	12	12	11	11	12	13	13	13	13
Supply/personnel/ operators/admin	16	16	16	15	14	13	13	13	13	14	13	14	14	15	16	16
Automotive/aircraft/ ammunition	14	15	16	15	16	14	13	14	15	15	15	15	15	15	15	16
Food service/police/ fuel drivers	10	10	11	11	12	13	14	13	14	14	14	13	13	11	11	12
Ground naval arms/ pilots	2	1	1	1	2	1	1	1	2	2	1	2	2	2	2	2
Other occupation	13	13	14	13	13	12	12	12	12	11	11	11	12	12	13	12

**Table C.7**  
**Overlap Between Posttraumatic Stress Disorder Diagnosis Cohorts,**  
**2002–2017**

Fiscal Year of Diagnosis	Number in Cohort	Share with TBI Diagnosis	Share with Back Pain Diagnosis	Share with Sleep Apnea Diagnosis	Share with MDD Diagnosis
2002	2,975	9%	46%	11%	39%
2003	2,656	12%	53%	11%	38%
2004	4,806	15%	54%	13%	37%
2005	8,418	19%	56%	15%	32%
2006	9,182	23%	60%	20%	32%
2007	12,561	32%	63%	24%	32%
2008	17,144	40%	68%	28%	32%
2009	17,003	39%	70%	31%	35%
2010	17,642	39%	72%	34%	35%
2011	18,753	39%	73%	35%	35%
2012	20,283	39%	74%	27%	33%
2013	18,248	37%	75%	38%	33%
2014	16,586	35%	76%	40%	33%
2015	15,837	33%	76%	42%	34%
2016	15,624	31%	77%	43%	32%
2017	13,709	27%	75%	38%	30%

**Table C.8**  
**Overlap Between Traumatic Brain Injury Diagnosis Cohorts, 2002–2017**

Fiscal Year of Diagnosis	Number in Cohort	Share with PTSD Diagnosis	Share with Back Pain Diagnosis	Share with MDD Diagnosis	Share with Sleep Apnea Diagnosis
2002	11,585	9%	50%	9%	14%
2003	10,772	10%	53%	10%	14%
2004	11,482	12%	55%	11%	14%
2005	12,190	15%	56%	12%	15%
2006	13,192	19%	57%	13%	16%
2007	15,975	27%	59%	15%	19%
2008	24,198	33%	62%	16%	22%
2009	23,024	32%	63%	17%	23%
2010	23,202	31%	63%	17%	23%
2011	25,318	30%	63%	16%	24%
2012	24,604	29%	63%	15%	24%
2013	23,220	26%	63%	15%	24%
2014	21,200	24%	63%	14%	24%
2015	20,224	22%	61%	14%	23%
2016	16,130	22%	61%	14%	26%
2017	14,741	19%	58%	11%	23%

**Table C.9**  
**Overlap Between Posttraumatic Stress Disorder plus Traumatic Brain Injury**  
**Diagnosis Cohorts, 2002–2017**

<b>Fiscal Year of Diagnosis</b>	<b>Number in Cohort</b>	<b>Share with Back Pain Diagnosis</b>	<b>Share with MDD Diagnosis</b>	<b>Share with Sleep Apnea Diagnosis</b>
2002	1,192	77%	37%	37%
2003	1,191	75%	39%	34%
2004	1,651	78%	38%	36%
2005	2,589	75%	36%	36%
2006	3,364	75%	36%	35%
2007	5,681	74%	35%	36%
2008	9,059	77%	35%	38%
2009	7,777	78%	37%	40%
2010	7,394	79%	36%	41%
2011	7,368	78%	34%	42%
2012	6,804	79%	33%	43%
2013	5,417	80%	34%	45%
2014	4,243	81%	36%	48%
2015	3,508	82%	36%	50%
2016	2,685	84%	34%	54%
2017	1,349	82%	30%	52%



**Table C.10**  
**Characteristics of the Posttraumatic Stress Disorder Disability Cohorts, 2004–2017**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	235	478	542	790	1,208	2,329	2,668	2,712	3,639	5,248	4,787	4,263	3,349	3,160
Age (mean)	27.7	26.9	27.5	28.1	27.6	28.6	29.7	30.6	31.5	31.7	32.5	33.0	33.1	33.5
Years of service (mean)	6.2	5.7	6.4	6.8	6.4	7.4	8.2	9.1	9.7	9.9	10.8	11.3	11.6	12.0
Cumulative months deployed (mean)	8.6	10.5	11.7	14.2	15.1	17.8	19.4	20.4	21.5	22.4	23.2	23.8	23.6	23.7
Characteristics of cohort (percentage of cohort)														
Ever deployed	63	85	84	86	89	88	88	89	88	93	93	90	87	83
Male	65	83	79	84	86	85	85	85	83	87	85	80	78	73
White, non-Hispanic	60	68	67	69	70	68	67	66	66	67	64	61	58	54
Black, non-Hispanic	12	11	11	7	10	10	11	13	12	14	16	19	21	23
Hispanic	7	9	10	10	10	10	11	11	11	12	13	13	14	15
Other/unknown	21	11	13	15	11	12	11	10	11	7	7	7	8	5
Army	85	88	81	87	89	93	91	89	88	90	89	86	81	72
Air Force	13	10	15	10	9	5	8	9	9	6	9	10	13	15
Marine Corps	1	1	2	2	1	1	1	2	2	2	2	2	4	6
Navy	1	2	2	2	1	0	0	0	1	1	1	2	3	7

Table C.10—Continued

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paygrade														
E01–E04	47	55	49	43	49	46	46	44	41	41	34	28	24	49
E05–E09	34	35	41	45	42	44	45	48	50	53	58	63	66	41
O1–O3	2	2	2	3	2	2	1	2	2	2	3	4	4	7
O4–O6	0	0	1	1	0	1	1	1	1	1	2	2	3	0
Warrant officer	0	0	0	0	0	1	1	1	1	1	1	2	2	1
Paygrade unknown	17	8	8	8	7	7	6	5	6	1	2	1	1	0

**Table C.11**  
**Characteristics of the Traumatic Brain Injury Disability Cohorts, 2004–2017**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	177	216	210	230	361	838	867	596	808	1,171	1,085	925	715	801
Age (mean)	27.2	26.9	27.9	27.8	27.9	28.7	29.4	30.7	31.8	31.5	32.7	33.6	33.6	33.7
Years of service (mean)	6.7	6.2	6.7	6.3	6.6	7.4	8.1	9.4	9.9	9.7	11.1	11.9	12.1	12.1
Cumulative months deployed (mean)	7.8	10.3	11	12.8	12.8	17.6	19.9	21	21.5	23.4	24.1	25.9	25.9	24.8
Characteristics of cohort (percentage of cohort)														
Ever deployed	41	55	64	66	83	87	85	85	85	93	90	91	85	81
Male	81	81	87	86	89	90	90	91	88	92	93	90	91	88
White, non-Hispanic	55	58	65	59	75	74	74	69	69	69	68	65	63	59
Black, non-Hispanic	16	16	12	11	9	7	8	11	11	13	13	16	15	20
Hispanic	10	9	11	12	8	7	9	10	9	12	11	13	12	13
Other/unknown	19	16	13	18	9	11	9	10	11	6	7	6	9	5
Army	81	79	87	92	91	93	92	88	86	92	92	90	83	77
Air Force	10	13	6	5	8	5	7	8	11	5	6	9	10	8
Marine Corps	5	3	3	3	1	1	1	3	2	2	1	2	5	9
Navy	5	5	3	0	1	0	0	1	1	0	1	0	2	7

Table C.11—Continued

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paygrade														
E01–E04	48	56	52	45	47	43	47	38	37	41	32	23	21	46
E05–E09	33	26	35	43	42	47	44	53	50	55	60	68	70	45
O1–O3	3	5	1	4	3	2	2	2	3	2	4	4	5	7
O4–O6	1	1	2	0	1	1	1	2	2	1	2	3	3	0
Warrant officer	1	2	1	0	1	1	1	1	1	1	1	1	1	1
Paygrade unknown	14	12	8	9	7	6	5	5	6	1	1	0	1	1

**Table C.12**  
**Characteristics of the Posttraumatic Stress Disorder Plus Traumatic Brain Injury Disability Cohorts, 2004–2017**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	—	18	30	36	90	491	545	407	537	801	722	647	471	508
Age (mean)	—	27.63	29.12	28.56	26.80	28.76	29.79	31.06	32.36	31.78	33.51	34.35	34.75	35.31
Years of service (mean)	—	6.75	6.77	7.41	5.37	7.32	8.33	9.75	10.41	10.03	11.84	12.69	13.47	13.78
Cumulative months deployed (mean)	—	9.13	11.50	12.16	12.85	18.80	20.20	21.55	22.59	24.51	25.50	27.13	27.60	26.61
Characteristics of cohort (percentage of cohort)														
Ever deployed	—	83	80	86	87	91	92	92	90	97	95	97	96	94
Male	—	89	87	89	86	90	91	93	88	95	95	91	92	90
White, non-Hispanic	—	50	70	61	64	73	73	68	66	69	68	63	62	58
Black, non-Hispanic	—	17	13	11	11	7	7	11	12	14	12	18	15	19
Hispanic	—	6	0	8	10	8	11	11	10	13	12	13	14	15
Other/unknown	—	6	0	6	2	3	2	4	2	3	3	3	7	4
Army	—	94	100	100	98	99	97	94	91	95	95	93	88	85
Air Force	—	6	0	0	2	1	2	3	8	3	4	5	7	5
Marine Corps	—	0	0	0	0	0	1	3	1	2	1	1	4	6
Navy	—	0	0	0	0	0	0	0	0	0	0	0	1	3

Table C.12—Continued

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paygrade														
E01–E04	—	44	43	33	51	40	44	34	33	35	26	17	11	13
E05–E09	—	44	43	50	36	51	47	58	55	60	66	75	80	77
O1–O3	—	0	0	6	0	2	1	2	3	2	3	4	5	5
O4–O6	—	0	0	0	0	0	1	1	2	1	2	2	3	2
Warrant officer	—	0	0	0	1	1	0	0	1	1	1	1	1	3
Paygrade unknown	—	11	13	11	12	7	6	4	7	1	2	0	0	0

**Table C.13**  
**Characteristics of the Back Pain Disability Cohorts, 2004–2017**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	2,562	3,132	2,559	2,729	2,723	3,089	3,108	2,722	4,285	6,279	6,967	7,069	5,748	5,257
Age (mean)	29.31	29.37	29.52	29.58	29.18	29.90	30.28	30.73	31.27	31.63	32.28	32.48	32.20	31.71
Years of service (mean)	7.65	7.67	7.83	7.76	7.44	7.75	8.15	8.74	9.07	9.04	9.75	9.95	9.95	9.67
Cumulative months deployed (mean)	6.46	8.84	9.85	11.47	12.43	14.90	16.49	16.62	17.44	19.28	19.80	20.37	20.21	19.43
Characteristics of cohort (percentage of cohort)														
Ever deployed	31	46	49	53	57	63	64	66	69	75	76	73	69	63
Male	68	71	73	76	77	79	79	76	77	83	83	83	83	81
White, non-Hispanic	62	61	63	66	69	69	68	69	70	71	69	66	64	62
Black, non-Hispanic	17	18	17	13	12	12	12	13	13	14	15	16	18	18
Hispanic	7	8	7	8	9	9	9	8	8	9	10	10	10	12
Other/unknown	3	3	2	3	3	3	3	4	4	4	4	5	6	6
Army	75	77	76	76	74	82	79	73	73	87	84	85	78	67
Air Force	18	19	20	21	22	15	18	24	24	12	14	14	16	19
Marine Corps	3	2	2	1	2	2	2	2	2	1	1	1	4	8
Navy	4	3	2	2	2	1	2	1	1	1	1	1	1	6

Table C.13—Continued

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paygrade														
E01–E04	50	48	46	45	51	50	50	47	47	49	43	40	39	39
E05–E09	35	39	40	43	40	40	40	44	45	46	50	52	54	54
O1–O3	3	3	3	3	3	3	2	3	2	2	3	3	4	4
O4–O6	1	1	2	1	1	1	1	1	1	1	2	2	2	2
Warrant officer	1	1	1	1	1	0	1	1	1	1	1	1	2	1
Paygrade unknown	9	8	8	7	5	5	5	5	4	1	1	1	0	0



**Table C.14**  
**Characteristics of the Sleep Apnea Disability Cohorts, 2004–2017**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	336	351	281	350	261	207	414	264	454	301	217	181	177	153
Age (mean)	36.63	35.93	36.06	35.22	36.32	35.09	34.52	35.22	34.26	35.09	34.99	34.86	33.87	35.26
Years of service (mean)	15.50	14.53	15.01	14.18	15.31	13.52	12.02	12.94	12.90	12.34	12.68	12.85	11.65	13.25
Cumulative months deployed (mean)	5.92	7.25	7.58	7.94	10.16	14.00	16.05	15.61	14.86	20.00	20.37	21.77	19.90	21.04
Characteristics of cohort (percentage of cohort)														
Ever deployed	35	45	52	60	58	65	71	63	75	84	76	85	73	74
Male	88	91	95	95	92	88	90	86	88	92	89	95	92	89
White, non-Hispanic	57	60	63	66	59	60	64	61	66	62	60	61	56	46
Black, non-Hispanic	24	23	24	21	23	25	19	19	20	22	21	24	25	24
Hispanic	4	4	7	4	8	7	9	9	6	9	9	7	11	16
Other/unknown	5	4	3	5	3	2	3	3	3	5	5	4	5	8
Army	25	26	12	14	11	41	63	41	33	74	70	71	62	48
Air Force	75	73	88	86	89	59	36	58	66	25	30	28	35	46
Marine Corps	0	0	0	0	0	0	0	1	0	0	0	1	1	1
Navy	1	0	0	0	0	0	0	0	0	1	0	1	3	5

Table C.14—Continued

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paygrade														
E01–E04	13	17	18	19	15	24	33	28	26	34	29	19	25	19
E05–E09	71	66	72	70	72	64	55	56	64	58	60	71	66	66
O1–O3	3	4	2	4	2	3	3	5	4	2	3	3	5	7
O4–O6	5	7	6	5	8	6	4	6	3	4	3	4	2	4
Warrant officer	1	0	1	0	0	0	1	0	0	1	2	2	2	3
Paygrade unknown	7	5	1	1	2	3	4	5	3	1	3	1	1	1

**Table C.15**  
**Characteristics of the Major Depressive Disorder Disability Cohorts, 2004–2017**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	370	404	323	329	415	498	667	908	1,171	1,552	1,380	1,322	1,068	1,215
Age (mean)	30.11	29.91	29.62	30.20	29.23	30.41	30.14	31.33	31.31	31.27	31.32	31.15	29.99	29.90
Years of service (mean)	8.83	8.25	7.93	8.50	7.58	7.80	7.95	9.01	9.16	9.02	9.03	8.91	8.25	8.27
Cumulative months deployed (mean)	6.62	9.07	8.74	10.95	11.72	13.99	15.97	16.78	17.26	19.00	18.75	17.70	17.03	16.16
Characteristics of cohort (percentage of cohort)														
Ever deployed	35	44	47	50	52	54	55	67	68	75	68	65	59	52
Male	54	52	60	61	61	69	66	68	67	76	71	68	68	67
White, non-Hispanic	58	64	60	65	66	63	61	61	63	62	60	59	56	52
Black, non-Hispanic	15	13	12	13	14	15	17	17	16	18	18	21	24	25
Hispanic	7	5	10	6	7	8	9	11	10	11	12	11	11	14
Other/unknown	4	3	8	8	3	6	5	4	5	7	6	6	7	7
Army	48	48	40	47	57	66	66	68	64	80	74	71	64	52
Air Force	44	43	54	46	35	28	28	28	32	16	20	22	25	24
Marine Corps	2	2	1	1	1	2	2	1	1	2	2	2	4	6
Navy	7	8	6	7	6	3	4	3	3	3	4	5	7	18

Table C.15—Continued

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paygrade														
E01–E04	39	38	46	41	47	50	52	46	45	51	49	48	46	48
E05–E09	38	37	37	41	36	34	34	42	43	42	43	42	45	43
O1–O3	7	9	7	6	7	8	6	3	4	4	4	4	5	5
O4–O6	3	3	4	5	3	4	3	3	3	2	2	4	3	2
Warrant officer	0	1	0	1	0	1	1	0	1	1	1	1	1	1
Paygrade unknown	13	12	6	5	7	4	4	6	4	0	2	1	1	1

**Table C.16**  
**Overlap Among Posttraumatic Stress Disorder Disability Cohorts,**  
**2004–2017**

Fiscal Year of Diagnosis	Number in Cohort	Share with TBI VASRD	Share with Back Pain VASRD	Share with MDD VASRD	Share with Sleep Apnea VASRD
2004	235	3%	7%	5%	0%
2005	478	4%	11%	2%	1%
2006	542	6%	14%	1%	0%
2007	790	5%	15%	1%	1%
2008	1,208	8%	19%	1%	0%
2009	2,329	21%	24%	1%	1%
2010	2,668	20%	27%	3%	5%
2011	2,712	15%	20%	12%	2%
2012	3,639	15%	24%	9%	2%
2013	5,248	15%	24%	11%	1%
2014	4,787	15%	25%	8%	1%
2015	4,263	15%	25%	6%	1%
2016	3,349	14%	21%	5%	1%
2017	3,160	16%	21%	5%	1%

**Table C.17**  
**Overlap Among Traumatic Brain Injury Disability Cohorts, 2004–2017**

Fiscal Year of Diagnosis	Number in Cohort	Share with PTSD VASRD	Share with Back Pain VASRD	Share with MDD VASRD	Share with Sleep Apnea VASRD
2004	177	5%	12%	1%	0%
2005	216	8%	9%	1%	0%
2006	210	14%	14%	1%	0%
2007	230	16%	17%	1%	1%
2008	361	25%	19%	1%	0%
2009	838	59%	24%	2%	2%
2010	867	63%	30%	4%	6%
2011	596	68%	23%	7%	2%
2012	808	67%	23%	6%	2%
2013	1,171	68%	30%	6%	2%
2014	1,085	67%	32%	5%	1%
2015	925	70%	32%	5%	1%
2016	715	66%	29%	5%	1%
2017	801	63%	25%	4%	1%

**Table C.18**  
**Overlap Among Posttraumatic Stress Disorder plus Traumatic Brain Injury**  
**Disability Cohorts, 2004–2017**

Fiscal Year of Diagnosis	Number in Cohort	Share with Back Pain VASRD	Share with MDD VASRD	Share with Sleep Apnea VASRD
2004	—	—	—	—
2005	18	11%	0%	0%
2006	30	27%	0%	0%
2007	36	19%	0%	0%
2008	90	19%	0%	0%
2009	491	26%	1%	2%
2010	545	32%	2%	7%
2011	407	24%	6%	2%
2012	537	26%	4%	2%
2013	801	31%	5%	2%
2014	722	37%	3%	1%
2015	647	35%	1%	1%
2016	471	32%	1%	1%
2017	508	29%	0%	1%





## Additional Department of Defense–Wide Results

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This appendix contains additional results from our prospective, retrospective, and hazard analyses.

### Prospective Analysis

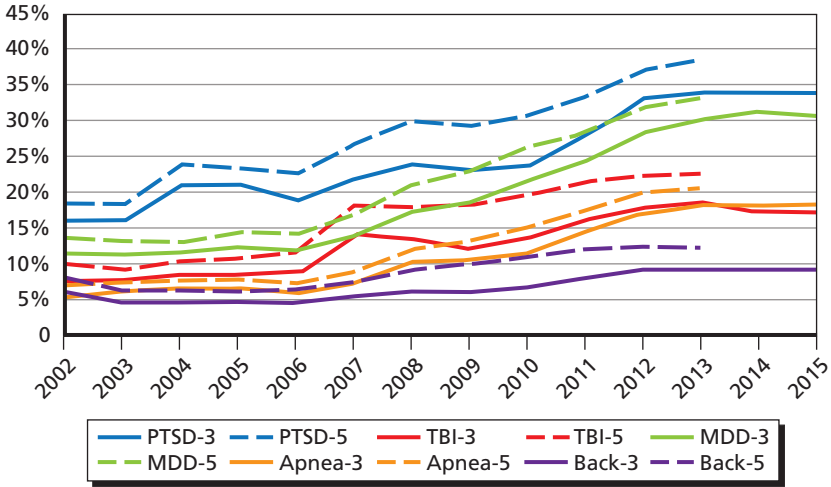
In our primary prospective analysis, we examine service member experiences in the three years following assignment to a diagnosis cohort. Figure D.1 shows rates of medical discharge using this definition and also expanding the observation window to five years. Rates of medical discharge increase by as much as six percentage points when service members are observed for five years following diagnosis compared with three.

### Years of Service

In Chapter Three, we showed the percentage of service members in each diagnosis cohort who had deployed prior to first diagnosis, as well as years of service (YOS). Here, we look at the interaction between these two variables, specifically the YOS distribution among all deployed service members in our analytic file. In general, personnel who were deployed had increasing YOS over time.

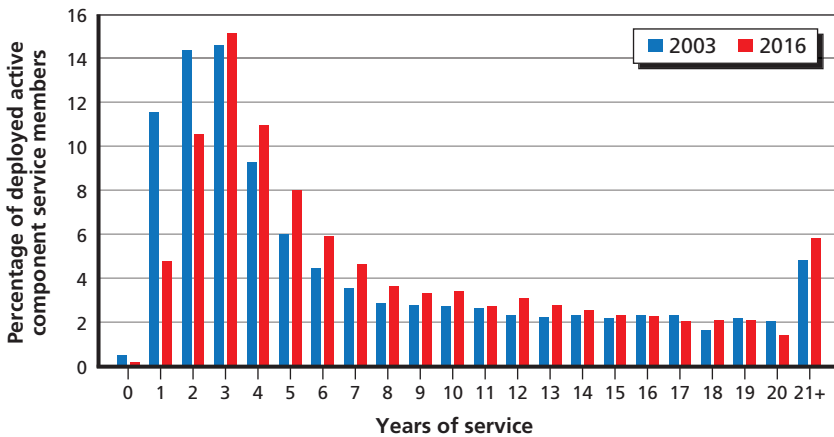
For ease of visualization, Figure D.2 shows the YOS distribution among personnel deployed in 2003 and 2016. In 2003, compared with 2016, a larger share of deployed personnel had one or two completed years of experience, whereas by 2016, the percentage of deployed personnel with four or more years of experience exceeded that of 2003.

**Figure D.1**  
**Rates of Medical Discharge Among Diagnosis Cohorts Using Three- and Five-Year Observation Periods Following Diagnosis**



NOTES: Fiscal year on the x-axis represents the fiscal year of first diagnosis. Cohorts defined based on the first fiscal year in which a diagnosis observed in the Military Health System Data Repository (MDR), using the International Classification of Diseases (ICD) codes documented in Tables B.8–B.13. Diagnosis cohorts are not mutually exclusive.

**Figure D.2**  
**Years of Service Distribution Among Deployed Personnel, 2003 and 2016**



**Table D.1**  
**Years of Service Distribution Among Deployed Personnel, by Fiscal Year**

YOS	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
0	1.18	0.50	1.26	1.13	0.97	1.13	0.79	0.81	1.00	0.94	0.55	0.79	0.60	0.65	0.21	0.00
1	9.18	11.57	10.11	9.53	8.79	9.39	8.04	7.69	7.70	8.43	7.01	6.87	6.85	5.11	4.79	0.02
2	14.11	14.41	14.93	14.10	14.93	13.29	13.95	13.22	13.61	13.01	13.57	12.85	12.96	12.87	10.57	1.36
3	13.62	14.60	14.37	15.04	14.47	15.13	13.80	14.16	13.22	13.54	13.34	13.25	13.09	14.10	15.14	3.47
4	8.81	9.32	9.20	9.37	9.72	9.70	10.63	9.84	10.15	9.49	10.17	10.10	10.41	10.22	10.98	26.48
5	5.68	6.04	6.53	6.46	6.46	6.77	7.14	7.56	6.86	7.46	7.21	7.25	7.42	7.89	8.01	10.74
6	4.05	4.48	4.87	4.82	4.78	4.75	5.07	5.40	5.60	5.00	5.51	5.29	5.10	5.52	5.94	11.70
7	3.19	3.59	3.98	4.15	4.10	3.97	4.08	4.29	4.50	4.63	4.29	4.58	4.34	4.28	4.62	5.97
8	2.93	2.86	3.28	3.53	3.67	3.62	3.63	3.65	3.73	3.75	3.99	3.55	3.86	3.55	3.67	5.56
9	2.96	2.79	2.75	3.06	3.34	3.39	3.42	3.52	3.47	3.50	3.50	3.67	3.16	3.59	3.36	2.96
10	2.99	2.72	2.61	2.57	2.87	3.06	3.14	3.19	3.27	3.26	3.29	3.35	3.45	3.03	3.37	2.24
11	2.63	2.63	2.49	2.44	2.36	2.64	2.84	2.89	2.93	3.01	3.06	3.06	3.15	3.20	2.75	2.15
12	2.58	2.33	2.38	2.28	2.22	2.15	2.45	2.63	2.64	2.68	2.80	2.87	2.84	2.96	3.08	2.37
13	2.62	2.23	2.11	2.27	2.12	2.08	2.04	2.28	2.45	2.47	2.52	2.62	2.62	2.72	2.82	2.58
14	2.41	2.32	2.10	1.99	2.16	2.05	2.00	1.94	2.15	2.27	2.34	2.41	2.42	2.46	2.58	2.26

Table D.1—Continued

YOS	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
15	2.80	2.19	2.23	2.01	1.95	2.13	2.03	1.96	1.87	2.06	2.18	2.29	2.25	2.27	2.30	2.64
16	2.88	2.31	2.07	2.20	1.97	1.88	2.07	1.95	1.88	1.82	1.99	2.21	2.23	2.10	2.24	1.60
17	2.05	2.36	2.18	2.06	2.16	1.97	1.88	2.02	1.91	1.82	1.77	2.00	2.17	2.12	2.07	1.26
18	2.78	1.66	2.17	2.15	1.98	2.09	1.95	1.83	1.93	1.82	1.79	1.77	1.98	2.06	2.09	1.04
19	2.75	2.22	1.52	2.13	2.14	1.98	2.09	1.93	1.77	1.88	1.84	1.82	1.78	1.94	2.11	0.72
20	2.37	2.03	1.84	1.26	1.70	1.67	1.57	1.68	1.51	1.39	1.47	1.44	1.39	1.32	1.43	2.22
21+	5.42	4.84	5.02	5.45	5.13	5.16	5.37	5.55	5.86	5.78	5.80	5.94	5.93	6.05	5.87	10.64

### Missing Data in the Prospective Analysis

Condition-specific ratings are not reported consistently in two of the legacy disability files, namely, the Military Personnel Data System (MilPDS) and the Joint Disability Evaluation Tracking System (JDETS). While the Physical Disability Case Processing System (PDCAPS), Veterans Tracking Application (VTA), and Electronic Physical Evaluation Board (ePEB) are more likely to report condition-specific ratings, missing condition-specific ratings are still common. As shown in Table D.2, approximately 15 percent of cases where we observe a VASRD code for PTSD, and 22 percent of cases where we observe a VASRD for TBI, do not have an associated value for the condition's rating across all data sources.<sup>1</sup> There are relatively high rates of missing data on condition ratings for our comparison conditions as well: approximately 17 and 30 percent of observations with Veterans Affairs Schedule for Rating Disabilities VASRD codes for back pain and MDD, respectively, have missing values for the ratings. There are several reasons why we may not observe a rating in the data. One is that the rating process occurs after disposition and is expected to take 15 days (DoD, 2011). For recent cohorts, we may observe a final disposition, but ratings may not yet have been determined for all cases by the time of the data extraction. Table D.2 shows that the share of cases with missing condition-specific ratings occurring in the last three years, 2015–2017 (e.g., those who could plausibly still be in the process of receiving a rating) range between 8 percent for observations with a back pain VASRD to a high of 27 percent for observations with a PTSD VASRD.

By contrast, the data on DoD total ratings is complete for nearly all medical discharges we observe in the data (98–99 percent). As a result, we present here overall DoD ratings due to additional challenges with missing data for condition-specific ratings. While the focus on DoD rating does not allow us to analyze the specific rating that was

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<sup>1</sup> The vast majority of cases with missing data on condition ratings come from JDETS or MilPDS. Approximately 95 percent of cases from VTA, ePEB and PDCAPS have data on condition ratings for both PTSD and TBI. By comparison, 41(23) percent of PTSD(TBI) cases in JDETS have data on condition ratings, and 68(82) percent of PTSD (TBI) cases in MilPDS have data on condition ratings.

**Table D.2**  
**Comparing Missing Observations for DoD and Condition-Specific Ratings**

	PTSD	TBI	Back Pain	MDD	Apnea
Percentage of medical discharges in diagnosis cohort with <i>any</i> observed VASRD code	98	98	98	97	97
Percentage of medical retirement/separation disposition in the three-year window with a non-missing DoD rating	79	66	51	79	61
Percentage of those who ever had a medical retirement/separation disposition with a non-missing DoD rating	99	99	99	98	99
Percentage of medical retirements/separations who were rated for the specified condition and have a rating for the condition (ever)	85	78	83	70	48
Percentage of missing cases occurring in last three fiscal years	27	12	8	15	2

received for the rated condition, this approach ensures consistency for compiling data over time and from these various data sources.

### ***Co-Occurring Diagnoses***

Tables D.3 and D.4 show the distribution of other diagnoses among the PTSD and TBI cohorts. Consistent with the disability ratings, nearly two-thirds of the PTSD diagnosis cohorts also received a diagnosis for depression at some point during the analysis period. The share ever receiving a diagnosis for back pain is also high, having increased from 46 percent in 2002 to 76 percent by 2015. Diagnosis for sleep conditions also increase significantly over the analysis period, from 25 percent in 2002 to 81 percent by the 2015 diagnosis cohort.

Table D.4 shows that back pain is the most common co-occurring diagnosis in the TBI diagnosis cohorts, with between 50 and 60 percent of the diagnosis cohort receiving a diagnosis for back pain at one time or other. The share of the TBI cohorts receiving a sleep diagnosis also increase significantly over time, from 25 percent in the 2002 diagnosis cohort to 54 percent of the 2015 diagnosis cohort.

**Table D.3**  
**Share of Posttraumatic Stress Disorder Diagnosis Cohorts Ever Who Received a Diagnosis for the Indicated Condition**  
**(as a Percentage)**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TBI	9	12	15	19	23	32	40	39	39	39	39	37	35	33
Any depression	65	67	66	61	61	63	65	68	69	68	68	67	67	66
Back injury	46	53	54	56	60	63	68	70	72	73	74	75	76	76
MDD	39	38	37	32	32	32	32	35	35	35	33	33	33	34
Any sleep condition	25	29	35	41	51	59	67	71	74	77	80	80	81	81
Sleep apnea	11	11	13	15	20	24	28	31	34	35	37	38	40	42

**Table D.4**  
**Share of Traumatic Brain Injury Diagnosis Cohorts Who Received a Diagnosis for the Indicated Condition**  
**(as a Percentage)**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
PTSD	9	10	12	15	19	27	33	32	31	30	29	26	24	22
Back pain	50	53	55	56	57	59	62	63	63	63	63	63	63	61
Any sleep condition	25	27	29	32	38	46	55	57	57	59	59	58	56	54
MDD	9	10	11	12	13	15	16	17	17	16	15	15	14	14
Sleep apnea	14	14	14	15	16	19	22	23	23	24	24	24	24	23
Any depression	22	24	26	27	30	34	38	40	39	38	37	35	35	33

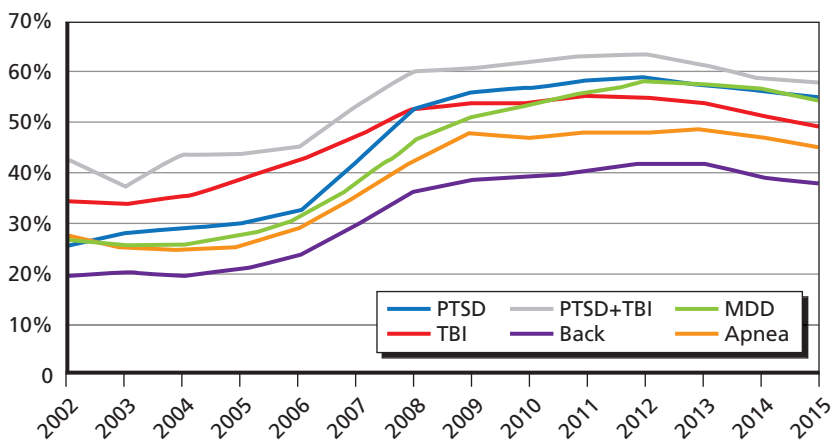


### Disability Ratings

Figure D.3 shows that the average total DoD rating increased for all conditions over the analysis period. The average total DoD rating for TBI increased from approximately 34 percent in 2002 to a high of 55 percent in 2012, while the average total DoD rating for PTSD increased from approximately 25 percent in 2002 to 58 percent in 2012. The average rating for the joint PTSD-TBI cohort was the highest throughout the entire analysis period, ranging from 42 percent in 2002 to a high of 63 percent in 2013. Importantly, there was a sharp increase in total DoD rating for the PTSD diagnosis cohorts beginning in 2008. Because we are analyzing ratings received within three years of first diagnosis, this cohort likely reflects one of the first groups to be impacted by the DoD's 2008 instruction to abide by the VASRD, including a requirement to give service members unfit due to PTSD a rating of not less than 50 percent.

**Figure D.3**

**Average Department of Defense Total Rating Among Service Members in Diagnosis Cohort Who Received a Rating Within Three Years of First Traumatic Brain Injury Diagnosis, 2002–2015**



NOTES: Fiscal year on the x-axis represents the fiscal year of first diagnosis. Cohorts defined based on the first fiscal year in which a diagnosis observed in the MDR, using the ICD codes documented in Tables B.8–B.13. Diagnosis cohorts are not mutually exclusive.

The comparison condition diagnosis cohorts also experienced marked increases in total DoD ratings between 2002 and 2015: the average total DoD rating for back pain increased from 19 percent in 2002 to 41 percent in 2012, the average total DoD rating for apnea increased from 27 to 48 percent, and the average total DoD rating for MDD diagnosis cohorts increased from 26 to 58 percent. Because the total DoD rating is a composite of ratings for all conditions, we are unable to determine whether these increases result from increased rating for the cohort condition or another condition. However, ratings for all groups experienced a notable increase between 2006 and 2009, a period of significant policy changes for PTSD and sleep apnea.

Figure 3.10 showed the distribution of final outcomes among diagnosis cohorts as of the end of our data period, including medical discharge through the Disability Evaluation System (DES), Expiration Term of Service (ETS), nondisability retirement, administrative separation, still serving, death, or unknown. Tables D.4–D.10 show the numbers behind these figures. Additionally, Table D.11–D.16 show the distributions with those still serving removed (i.e., only those who left service by the end of our data period).

Beginning with Table D.11, individuals who are still serving are removed from the distribution of final status. In other words, Tables D.10–D.16 are conditional on individuals having left the military by the time our data ended in FY2017. A larger share of more recent (first diagnosis) cohorts were still serving when our data ended (as shown in Figure 3.10), so the portion of the cohort represented in these tables gets smaller in more recent years. Sample sizes (the number in the cohort no longer serving) are shown and can be compared with sample sizes in Tables D.5–D.10 to provide a sense of the share of the cohort represented.

**Table D.5  
Distribution of Posttraumatic Stress Disorder Diagnosis Cohort Status at End of Observation, by Fiscal Year of First Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	2,975	2,656	4,806	8,418	9,182	12,562	17,144	17,003	17,642	18,753	20,283	18,248	16,586	15,837	15,624	13,709
	Percentage															
DES	21	23	29	29	30	34	37	35	35	36	39	39	38	36	32	27
ETS	19	19	21	25	22	21	19	19	19	18	17	16	13	11	9	5
Retired (nondisability)	17	15	13	13	15	14	14	15	16	15	14	14	15	15	15	7
Administrative separation	34	34	29	25	23	22	20	21	21	21	19	17	16	14	10	5
Still serving	3	4	4	5	6	7	8	8	8	9	10	12	16	22	32	54
Death	0.5	0.2	0.4	0.5	0.6	0.4	0.6	0.5	0.6	0.3	0.3	0.3	0.3	0.2	0.1	0.1
Unknown	5	5	3	3	3	2	1	1	1	1	1	1	1	1	1	3



**Table D.7**  
**Distribution of Posttraumatic Stress Disorder plus Traumatic Brain Injury Diagnosis Cohort Status at End of**  
**Observation, by Fiscal Year of First Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	1,192	1,191	1,651	2,589	3,364	5,568	9,059	7,777	7,394	7,368	6,804	5,417	4,243	3,508	2,685	1,349
	<b>Percentage</b>															
DES	34	36	41	44	47	55	51	49	49	49	51	51	49	47	42	36
ETS	13	15	14	14	14	13	14	14	15	14	13	11	9	7	6	4
Retired (nondisability)	19	17	13	13	12	9	10	11	10	10	9	10	11	12	14	7
Administrative separation	17	18	16	14	13	12	13	15	15	15	14	13	12	10	7	4
Still serving	14	12	13	12	11	10	10	10	10	12	12	14	17	21	30	45
Death	0.5	0.4	0.4	0.8	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.1	0.1
Unknown	3	3	2	2	2	1	1	1	1	1	1	1	1	1	2	3



**Table D.9  
Distribution of Major Depressive Disorder Diagnosis Cohort Status at End of Observation, by Fiscal Year of First  
Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort	13,318	10,941	11,182	12,018	12,011	13,058	14,187	15,205	15,211	15,817	15,252	14,488	13,783	14,725	16,587	15,591
	<b>Percentage</b>															
DES	17	17	17	18	19	21	26	27	29	30	33	34	34	33	29	23
ETS	18	19	20	20	19	18	17	18	17	17	16	16	13	12	9	4
Retired (nondisability)	26	20	18	15	15	13	11	11	11	10	9	9	9	7	7	3
Administrative separation	31	35	36	38	38	38	36	35	33	33	30	28	26	23	18	8
Still serving	3	4	5	5	6	7	7	7	8	9	10	13	16	24	37	59
Death	0.3	0.4	0.3	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.3	0.4	0.3	0.1
Unknown	5	5	4	4	3	3	2	2	1	1	1	1	1	1	1	2





**Table D.11**  
**Distribution of Posttraumatic Stress Disorder Diagnosis Cohort Status, Excluding Those Still Serving, at End of Observation, by Fiscal Year of First Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort no longer serving	2,885	2,558	4,595	8,015	8,602	11,660	15,755	15,605	16,152	17,034	18,231	16,036	13,948	12,366	10,626	6,331
	<b>Percentage</b>															
DES	22	24	31	31	32	36	40	38	38	40	43	45	46	46	48	58
ETS	19	20	22	26	24	22	21	21	21	20	19	18	16	14	13	11
Retired (nondisability)	18	15	14	13	16	15	15	16	17	17	15	16	18	20	22	16
Administrative separation	35	36	30	26	25	24	22	23	23	23	21	20	19	18	15	11
Death	0.5	0.2	0.4	0.5	0.7	0.4	0.7	0.6	0.6	0.4	0.3	0.4	0.3	0.3	0.2	0.2
Unknown	5	5	3	3	4	2	2	1	1	1	1	1	1	2	2	5

**Table D.12**  
**Distribution of Traumatic Brain Injury Diagnosis Cohort Status, Excluding Those Still Serving, at End of Observation, by Fiscal Year of First Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort no longer serving	10,420	9,594	10,068	10,536	11,249	13,630	20,420	19,198	19,150	20,335	19,168	16,812	13,846	11,341	7,431	4,045
	<b>Percentage</b>															
DES	16	16	18	19	22	29	30	29	29	30	31	32	33	35	39	51
ETS	34	36	35	35	35	30	33	31	32	32	32	31	29	26	21	16
Retired (nondisability)	17	16	15	14	13	11	11	11	10	10	10	10	11	12	16	12
Administrative separation	26	27	28	27	26	25	23	26	27	26	26	25	25	25	21	14
Death	1.1	1.4	1.4	1.7	1.9	1.5	1.3	1.1	1.0	0.9	0.8	0.9	0.8	0.9	0.8	1.2
Unknown	5	4	3	3	3	2	1	1	1	1	1	1	1	2	2	6

**Table D.13****Distribution of Posttraumatic Stress Disorder plus Traumatic Brain Injury Diagnosis Cohort Status, Excluding Those Still Serving at End of Observation, by Fiscal Year of First Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort no longer serving	1,021	1,054	1,439	2,275	2,988	5,030	8,127	6,991	6,677	6,503	5,986	4,657	3,516	2,756	1,885	743
	<b>Percentage</b>															
DES	40	41	47	50	53	60	57	54	54	56	58	59	60	60	60	65
ETS	15	17	16	16	16	14	16	16	17	15	15	13	11	9	9	8
Retired (nondisability)	22	19	15	14	13	10	11	12	11	11	10	12	13	16	19	13
Administrative separation	19	20	18	16	15	14	14	17	17	17	16	15	15	13	10	8
Death	0.6	0.5	0.4	1.0	1.0	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.2	0.1
Unknown	3	3	2	2	2	2	1	1	1	1	1	1	2	1	2	6



**Table D.15**  
**Distribution of Major Depressive Disorder Diagnosis Cohort Status, Excluding Those Still Serving, at End of Observation, by Fiscal Year of First Diagnosis**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number in cohort no longer serving	12,922	10,535	10,663	11,406	11,299	12,184	13,168	14,077	14,024	14,415	13,737	12,615	11,528	11,216	10,529	6,371
	<b>Percentage</b>															
DES	17	17	18	19	20	23	28	29	32	33	37	39	41	43	45	57
ETS	18	19	20	21	20	20	19	19	19	19	18	18	16	16	15	10
Retired (nondisability)	26	21	19	16	15	13	12	12	12	11	10	10	11	10	10	7
Administrative separation	32	36	38	40	40	41	39	38	36	36	33	32	31	30	28	20
Death	0.3	0.4	0.4	0.5	0.6	0.5	0.6	0.6	0.5	0.6	0.5	0.4	0.4	0.5	0.4	0.3
Unknown	6	6	4	4	4	3	2	2	1	1	1	1	1	2	2	6



## Time to Diagnosis

Chapter Four presented results of a multivariate analysis of duration-to-DES disposition. This section provides additional technical details about those analyses.

### Modeling the Hazard of DES Referral

#### *Kaplan-Meier*

The analyses in Chapter Four were hazard and survival analyses. They allow us to deal with data censoring, since we do not observe all service members after diagnosis until they are referred to DES. The first form of censoring, that some service members are still active duty by the end of our data set's period of observation in 2017, is especially true for more recent diagnosis cohorts. That is, these service members have not been referred to DES by the time our data end, but they may still be referred in the future. We used the Kaplan-Meier "survivor" function technique to deal with this, where the survival function measures the fraction of the diagnosis cohort who had not yet been referred to DES at each year after diagnosis. The survival function measures the opposite of the hazard: a lower hazard means that more individuals have "survived"—or in our context, remain in active duty without referral to DES—and thus the survival rate is higher. Right-censored service members (those who were still serving at the time our data ended or who left the military for a reason other than medical discharge, e.g., completion of term of service or retirement) do not add to the hazard of being referred to DES in the years after their censoring, since they are not "at risk" at being referred. Put differently, once censored, these individuals are not counted in the denominator or numerator of calculating the hazard rate for the years after diagnosis, and thus cannot be subtracted from the fraction who have not been censored (the survivor curve) after their censoring point. For example, since we cannot observe the hazard of DES referral ten years after diagnosis for those who were diagnosed in any year after 2007, our calculations of the hazard rate in the tenth year after diagnosis is based on service members diagnosed prior to 2007.

The second source of right-censoring stems from service members no longer being “at risk” of DES referral due to separation for another reason (e.g., administrative separation, ETS). Once separated for one of these other reasons, that service member cannot be referred to DES, and thus should not count in the calculation of the underlying hazard function after this separation.

In contrast to the first source of right-censoring, there is no single agreed-upon approach to addressing this second source of censoring. This analysis takes the cause-specific hazard approach: That is, we focus just on DES referral as our outcome of interest, and we assume that up until separation for non-DES-related reasons, service members have the same underlying hazard until this separation. This approach assumes that this right-censoring is not informative as to underlying DES hazard and that up until censoring, observationally equivalent service members have the same hazard, and other separation does not influence these prior hazards.

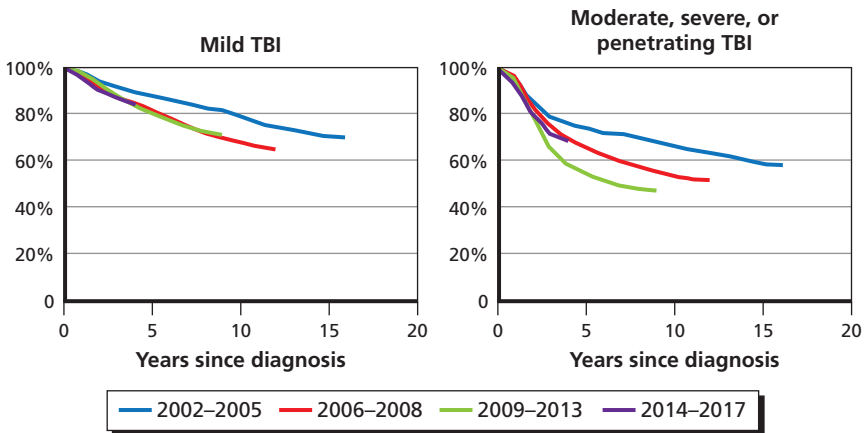
The major advantage to this approach is that it allows us to focus on DES entry as a single hazard of interest in a tractable and intuitive way: We do not model interrelationships among separation risks, and once separated for another reason, service members are no longer “at risk” of DES referral. The major disadvantage is that separating for another reason could be informative about how likely that individual was to be referred to DES prior to separation (e.g., if a TBI-diagnosed service member separated at the end of a term of service and was never referred to DES prior to separation, this service member may have had a less severe TBI condition prior to separation conditional on what we can observe, and his or her inclusion without accounting for this unobserved lower severity may bias estimates of hazard lower). Unfortunately, there is no direct way to test for whether this form of censoring is informative with regard to other hazards (Tsiatis, 1975), and the alternative analysis of subdistribution hazards using cumulative incidence functions (Fine and Gray, 1999), would assume service members remain “at risk” for DES and introduce substantial bias in its own right (Allison, 2018). An alternative approach would be to directly model the interrelationship of hazards for DES referral and different forms of separation; however, such modeling would require additional assump-



tions, and this analysis is focused on applying a consistent methodology to make comparisons across cohorts and service member characteristics. Although we could have done this in other ways, in focusing our comparisons across cohorts and service member characteristics, we deprioritized the relationship between hazards for different types of separation outcomes; we save explicit modeling of multi-cause separation hazards for future analyses.

Chapter Four showed the Kaplan-Meier estimates for six cohorts: PTSD, TBI, PTSD+TBI, MDD, sleep apnea, and back pain. Figure D.4 shows the results for two specific TBI severity cohorts, mild and moderate, severe, or penetrating.

**Figure D.4**  
Kaplan-Meier Survivor Curve Estimates, by Diagnosis and Year of Diagnosis



### ***Cox Proportional Hazard***

Kaplan-Meier estimates do not control for cross-cohort differences in observable characteristics. For example, if later cohorts have lower average education, and lower education is positively correlated with DES referral, such differences would lead to cross-cohort differences due only to differences in individual characteristics. Furthermore, these estimates include all services, and service-specific trends across cohorts may differ.

To incorporate these potential confounding issues, we use Cox Proportional Hazard (PH) models to estimate the role of observable characteristics and service-specific time trends in the hazard of DES referral after diagnosis. The Cox PH approach assumes that the hazard function for service member  $i$  with a vector of individual characteristics  $\mathbf{X}_i$  can be written as:

$$h_i(t, \mathbf{X}_i) = h_0(t) e^{\beta' \mathbf{X}_i},$$

where  $h_0(t)$  is the baseline hazard, and  $\beta$  is a vector of regression coefficients and includes an intercept term. The regressions all include service by year-of-diagnosis indicator variables, which allows for statistical estimation of how the hazard of DES referral after diagnosis varies across services and diagnosis cohorts. In addition, each regression includes a range of covariates; Table D.4 provides the estimated coefficients on these covariates, which are

1. sex (whether the service member was female; male is the baseline group)
2. race/ethnicity (separate variables for Black, non-Hispanic; Hispanic; and Other, non-Hispanic; White, non-Hispanic is the baseline group)
3. race/ethnicity interacted with sex
4. educational level (separate variables for less than high school, some college, and college or higher; high school is the baseline group)
5. cumulative months deployed in the year of diagnosis
6. ever deployed by the year of diagnosis
7. indicator variables for cumulative YOS at the time of diagnosis, ranging from 0 to 20<sup>e</sup> (3 is the baseline group)
8. pay grade groupings (E4 is the baseline group)
9. standardized occupational measure (“Artillery/Seaman/Air Crew/Small Boat Operator/Infantry” is the baseline group).

All results reported in Table D.17 are hazard ratios, such that an estimated ratio greater than 1 implies that the variable has a greater likelihood of DES referral sooner (i.e., a higher hazard), estimates less

**Table D.17**

**Disability Evaluation System Hazard Ratios from Cox Proportional Hazard Models, Including Service × Year Indicator Variables**

	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI	Both PTSD and TBI	Back Pain	MDD	Apnea
Black, non-Hispanic	0.821 <sup>ab</sup> (0.0102)	0.777 <sup>ab</sup> (0.0107)	0.755 <sup>ab</sup> (0.0137)	0.870 <sup>ab</sup> (0.0275)	0.778 <sup>ab</sup> (0.0142)	0.752 <sup>ab</sup> (0.00562)	0.964 <sup>a</sup> (0.0140)	0.803 <sup>ab</sup> (0.00866)
Hispanic	0.860 <sup>ab</sup> (0.0110)	0.771 <sup>ab</sup> (0.0107)	0.748 <sup>ab</sup> (0.0140)	0.810 <sup>ab</sup> (0.0259)	0.839 <sup>ab</sup> (0.0146)	0.733 <sup>ab</sup> (0.00638)	0.964 <sup>a</sup> (0.0148)	0.853 <sup>ab</sup> (0.0109)
Other, non-Hispanic	0.892 <sup>ab</sup> (0.0143)	0.846 <sup>ab</sup> (0.0142)	0.821 <sup>ab</sup> (0.0185)	0.876 <sup>ab</sup> (0.0328)	0.879 <sup>ab</sup> (0.0195)	0.784 <sup>ab</sup> (0.00792)	0.995 (0.0176)	0.824 <sup>ab</sup> (0.0123)
Female	1.072 <sup>ab</sup> (0.0159)	1.301 <sup>ab</sup> (0.0234)	1.397 <sup>ab</sup> (0.0306)	1.238 <sup>ab</sup> (0.0598)	1.050 <sup>b</sup> (0.0287)	1.383 <sup>ab</sup> (0.0109)	1.087 <sup>ab</sup> (0.0145)	1.392 <sup>ab</sup> (0.0262)
Female × Black, non-Hispanic	1.059 <sup>a</sup> (0.0254)	1.050 (0.0324)	1.059 (0.0396)	1.026 (0.0857)	1.078 <sup>b</sup> (0.0485)	0.947 <sup>ab</sup> (0.0127)	0.961 <sup>b</sup> (0.0221)	1.048 <sup>b</sup> (0.0284)
Female × Hispanic	0.888 <sup>ab</sup> (0.0276)	0.894 <sup>ab</sup> (0.0361)	0.953 (0.0459)	0.889 (0.0990)	0.904 <sup>b</sup> (0.0518)	0.858 <sup>ab</sup> (0.0158)	0.821 <sup>ab</sup> (0.0245)	0.935 <sup>b</sup> (0.0381)
Female × other, non-Hispanic	0.976 (0.0328)	0.962 (0.0418)	0.997 (0.0522)	1.025 (0.113)	0.990 (0.0626)	0.926 <sup>ab</sup> (0.0184)	0.881 <sup>ab</sup> (0.0278)	1.044 (0.0443)
Less than high school	1.076 <sup>ab</sup> (0.0129)	1.136 <sup>ab</sup> (0.0149)	1.175 <sup>ab</sup> (0.0206)	1.030 (0.0328)	1.097 <sup>ab</sup> (0.0180)	1.202 <sup>ab</sup> (0.00981)	1.072 <sup>ab</sup> (0.0160)	1.195 <sup>ab</sup> (0.0172)
Some college	1.048 <sup>ab</sup> (0.0136)	1.054 <sup>ab</sup> (0.0162)	1.046 <sup>a</sup> (0.0214)	1.025 (0.0365)	1.025 (0.0212)	1.057 <sup>ab</sup> (0.00936)	1.049 <sup>ab</sup> (0.0149)	0.933 <sup>ab</sup> (0.0110)
College plus	1.056 <sup>ab</sup> (0.0196)	1.042 <sup>b</sup> (0.0220)	1.040 (0.0291)	1.052 (0.0499)	1.031 (0.0300)	1.063 <sup>ab</sup> (0.0116)	1.125 <sup>ab</sup> (0.0213)	0.918 <sup>ab</sup> (0.0147)

Table D.17—Continued

	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI	Both PTSD and TBI	Back Pain	MDD	Apnea
Cumulative months deployed at diagnosis (dx)	0.992 <sup>ab</sup> (0.000453)	0.995 <sup>ab</sup> (0.000525)	0.996 <sup>ab</sup> (0.000711)	1.000 (0.00118)	0.996 <sup>ab</sup> (0.000677)	1.005 <sup>ab</sup> (0.000387)	1.005 <sup>ab</sup> (0.000551)	0.997 <sup>ab</sup> (0.000432)
Ever deployed before dx	1.001 (0.0145)	1.084 <sup>ab</sup> (0.0146)	1.025 (0.0176)	1.112 <sup>ab</sup> (0.0337)	1.257 <sup>ab</sup> (0.0282)	0.904 <sup>ab</sup> (0.00625)	0.963 <sup>ab</sup> (0.0121)	0.905 <sup>ab</sup> (0.0108)
Dummy for YOS== (3 omitted)								
0	0.446 <sup>ab</sup> (0.0235)	0.605 <sup>ab</sup> (0.0184)	0.585 <sup>ab</sup> (0.0220)	0.593 <sup>ab</sup> (0.0452)	0.625 <sup>ab</sup> (0.0336)	0.649 <sup>ab</sup> (0.00832)	0.454 <sup>ab</sup> (0.0166)	0.493 <sup>ab</sup> (0.0386)
1	0.826 <sup>ab</sup> (0.0209)	0.731 <sup>ab</sup> (0.0156)	0.676 <sup>ab</sup> (0.0186)	0.790 <sup>ab</sup> (0.0376)	0.773 <sup>ab</sup> (0.0251)	0.785 <sup>ab</sup> (0.00866)	0.772 <sup>ab</sup> (0.0172)	0.722 <sup>ab</sup> (0.0221)
2	0.976 (0.0166)	0.878 <sup>ab</sup> (0.0145)	0.840 <sup>ab</sup> (0.0184)	0.904 <sup>ab</sup> (0.0345)	0.911 <sup>ab</sup> (0.0207)	0.941 <sup>ab</sup> (0.00875)	0.926 <sup>ab</sup> (0.0165)	0.976 (0.0202)
4	1.122 <sup>ab</sup> (0.0181)	1.132 <sup>ab</sup> (0.0199)	1.136 <sup>ab</sup> (0.0264)	1.088 <sup>a</sup> (0.0450)	1.038 (0.0239)	1.115 <sup>ab</sup> (0.0118)	1.144 <sup>ab</sup> (0.0210)	1.200 <sup>ab</sup> (0.0228)
5	1.170 <sup>ab</sup> (0.0198)	1.166 <sup>ab</sup> (0.0224)	1.166 <sup>ab</sup> (0.0296)	1.104 <sup>a</sup> (0.0503)	1.100 <sup>ab</sup> (0.0271)	1.194 <sup>ab</sup> (0.0139)	1.197 <sup>ab</sup> (0.0236)	1.319 <sup>ab</sup> (0.0252)
6	1.172 <sup>ab</sup> (0.0212)	1.242 <sup>ab</sup> (0.0259)	1.249 <sup>ab</sup> (0.0345)	1.135 <sup>a</sup> (0.0559)	1.102 <sup>ab</sup> (0.0296)	1.189 <sup>ab</sup> (0.0153)	1.190 <sup>ab</sup> (0.0253)	1.369 <sup>ab</sup> (0.0271)
7	1.210 <sup>ab</sup> (0.0230)	1.274 <sup>ab</sup> (0.0284)	1.285 <sup>ab</sup> (0.0378)	1.138 <sup>a</sup> (0.0595)	1.113 <sup>ab</sup> (0.0319)	1.171 <sup>ab</sup> (0.0164)	1.197 <sup>ab</sup> (0.0269)	1.342 <sup>ab</sup> (0.0276)
8	1.265 <sup>ab</sup> (0.0258)	1.252 <sup>ab</sup> (0.0305)	1.240 <sup>ab</sup> (0.0402)	1.234 <sup>ab</sup> (0.0682)	1.100 <sup>ab</sup> (0.0340)	1.184 <sup>ab</sup> (0.0173)	1.244 <sup>ab</sup> (0.0300)	1.441 <sup>ab</sup> (0.0310)

Table D.17—Continued

	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI	Both PTSD and TBI	Back Pain	MDD	Apnea
9	1.264 <sup>ab</sup> (0.0273)	1.235 <sup>ab</sup> (0.0314)	1.274 <sup>ab</sup> (0.0428)	1.083 (0.0651)	1.086 <sup>a</sup> (0.0350)	1.187 <sup>ab</sup> (0.0183)	1.266 <sup>ab</sup> (0.0316)	1.436 <sup>ab</sup> (0.0317)
10	1.316 <sup>ab</sup> (0.0294)	1.291 <sup>ab</sup> (0.0342)	1.250 <sup>ab</sup> (0.0442)	1.207 <sup>ab</sup> (0.0748)	1.088 <sup>a</sup> (0.0365)	1.214 <sup>ab</sup> (0.0197)	1.260 <sup>ab</sup> (0.0332)	1.462 <sup>ab</sup> (0.0327)
11	1.312 <sup>ab</sup> (0.0307)	1.312 <sup>ab</sup> (0.0360)	1.286 <sup>ab</sup> (0.0478)	1.114 <sup>b</sup> (0.0730)	1.134 <sup>ab</sup> (0.0393)	1.202 <sup>ab</sup> (0.0207)	1.233 <sup>ab</sup> (0.0338)	1.462 <sup>ab</sup> (0.0337)
12	1.300 <sup>ab</sup> (0.0319)	1.310 <sup>ab</sup> (0.0386)	1.298 <sup>ab</sup> (0.0516)	1.290 <sup>ab</sup> (0.0862)	1.072 <sup>b</sup> (0.0403)	1.170 <sup>ab</sup> (0.0212)	1.287 <sup>ab</sup> (0.0365)	1.470 <sup>ab</sup> (0.0344)
13	1.260 <sup>ab</sup> (0.0327)	1.309 <sup>ab</sup> (0.0411)	1.351 <sup>ab</sup> (0.0560)	1.167 <sup>a</sup> (0.0873)	1.068 <sup>b</sup> (0.0422)	1.074 <sup>ab</sup> (0.0210)	1.202 <sup>ab</sup> (0.0360)	1.314 <sup>ab</sup> (0.0322)
14	1.237 <sup>ab</sup> (0.0340)	1.257 <sup>ab</sup> (0.0416)	1.240 <sup>ab</sup> (0.0548)	1.164 <sup>a</sup> (0.0888)	1.081 <sup>b</sup> (0.0453)	1.107 <sup>ab</sup> (0.0223)	1.214 <sup>ab</sup> (0.0384)	1.280 <sup>ab</sup> (0.0322)
15	1.130 <sup>ab</sup> (0.0331)	1.230 <sup>ab</sup> (0.0434)	1.224 <sup>ab</sup> (0.0586)	1.093 (0.0876)	0.962 (0.0437)	1.096 <sup>ab</sup> (0.0234)	1.106 <sup>ab</sup> (0.0370)	1.160 <sup>ab</sup> (0.0301)
16	1.061 <sup>b</sup> (0.0330)	1.203 <sup>ab</sup> (0.0455)	1.153 <sup>ab</sup> (0.0586)	1.089 (0.0914)	0.965 (0.0463)	1.146 <sup>ab</sup> (0.0251)	1.029 (0.0364)	1.105 <sup>ab</sup> (0.0293)
17	0.959 (0.0314)	1.162 <sup>ab</sup> (0.0451)	1.087 (0.0588)	1.066 (0.0920)	0.984 (0.0468)	1.128 <sup>ab</sup> (0.0270)	1.010 (0.0367)	1.044 (0.0283)
18	0.888 <sup>ab</sup> (0.0304)	1.174 <sup>ab</sup> (0.0481)	1.199 <sup>ab</sup> (0.0661)	1.063 (0.0949)	0.969 (0.0504)	1.206 <sup>ab</sup> (0.0293)	0.989 (0.0367)	0.970 (0.0262)

Table D.17—Continued

	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI	Both PTSD and TBI	Back Pain	MDD	Apnea
19	0.789 <sup>ab</sup> (0.0270)	1.103 <sup>a</sup> (0.0471)	0.997 (0.0586)	0.950 (0.0904)	0.982 (0.0529)	1.233 <sup>ab</sup> (0.0313)	0.855 <sup>ab</sup> (0.0336)	0.744 <sup>ab</sup> (0.0199)
20+	0.926 <sup>ab</sup> (0.0238)	1.404 <sup>ab</sup> (0.0427)	1.411 <sup>ab</sup> (0.0581)	1.241 <sup>ab</sup> (0.0819)	1.050 (0.0421)	1.477 <sup>ab</sup> (0.0296)	1.127 <sup>ab</sup> (0.0336)	0.849 <sup>ab</sup> (0.0178)
Paygrade (E4 omitted)								
E1–E3	0.890 <sup>ab</sup> (0.0144)	1.100 <sup>ab</sup> (0.0177)	1.125 <sup>ab</sup> (0.0236)	1.008 (0.0364)	1.156 <sup>ab</sup> (0.0274)	1.074 <sup>ab</sup> (0.00944)	0.872 <sup>ab</sup> (0.0141)	0.986 (0.0198)
E5–E6	0.802 <sup>ab</sup> (0.00900)	0.699 <sup>ab</sup> (0.00906)	0.675 <sup>ab</sup> (0.0117)	0.735 <sup>ab</sup> (0.0227)	0.766 <sup>ab</sup> (0.0128)	0.611 <sup>ab</sup> (0.00494)	0.814 <sup>ab</sup> (0.0109)	0.681 <sup>ab</sup> (0.00820)
E7–E9	0.468 <sup>ab</sup> (0.00948)	0.393 <sup>ab</sup> (0.00937)	0.366 <sup>ab</sup> (0.0119)	0.469 <sup>ab</sup> (0.0248)	0.447 <sup>ab</sup> (0.0134)	0.284 <sup>ab</sup> (0.00445)	0.526 <sup>ab</sup> (0.0126)	0.330 <sup>ab</sup> (0.00595)
O1–O2	0.480 <sup>ab</sup> (0.100)	0.439 <sup>ab</sup> (0.0734)	0.361 <sup>ab</sup> (0.0832)	0.444 <sup>ab</sup> (0.135)	0.745 (0.220)	0.280 <sup>ab</sup> (0.0203)	0.635 <sup>ab</sup> (0.0936)	0.278 <sup>ab</sup> (0.0498)
O3–O4	0.366 <sup>ab</sup> (0.0757)	0.350 <sup>ab</sup> (0.0588)	0.287 <sup>ab</sup> (0.0667)	0.406 <sup>ab</sup> (0.123)	0.539 <sup>a</sup> (0.159)	0.182 <sup>ab</sup> (0.0133)	0.482 <sup>ab</sup> (0.0711)	0.204 <sup>ab</sup> (0.0361)
O5–O6	0.211 <sup>ab</sup> (0.0453)	0.205 <sup>ab</sup> (0.0370)	0.174 <sup>ab</sup> (0.0432)	0.200 <sup>ab</sup> (0.0665)	0.339 <sup>ab</sup> (0.106)	0.102 <sup>ab</sup> (0.00818)	0.286 <sup>ab</sup> (0.0451)	0.102 <sup>ab</sup> (0.0184)
O7–O10	0.106 <sup>a</sup> (0.108)	0.148 <sup>ab</sup> (0.0917)	0 (0)	0.372 (0.293)	0.148 <sup>b</sup> (0.160)	0.0452 <sup>ab</sup> (0.0165)	0.415 (0.250)	0.0158 <sup>ab</sup> (0.0115)
W1–W2	0.434 <sup>ab</sup> (0.0889)	0.417 <sup>ab</sup> (0.0704)	0.354 <sup>ab</sup> (0.0821)	0.353 <sup>ab</sup> (0.109)	0.621 (0.182)	0.260 <sup>ab</sup> (0.0204)	0.573 <sup>ab</sup> (0.0875)	0.246 <sup>ab</sup> (0.0436)

**Table D.17—Continued**

	<b>PTSD</b>	<b>All TBI</b>	<b>Mild TBI</b>	<b>Mod, Sev, or Pen TBI</b>	<b>Both PTSD and TBI</b>	<b>Back Pain</b>	<b>MDD</b>	<b>Apnea</b>
W3–W5	0.376 <sup>ab</sup> (0.0798)	0.435 <sup>ab</sup> (0.0776)	0.357 <sup>ab</sup> (0.0882)	0.422 <sup>ab</sup> (0.137)	0.635 (0.194)	0.191 <sup>ab</sup> (0.0163)	0.503 <sup>ab</sup> (0.0810)	0.170 <sup>ab</sup> (0.0308)
Observations	209,409	289,464	205,448	38,683	70,767	1,490,873	221,234	385,958

NOTES: Standard errors in parentheses. <sup>ab</sup> p < 0.01, <sup>a</sup> p < 0.05, <sup>b</sup> p < 0.1. Occupation dummies were also included but have been omitted for ease of reporting. Results are available upon request.

than 1 imply a lower hazard, and an estimate indistinguishable from 1 implies no difference in hazard. For simplicity, we have omitted occupation results from the regression tables in this chapter, but coefficients and standard errors are available from the authors upon request.

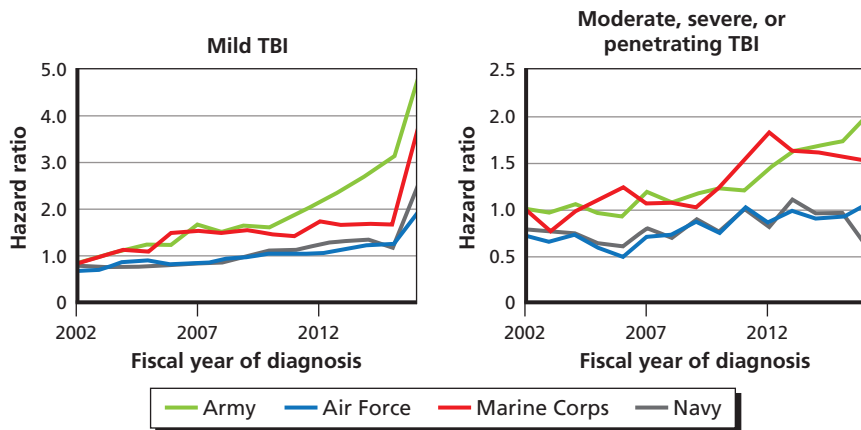
We note three things about the estimates from the Cox PH analysis. First, these analyses are descriptive in nature and thus cannot be interpreted as causal (i.e., that more education causes high rates of DES referral; it is just that rates may be higher among those with more education). Second, all estimates are relative to category omitted, or the baseline category (e.g., males, those with a high school degree) and include all these covariates in the same regression, so the estimated effect is conditional on holding constant the other covariates included. Third, we opted to employ time-invariant measures of these covariates. That is, their values are fixed at the time of diagnosis. This approach leads to more tractable analysis and interpretation of our results.

However, we conducted additional analyses as to how these covariates may vary after diagnosis and how this variability may differ across diagnosis cohorts. Most notably, we focused on deployment experiences subsequent to diagnosis. There were clear differences across cohorts: earlier cohorts were more likely to deploy than more recent diagnosis cohorts. However, these different patterns were accounted for by differences in the year of diagnosis, and trends did not differ substantially in years after diagnosis. Including deployment measures in the year after diagnosis did not change our other estimates, and hence we focus on covariates at the time of diagnosis. In a PH model, these individual characteristics scale the baseline hazard multiplicatively by the same amount at each value of  $t$ , such that if the estimated decrease in DES referral of having a college degree was 10 percent, this estimate implies that there is a 10 percent lower likelihood in every year, from the first year after diagnosis to the tenth, fifteenth, or twentieth year after diagnosis.

Although this proportionality assumption is a strong assumption, the Cox model places no restrictions at all on the shape of the baseline hazard function itself. That is, it allows this hazard to vary in shape nonparametrically. Figure D.5 below shows the estimated service



**Figure D.5**  
**Service by Year-of-Diagnosis Coefficient Estimates from Cox Proportional Hazard Model, by Condition**



by year-of-diagnosis effects from the Cox PH models.<sup>2</sup> The y-axes in Figure D.5 represent the estimated hazard ratios for the service by year-of-diagnosis indicator variables, where a value of 1 indicates that there was no change in the baseline hazard, a value of 2 indicates a doubling of the hazard rate, and a value of 0.5 indicates a hazard rate half of the baseline.

As we did for the Kaplan-Meier estimates, we included the results of the Cox PH model for six cohorts in Chapter Four; we show two additional TBI cohorts below.

Table D.18 reports the same regressions for PTSD and TBI diagnosis, but including additional variables based on the presence of co-diagnoses.

<sup>2</sup> In additional analyses, we stratified the estimation by service, allowing for separate non-parametric hazard functions for each service instead of the proportional estimation reported in Figure D.5. However, the results were nearly identical. Additionally, confidence intervals for the hazard estimates reported in Figure D.5 are available upon request. All results discussed are highly statistically significant.

**Table D.18**  
**Disability Evaluation System Hazard Ratios from Cox Proportional Hazard Models, Including Service × Year and Co-Occurring Condition Indicator Variables**

	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI
With MDD diagnosis	1.347 <sup>ab</sup> (0.0117)			
With depression diagnosis	1.322 <sup>ab</sup> (0.0138)			
With TBI and PTSD diagnosis	1.313 <sup>ab</sup> (0.0105)	3.231 <sup>ab</sup> (0.0300)	3.396 <sup>ab</sup> (0.0414)	2.551 <sup>ab</sup> (0.0555)
With apnea diagnosis		1.419 <sup>ab</sup> (0.0135)	1.518 <sup>ab</sup> (0.0193)	1.209 <sup>ab</sup> (0.0269)
Black, non-Hispanic	0.835 <sup>ab</sup> (0.0104)	0.777 <sup>ab</sup> (0.0107)	0.755 <sup>ab</sup> (0.0137)	0.870 <sup>ab</sup> (0.0275)
Hispanic	0.857 <sup>ab</sup> (0.0109)	0.771 <sup>ab</sup> (0.0107)	0.748 <sup>ab</sup> (0.0140)	0.810 <sup>ab</sup> (0.0259)
Other, non-Hispanic	0.888 <sup>ab</sup> (0.0142)	0.846 <sup>ab</sup> (0.0142)	0.821 <sup>ab</sup> (0.0185)	0.876 <sup>ab</sup> (0.0328)
Female	1.030 <sup>a</sup> (0.0154)	1.301 <sup>ab</sup> (0.0234)	1.397 <sup>ab</sup> (0.0306)	1.238 <sup>ab</sup> (0.0598)
Female × black, non-Hispanic	1.033 (0.0248)	1.050 (0.0324)	1.059 (0.0396)	1.026 (0.0857)
Female × Hispanic	0.889 <sup>ab</sup> (0.0277)	0.894 <sup>ab</sup> (0.0361)	0.953 (0.0459)	0.889 (0.0990)
Female × other, non-Hispanic	0.981 (0.0330)	0.962 (0.0418)	0.997 (0.0522)	1.025 (0.113)
Less than high school	1.056 <sup>ab</sup> (0.0127)	1.136 <sup>ab</sup> (0.0149)	1.175 <sup>ab</sup> (0.0206)	1.030 (0.0328)
Some college	1.042 <sup>ab</sup> (0.0135)	1.054 <sup>ab</sup> (0.0162)	1.046 <sup>a</sup> (0.0214)	1.025 (0.0365)
College plus	1.061 <sup>ab</sup> (0.0197)	1.042 <sup>b</sup> (0.0220)	1.040 (0.0291)	1.052 (0.0499)
Cumulative months deployed at dx	0.992 <sup>ab</sup> (0.000453)	0.995 <sup>ab</sup> (0.000525)	0.996 <sup>ab</sup> (0.000711)	1.000 (0.00118)
Ever deployed before dx	1.020 (0.0148)	1.084 <sup>ab</sup> (0.0146)	1.025 (0.0176)	1.112 <sup>ab</sup> (0.0337)

Table D.18—Continued

	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI
Dummy for YOS== (3 omitted)				
0	0.481 <sup>ab</sup> (0.0254)	0.605 <sup>ab</sup> (0.0184)	0.585 <sup>ab</sup> (0.0220)	0.593 <sup>ab</sup> (0.0452)
1	0.844 <sup>ab</sup> (0.0213)	0.731 <sup>ab</sup> (0.0156)	0.676 <sup>ab</sup> (0.0186)	0.790 <sup>ab</sup> (0.0376)
2	0.976 (0.0167)	0.878 <sup>ab</sup> (0.0145)	0.840 <sup>ab</sup> (0.0184)	0.904 <sup>ab</sup> (0.0345)
4	1.103 <sup>ab</sup> (0.0178)	1.132 <sup>ab</sup> (0.0199)	1.136 <sup>ab</sup> (0.0264)	1.088 <sup>a</sup> (0.0450)
5	1.139 <sup>ab</sup> (0.0193)	1.166 <sup>ab</sup> (0.0224)	1.166 <sup>ab</sup> (0.0296)	1.104 <sup>a</sup> (0.0503)
6	1.136 <sup>ab</sup> (0.0206)	1.242 <sup>ab</sup> (0.0259)	1.249 <sup>ab</sup> (0.0345)	1.135 <sup>a</sup> (0.0559)
7	1.169 <sup>ab</sup> (0.0223)	1.274 <sup>ab</sup> (0.0284)	1.285 <sup>ab</sup> (0.0378)	1.138 <sup>a</sup> (0.0595)
8	1.208 <sup>ab</sup> (0.0246)	1.252 <sup>ab</sup> (0.0305)	1.240 <sup>ab</sup> (0.0402)	1.234 <sup>ab</sup> (0.0682)
9	1.199 <sup>ab</sup> (0.0259)	1.235 <sup>ab</sup> (0.0314)	1.274 <sup>ab</sup> (0.0428)	1.083 (0.0651)
10	1.249 <sup>ab</sup> (0.0279)	1.291 <sup>ab</sup> (0.0342)	1.250 <sup>ab</sup> (0.0442)	1.207 <sup>ab</sup> (0.0748)
11	1.240 <sup>ab</sup> (0.0290)	1.312 <sup>ab</sup> (0.0360)	1.286 <sup>ab</sup> (0.0478)	1.114 <sup>b</sup> (0.0730)
12	1.217 <sup>ab</sup> (0.0299)	1.310 <sup>ab</sup> (0.0386)	1.298 <sup>ab</sup> (0.0516)	1.290 <sup>ab</sup> (0.0862)
13	1.181 <sup>ab</sup> (0.0307)	1.309 <sup>ab</sup> (0.0411)	1.351 <sup>ab</sup> (0.0560)	1.167 <sup>a</sup> (0.0873)
14	1.159 <sup>ab</sup> (0.0319)	1.257 <sup>ab</sup> (0.0416)	1.240 <sup>ab</sup> (0.0548)	1.164 <sup>a</sup> (0.0888)
15	1.061 <sup>a</sup> (0.0311)	1.230 <sup>ab</sup> (0.0434)	1.224 <sup>ab</sup> (0.0586)	1.093 (0.0876)
16	0.993 (0.0309)	1.203 <sup>ab</sup> (0.0455)	1.153 <sup>ab</sup> (0.0586)	1.089 (0.0914)
17	0.910 <sup>ab</sup> (0.0298)	1.162 <sup>ab</sup> (0.0451)	1.087 (0.0588)	1.066 (0.0920)

Table D.18—Continued

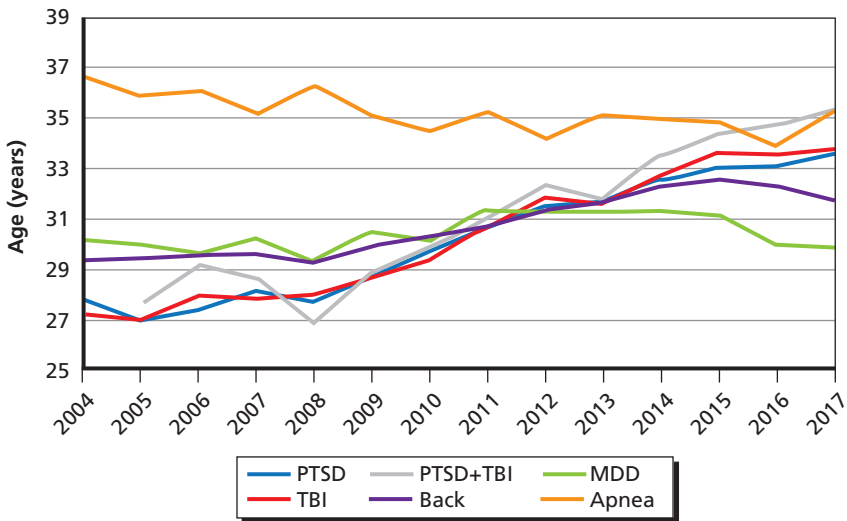
	PTSD	All TBI	Mild TBI	Mod, Sev, or Pen TBI
18	0.842 <sup>ab</sup> (0.0288)	1.174 <sup>ab</sup> (0.0481)	1.199 <sup>ab</sup> (0.0661)	1.063 (0.0949)
19	0.774 <sup>ab</sup> (0.0265)	1.103 <sup>a</sup> (0.0471)	0.997 (0.0586)	0.950 (0.0904)
20+	0.912 <sup>ab</sup> (0.0233)	1.404 <sup>ab</sup> (0.0427)	1.411 <sup>ab</sup> (0.0581)	1.241 <sup>ab</sup> (0.0819)
Paygrade (E4 omitted)				
E1–E3	0.876 <sup>ab</sup> (0.0142)	1.100 <sup>ab</sup> (0.0177)	1.125 <sup>ab</sup> (0.0236)	1.008 (0.0364)
E5–E6	0.803 <sup>ab</sup> (0.00901)	0.699 <sup>ab</sup> (0.00906)	0.675 <sup>ab</sup> (0.0117)	0.735 <sup>ab</sup> (0.0227)
E7–E9	0.477 <sup>ab</sup> (0.00965)	0.393 <sup>ab</sup> (0.00937)	0.366 <sup>ab</sup> (0.0119)	0.469 <sup>ab</sup> (0.0248)
O1–O2	0.494 <sup>ab</sup> (0.103)	0.439 <sup>ab</sup> (0.0734)	0.361 <sup>ab</sup> (0.0832)	0.444 <sup>ab</sup> (0.135)
O3–O4	0.381 <sup>ab</sup> (0.0789)	0.350 <sup>ab</sup> (0.0588)	0.287 <sup>ab</sup> (0.0667)	0.406 <sup>ab</sup> (0.123)
O5–O6	0.226 <sup>ab</sup> (0.0485)	0.205 <sup>ab</sup> (0.0370)	0.174 <sup>ab</sup> (0.0432)	0.200 <sup>ab</sup> (0.0665)
O7–O10	0.107 <sup>a</sup> (0.109)	0.148 <sup>ab</sup> (0.0917)	0 (0)	0.372 (0.293)
W1–W2	0.466 <sup>ab</sup> (0.0956)	0.417 <sup>ab</sup> (0.0704)	0.354 <sup>ab</sup> (0.0821)	0.353 <sup>ab</sup> (0.109)
W3–W5	0.401 <sup>ab</sup> (0.0851)	0.435 <sup>ab</sup> (0.0776)	0.357 <sup>ab</sup> (0.0882)	0.422 <sup>ab</sup> (0.137)
Observations	209,409	289,464	205,448	38,683

NOTES: Standard errors in parentheses. <sup>ab</sup>  $p < 0.01$ , <sup>a</sup>  $p < 0.05$ , <sup>b</sup>  $p < 0.1$ . Occupation dummies were also included but have been omitted for ease of reporting. Results are available upon request.

## Retrospective Analysis

Chapter Five showed YOS and pay grade for disability cohorts, both of which are highly correlated with age. Figure D.6 shows the average age of service members by cohort.

**Figure D.6**  
Average Age of Service Members by Veterans Affairs Schedule for Rating Disabilities Condition Cohort, 2004–2017



### Multivariate Analysis of the Probability of Having a Posttraumatic Stress Disorder or Traumatic Brain Injury Veterans Affairs Schedule for Rating Disabilities

In Chapter Five, we discussed the results of a multivariate analysis of whether or not a medically discharged service member is awarded a disability rating for PTSD or TBI. Table D.19 shows the results of that analysis (regression coefficients and standard errors).

Figures D.7 and D.8 show additional results from the PHDA/PDHA for the disability cohorts. Figure D.7 shows the percentage of service members in the PTSD, TBI, and MDD cohorts who screened positive for suicide risk on the PDHA/PDHA. Compared to all service members discharged through DES who were identified as being

**Table D.19**  
**Regression Coefficients from a Linear Probability Model Measuring**  
**Presence of a Posttraumatic Stress Disorder or Traumatic Brain Injury**  
**on Veterans Affairs Schedule for Rating Disabilities Among Medically**  
**Discharged Service Members**

	PTSD VASRD	TBI VASRD
Cumulative number of months deployed	0.00915 <sup>a</sup> (9.43e-05)	0.00190 <sup>a</sup> (5.63e-05)
Deployment periods		
Deployed during FY 2002–2003	–0.0569 <sup>a</sup> (0.00520)	0.0357 <sup>a</sup> (0.0128)
Deployed during FY 2004–2007	–6.15e-05 (0.00570)	0.00384 (0.00356)
Deployed during FY 2008–2011	0.0247 <sup>a</sup> (0.00760)	0.0315 <sup>a</sup> (0.00524)
Deployed during FY 2012–2017	0.0150 <sup>c</sup> (0.00882)	0.0179 <sup>a</sup> (0.00546)
Gender (Male omitted)		
Female	0.0149 <sup>a</sup> (0.00178)	–0.0112 <sup>a</sup> (0.000783)
Race/ethnicity (white, non-Hispanic omitted)		
Black, non-Hispanic	–0.00893 <sup>a</sup> (0.00190)	–0.00427 <sup>a</sup> (0.00102)
Hispanic	0.0375 <sup>a</sup> (0.00269)	0.00464 <sup>a</sup> (0.00153)
Other/unknown	0.00986 <sup>a</sup> (0.00303)	0.00210 (0.00171)
Officer	0.0385 (0.0728)	0.0481 (0.0484)
Warrant officer	0.140 <sup>c</sup> (0.0760)	0.0439 (0.0501)
YOS	0.00182 <sup>a</sup> (0.000160)	0.000910 <sup>a</sup> (9.57e-05)
Officer × YOS	0.000915 <sup>c</sup> (0.000488)	–0.000253 (0.000301)
Warrant officer × YOS	–0.00582 <sup>a</sup> (0.00138)	–0.00132 (0.000901)

Table D.19—Continued

	PTSD VASRD	TBI VASRD
Occupation		
Occupation = 10	Ref	Ref
2-Digit Standardized DoD Occupation Code (Crosswalk) = 11	-0.0792 <sup>a</sup> (0.00291)	-0.0395 <sup>a</sup> (0.00162)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 12	-0.0258 <sup>a</sup> (0.00297)	-0.0169 <sup>a</sup> (0.00187)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 13	0.0104 <sup>a</sup> (0.00335)	-0.0265 <sup>a</sup> (0.00180)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 14	-0.0407 <sup>a</sup> (0.00447)	-0.0228 <sup>a</sup> (0.00265)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 15	-0.0599 <sup>a</sup> (0.00276)	-0.0356 <sup>a</sup> (0.00157)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 16	-0.0726 <sup>a</sup> (0.00246)	-0.0363 <sup>a</sup> (0.00147)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 17	-0.0581 <sup>a</sup> (0.00413)	-0.0298 <sup>a</sup> (0.00243)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 18	-0.0378 <sup>a</sup> (0.00263)	-0.0295 <sup>a</sup> (0.00158)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 19	-0.0328 <sup>a</sup> (0.00378)	-0.0163 <sup>a</sup> (0.00243)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 21	-0.279 <sup>a</sup> (0.0779)	0.212 (0.196)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 22	-0.101 (0.0730)	-0.0525 (0.0486)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 23	-0.0789 (0.0738)	-0.0697 (0.0489)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 24	-0.101 (0.0733)	-0.0711 (0.0487)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 25	-0.0438 (0.0746)	-0.0646 (0.0495)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 26	-0.0384 (0.0733)	-0.0670 (0.0488)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 27	-0.0835 (0.0739)	-0.0538 (0.0492)

**Table D.19—Continued**

	PTSD VASRD	TBI VASRD
2-Digit Standardized DoD Occupation Code (Crosswalk) = 28	–0.0828 (0.0736)	–0.0635 (0.0490)
2-Digit Standardized DoD Occupation Code (Crosswalk) = 29	–0.0786 (0.0739)	–0.0681 (0.0490)
Service × FY (Navy × 2002 omitted)		
Army × 2002	–0.0388 <sup>a</sup> (0.00964)	–0.00108 (0.00517)
Army × 2003	–0.0409 <sup>a</sup> (0.00963)	0.00591 (0.00520)
Army × 2004	–0.0419 <sup>a</sup> (0.00972)	0.00366 (0.00518)
Army × 2005	–0.0398 <sup>a</sup> (0.00980)	–0.00183 (0.00513)
Army × 2006	–0.0407 <sup>a</sup> (0.00994)	–0.000107 (0.00526)
Army × 2007	–0.0229 <sup>b</sup> (0.0101)	–0.000562 (0.00530)
Army × 2008	0.00536 (0.0102)	0.00526 (0.00537)
Army × 2009	0.0766 <sup>a</sup> (0.0104)	0.0415 <sup>a</sup> (0.00565)
Army × 2010	0.119 <sup>a</sup> (0.0106)	0.0501 <sup>a</sup> (0.00579)
Army × 2011	0.104 <sup>a</sup> (0.0106)	0.0194 <sup>a</sup> (0.00553)
Army × 2012	0.0724 <sup>a</sup> (0.0103)	0.0120 <sup>b</sup> (0.00533)
Army × 2013	0.0652 <sup>a</sup> (0.0100)	0.0138 <sup>a</sup> (0.00520)
Army × 2014	0.0464 <sup>a</sup> (0.0100)	0.0107 <sup>b</sup> (0.00521)
Army × 2015	0.0246 <sup>b</sup> (0.0100)	0.00427 (0.00517)
Army × 2016	0.0106 (0.0100)	1.00e-05 (0.00517)



Table D.19—Continued

	PTSD VASRD	TBI VASRD
Army × 2017	0.0208 <sup>b</sup> (0.0101)	0.0120 <sup>b</sup> (0.00527)
Air Force × 2002	-0.0239 <sup>b</sup> (0.0108)	0.0116 <sup>c</sup> (0.00699)
Air Force × 2003	-0.0176 (0.0109)	0.00666 (0.00628)
Air Force × 2004	-0.0296 <sup>a</sup> (0.0104)	-0.000340 (0.00546)
Air Force × 2005	-0.0359 <sup>a</sup> (0.0102)	0.00189 (0.00549)
Air Force × 2006	-0.0163 (0.0109)	-0.00177 (0.00544)
Air Force × 2007	-0.0336 <sup>a</sup> (0.0106)	-0.00852 (0.00521)
Air Force × 2008	-0.0258 <sup>b</sup> (0.0108)	-0.00425 (0.00546)
Air Force × 2009	-0.0229 <sup>b</sup> (0.0111)	0.00385 (0.00598)
Air Force × 2010	-0.0180 <sup>c</sup> (0.0108)	0.00356 (0.00572)
Air Force × 2011	-0.00814 (0.0108)	-0.00198 (0.00545)
Air Force × 2012	0.00955 (0.0111)	0.0108 <sup>c</sup> (0.00586)
Air Force × 2013	0.00681 (0.0111)	-0.000368 (0.00557)
Air Force × 2014	0.0119 (0.0111)	-0.00157 (0.00550)
Air Force × 2015	0.0177 (0.0111)	0.00231 (0.00561)
Air Force × 2016	0.0200 <sup>c</sup> (0.0111)	-0.00149 (0.00549)
Air Force × 2017	0.0208 <sup>c</sup> (0.0111)	-0.00540 (0.00538)

**Table D.19—Continued**

	PTSD VASRD	TBI VASRD
Marine Corps × 2002	-0.0363 <sup>a</sup> (0.00973)	-0.00711 (0.00615)
Marine Corps × 2003	-0.0339 <sup>a</sup> (0.00971)	-0.00124 (0.00729)
Marine Corps × 2004	-0.0493 <sup>a</sup> (0.00976)	-0.0119 <sup>b</sup> (0.00573)
Marine Corps × 2005	-0.0558 <sup>a</sup> (0.0107)	-0.0113 <sup>c</sup> (0.00668)
Marine Corps × 2006	-0.0374 <sup>a</sup> (0.0121)	-0.00673 (0.00731)
Marine Corps × 2007	-0.0384 <sup>a</sup> (0.0131)	-0.00820 (0.00780)
Marine Corps × 2008	-0.0495 <sup>a</sup> (0.0127)	-0.0226 <sup>a</sup> (0.00578)
Marine Corps × 2009	-0.0485 <sup>a</sup> (0.0127)	-0.0107 (0.00764)
Marine Corps × 2010	-0.00705 (0.0146)	-0.00381 (0.00806)
Marine Corps × 2011	-0.0497 <sup>a</sup> (0.0128)	-0.0130 <sup>c</sup> (0.00690)
Marine Corps × 2012	-0.0239 <sup>c</sup> (0.0138)	-0.0125 <sup>c</sup> (0.00700)
Marine Corps × 2013	0.0110 (0.0157)	-0.0167 <sup>b</sup> (0.00686)
Marine Corps × 2014	-0.000232 (0.0146)	-0.0196 <sup>a</sup> (0.00610)
Marine Corps × 2015	-9.68e-05 (0.0139)	-0.00790 (0.00668)
Marine Corps × 2016	-0.00589 (0.0122)	0.00621 (0.00691)
Marine Corps × 2017	-0.00127 (0.0110)	0.00719 (0.00604)
Navy × 2003	-0.0153 (0.0119)	-0.00405 (0.00595)

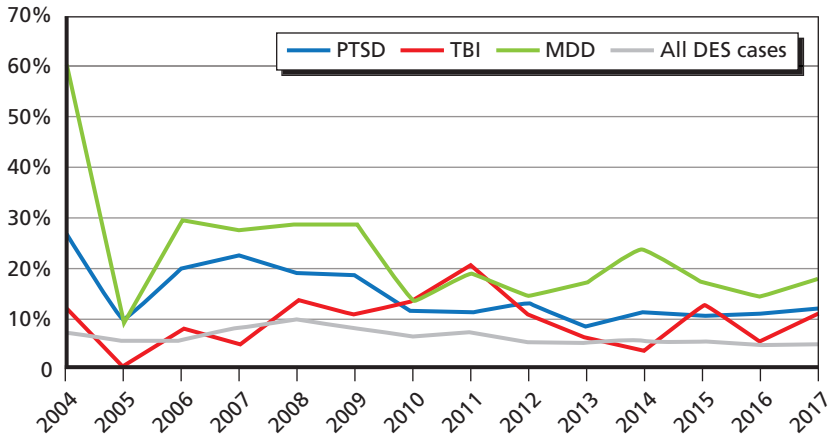
Table D.19—Continued

	PTSD VASRD	TBI VASRD
Navy × 2004	−0.0414 <sup>a</sup> (0.0100)	−0.00674 (0.00525)
Navy × 2005	−0.0441 <sup>a</sup> (0.0102)	−0.00554 (0.00580)
Navy × 2006	−0.0430 <sup>a</sup> (0.0109)	−0.00341 (0.00633)
Navy × 2007	−0.0415 <sup>a</sup> (0.0110)	−0.0100 <sup>c</sup> (0.00533)
Navy × 2008	−0.0497 <sup>a</sup> (0.0110)	−0.0119 <sup>b</sup> (0.00545)
Navy × 2009	−0.0488 <sup>a</sup> (0.0120)	−0.0132 <sup>b</sup> (0.00567)
Navy × 2010	−0.0490 <sup>a</sup> (0.0115)	−0.00871 (0.00618)
Navy × 2011	−0.0529 <sup>a</sup> (0.0117)	−0.0101 (0.00619)
Navy × 2012	−0.0334 <sup>a</sup> (0.0128)	−0.00642 (0.00636)
Navy × 2013	−0.00232 (0.0149)	−0.00987 (0.00602)
Navy × 2014	−0.00694 (0.0147)	−0.00841 (0.00638)
Navy × 2015	0.0450 <sup>a</sup> (0.0157)	−0.0127 <sup>b</sup> (0.00538)
Navy × 2016	0.0261 <sup>c</sup> (0.0142)	0.000907 (0.00660)
Navy × 2017	0.0154 (0.0117)	0.00889 (0.00604)
Constant	0.0599 <sup>a</sup> (0.00975)	0.0310 <sup>a</sup> (0.00505)
Observations	221,264	221,286
R-squared	0.150	0.036

NOTES: Robust standard errors in parentheses

<sup>a</sup>  $p < 0.01$ , <sup>b</sup>  $p < 0.05$ , <sup>c</sup>  $p < 0.10$ .

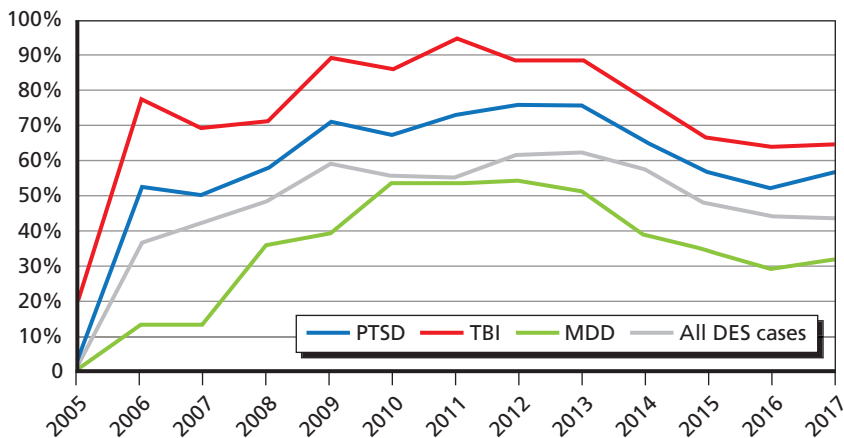
**Figure D.7**  
**Rates of Suicide Risk as Detected on the Post-Deployment Health Assessments, Disability Cohorts Compared with All Medically Discharged Service Members Who Completed Post-Deployment Health Assessments**



at risk for suicide at a rate of 4–9 percent depending upon the year, members of the PTSD and MDD, and in most years, TBI, cohorts were relatively more likely to be at risk of committing suicide. Rates were highest for service members discharged with a PTSD or MDD disability rating between 2006 and 2009 (other than 2004, the first year we are able to measure this outcome), versus 2011 for members of the TBI cohort.

Figure D.8 shows the rate at which members of the PTSD, TBI, and MDD cohorts reported being injured, according to the PDHA/PDHRA, relative to all service members discharged through DES. For all cohorts, the percentage of service members who were injured increased through 2009 before beginning to taper off, followed by a decline starting around 2013. As a reminder, these years represent the year DES determined that the service member was not fit to continue serving, so these injury rates correspond to activities in the few years prior. Both the PTSD and the TBI cohorts consistently reported higher rates of injury than all service members medically discharged through DES; members of the MDD cohorts had lower rates of injury.

**Figure D.8**  
**Rates of Injury as Reported on the Post-Deployment Health Assessments, Disability Cohorts Compared with All Medically Discharged Service Members Who Completed Post-Deployment Health Assessments**





## Air Force Results

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This appendix contains Air Force results that correspond to the DoD-wide results shown in Chapters Three and Five.

### Prospective Analysis

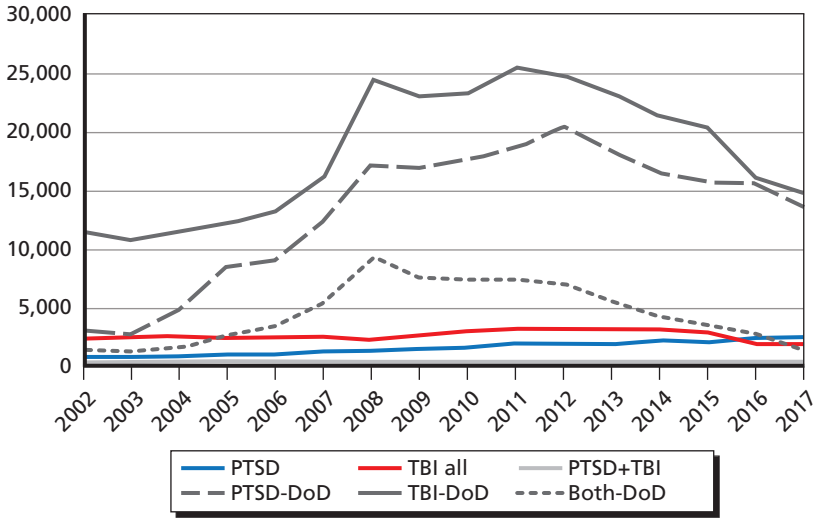
Figure E.1 shows the number and percentage of airmen assigned to the PTSD, TBI, and PTSD+TBI diagnosis cohorts, relative to the total number and percentage of service members assigned to these cohorts across DoD.

Figure E.2 shows the percentage of airmen assigned to the comparison condition diagnosis cohorts, relative to both the PTSD, TBI, and PTSD+TBI cohorts and to the total number and percentage of service members assigned to these cohorts across DoD.

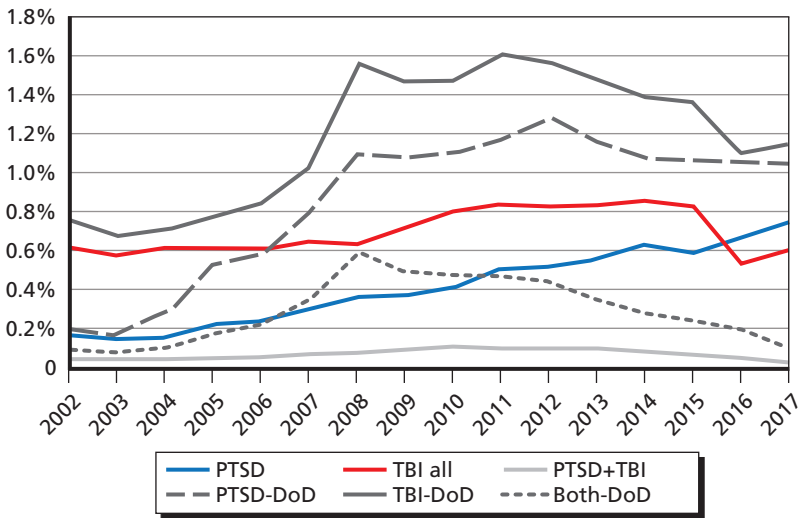
Figure E.3 shows the percentage of the PTSD and TBI Air Force cohorts who had a matching disability rating at the conclusion of DES, with the DoD-wide results from Chapter Three repeated as a comparison.

Figure E.4 shows the percentage of the PTSD, TBI, and PTSD+TBI cohorts who were evaluated for disability and medically retired (total DoD disability rating of 30 percent or higher). This figure includes the results for the Air Force and for the DoD-wide cohorts, as presented in Chapter Three.

**Figure E.1**  
**Number and Percentage of Active Component Service Members in Each**  
**Diagnosis Cohort, Air Force, 2002–2017**



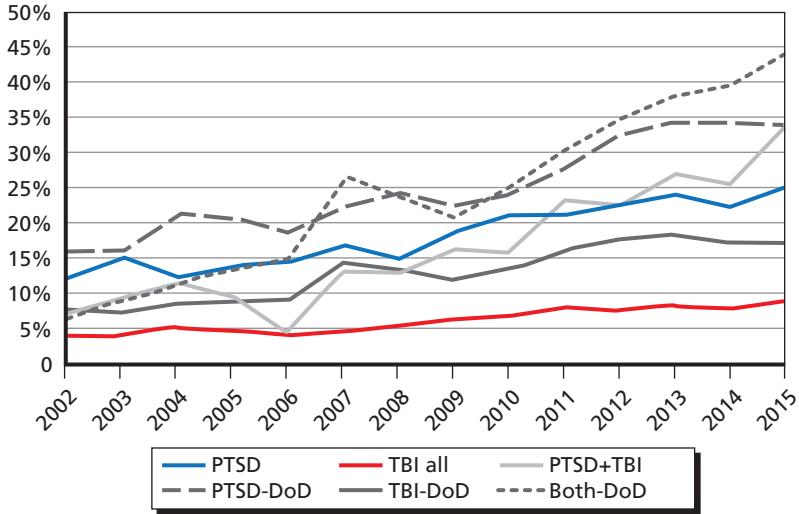
(a)



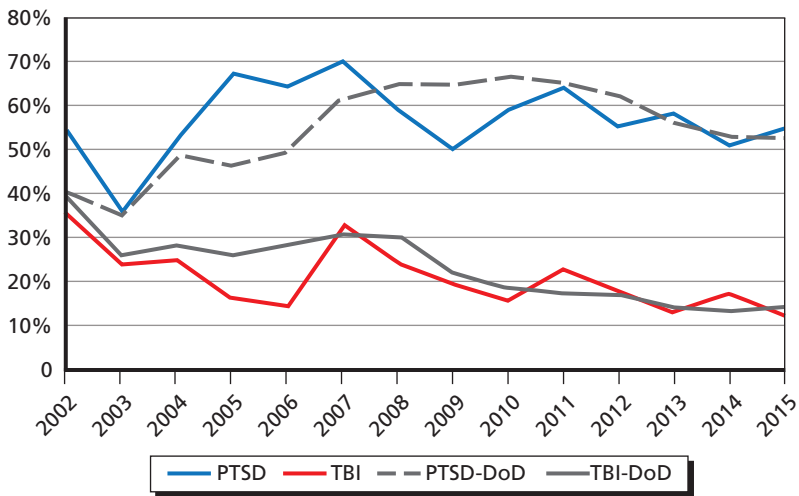
(b)



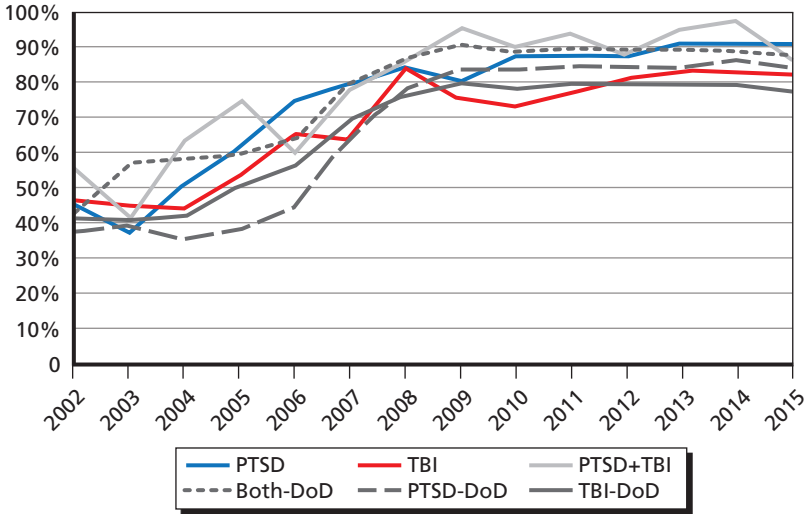
**Figure E.2**  
**Percentage of Diagnosis Cohort with Medical Discharge Within Three Years, Air Force, 2002–2015**



**Figure E.3**  
**Percentage of Diagnosis Cohort with Disability by Veterans Affairs Schedule for Rating Disabilities for the Cohort Condition, Air Force, 2002–2015**



**Figure E.4**  
**Percentage Medically Retired (Initial Rating  $\geq$  30 Percent), Air Force, 2002–2015**

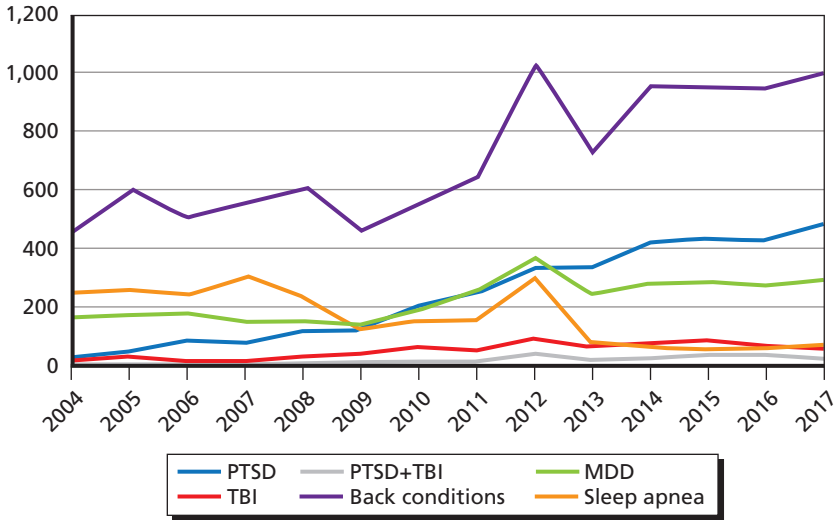


SOURCE: Author calculations using Defense Manpower Data Center (DMDC) and Defense Health Agency (DHA) data, as well as data from Physical Disability Case Processing System (PDCAPS), Joint Disability Evaluation Tracking System (JDETS), Military Personnel Data System (MilPDS), Electronic Physical Evaluation Board (ePEB) and Veterans Tracking Application (VTA).

### Retrospective Analysis

Figure E.5 displays the number of airmen assigned to the PTSD, TBI, PTSD+TBI, and comparison condition disability cohorts, as defined by the presence of a VASRD at the conclusion of DES.

**Figure E.5**  
**Number of Active Component Service Members in Each Disability Cohort, Air Force, 2004–2017**



NOTE: Individuals are assigned to a FY cohort according to the FY of disposition.



## Army Results

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This appendix contains Army results that correspond to the DoD-wide results shown in Chapters Three and Five.

### Prospective Analysis

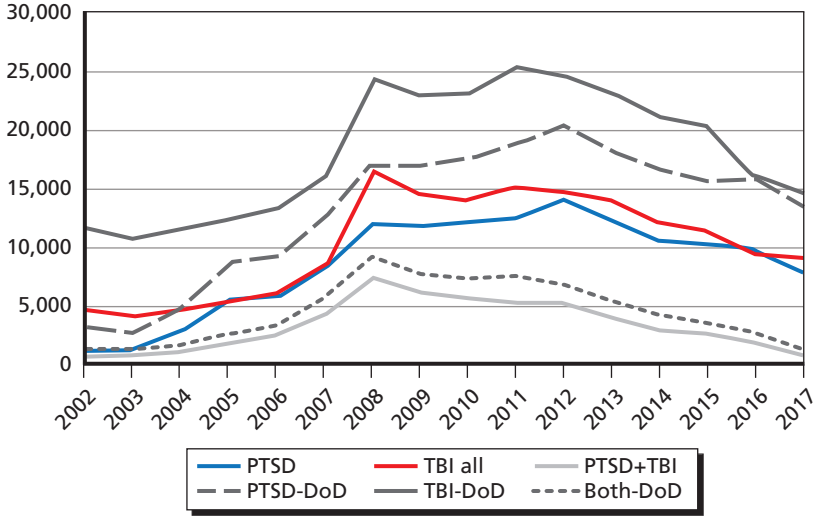
Figure F.1 shows the number and percentage of soldiers assigned to the PTSD, TBI, and PTSD+ TBI diagnosis cohorts, relative to the total number and percentage of service members assigned to these cohorts across DoD.

Figure F.2 shows the percentage of soldiers assigned to the comparison condition diagnosis cohorts, relative to both the PTSD, TBI, and PTSD+TBI cohorts and to the total number and percentage of service members assigned to these cohorts across DoD.

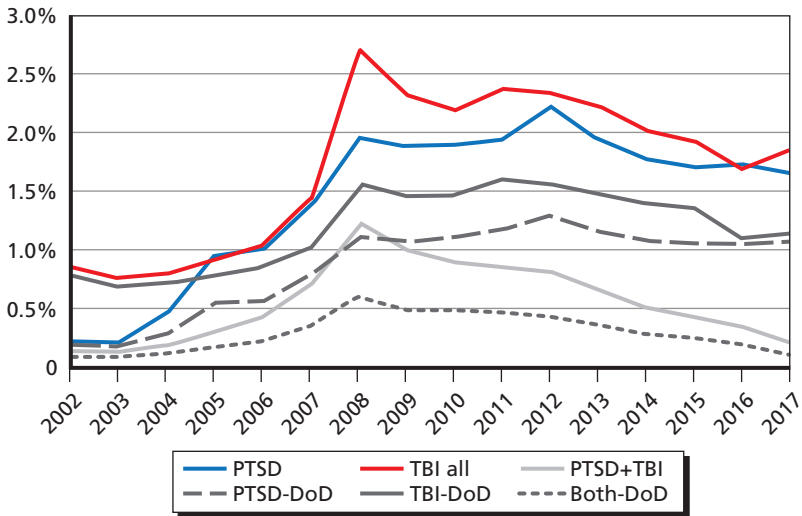
Figure F.3 shows the percent of the PTSD and TBI Army cohorts who had a matching disability rating at the conclusion of DES, with the DoD-wide results from Chapter Three repeated as a comparison.

Figure F.4 shows the percentage of the PTSD, TBI, and PTSD+TBI cohorts who were evaluated for disability and medically retired (total DoD disability rating of 30 percent or higher). This figure includes the results for the Army and for the DoD-wide cohorts, as presented in Chapter Three.

**Figure F.1**  
**Number and Percentage of Active Component Service Members in Each**  
**Diagnosis Cohort, Army, 2002–2017**

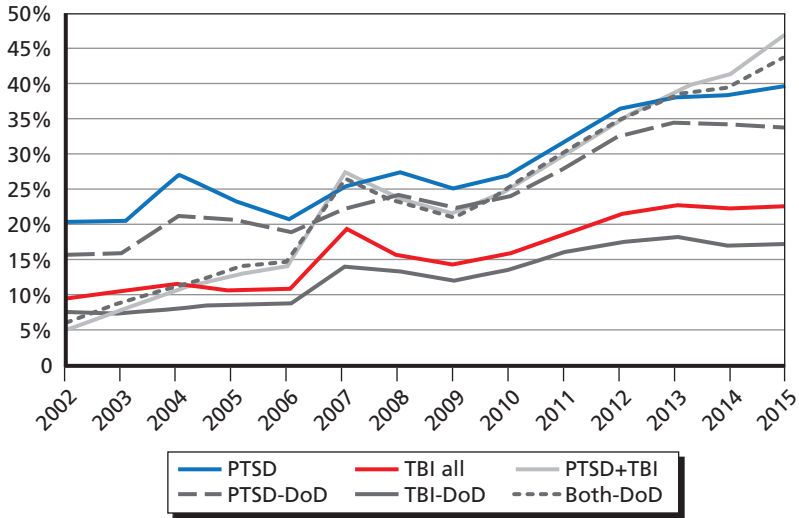


(a)

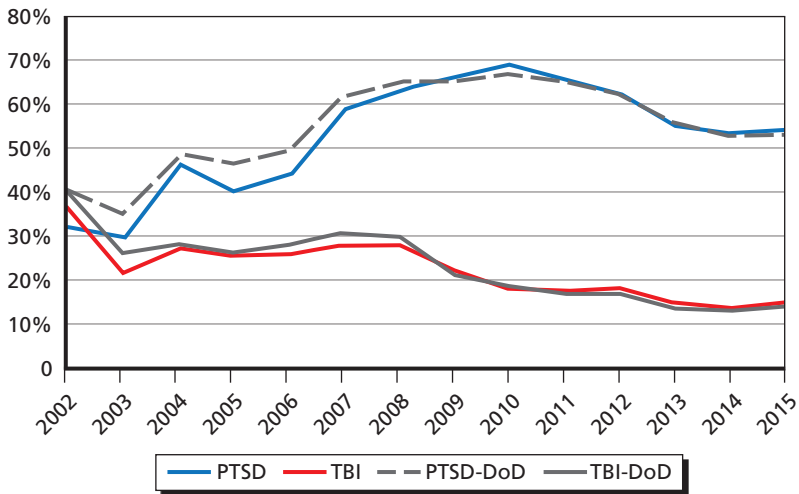


(b)

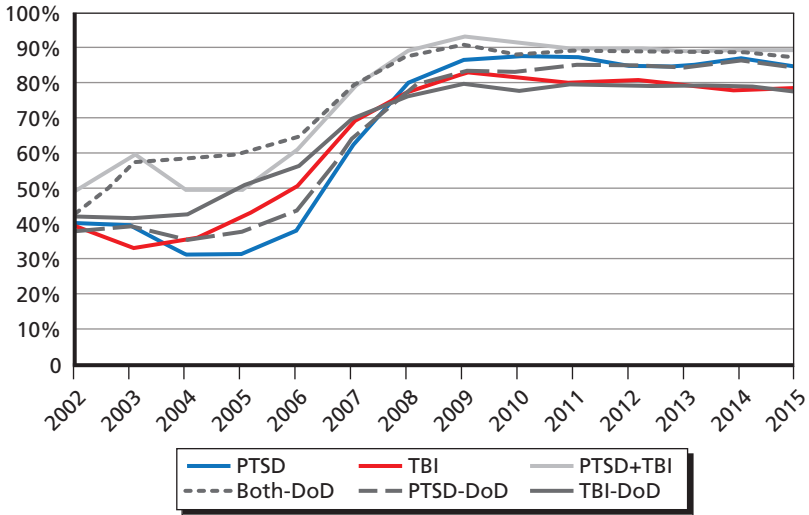
**Figure F.2**  
**Percentage of Diagnosis Cohort with Medical Discharge Within Three Years, Army, 2002–2015**



**Figure F.3**  
**Percentage of Diagnosis Cohort with Disability by Veterans Affairs Schedule for Rating Disabilities for the Cohort Condition, Army, 2002–2015**



**Figure F.4**  
**Percentage Medically Retired (Initial Rating  $\geq$  30 Percent), Army, 2002–2015**

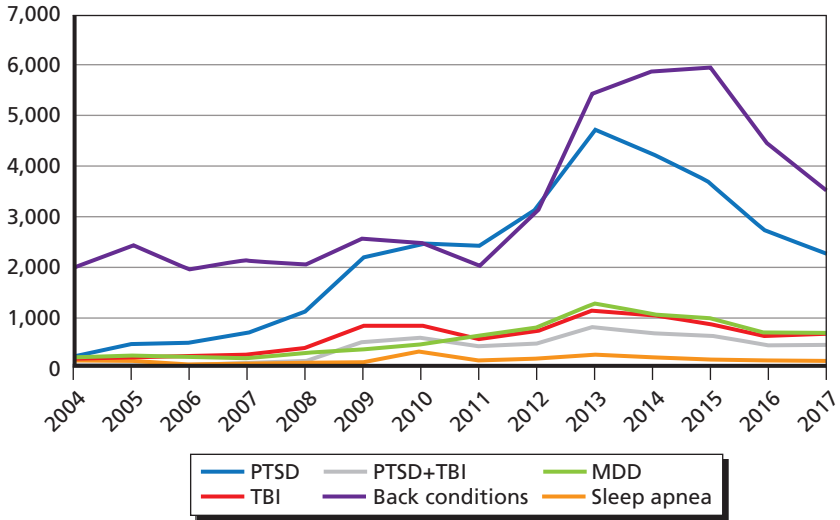


### Retrospective Analysis

Figure F.5 displays the number of soldiers assigned to the PTSD, TBI, PTSD+TBI, and comparison condition disability cohorts, as defined by the presence of a VASRD at the conclusion of DES.



**Figure F.5**  
**Number of Active Component Service Members in Each Disability Cohort, Army, 2002–2017**



NOTE: Individuals are assigned to a FY cohort according to the FY of disposition.



## Marine Corps Results

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This appendix contains Marine Corps results that correspond to the DoD-wide results shown in Chapters Three and Five.

### Prospective Analysis

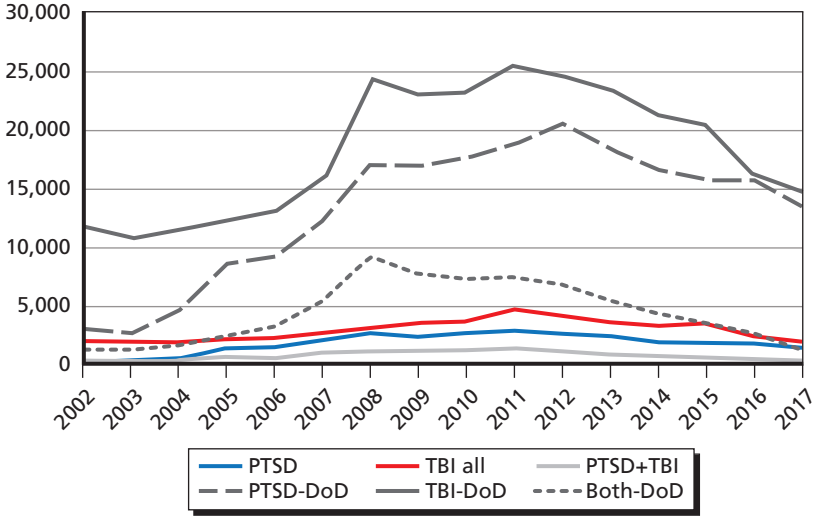
Figure G.1 shows the number and percentage of marines assigned to the PTSD, TBI, and PTSD+TBI diagnosis cohorts, relative to the total number and percentage of service members assigned to these cohorts across DoD.

Figure G.2 shows the percentage of marines assigned to the comparison condition diagnosis cohorts, relative to both the PTSD, TBI, and PTSD+ TBI cohorts and to the total number and percentage of service members assigned to these cohorts across DoD.

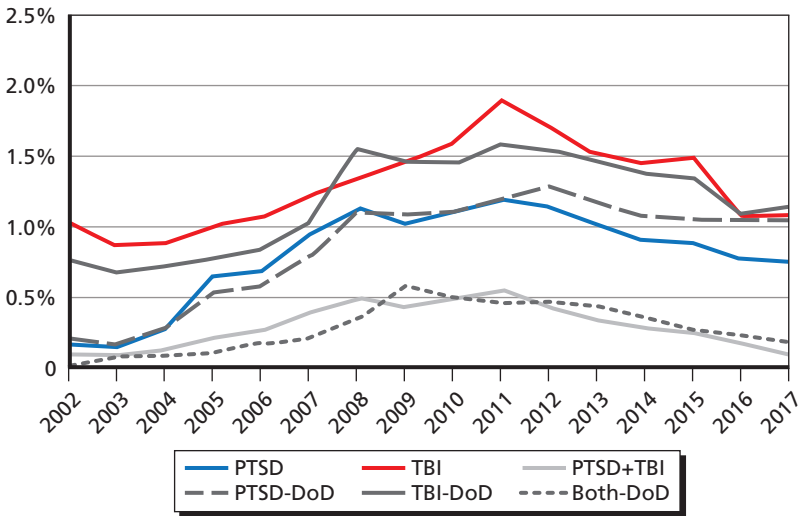
Figure G.3 shows the percentage of the PTSD and TBI Marine Corps cohorts who had a matching disability rating at the conclusion of DES, with the DoD-wide results from Chapter Three repeated as a comparison.

Figure G.4 shows the percentage of the PTSD, TBI, and PTSD+TBI cohorts who were evaluated for disability and medically retired (total DoD disability rating of 30 percent or higher). This figure includes the results for the Marine Corps and for the DoD-wide cohorts, as presented in Chapter Three.

**Figure G.1**  
**Number and Percentage of Active Component Service Members in Each**  
**Diagnosis Cohort, Marine Corps, 2002–2017**

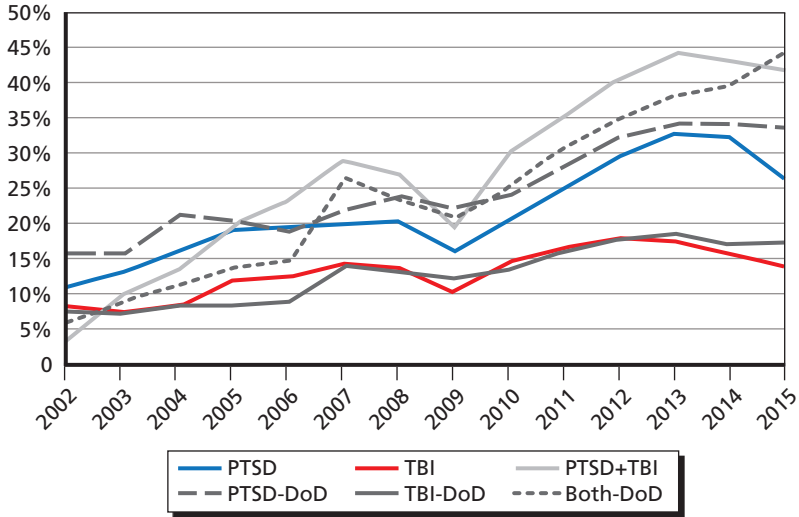


(a)

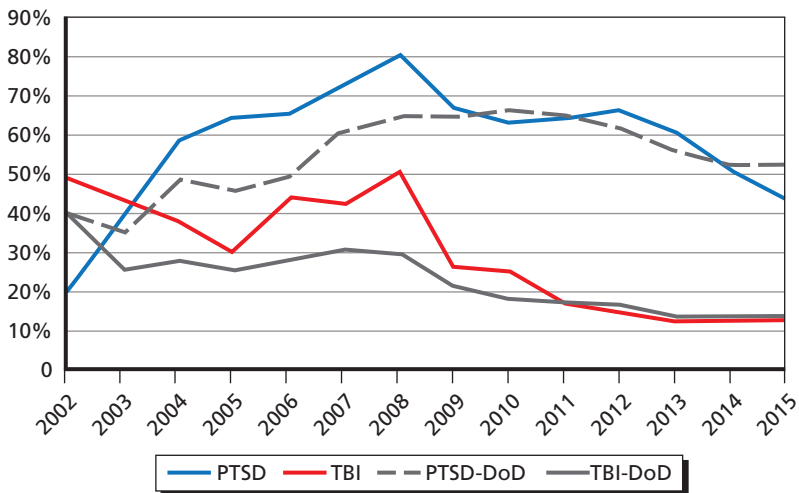


(b)

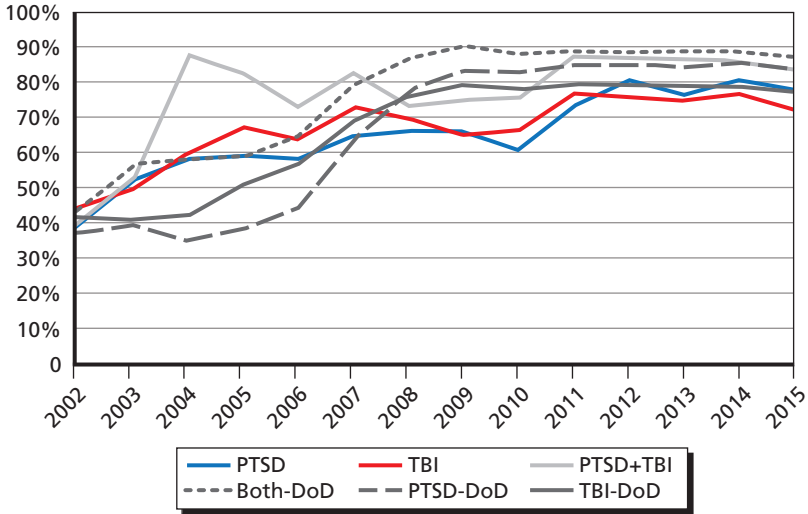
**Figure G.2**  
**Percentage of Diagnosis Cohort with Medical Discharge Within Three Years, Marine Corps, 2002–2015**



**Figure G.3**  
**Percentage of Diagnosis Cohort with Disability by Veterans Affairs Schedule for Rating Disabilities for the Cohort Condition, Marine Corps, 2002–2015**



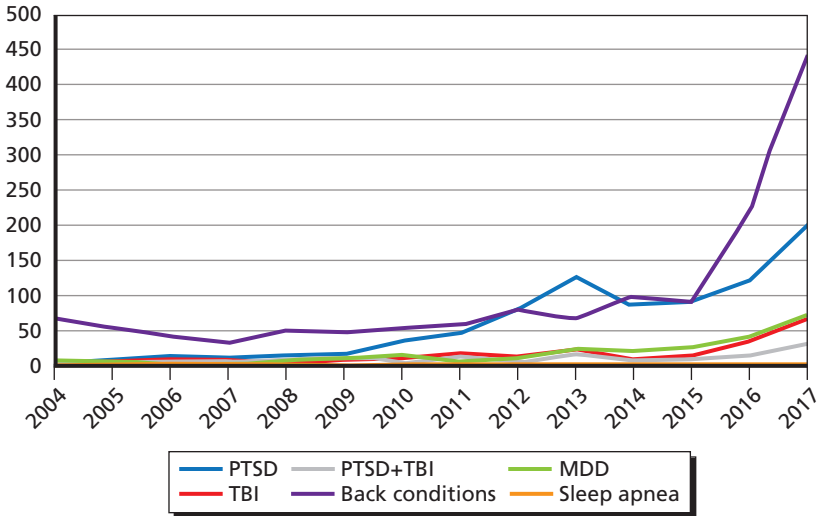
**Figure G.4**  
**Percentage Medically Retired (Initial Rating  $\geq$  30 Percent), Marine Corps, 2002–2015**



### Retrospective Analysis

Figure G.5 displays the number of marines assigned to the PTSD, TBI, PTSD+ TBI, and comparison condition disability cohorts, as defined by the presence of a VASRD at the conclusion of DES.

**Figure G.5**  
**Number of Active Component Service Members in Each Disability Cohort, Marine Corps, 2004–2017**



NOTE: Individuals are assigned to a FY cohort according to the FY of disposition.





## Navy Results

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This appendix contains Navy results that correspond to the DoD-wide results shown in Chapters Three and Five.

### Prospective Analysis

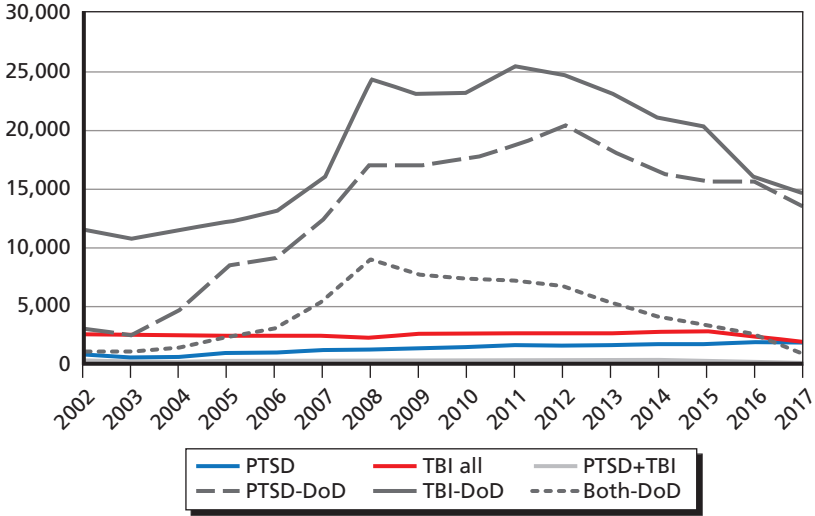
Figure H.1 shows the number and percentage of sailors assigned to the PTSD, TBI, and PTSD+ TBI diagnosis cohort, relative to the total number and percentage of service members assigned to these cohorts across DoD.

Figure H.2 shows the percentage of sailors assigned to the comparison condition diagnosis cohorts, relative to both the PTSD, TBI, and PTSD+TBI cohorts and to the total number and percentage of service members assigned to these cohorts across DoD.

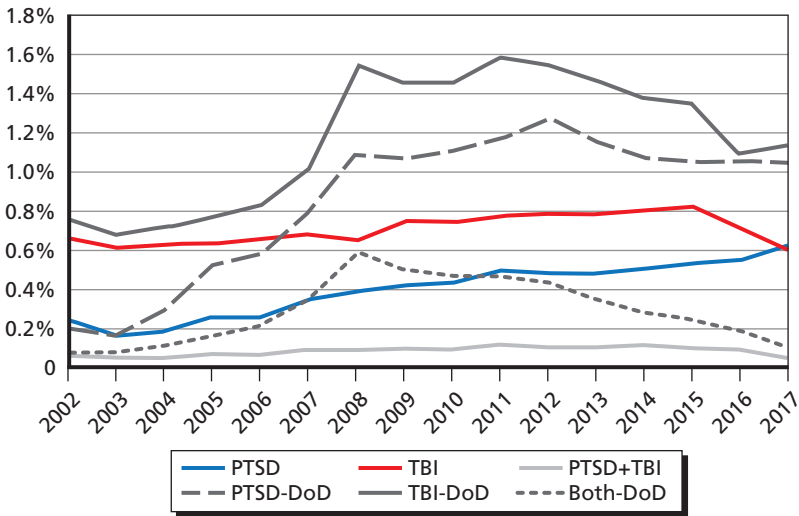
Figure H.3 shows the percentage of the PTSD and TBI Navy cohorts who had a matching disability rating at the conclusion of DES, with the DoD-wide results from Chapter Three repeated as a comparison.

Figure H.4 shows the percentage of the PTSD, TBI, and PTSD and TBI cohorts who were evaluated for disability and medically retired (total DoD disability rating of 30 percent or higher). This figure includes the results for the Navy and for the DoD-wide cohorts, as presented in Chapter Three.

**Figure H.1**  
**Number and Percentage of Active Component Service Members in Each**  
**Diagnosis Cohort, Navy, 2002–2017**

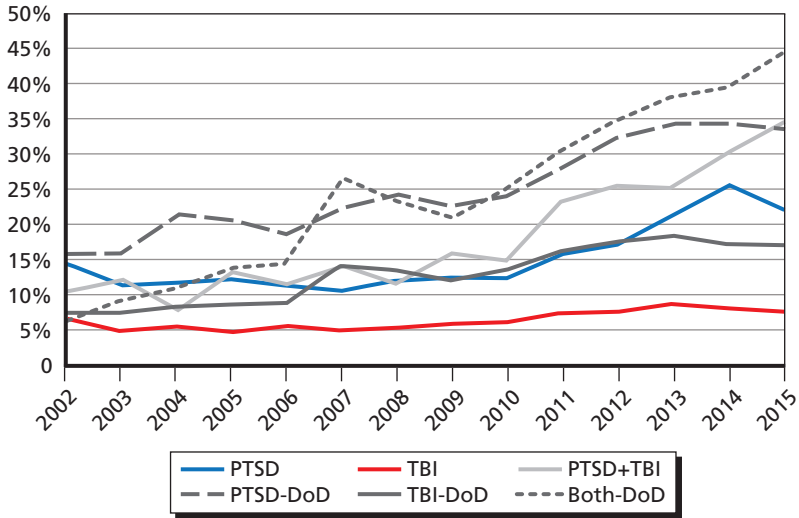


(a)

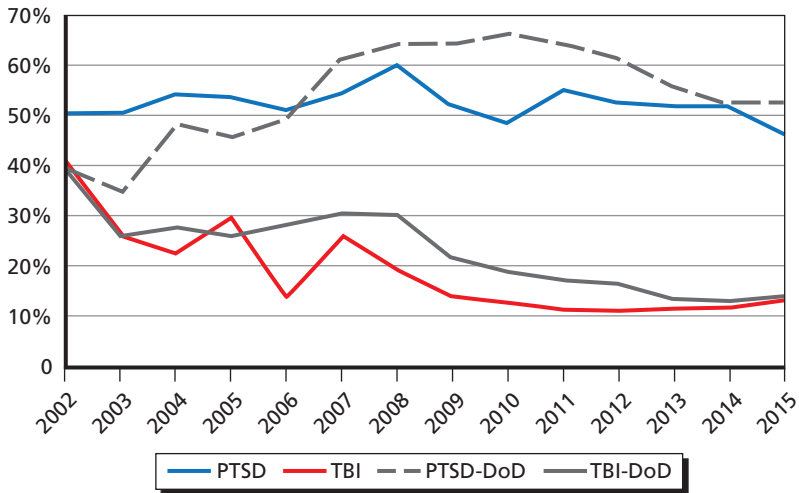


(b)

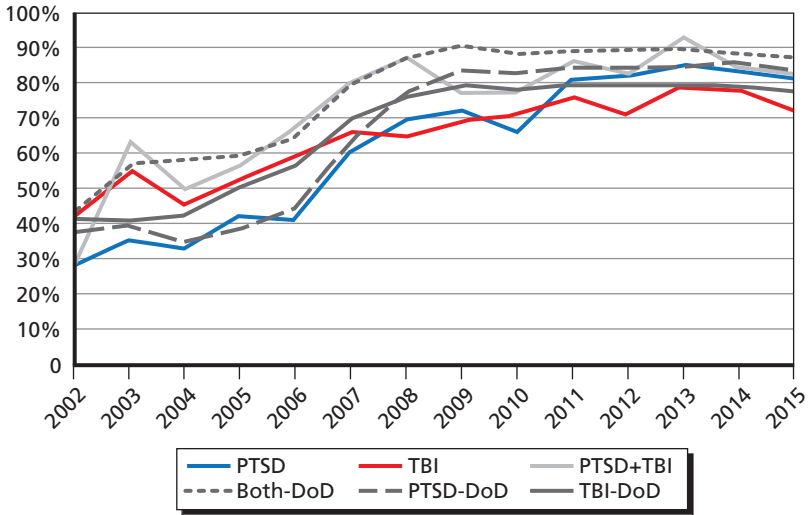
**Figure H.2**  
**Percentage of Diagnosis Cohort with Medical Discharge Within Three Years, Navy, 2002–2015**



**Figure H.3**  
**Percentage of Diagnosis Cohort with Disability by Veterans Affairs Schedule for Rating Disabilities for the Cohort Condition, Navy, 2002–2015**



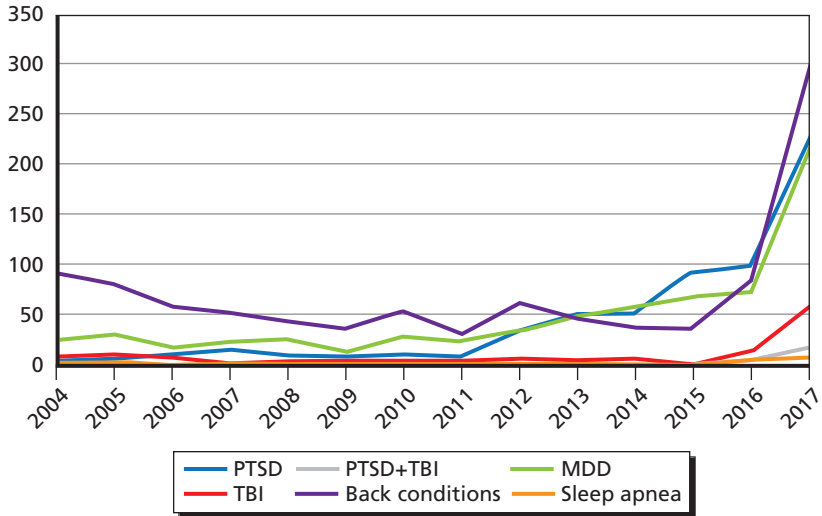
**Figure H.4**  
**Percentage Medically Retired (Initial Rating  $\geq$  30 Percent), Navy, 2002–2015**



### Retrospective Analysis

Figure H.5 displays the number of sailors assigned to the PTSD, TBI, PTSD+TBI, and comparison condition disability cohorts, as defined by the presence of a VASRD at the conclusion of DES.

**Figure H.5**  
**Number of Active Component Service Members in Each Disability Cohort, Navy, 2004–2017**



NOTE: Individuals are assigned to a FY cohort according to the FY of disposition.



## References

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Fine, Jason P., and Robert J. Gray, “A Proportional Hazards Model for the Subdistribution of a Competing Risk,” *Journal of the American Statistical Association*, Vol. 94, No. 446, 1999, pp. 496–509.

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