For the HLA-DR cells, age ($p<0.001$), occupation ($p=0.005$), current cigarette smoking ($p<0.001$), and lifetime cigarette smoking history ($p<0.001$) exhibited significant covariate associations. Averages for the HLA-DR cell counts decreased with increasing age. For those individuals born in or after 1942, the average HLA-DR was 450.1 cells/mm^3. Older individuals, born between 1923 and 1941, had a lower average HLA-DR value of 418.0 cells/mm^3. Those participants born in or before 1922 had the lowest HLA-DR average value at 346.9 cells/mm^3. For enlisted flyers, the average HLA-DR cell count was 448.1 cells/mm^3, as compared to 443.6 cells/mm^3 for the enlisted groundcrew and 402.5 cells/mm^3 for the officers. For the current cigarette smoking covariate, those who never smoked had the lowest HLA-DR average at 378.8 cells/mm^3. Former smokers had a higher HLA-DR average value of 396.9 cells/mm^3. Those individuals not smoking over 20 cigarettes per day had a higher HLA-DR average at 515.6 cells/mm^3. Smokers over 20 cigarettes per day also had a higher HLA-DR average at 527.6 cells/mm^3. Based on the lifetime cigarette smoking history covariate, the average HLA-DR cell count increased as number of pack-years increased. For nonsmokers, the average HLA-DR cell count was 381.3 cells/mm^3. Smokers with at most a 10 pack-year value for this covariate had an HLA-DR average of 427.9 cells/mm^3. Those smokers with over 10 pack-years lifetime cigarette smoking history had an average HLA-DR cell count of 463.4 cells/mm^3.

The adjusted group contrast of Ranch Hands and Comparisons was not significant ($p=0.268$) for the HLA-DR cell counts. This adjusted analysis had the following significant covariates in the model: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p=0.003$), age ($p<0.001$), current cigarette smoking ($p<0.001$), current alcohol use ($p=0.027$), and lifetime alcohol history ($p=0.022$).

CD4/CD8 Ratio

No group difference was found for the unadjusted analysis of the CD4/CD8 ratio ($p=0.537$). Only the covariates of batch-to-batch and blood draw day-to-day variation were used.

Current cigarette smoking and lifetime cigarette smoking history exhibited significant associations with the CD4/CD8 ratio ($p=0.043$ and $p=0.041$, respectively). Lifetime alcohol history also displayed a significant covariate relation with CD4/CD8 ratio ($p=0.050$). For current cigarette smoking, the participants who never smoked or were former smokers had average CD4/CD8 ratios of 1.75 and 1.86, respectively. Smokers not exceeding 20 cigarettes per day had an average CD4/CD8 ratio of 2.00, and those individuals smoking more than 20 cigarettes per day had an average CD4/CD8 ratio of 1.97. Based on lifetime cigarette smoking history, nonsmokers had an average CD4/CD8 ratio of 1.75. Smokers at or below 10 pack-years had an average CD4/CD8 ratio of 1.97, and those smokers with more than 10 pack-years had an average CD4/CD8 ratio of 1.89. For the lifetime alcohol history covariate, the average CD4/CD8 ratio increased as number of drink-years increased. For lifetime nondrinkers, the average CD4/CD8 ratio was 1.73. For those individuals with at most 40 drink-years on lifetime alcohol history, the average CD4/CD8 ratio increased to 1.85, and for those over 40 drink-years the average CD4/CD8 ratio increased to 2.01.

For the adjusted analysis of the CD4/CD8 ratio, the Ranch Hand and Comparison group contrast was not significant (p=0.707). Significant covariate terms in the adjusted model were the batch-to-batch and blood draw day-to-day covariates (p=0.003 and p=0.038, respectively) and current cigarette smoking (p=0.031). The interaction of current alcohol use-by-occupation was also significant (p=0.032).

Laboratory Examination Data: Quantitative Studies--TLC

The results of the unadjusted analyses, as presented in Table 19-7, showed that the Ranch Hand and Comparison group contrast was not significant (p=0.790). Only the batch-to-batch and blood draw day-to-day covariates were used in this analysis.

As shown in Table P-2 of Appendix P, age (p<0.001), occupation (p=0.016), current cigarette smoking (p<0.001), and lifetime cigarette smoking history (p=0.001) exhibited significant covariate associations with TLC. The mean TLC decreased with age (2,066.5 cells/mm^3 for those born in or after 1942, 1,966.7 cells/mm^3 for those born between 1923 and 1941, and 1,651.5 cells/mm^3 for those born in or before 1922). For occupation, the highest mean TLC was in the enlisted flyers (2,065.6 cells/mm^3). The mean counts for the officers and enlisted groundcrew were 1,905.1 cells/mm^3 and 2,041.5 cells/mm^3, respectively. The mean TLC was also found to have increased with increasing levels of both current and lifetime cigarette smoking. For current cigarette smoking, the nonsmokers had a mean TLC of 1,849.7 cells/mm^3, as compared to means of 1,862.5 cells/mm^3 for former smokers, 2,251.5 cells/mm^3 for moderate smokers, and 2,323.2 cells/mm^3 for heavy smokers. Based on lifetime cigarette smoking history, the mean counts were 1,849.7 cells/mm^3, 2,008.3 cells/mm^3, and 2,073.4 cells/mm^3 for nonsmokers, moderate smokers, and heavy smokers, respectively.

No significant difference between the two groups was detected in the adjusted analysis (p=0.597). Age, batch-to-batch, and blood draw day-to-day variation were significant covariates in the adjusted model (p<0.001 for each). The model also contained a significant occupation-by-current cigarette smoking interaction (p=0.016). The results are presented in Table 19-8.

Laboratory Examination Data: Quantitative Studies--Quantitative Immunoglobulins

Tables 19-7 and 19-8 present the results of unadjusted and adjusted analyses, respectively, for IgG, IgA, and IgM. Table P-2 of Appendix P summarizes the dependent variable-covariate associations for these variables.

IgG

No group difference was found in the unadjusted analysis of IgG (p=0.205).

Significant associations with IgG were found for age (p=0.028), race (p<0.001), occupation (p<0.001), current cigarette smoking (p<0.001), lifetime

cigarette smoking history ($p<0.001$), current alcohol use ($p=0.043$), and lifetime alcohol history ($p=0.040$).

The mean IgG was 1,054.7 mg/dl for those born in or after 1942, as compared to means of 1,032.0 mg/dl and 1,081.7 mg/dl for those born between 1923 and 1941 and those born in or before 1922, respectively. The mean for Blacks was higher than the mean for nonblacks (1,264.2 mg/dl vs. 1,029.1 mg/dl). The enlisted groundcrew had the highest mean (1,067.6 mg/dl), followed by the enlisted flyers (1,027.9 mg/dl) and the officers (1,020.8 mg/dl).

The mean IgG decreased with smoking intensity for both current and lifetime cigarette smoking. For current smoking, the nonsmokers had a mean of 1,094.2 mg/dl, as compared to means of 1,043.4 mg/dl, 1,015.5 mg/dl, and 986.3 mg/dl for former, moderate, and heavy smokers, respectively. Based on lifetime cigarette smoking history, the nonsmokers had a mean IgG of 1,094.1 mg/dl. The means for moderate and heavy smokers were 1,041.2 mg/dl and 1,013.4 mg/dl, respectively, based on lifetime cigarette smoking history.

For current alcohol use, the moderate drinkers had the lowest mean IgG (1,016.2 mg/dl). Heavy drinkers had a lower mean than nondrinkers (1,039.0 mg/dl vs. 1,049.2 mg/dl). IgG decreased with lifetime alcohol consumption (1,079.0 mg/dl for nondrinkers, 1,043.8 mg/dl for moderate drinkers, and 1,028.7 mg/dl for heavy drinkers).

In the adjusted analysis, there was no significant difference between the two groups ($p=0.406$). In the adjusted model, there were five significant covariate-by-covariate interactions: age-by-lifetime cigarette smoking history ($p<0.001$), race-by-current cigarette smoking ($p=0.046$), race-by-lifetime cigarette smoking history ($p=0.027$), lifetime alcohol history-by-lifetime cigarette smoking history ($p=0.030$), and current cigarette smoking-by-lifetime cigarette smoking history ($p=0.012$).

IgA

In the unadjusted analysis of IgA, no significant difference between the Ranch Hands and Comparisons was detected ($p=0.406$).

The covariate tests for IgA revealed significant or borderline significant associations with race ($p=0.035$), occupation ($p=0.070$), current alcohol use ($p=0.060$), lifetime alcohol history ($p=0.003$), and current cigarette smoking ($p=0.032$). Blacks had a higher mean IgA than nonblacks (226.06 mg/dl vs. 208.08 mg/dl). Of the three occupational categories, the officers had the lowest mean (203.56 mg/dl), followed by the enlisted flyers (210.24 mg/dl) and the enlisted groundcrew (213.40 mg/dl). IgA decreased with smoking intensity based on current smoking patterns (213.46 mg/dl for nonsmokers, 211.81 mg/dl for former smokers, 208.03 mg/dl for moderate smokers, and 196.97 mg/dl for heavy smokers). IgA increased with increasing alcohol consumption based on current alcohol use and lifetime alcohol history. For current alcohol use, the means were 207.36 mg/dl, 213.07 mg/dl, and 232.37 mg/dl for nondrinkers, moderate drinkers, and heavy drinkers, respectively. Based on lifetime alcohol history, the nondrinkers had a mean of 197.06 mg/dl, as compared to means of 207.24 mg/dl and 220.52 mg/dl for moderate and heavy drinkers, respectively.

Based on the results of the adjusted analysis of IgA, no significant difference between the Ranch Hands and Comparisons was revealed (p=0.499). Age-by-current cigarette smoking and lifetime cigarette smoking history-by-lifetime alcohol history interactions were significant terms in the model (p=0.020 and p=0.032, respectively).

IgM

Based on the unadjusted analysis of IgM, there was no significant difference between the two groups (p=0.855).

Significant associations for IgM were detected for race and current alcohol use (p<0.001 and p=0.011, respectively). The association with age was marginally significant (p=0.088). IgM decreased with age (113.80 mg/dl for those born in or after 1942, 109.09 mg/dl for those born between 1923 and 1941, and 106.58 mg/dl for those born in or before 1922). Nonblacks had a higher mean than Blacks (111.95 mg/dl vs. 96.70 mg/dl). IgM was found to increase with current alcohol use. The nondrinkers had a mean of 110.08 mg/dl, as compared to means of 111.91 mg/dl and 129.93 mg/dl for moderate and heavy drinkers, respectively.

The adjusted analysis of IgM also did not detect a significant group difference (p=0.876). Race was a significant covariate in the adjusted model (p<0.001).

Laboratory Examination Data: Functional Stimulation Tests

Tables 19-9 and 19-10 summarize unadjusted and adjusted group contrasts for the functional stimulation studies of PHA, MLC, NKCA, and NKCI. Table P-2 of Appendix P summarizes the dependent variable-covariate associations. The summary of group-by-covariate interactions is provided in Appendix Table P-3.

The following PHA response variables were analyzed: unstimulated PHA responses for day 1 and day 2 concurrently, six PHA net responses for each of two harvest days at three mitogen concentration levels, an overall simultaneous analysis of the six PHA net responses, and the maximum of the six PHA net responses over day and concentration level. Analyses for the two unstimulated PHA variables were performed on the natural logarithm of the cell counts (i.e., the natural logarithm of cpm). No transformations were used for the analyses of the PHA net response variables.

For the MLC test, analyses were performed on an unstimulated MLC response and a MLC net response. Analyses of the unstimulated MLC variable were based on the natural logarithm of the counts (in cpm). The MLC net responses were analyzed without transformation.

For the natural killer cell assays, the following variables were analyzed: NKCA 50/1 net response (cpm), NKCA 50/1 percent release, NKCI 50/1 net response (cpm), and NKCI 50/1 percent release. These variables were analyzed without transformation.

TABLE 19-9.

Unadjusted Analysis* for Functional Stimulation Test Variables by Group

Variable	Statistic	Group: Ranch Hand	Group: Comparison	p-Value
Unstimulated PHA Response	n	368	468	
	Mean[a]	1,965	1,979	0.840
	95% C.I.[a]	(1,869, 2,067)	(1,894, 2,067)	
PHA Net Response (day 1, concentration 1)	n	373	473	
	Mean	100,142	100,483	0.915
	95% C.I.	(95,221, 105,064)	(96,229, 104,737)	
PHA Net Response (day 1, concentration 2)	n	373	473	
	Mean	160,626	160,741	0.976
	95% C.I.	(154,885, 166,368)	(155,778, 165,703)	
PHA Net Response (day 1, concentration 3)	n	373	473	
	Mean	147,511	145,368	0.538
	95% C.I.	(142,139, 152,883)	(140,723, 150,012)	
PHA Net Response (day 2, concentration 1)	n	369	471	
	Mean	159,602	162,849	0.337
	95% C.I.	(154,389, 164,816)	(158,326, 167,372)	
PHA Net Response (day 2, concentration 2)	n	369	471	
	Mean	179,173	181,369	0.511
	95% C.I.	(174,023, 184,324)	(176,900, 185,837)	
PHA Net Response (day 2, concentration 3)	n	369	471	
	Mean	127,510	127,034	0.886
	95% C.I.	(122,385, 132,635)	(122,587, 131,480)	
Overall PHA Net Response	n	365	467	
	Mean	145,509	146,038	0.841
	95% C.I.	(141,429, 149,589)	(142,511, 149,566)	

TABLE 19-9. (continued)

Unadjusted Analysis* for Functional Stimulation Test Variables by Group

Variable	Statistic	Group: Ranch Hand	Group: Comparison	p-Value
Maximum PHA Net Response	n	365	467	
	Mean	205,322	205,072	0.506
	95% C.I.	(197,898, 212,745)	(198,826, 211,318)	
Unstimulated MLC Response	n	370	467	
	Mean[a]	4,067	3,813	0.221
	95% C.I.[a]	(3,752, 4,409)	(3,554, 4,091)	
MLC Net Response	n	370	467	
	Mean	87,966	86,693	0.647
	95% C.I.	(83,709, 92,223)	(82,980, 90,406)	
NKCA 50/1 Net Response	n	370	467	
	Mean	410.6	420.9	0.435
	95% C.I.	(390.2,430.9)	(403.1,438.8)	
NKCA 50/1 Percent Release	n	370	467	
	Mean	35.2	35.8	0.569
	95% C.I.	(33.5,36.8)	(34.3,37.2)	
NKCI 50/1 Net Response	n	371	472	
	Mean	807.5	813.2	0.462
	95% C.I.	(795.4,819.5)	(802.8,823.6)	
NKCI 50/1 Percent Release	n	371	472	
	Mean	66.4	67.1	0.270
	95% C.I.	(65.5,67.4)	(66.3,67.9)	

*Adjusted for batch-to-batch variation and blood draw day-to-day variation.

[a]Transformed from natural logarithm scale.

TABLE 19-10.

Adjusted Analysis for Functional Stimulation Test Variables by Group

Variable	Statistic	Group: Ranch Hand	Group: Comparison	p-Value	Covariate Remarks
Unstimulated PHA Response	n	367	466		BATCH (p<0.001)
	Adj. Mean[a]	2,182	2,176	0.933	DAY(BATCH) (p=0.021)
	95% C.I.[a]	(2,017, 2,361)	(2,018, 2,347)		AGE (p<0.001)
					RACE (p=0.001)
					ALC*CSMOK (p=0.007)
					ALC*DRKYR (p=0.039)
PHA Net Response (day 1, concentration 1)	n	372	472		GRP*ALC (p=0.042)
	Adj. Mean**	107,678	106,996	0.817**	BATCH (p<0.001)
	95% C.I.**	(99,934, 115,423)	(99,522, 114,411)		DAY(BATCH) (p<0.001)
					AGE (p<0.001)
					RACE (p=0.008)
					OCC (p=0.012)
PHA Net Response (day 1, concentration 2)	n	373	473		BATCH (p<0.001)
	Adj. Mean	169,663	167,524	0.540	DAY(BATCH) (p<0.001)
	95% C.I.	(160,525, 178,801)	(158,712, 176,335)		CSMOK (p=0.044)
					AGE*RACE (p=0.044)
PHA Net Response (day 1, concentration 3)	n	372	472		BATCH (p<0.001)
	Adj. Mean	152,113	147,780	0.185	DAY(BATCH) (p<0.001)
	95% C.I.	(141,773, 162,454)	(137,597, 157,963)		AGE*RACE (p=0.048)
					AGE*ALC (p=0.035)
					RACE*PACKYR (p=0.043)
PHA Net Response (day 2, concentration 1)	n	369	471		BATCH (p<0.001)
	Adj. Mean	160,389	162,777	0.474	DAY(BATCH) (p<0.001)
	95% C.I.	(151,973, 168,805)	(154,582, 170,972)		AGE (p<0.001)
					OCC (p=0.004)
					RACE*CSMOK (p=0.015)
PHA Net Response (day 2, concentration 2)	n	369	471		BATCH (p<0.001)
	Adj. Mean	179,568	180,306	0.820	DAY(BATCH) (p<0.001)
	95% C.I.	(174,573, 184,563)	(175,966, 184,645)		AGE*PACKYR (p=0.027)
PHA Net Response (day 2, concentration 3)	n	369	471		BATCH (p<0.001)
	Adj. Mean	136,095	134,758	0.683	DAY(BATCH) (p<0.001)
	95% C.I.	(128,066, 144,124)	(127,088, 142,428)		AGE (p<0.001)
					RACE (p=0.009)

TABLE 19-10. (continued)

Adjusted Analysis for Functional Stimulation Test Variables by Group

Variable	Statistic	Group: Ranch Hand	Group: Comparison	p-Value	Covariate Remarks
Overall PHA Net Response	n	364	466		BATCH (p<0.001)
	Adj. Mean	151,983	151,085	0.720	DAY(BATCH) (p<0.001)
	95% C.I.	(145,766, 158,199)	(145,158, 157,012)		RACE (p=0.014) AGE*ALC (p=0.035)
Maximum PHA Net Response	n	365	467		BATCH (p<0.001)
	Adj. Mean	203,157	203,488	0.914	DAY(BATCH) (p<0.001)
	95% C.I.	(198,322, 207,991)	(199,298, 207,679)		AGE (p<0.001) CSMOK (p=0.006)
Unstimulated MLC Response	n	369	467		BATCH (p<0.001)
	Adj. Mean[a]	4,971	4,590	0.116	DAY(BATCH) (p=0.027)
	95% C.I.[a]	(4,387, 5,633)	(4,073, 5,172)		RACE (p<0.001) AGE*DRKYR (p=0.014)
MLC Net Response	n	370	467		GRP*RACE (p=0.039)
	Adj. Mean**	93,751	92,383	0.617**	BATCH (p<0.001)
	95% C.I.**	(86,960, 100,543)	(85,845, 98,921)		DAY(BATCH) (p<0.001) AGE (p=0.014) OCC (p=0.014) CSMOK*PACKYR (p=0.032)
NKCA 50/1 Net Response	n	369	466		GRP*RACE (p=0.040)
	Adj. Mean**	409.5	418.4	0.494**	BATCH (p<0.001)
	95% C.I.**	(376.2,442.8)	(385.9,450.8)		DAY(BATCH) (p<0.001) RACE*CSMOK (p=0.014) OCC*PACKYR (p=0.004) CSMOK*PACKYR (p=0.041) AGE*ALC (p=0.031)
NKCA 50/1 Percent Release	n	369	466		GRP*RACE (p=0.022)
	Adj. Mean**	35.1	35.5	0.710**	BATCH (p<0.001)
	95% C.I.**	(32.3,37.8)	(32.8,38.1)		DAY(BATCH) (p<0.001) RACE*CSMOK (p=0.006) OCC*PACKYR (p=0.020) AGE*ALC (p=0.034)
NKCI 50/1 Net Response	n	371	472		GRP*RACE (p=0.003)
	Adj. Mean	****	****	****	BATCH (p<0.001)
	95% C.I.	****	****		DAY(BATCH) (p<0.001) RACE*CSMOK (p=0.020) OCC*PACKYR (p=0.031) CSMOK*PACKYR (p=0.004)

TABLE 19-10. (continued)

Adjusted Analysis for Functional Stimulation Test Variables by Group

Variable	Statistic	Group		p-Value	Covariate Remarks
		Ranch Hand	Comparison		
NKCI 50/1	n	371	472		GRP*RACE (p=0.003)
Percent	Adj. Mean	****	****	****	BATCH (p<0.001)
Release	95% C.I.	****	****		DAY(BATCH) (p<0.001)
					RACE*CSMOK (p=0.013)
					OCC*PACKYR (p=0.020)
					CSMOK*PACKYR (p=0.003)

[a]Transformed from natural logarithm scale.

**Group-by-covariate interaction (0.01<p<0.05)—adjusted mean, confidence interval, and p-value derived from a model fitted after deletion of this interaction.

****Group-by-covariate interaction (p≤0.01)—Adjusted mean, confidence interval, and p-value not presented.

Unstimulated PHA Response

For the unstimulated PHA response, the unadjusted group contrast was essentially based on a two-factor model (containing group, day, and the group-by-day interaction) assuming repeated measures across days. For the unadjusted analysis, the model was expanded to include the batch-to-batch and blood draw day-to-day covariates. The Ranch Hand and Comparison contrast was not significant ($p=0.840$).

Significant or borderline significant associations with the unstimulated PHA responses were noted for the following covariates: age ($p=0.002$ for day 1 responses and $p<0.001$ for day 2 responses), race ($p=0.007$ for day 1 responses and $p<0.001$ for day 2 responses), occupation ($p=0.002$ for day 1 responses and $p=0.003$ for day 2 responses), current alcohol use ($p=0.018$ for day 2 responses), and lifetime alcohol history ($p=0.079$ for day 2 responses). For both day 1 and day 2, average unstimulated PHA responses decreased with increasing participant age. For younger participants, born in or after 1942, the average unstimulated PHA responses were 2,043 cpm and 2,224 cpm for day 1 and day 2, respectively. For those individuals born between 1923 and 1941, the average unstimulated PHA responses were 1,844 cpm and 1,918 cpm for day 1 and day 2, respectively. For the oldest group of participants, born in 1922 or before, the average unstimulated PHA responses were 1,629 cpm and 1,604 cpm for day 1 and day 2, respectively.

For race, the average unstimulated PHA response for day 1 among Blacks was 2,308 cpm and 1,902 cpm among nonblacks. For the day 2 responses, Blacks had an average of 2,749 cpm and nonblacks had an average of 2,001 cpm.

The average unstimulated PHA response was highest for the enlisted groundcrew (2,050 cpm and 2,184 cpm for day 1 and day 2, respectively); followed by the enlisted flyers (1,851 cpm and 1,955 cpm for day 1 and day 2, respectively); and officers (1,809 cpm and 1,904 cpm for day 1 and day 2, respectively).

The average unstimulated PHA response for day 2 was highest for participants with current alcohol use values of more than four drinks per day (2,375 cpm), followed by those participants having zero to one drink per day (2,057 cpm), and those with more than one but not over four drinks per day (1,843 cpm). For lifetime alcohol history, the average unstimulated PHA response for day 2 was 2,247 cpm for nondrinkers. For those participants with average lifetime alcohol values not exceeding 40 drink-years, the average unstimulated PHA response for day 2 was 1,977 cpm. For those participants with a lifetime alcohol history value over 40 drink-years, the average unstimulated PHA response for day 2 was 2,105 cpm.

For the repeated measures adjusted analysis of the unstimulated PHA responses for day 1 and day 2, the group contrast of Ranch Hand and Comparison was not significant ($p=0.933$) following adjustment for covariates. The adjusted model had the following significant terms: batch-to-batch variation ($p<0.001$); blood draw day-to-day variation ($p=0.021$); age ($p<0.001$); race ($p=0.001$); current alcohol use-by-current cigarette smoking ($p=0.007$); and current alcohol use-by-lifetime alcohol history ($p=0.039$).

PHA Net Response for Day 1 at Concentration Level 1

Ranch Hands and Comparisons did not differ significantly on the unadjusted analysis of the PHA net response for day 1 at concentration level 1 ($p=0.915$). The group contrast for this PHA net response variable was performed without adjusting for covariates, except batch-to-batch and blood draw day-to-day variation.

Significant associations were found for the PHA net responses for day 1 at concentration level 1 with age ($p<0.001$) and race ($p=0.014$). Average PHA net responses decreased with increasing age. For younger participants born in or after 1942, the average PHA net response was 111,953 cpm. Participants born between 1923 and 1941 had an average PHA net response of 91,675 cpm, and those born in or before 1922 had an average net response of 86,669 cpm. Blacks had a higher average PHA net response than nonblacks (116,774 cpm vs. 99,550 cpm, respectively).

For the adjusted analysis of the PHA net response for day 1 at concentration level 1, there was a significant group-by-current alcohol use interaction ($p=0.042$). In addition, the following covariates were significant in the adjusted model: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), age ($p<0.001$), race ($p=0.008$), and occupation ($p=0.012$). As a result of the group-by-current alcohol use interaction, Table P-3 presents group contrasts performed and significance levels within each of the following current alcohol use strata: at most one drink per day ($p=0.305$), over one but not more than four drinks per day ($p=0.489$), and over four drinks per day ($p=0.024$). Comparisons having over four drinks per day had a significantly higher adjusted mean PHA net response for day 1 at concentration level 1 than Ranch Hands also having over four drinks per day (114,309 cpm vs. 73,793 cpm). Without the group-by-current alcohol use interaction in the model, there was no significant difference between the Ranch Hands and Comparisons ($p=0.817$).

PHA Net Response for Day 1 at Concentration Level 2

The unadjusted PHA net response for day 1 at concentration level 2 was not significantly different between Ranch Hands and Comparisons ($p=0.976$). This group contrast analysis accounted for only the batch-to-batch and blood draw day-to-day covariates.

The following covariates displayed significant relationships with PHA net responses for day 1 at concentration level 2: age ($p<0.001$), race ($p=0.035$), and occupation ($p=0.012$). The average PHA net responses were inversely related with age. For participants born in or after 1942, the PHA net response was 177,443 cpm; followed by those born between 1923 and 1941, having an average of 149,059 cpm; and those born in or before 1922, with an average of 129,819 cpm. Blacks had a higher average PHA net response than nonblacks (177,087 cpm vs. 159,905 cpm). Among the enlisted groundcrew, the average PHA net response for day 1 at concentration level 2 was 166,943 cpm. The average PHA net response for enlisted flyers was lower at 158,066 cpm. Officers had the lowest average PHA net response at 154,669 for day 1 at concentration level 2.

The Ranch Hand and Comparison groups did not differ on the adjusted analysis of the PHA net responses for day 1 at concentration level 2 ($p=0.540$). For this adjusted analysis, the following significant covariates were found: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), and current cigarette smoking ($p=0.044$). This adjusted model also contained a significant age-by-race interaction ($p=0.044$).

PHA Net Response for Day 1 at Concentration Level 3

Ranch Hands and Comparisons did not differ significantly on the PHA net response for day 1 at concentration level 3 ($p=0.538$). The unadjusted analysis used only the batch-to-batch and blood draw day-to-day covariates.

As for day 1 of concentration level 2, the covariates of age, race, and occupation exhibited significant relationships with the PHA net responses for day 1 at concentration level 3 ($p<0.001$, $p=0.005$, and $p=0.002$, respectively). Lifetime cigarette smoking history displayed a borderline significant association ($p=0.055$). For younger participants, born in or after 1942, the average PHA net response for day 1 at concentration level 3 was 162,016 cpm. Participants born between 1923 and 1941 had an average PHA net response of 135,851 cpm. Individuals born in or before 1922 had an average PHA net response of 110,263 cpm. Blacks had a higher PHA net response for day 1 at concentration level 3 than did nonblacks (166,867 cpm vs. 145,282 cpm). The average PHA net responses for enlisted groundcrew, enlisted flyers, and officers were 152,947 cpm, 145,781 cpm, and 138,662 cpm, respectively. With respect to the borderline significance of the covariate lifetime cigarette smoking history, participants with lifetime smoking values greater than 0 pack-years and less than or equal to 10 pack-years had the highest PHA net response at 153,032 cpm. Participants with a lifetime cigarette smoking history value over 10 pack-years had an average of 143,911 cpm, and nonsmokers had an average of 143,768 cpm.

For the adjusted analysis of the PHA net responses for day 1 at concentration level 3, there was no group difference ($p=0.185$). The model had the following significant covariates and covariate interactions: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), age-by-race ($p=0.048$), age-by-current alcohol use ($p=0.035$), and lifetime cigarette smoking history-by-race ($p=0.043$).

PHA Net Response for Day 2 at Concentration Level 1

Ranch Hands and Comparisons did not differ significantly on unadjusted analyses of the PHA net responses for day 2 at concentration level 1 ($p=0.337$). This group contrast was based only on the batch-to-batch and blood draw day-to-day covariates.

The covariates age ($p=0.040$), occupation ($p=0.046$), and current cigarette smoking ($p=0.019$) displayed significant relationships on the PHA net responses for day 2 at concentration level 1. For participants born in or after 1942, the average PHA net response was 165,370 cpm. For individuals born between 1923 and 1941, the average PHA net response was 159,549 cpm. The average PHA net response for those born in or before 1922 was 144,773 cpm. For day 2 at

concentration level 1, officers had the highest average net response at 165,673 cpm. The next highest average net response was 161,299 cpm for the enlisted groundcrew. Enlisted flyers had an average PHA net response of 153,648 cpm. For current cigarette smoking, former smokers had the highest average PHA net response at 166,067 cpm. Those individuals who never smoked had the next highest average at 163,835 cpm. Individuals who smoked at most 20 cigarettes per day had an average PHA net response of 152,397 cpm. Participants smoking over 20 cigarettes per day had an average PHA net response of 156,143 cpm.

For the adjusted group contrast of the PHA net responses for day 2 at concentration level 1, there was no significant group difference ($p=0.474$). The adjusted model had the following significant covariates and covariate interaction: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), age ($p<0.001$), occupation ($p=0.004$), and current cigarette smoking-by-race ($p=0.015$).

PHA Net Response for Day 2 at Concentration Level 2

The unadjusted Ranch Hand and Comparison group contrast was not significant for the PHA net response for day 2 at concentration level 2 ($p=0.511$). This analysis used only the batch-to-batch and blood draw day-to-day covariates.

Age exhibited a significant covariate association with the PHA net responses for day 2 at concentration level 2 ($p<0.001$). Occupation was a borderline significant covariate ($p=0.055$). Participants born in or after 1942 had an average PHA net response of 190,416 cpm. Participants born between 1923 and 1941 had an average PHA net value of 174,418 cpm, and those born in or before 1922 had an average of 152,011 cpm. The average PHA net responses were 184,678 cpm for enlisted groundcrew, 180,597 cpm for enlisted flyers, and 175,499 cpm for officers.

The adjusted analysis of the PHA net responses for day 2 at concentration level 2 was not significantly different between the Ranch Hand and Comparison groups ($p=0.820$). The adjusted model had significant batch-to-batch and blood draw day-to-day covariates ($p<0.001$ and $p<0.001$, respectively), and a significant covariate interaction of age-by-lifetime cigarette smoking history ($p=0.027$).

PHA Net Response for Day 2 at Concentration Level 3

Ranch Hands and Comparisons did not differ significantly for the unadjusted PHA net response for day 2 at concentration level 3 ($p=0.886$). The unadjusted analysis used the batch-to-batch and blood draw day-to-day covariates.

Age ($p<0.001$), race ($p=0.005$), and occupation ($p=0.023$) were significant covariates with the PHA net responses for day 2 at concentration level 3. Participants born in or after 1942 had an average PHA net response of 134,016 cpm. For those individuals born between 1923 and 1941, the average PHA net response was 123,717 cpm. Individuals born in or before 1922 had an

average PHA net response of 100,378 cpm. The average PHA net response for Blacks was 146,588 cpm versus 126,291 cpm for nonblacks. The average PHA net responses for enlisted flyers, enlisted groundcrew, and officers were 131,229 cpm, 130,709 cpm, and 121,213 cpm, respectively.

For the PHA net responses on day 2 at concentration level 3, the adjusted group contrast of Ranch Hands and Comparisons was not significant ($p=0.683$). The adjusted model contained the following significant covariate terms: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), age ($p<0.001$), and race ($p=0.009$).

Overall PHA Net Response

For the unadjusted analysis of the six PHA net responses (for 2 harvest days at each of three concentration levels), a three-factor repeated measures model (containing group, day, concentration level, associated two-factor interactions, and a three-factor interaction) was used to evaluate the Ranch Hand and Comparison group contrast. In the context of this model, the repeated measures factors were the day and concentration level effects. The unadjusted model also included terms for batch-to-batch variation and blood draw day-to-day variation. The group contrast was not significant ($p=0.841$).

The six PHA net responses were also analyzed using covariate adjustment within the framework of the three-factor repeated measures analysis described above. The adjusted group contrast was not significant ($p=0.720$). The model had the following significant terms: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), race ($p=0.014$), and age-by-current alcohol use interaction ($p=0.035$).

Maximum of Day and Concentration Level PHA Net Response

In the unadjusted analysis of the maximum PHA net response (maximum net response of the six PHA responses), the Ranch Hand and Comparison group contrast was not significant ($p=0.506$). The batch-to-batch and blood draw day-to-day covariates were used in the analysis.

As in other PHA analyses, significant covariate associations were found for age and occupation ($p<0.001$ and $p=0.008$, respectively). The mean maximum response decreased with age (220,904 cpm for those born in or after 1942, 196,253 cpm for those born between 1923 and 1941, and 163,872 cpm for those born in or before 1922). The enlisted groundcrew had the highest mean maximum PHA net response (212,528 cpm), followed by the officers (199,887 cpm) and the enlisted flyers (198,386 cpm).

For the adjusted analysis of maximum PHA net response, there was no significant difference between the Ranch Hands and the Comparisons ($p=0.914$). Age ($p<0.001$), current cigarette smoking ($p=0.006$), batch-to-batch variation ($p<0.001$), and blood draw day-to-day variation ($p<0.001$) were significant covariates in the model.

Unstimulated MLC Response

The unadjusted Ranch Hand and Comparison group contrast was not significant for the unstimulated MLC response ($p=0.221$). The analysis included only the batch-to-batch and blood draw day-to-day covariates.

Age ($p<0.001$), race ($p<0.001$), and occupation ($p=0.002$) displayed significant associations with the unstimulated MLC responses. Participants born in or after 1942 had an unstimulated MLC average response of 4,647 cpm. Individuals born between 1923 and 1941 had an average unstimulated MLC response of 3,516 cpm. Those participants born in or before 1922 had an average unstimulated response of 2,541 cpm. Black participants had a significantly higher unstimulated MLC response than nonblack participants (6,246 cpm vs. 3,831 cpm). For enlisted groundcrew, the average unstimulated MLC response was 4,359 cpm. Officers and enlisted flyers had average unstimulated MLC responses of 3,635 cpm and 3,573 cpm, respectively.

For the adjusted analysis of the unstimulated MLC response, Ranch Hands and Comparisons did not differ significantly ($p=0.116$). For this adjusted analysis, batch-to-batch variation, blood draw day-to-day variation, and race were significant covariates ($p<0.001$, $p=0.027$, and $p<0.001$, respectively). Also, the age-by-lifetime alcohol history interaction was significant ($p=0.014$).

MLC Net Response

The unadjusted group contrast of Ranch Hands and Comparisons was not significant for the MLC net response ($p=0.647$). The analysis included only the batch-to-batch and blood draw day-to-day covariates.

Current cigarette smoking ($p<0.001$) and lifetime cigarette smoking history ($p=0.012$) displayed significant covariate relationships with the MLC net responses. Age exhibited a borderline significant association ($p=0.063$) with the MLC net responses. For the current cigarette smoking covariate, participants who never smoked and who were former smokers had average MLC net responses of 81,169 cpm and 84,935 cpm, respectively. For those individuals smoking no more than 20 cigarettes per day and those smoking more than 20 cigarettes per day, the average MLC net responses were 91,349 cpm and 99,745 cpm, respectively. For individuals with a lifetime cigarette smoking history above 10 pack-years, the average MLC net response was 91,447 cpm. For those with lifetime cigarette smoking history values between 0 and 10 pack-years, the average MLC net response was 86,642 cpm. Nonsmokers had an average MLC net response of 81,368 cpm. Participants born in or after 1942 had an average MLC net response of 90,828 cpm. Individuals born between 1923 and 1941 had an average MLC net response of 84,924 cpm, and those born in or before 1922 had an average MLC net response of 78,324 cpm.

For the adjusted analysis of the MLC net response, there was a significant group-by-race interaction ($p=0.039$). In addition, the following covariates and interactions were significant in the adjusted model: batch-to-batch variation ($p<0.001$), blood draw day-to-day variation ($p<0.001$), age ($p=0.014$), occupation ($p=0.014$), and current cigarette smoking-by-lifetime cigarette smoking history ($p=0.032$). Because of the group-by-race interaction, Ranch Hand and Comparison group contrasts were performed separately

for Blacks and nonblacks. For the Blacks, Ranch Hands had a lower adjusted mean MLC net response than the Comparisons (87,383 cpm vs. 109,376 cpm), and this group contrast was borderline significant (p=0.059). For the nonblacks, the group contrast was not significant (p=0.341). The adjusted means for nonblack Ranch Hands and nonblack Comparisons were 87,867 cpm and 85,200 cpm, respectively. Without the group-by-race interaction in the model, there was no significant difference between the Ranch Hands and Comparisons (p=0.617).

NKCA 50/1 Net Response

The unadjusted group contrast of the NKCA 50/1 net response was not significant (p=0.435). The analysis included only the batch-to-batch and blood draw day-to-day covariates.

For the NKCA 50/1 net response, significant covariate associations were displayed for the following: occupation (p=0.032), current cigarette smoking history (p=0.007), current alcohol use (p=0.006), and lifetime alcohol history (p=0.048). Officers had the highest average net response at 439.1 cpm. Enlisted flyers and enlisted groundcrew had average net responses of 405.0 cpm and 401.4 cpm, respectively. For the covariate current cigarette smoking, participants who never smoked or those who quit had average net responses of 436.4 cpm and 429.7 cpm, respectively. Smokers above 20 cigarettes per day had an average net response of 384.6 cpm, and those not exceeding 20 cigarettes per day had an average net response of 382.3 cpm. For participants with current alcohol use of more than four drinks per day, the average net response was 506.1 cpm. Individuals consuming more than one drink per day but no more than four drinks per day had an average net response of 443.9 cpm. For those individuals having at most one drink per day, the average was 408.1 cpm. Among participants with lifetime alcohol history scores above 40 drink-years, the average net response was 445.8 cpm. Participants with a lifetime alcohol history value of more than 0 drink-years but not exceeding 40 drink-years had an average net response of 412.8 cpm. Individuals with a lifetime alcohol history of 0 drink-years had an average net response of 388.9 cpm.

For the adjusted analysis of the NKCA 50/1 net response, the group-by-race interaction was significant (p=0.040). The batch-to-batch and blood draw day-to-day covariates were significant in the adjusted model (p<0.001 for both covariates). The following covariate interactions were also significant for this analysis: current cigarette smoking-by-race (p=0.014), lifetime cigarette smoking history-by-occupation (p=0.004), current cigarette smoking-by-lifetime cigarette smoking history (p=0.041), and age-by-current alcohol use (p=0.031). To examine the group-by-race interaction, Ranch Hands and Comparisons were compared for Blacks and nonblacks separately. The group contrast for the nonblacks was not significant (p=0.268) and the group contrast for the Blacks was borderline significant (p=0.065), with the Black Ranch Hands having a higher adjusted mean net response (467.1 cpm) than the Black Comparisons (359.3 cpm). Without the group-by-race interaction, the adjusted group contrast was not significant (p=0.494).

NKCA 50/1 Percent Release

No significant unadjusted group difference was found for the NKCA 50/1 percent release ($p=0.569$). The analysis included only the batch-to-batch and blood draw day-to-day covariates.

For the NKCA 50/1 percent release, occupation ($p=0.039$), current cigarette smoking ($p=0.007$), and current alcohol use ($p=0.022$) displayed significant associations. Officers had the highest average percent release at 37.3. Enlisted flyers and enlisted groundcrew had average percent releases of 34.4. For participants who never smoked or were former smokers, the average percent releases were 37.0 and 36.7, respectively. For smokers not exceeding 20 cigarettes per day, the average percent release was 32.5, and for those smoking more than 20 cigarettes per day the average percent release was 33.1. Participants with current alcohol use over four drinks per day had an average percent release of 41.8; those above one drink per day but not exceeding four drinks per day had an average percent release of 37.4; and those individuals not exceeding one drink per day had an average percent release of 34.9.

The adjusted analysis contained a significant group-by-race interaction ($p=0.022$). The batch-to-batch and blood draw day-to-day covariates were significant in the adjusted model ($p<0.001$ for both covariates). In addition, the following three covariate interactions were significant: current cigarette smoking-by-race ($p=0.006$), lifetime cigarette smoking history-by-occupation ($p=0.020$), and age-by-current alcohol use ($p=0.034$). Because of the group-by-race interaction, Ranch Hands and Comparisons were contrasted for Blacks and nonblacks separately. For the nonblacks, Ranch Hands and Comparisons were not significantly different ($p=0.392$) on their adjusted mean percent release. The Black Ranch Hands had a significantly higher average percent release than the Black Comparisons ($p=0.031$, 40.4% vs. 30.1%). Deleting the group-by-race interaction from the adjusted model resulted in a nonsignificant group contrast ($p=0.710$).

NKCI 50/1 Net Response

The unadjusted group contrast of the NKCI 50/1 net response variable was not significant ($p=0.462$). The analysis included only the batch-to-batch and blood draw day-to-day covariates.

Current cigarette smoking ($p<0.001$) and lifetime cigarette smoking history ($p=0.034$) exhibited significant covariate associations with the 50/1 net responses for the NKCI. Occupation also displayed a marginal association with these net responses ($p=0.077$). For enlisted flyers and officers, the NKCI average net responses were 822.7 cpm and 816.3 cpm, respectively. Enlisted groundcrew had an average net response of 801.2 cpm for the NKCI. For those participants who never smoked or were former smokers, the average net responses were 827.7 cpm and 817.4 cpm, respectively. Individuals who smoked no more than 20 cigarettes per day had an average net response of 787.0 cpm, and those who smoked over 20 cigarettes per day had an average net response of 789.9 cpm. For the covariate of lifetime cigarette smoking history, those participants who never smoked had the highest average net response at 827.0 cpm. Smokers with lifetime cigarette smoking history not exceeding 10 pack-years versus those above 10 pack-years had average net responses of 806.3 cpm and 802.7 cpm, respectively.

For the adjusted analysis of the NKCI 50/1 net response, there was a significant group-by-race interaction (p=0.003). This model also had the following significant covariates and interactions: batch-to-batch variation (p<0.001), blood draw day-to-day variation (p<0.001), current cigarette smoking-by-race (p=0.020), lifetime cigarette smoking history-by-occupation (p=0.031), and current cigarette smoking-by-lifetime cigarette smoking history (p=0.004). Because of the significant group-by-race interactions, group contrasts were performed separately for Blacks and nonblacks. Black Ranch Hands had a significantly higher adjusted mean net response for the NKCI than did the Black Comparisons (828.6 cpm vs. 734.7 cpm, p=0.007). The nonblack Ranch Hands and Comparisons were not significantly different (p=0.146).

NKCI 50/1 Percent Release

No significant unadjusted group difference was found for the NKCI 50/1 percent release (p=0.270). The analysis included only the batch-to-batch and blood draw day-to-day covariates.

For the NKCI 50/1 percent release, current cigarette smoking and lifetime cigarette smoking history exhibited significant covariate relationships (p<0.001 and p=0.019, respectively). For the first covariate, participants who never smoked or were former smokers had average percent releases of 68.2 and 67.3, respectively. Smokers, categorized as those with current cigarette smoking levels not exceeding 20 cigarettes per day and those exceeding 20 cigarettes per day, had the same average percent release of 65.0. For lifetime cigarette smoking history, nonsmokers had an average percent release of 68.2. For those participants between 0 and 10 pack-years, the average percent release was 66.6. Those participants with more than 10 pack-years of lifetime cigarette smoking history had an average percent release of 66.0.

For the adjusted analysis of the NKCI 50/1 percent release, the group-by-race interaction was significant (p=0.003). In addition, this adjusted model had the following significant covariates and interactions: batch-to-batch variation (p<0.001), blood draw day-to-day variation (p<0.001), current cigarette smoking-by-race (p=0.013), lifetime cigarette smoking history-by-occupation (p=0.020), and current cigarette smoking-by-lifetime cigarette smoking history (p=0.003). To investigate the group-by-race interaction, Ranch Hands and Comparisons were compared separately for Blacks and nonblacks. For the NKCI, the Black Ranch Hands had a significantly higher adjusted mean percent release than the Black Comparisons (67.9% vs. 60.5%, p=0.008). For the nonblacks, the Ranch Hands had a lower adjusted mean percent release that was marginally different from that of the Comparisons (66.5% vs. 67.7%, p=0.069).

Exposure Index Analysis

The unadjusted and adjusted results of the exposure index analyses of the Ranch Hands are presented by occupation in Tables 19-11 and 19-12, respectively. The adjusted models investigated effects of the covariates of race, age, current cigarette smoking, lifetime cigarette smoking history, current alcohol use, and lifetime alcohol history; and the exposure index-by-covariate interactions. An overall summary of the significant exposure index-by-covariate interactions is provided in Table 19-13. For these interactions, detailed results are presented by strata in Table P-4 of Appendix P.

TABLE 19-11.

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
Composite Skin Test Diagnosis	Officer	n	93	96	102	Overall		0.090
		Number/%						
		Abnormal	8 8.6%	4 4.2%	2 2.0%	M vs. L	0.46 (0.13,1.59)	0.342
		Normal	85 91.4%	92 95.8%	100 98.0%	H vs. L	0.21 (0.04,1.03)	0.073
	Enlisted Flyer	n	40	44	40	Overall		0.100
		Number/%						
		Abnormal	6 15.0%	1 2.3%	3 7.5%	M vs. L	0.13 (0.02,1.15)	0.083
		Normal	34 85.0%	43 97.7%	37 92.5%	H vs. L	0.46 (0.11,1.98)	0.482
	Enlisted Groundcrew	n	118	105	110	Overall		0.127
		Number/%						
		Abnormal	6 5.1%	13 12.4%	8 7.3%	M vs. L	2.64 (0.97,7.21)	0.087
		Normal	112 94.9%	92 87.6%	102 92.7%	H vs. L	1.46 (0.49,4.36)	0.680
CD2 Cells	Officer	n	51	53	48	Overall		0.518
		Mean[a]	1,489.1	1,606.3	1,574.4	M vs. L	—	0.254
		95% C.I.[a]	(1,344.1, 1,649.8)	(1,482.7, 1,740.2)	(1,419.0, 1,746.8)	H vs. L	—	0.457
	Enlisted Flyer	n	20	24	24	Overall		0.597
		Mean[a]	1,656.2	1,569.2	1,722.1	M vs. L	—	0.589
		95% C.I.[a]	(1,414.7, 1,938.8)	(1,392.9, 1,767.7)	(1,528.9, 1,939.7)	H vs. L	—	0.695
	Enlisted Groundcrew	n	43	64	47	Overall		0.733
		Mean[a]	1,701.5	1,693.2	1,615.1	M vs. L	—	0.941
		95% C.I.[a]	(1,550.4, 1,867.3)	(1,554.7 1,844.1)	(1,437.4, 1,814.6)	H vs. L	—	0.500

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
CD4 Cells	Officer	n	51	53	48	Overall		0.311
		Mean[a]	823.2	932.3	842.7	M vs. L	—	0.100
		95% C.I.[a]	(735.9, 920.9)	(847.2, 1,025.9)	(722.8, 982.5)	H vs. L	—	0.808
	Enlisted Flyer	n	20	24	25	Overall		0.852
		Mean[a]	971.9	914.7	950.9	M vs. L	—	0.610
		95% C.I.[a]	(794.8, 1,188.4)	(817.2, 1,023.9)	(831.0, 1,088.0)	H vs. L	—	0.856
	Enlisted Groundcrew	n	43	63	47	Overall		0.550
		Mean[a]	974.7	977.6	907.2	M vs. L	—	0.966
		95% C.I.[a]	(883.6, 1,075.3)	(895.0, 1,067.8)	(796.3, 1,033.5)	H vs. L	—	0.391
CD8 Cells	Officer	n	51	53	47	Overall		0.817
		Mean[a]	461.7	452.6	480.3	M vs. L	—	0.831
		95% C.I.[a]	(401.7, 530.7)	(401.3, 510.4)	(421.3, 547.6)	H vs. L	—	0.689
	Enlisted Flyer	n	20	24	25	Overall		0.398
		Mean[a]	438.9	465.7	527.0	M vs. L	—	0.680
		95% C.I.[a]	(350.1, 550.2)	(392.0, 553.2)	(442.2, 628.1)	H vs. L	—	0.210
	Enlisted Groundcrew	n	43	64	46	Overall		0.971
		Mean[a]	500.9	489.4	494.8	M vs. L	—	0.805
		95% C.I.[a]	(430.2, 583.3)	(438.4, 546.4)	(427.7, 572.4)	H vs. L	—	0.909

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
CD20 Cells	Officer	n	51	53	48	Overall		0.939
		Mean[a]	142.8	146.0	140.4	M vs. L	—	0.848
		95% C.I.[a]	(124.6, 163.6)	(122.7, 173.7)	(122.6, 160.8)	H vs. L	—	0.864
	Enlisted Flyer	n	20	24	25	Overall		0.388
		Mean[a]	176.2	148.0	142.0	M vs. L	—	0.300
		95% C.I.[a]	(135.1, 229.8)	(121.2, 180.7)	(115.4, 174.7)	H vs. L	—	0.209
	Enlisted Groundcrew	n	43	64	47	Overall		0.825
		Mean[a]	173.5	161.5	167.1	M vs. L	—	0.540
		95% C.I.[a]	(147.5, 204.1)	(138.7, 188.1)	(141.6, 197.1)	H vs. L	—	0.750
CD14 Cells	Officer	n	51	54	48	Overall		0.692
		Mean[a]	31.9	31.3	35.1	M vs. L	—	0.889
		95% C.I.[a]	(26.5,38.4)	(25.9,37.9)	(28.6,43.1)	H vs. L	—	0.505
	Enlisted Flyer	n	20	24	25	Overall		0.078
		Mean[a]	39.4	29.8	22.9	M vs. L	—	0.241
		95% C.I.[a]	(28.4,54.8)	(21.7,41.0)	(16.7,31.4)	H vs. L	—	0.025
	Enlisted Groundcrew	n	43	64	48	Overall		0.897
		Mean[a]	31.4	29.8	31.5	M vs. L	—	0.714
		95% C.I.[a]	(25.8,38.3)	(24.7,36.0)	(26.1,37.9)	H vs. L	—	0.987

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
CD25 Cells[b]	Officer	n	39	37	30	Overall		0.579
		Mean[a]	10.9	11.0	14.0	M vs. L	—	0.975
		95% C.I.[a]	(8.0,14.9)	(7.9,15.3)	(9.1,21.6)	H vs. L	—	0.359
		n	51	54	48	Overall		0.318
		Number/%						
		0	12 23.5%	17 31.5%	18 37.5%	M vs. L	—	0.490
		>0	39 76.5%	37 68.5%	30 62.5%	H vs. L	—	0.196
	Enlisted Flyer	n	13	15	18	Overall		0.360
		Mean[a]	13.3	9.2	8.3	M vs. L	—	0.308
		95% C.I.[a]	(8.8,20.2)	(5.4,15.8)	(5.6,12.5)	H vs. L	—	0.134
		n	20	24	25	Overall		0.766
		Number/%						
		0	7 35.0%	9 37.5%	7 28.0%	M vs. L	—	0.999
		>0	13 65.0%	15 62.5%	18 72.0%	H vs. L	—	0.854
	Enlisted Groundcrew	n	31	48	37	Overall		0.283
		Mean[a]	13.8	11.1	9.3	M vs. L	—	0.356
		95% C.I.[a]	(10.0,19.0)	(8.1,15.1)	(6.7,12.8)	H vs. L	—	0.095
		n	43	64	47	Overall		0.764
		Number/%						
		0	12 27.9%	16 25.0%	10 21.3%	M vs. L	—	0.906
		>0	31 72.1%	48 75.0%	37 78.7%	H vs. L	—	0.626

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
HLA-DR Cells	Officer	n	51	54	48	Overall		0.748
		Mean[a]	401.0	420.7	427.6	M vs. L	—	0.584
		95% C.I.[a]	(362.4, 443.7)	(366.4, 483.1)	(380.8, 480.1)	H vs. L	—	0.413
	Enlisted Flyer	n	20	24	25	Overall		0.137
		Mean[a]	504.1	416.1	389.0	M vs. L	—	0.133
		95% C.I.[a]	(414.1, 613.7)	(357.0, 484.9)	(322.9, 468.6)	H vs. L	—	0.069
	Enlisted Groundcrew	n	43	64	48	Overall		0.760
		Mean[a]	465.7	439.5	447.8	M vs. L	—	0.462
		95% C.I.[a]	(417.6, 519.4)	(396.7, 487.0)	(400.1, 501.1)	H vs. L	—	0.626
CD4/CD8 Ratio	Officer	n	51	53	47	Overall		0.251
		Mean[a]	1.78	2.06	1.82	M vs. L	—	0.152
		95% C.I.[a]	(1.54,2.06)	(1.81,2.35)	(1.63,2.04)	H vs. L	—	0.825
	Enlisted Flyer	n	20	24	25	Overall		0.248
		Mean[a]	2.21	1.96	1.80	M vs. L	—	0.304
		95% C.I.[a]	(1.83,2.68)	(1.72,2.24)	(1.52,2.15)	H vs. L	—	0.128
	Enlisted Groundcrew	n	43	63	46	Overall		0.425
		Mean[a]	1.95	2.01	1.81	M vs. L	—	0.684
		95% C.I.[a]	(1.69,2.24)	(1.83,2.21)	(1.61,2.04)	H vs. L	—	0.446

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
TLC	Officer	n	51	54	48	Overall		0.551
		Mean[a]	1,845.6	1,972.6	1,922.9	M vs. L	—	0.279
		95% C.I.[a]	(1,686.0, 2,020.3)	(1,821.7, 2,135.4)	(1,750.5, 2,112.3)	H vs. L	—	0.516
	Enlisted Flyer	n	20	24	25	Overall		0.544
		Mean[a]	2,179.9	1,978.5	2,087.0	M vs. L	—	0.275
		95% C.I.[a]	(1,867.9, 2,544.0)	(1,766.6, 2,215.9)	(1,885.8, 2,309.8)	H vs. L	—	0.620
	Enlisted Groundcrew	n	43	64	48	Overall		0.681
		Mean[a]	2,099.4	2,112.4	2,003.1	M vs. L	—	0.925
		95% C.I.[a]	(1,925.7, 2,288.7)	(1,951.5, 2,286.6)	(1,788.3, 2,243.8)	H vs. L	—	0.504
IgG	Officer	n	125	119	118	Overall		0.973
		Mean	1,006.7	1,010.3	1,013.3	M vs. L	—	0.898
		95% C.I.	(970.5, 1,042.8)	(971.5, 1,049.2)	(966.6, 1,060.0)	H vs. L	—	0.816
	Enlisted Flyer	n	53	62	53	Overall		0.420
		Mean	1,038.6	1,016.8	979.8	M vs. L	—	0.615
		95% C.I.	(974.9, 1,102.4)	(959.0, 1,074.5	(914.6, 1,045.1)	H vs. L	—	0.194
	Enlisted Groundcrew	n	145	150	138	Overall		0.973
		Mean	1,067.6	1,070.5	1,063.5	M vs. L	—	0.924
		95% C.I.	(1,027.3, 1,107.9)	(1,025.5, 1,115.4)	(1,022.3, 1,104.6)	H vs. L	—	0.890

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
IgA	Officer	n	125	119	118	Overall		0.508
		Mean[a]	207.42	199.05	193.35	M vs. L	—	0.500
		95% C.I.[a]	(191.65, 224.50)	(180.98, 218.92)	(177.39, 210.54)	H vs. L	—	0.248
	Enlisted Flyer	n	53	62	53	Overall		0.218
		Mean[a]	225.57	195.85	215.75	M vs. L	—	0.091
		95% C.I.[a]	(200.60, 253.64)	(174.65, 219.62)	(190.56, 244.27)	H vs. L	—	0.606
	Enlisted Groundcrew	n	145	150	138	Overall		0.632
		Mean[a]	206.57	216.95	212.77	M vs. L	—	0.341
		95% C.I.[a]	(192.53, 221.63)	(200.86, 234.32)	(197.85, 228.82)	H vs. L	—	0.574
IgM	Officer	n	125	119	117	Overall		0.718
		Mean[a]	108.59	113.16	113.73	M vs. L	—	0.509
		95% C.I.[a]	(100.97, 116.78)	(102.52, 124.90)	(103.48, 124.99)	H vs. L	—	0.461
	Enlisted Flyer	n	53	62	53	Overall		0.495
		Mean[a]	110.62	101.04	110.80	M vs. L	—	0.316
		95% C.I.[a]	(97.43, 125.60)	(90.31, 113.03)	(95.50, 128.55)	H vs. L	—	0.986
	Enlisted Groundcrew	n	145	150	138	Overall		0.442
		Mean[a]	109.32	116.54	111.26	M vs. L	—	0.217
		95% C.I.[a]	(101.28, 118.00)	(108.80, 124.83)	(103.03, 120.14)	H vs. L	—	0.740

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
Unstimulated PHA Response	Officer	n	50	53	46	Overall		0.511
		Mean[a]	1,953	1,756	1,940	M vs. L	—	0.313
		95% C.I.[a]	(1,703, 2,239)	(1,508, 2,045)	(1,683, 2,237)	H vs. L	—	0.948
	Enlisted Flyer	n	20	23	25	Overall		0.275
		Mean[a]	1,913	1,706	2,168	M vs. L	—	0.509
		95% C.I.[a]	(1,470, 2,491)	(1,375, 2,117)	(1,848, 2,544)	H vs. L	—	0.412
	Enlisted Groundcrew	n	41	63	47	Overall		0.883
		Mean[a]	2,198	2,085	2,102	M vs. L	—	0.648
		95% C.I.[a]	(1,824, 2,648)	(1,822, 2,387)	(1,834, 2,409)	H vs. L	—	0.701
PHA Net Response (day 1, conc. 1)	Officer	n	50	52	47	Overall		0.714
		Mean	96,518	103,412	95,338	M vs. L	—	0.500
		95% C.I.	(83,052, 109,984)	(88,672, 118,151)	(79,062, 111,615)	H vs. L	—	0.913
	Enlisted Flyer	n	20	24	25	Overall		0.494
		Mean	92,996	79,423	97,148	M vs. L	—	0.420
		95% C.I.	(69,412, 116,581)	(57,034, 101,812)	(76,811, 117,484)	H vs. L	—	0.794
	Enlisted Groundcrew	n	43	64	48	Overall		0.804
		Mean	98,018	97,832	104,742	M vs. L	—	0.986
		95% C.I.	(80,279, 115,757)	(85,059, 110,605)	(85,375, 124,109)	H vs. L	—	0.620

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
PHA Net Response (day 1, conc. 2)	Officer	n	50	52	47	Overall		0.439
		Mean	141,287	159,755	148,838	M vs. L	—	0.182
		95% C.I.	(123,201, 159,374)	(139,855, 179,654)	(125,933, 171,743)	H vs. L	—	0.611
	Enlisted Flyer	n	20	24	25	Overall		0.111
		Mean	173,558	136,739	171,800	M vs. L	—	0.077
		95% C.I.	(143,420, 203,696)	(110,393, 163,085)	(146,076, 197,524)	H vs. L	—	0.931
	Enlisted Groundcrew	n	43	64	48	Overall		0.955
		Mean	172,510	177,018	174,083	M vs. L	—	0.766
		95% C.I.	(149,054, 195,967)	(158,601, 195,434)	(150,550, 197,615)	H vs. L	—	0.927
PHA Net Response (day 1, conc. 3)	Officer	n	50	52	47	Overall		0.471
		Mean	127,960	143,506	136,771	M vs. L	—	0.203
		95% C.I.	(111,672, 144,248)	(126,212, 160,800)	(116,978, 156,565)	H vs. L	—	0.500
	Enlisted Flyer	n	20	24	25	Overall		0.067
		Mean	165,631	126,209	158,427	M vs. L	—	0.033
		95% C.I.	(140,307, 190,955)	(102,257, 150,161)	(134,311, 182,542)	H vs. L	—	0.691
	Enlisted Groundcrew	n	43	64	48	Overall		0.686
		Mean	166,100	165,540	155,349	M vs. L	—	0.968
		95% C.I.	(143,296, 188,903)	(149,491, 181,589)	(136,431, 174,268)	H vs. L	—	0.476

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
PHA Net Response (day 2, conc. 1)	Officer	n	50	54	47	Overall		0.127
		Mean	163,987	169,754	142,635	M vs. L	—	0.674
		95% C.I.	(145,159, 182,815)	(150,760, 188,749)	(123,096, 162,175)	H vs. L	—	0.126
	Enlisted Flyer	n	20	23	25	Overall		0.406
		Mean	161,962	135,314	156,092	M vs. L	—	0.262
		95% C.I.	(132,926, 190,997)	(100,776, 169,853)	(135,114, 177,071)	H vs. L	—	0.744
	Enlisted Groundcrew	n	41	63	46	Overall		0.943
		Mean	169,072	164,308	167,752	M vs. L	—	0.750
		95% C.I.	(146,217, 191,926)	(146,038, 182,578)	(146,929, 188,574)	H vs. L	—	0.933
PHA Net Response (day 2, conc. 2)	Officer	n	50	54	47	Overall		0.104
		Mean	169,516	176,020	151,107	M vs. L	—	0.596
		95% C.I.	(151,984, 187,048)	(159,598, 192,443)	(135,717, 166,496)	H vs. L	—	0.127
	Enlisted Flyer	n	20	23	25	Overall		0.369
		Mean	197,085	173,968	199,183	M vs. L	—	0.279
		95% C.I.	(169,446, 224,723)	(143,925, 204,012)	(174,547, 223,818)	H vs. L	—	0.912
	Enlisted Groundcrew	n	41	63	46	Overall		0.953
		Mean	192,394	196,800	193,698	M vs. L	—	0.772
		95% C.I.	(170,008, 214,780)	(177,728, 215,873)	(172,282, 215,113)	H vs. L	—	0.935

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
PHA Net Response (day 2, conc. 3)	Officer	n	50	54	47	Overall		0.294
		Mean	117,323	120,887	105,378	M vs. L	—	0.732
		95% C.I.	(102,922, 131,724)	(106,533, 135,240)	(91,859, 118,897)	H vs. L	—	0.240
	Enlisted Flyer	n	20	23	25	Overall		0.549
		Mean	133,841	122,395	141,992	M vs. L	—	0.509
		95% C.I.	(116,575, 151,107)	(93,518, 151,271)	(115,630, 168,354)	H vs. L	—	0.615
	Enlisted Groundcrew	n	41	63	46	Overall		0.701
		Mean	141,118	139,131	131,379	M vs. L	—	0.870
		95% C.I.	(124,293, 157,943)	(123,531, 154,732)	(115,711, 147,046)	H vs. L	—	0.408
Overall PHA Net Response	Officer	n	49	52	46	Overall		0.433
		Mean	135,880	144,803	130,914	M vs. L	—	0.407
		95% C.I.	(121,300, 150,461)	(129,772, 159,835)	(115,205, 146,623)	H vs. L	—	0.650
	Enlisted Flyer	n	20	23	25	Overall		0.217
		Mean	154,179	129,797	154,107	M vs. L	—	0.159
		95% C.I.	(132,437, 175,920)	(105,199, 154,395)	(134,375, 173,839)	H vs. L	—	0.996
	Enlisted Groundcrew	n	41	63	46	Overall		0.998
		Mean	156,709	156,360	156,002	M vs. L	—	0.976
		95% C.I.	(137,890, 175,527)	(142,764, 169,957)	(138,963, 173,041)	H vs. L	—	0.957

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
Maximum PHA Net Response	Officer	n	49	52	46	Overall		0.351
		Mean	188,315	199,596	179,981	M vs. L	—	0.401
		95% C.I.	(169,815, 206,816)	(181,336, 217,856)	(158,967, 200,995)	H vs. L	—	0.547
	Enlisted Flyer	n	20	23	25	Overall		0.323
		Mean	214,337	190,274	216,475	M vs. L	—	0.231
		95% C.I.	(184,236, 244,438)	(159,944, 220,605)	(194,428, 238,522)	H vs. L	—	0.913
	Enlisted Groundcrew	n	41	63	46	Overall		0.852
		Mean	216,339	223,889	217,546	M vs. L	—	0.614
		95% C.I.	(192,781, 239,898)	(205,245, 242,534)	(195,630, 239,461)	H vs. L	—	0.940
Unstimulated MLC Response	Officer	n	49	54	47	Overall		0.352
		Mean[a]	4,187	3,960	3,330	M vs. L	—	0.731
		95% C.I.[a]	(3,394, 5,167)	(3,131, 5,009)	(2,669, 4,154)	H vs. L	—	0.144
	Enlisted Flyer	n	20	23	24	Overall		0.393
		Mean[a]	3,709	3,177	4,404	M vs. L	—	0.526
		95% C.I.[a]	(2,650, 5,192)	(2,279, 4,429)	(3,136, 6,184)	H vs. L	—	0.489
	Enlisted Groundcrew	n	43	62	48	Overall		0.834
		Mean[a]	5,001	4,549	4,566	M vs. L	—	0.555
		95% C.I.[a]	(3,900, 6,414)	(3,740, 5,533)	(3,476, 5,998)	H vs. L	—	0.633

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
MLC Net Response	Officer	n	49	54	47	Overall		0.977
		Mean	91,587	90,282	89,528	M vs. L	—	0.898
		95% C.I.	(77,545, 105,629)	(76,340, 104,225)	(78,400, 100,656)	H vs. L	—	0.823
	Enlisted Flyer	n	20	23	24	Overall		0.220
		Mean	104,580	90,817	111,932	M vs. L	—	0.263
		95% C.I.	(84,185, 124,975)	(78,839, 102,795)	(93,191, 130,673)	H vs. L	—	0.606
	Enlisted Groundcrew	n	43	62	48	Overall		0.900
		Mean	96,778	92,503	94,910	M vs. L	—	0.638
		95% C.I.	(82,289, 111,266)	(81,676, 103,330)	(80,348, 109,473)	H vs. L	—	0.860
NKCA 50/1 Net Response	Officer	n	51	53	48	Overall		0.829
		Mean	470.6	444.7	450.6	M vs. L	—	0.556
		95% C.I.	(408.0, 533.2)	(385.8, 503.6)	(386.4, 514.9)	H vs. L	—	0.664
	Enlisted Flyer	n	19	24	25	Overall		0.934
		Mean	387.9	399.5	381.0	M vs. L	—	0.820
		95% C.I.	(324.1, 451.8)	(327.8, 471.2)	(304.7, 457.4)	H vs. L	—	0.897
	Enlisted Groundcrew	n	42	62	46	Overall		0.780
		Mean	398.9	410.9	426.6	M vs. L	—	0.748
		95% C.I.	(336.2, 461.6)	(368.3, 453.5)	(374.2, 478.9)	H vs. L	—	0.506

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
NKCA 50/1 Percent Release	Officer	n	51	53	48	Overall		0.853
		Mean	39.1	38.0	37.2	M vs. L	—	0.740
		95% C.I.	(34.3,43.9)	(33.8,42.2)	(32.7,41.8)	H vs. L	—	0.586
	Enlisted Flyer	n	19	24	25	Overall		0.819
		Mean	33.0	34.1	31.6	M vs. L	—	0.779
		95% C.I.	(27.8,38.2)	(28.8,39.4)	(25.7,37.6)	H vs. L	—	0.746
	Enlisted Groundcrew	n	42	62	46	Overall		0.859
		Mean	33.2	34.5	34.8	M vs. L	—	0.677
		95% C.I.	(28.6,37.9)	(30.8,38.1)	(31.1,38.6)	H vs. L	—	0.595
NKCI 50/1 Net Response	Officer	n	50	53	45	Overall		0.208
		Mean	809.6	838.7	888.4	M vs. L	—	0.514
		95% C.I.	(748.9, 870.4)	(776.5, 901.0)	(831.1, 945.7)	H vs. L	—	0.069
	Enlisted Flyer	n	20	24	25	Overall		0.247
		Mean	829.2	756.6	862.4	M vs. L	—	0.291
		95% C.I.	(718.6, 939.8)	(677.4, 835.8)	(775.7, 949.2)	H vs. L	—	0.641
	Enlisted Groundcrew	n	42	64	48	Overall		0.363
		Mean	867.9	802.6	846.5	M vs. L	—	0.211
		95% C.I.	(781.7, 954.1)	(749.6, 855.6)	(781.3, 911.7)	H vs. L	—	0.696

TABLE 19-11. (continued)

Unadjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Est. Relative Risk (95% C.I.)	p-Value
NKCI 50/1	Officer	n	50	53	45	Overall		0.765
Percent		Mean	69.2	68.2	67.6	M vs. L	—	0.659
Release		95% C.I.	(65.8,72.5)	(65.3,71.1)	(65.5,69.8)	H vs. L	—	0.454
	Enlisted	n	20	24	25	Overall		0.421
	Flyer	Mean	65.2	64.3	68.2	M vs. L	—	0.779
		95% C.I.	(60.8,69.6)	(59.5,69.0)	(64.0,72.5)	H vs. L	—	0.337
	Enlisted	n	42	64	48	Overall		0.798
	Groundcrew	Mean	64.5	65.3	66.1	M vs. L	—	0.746
		95% C.I.	(61.6,67.5)	(62.4,68.1)	(63.2,69.0)	H vs. L	—	0.475

—Estimated relative risk not applicable.

[a]Transformed from natural logarithm scale.

[b]CD25 cell counts contained both zero values and positive values. Exposure index categories were compared on mean of positive CD25 cell counts and on proportion of zero CD25 cell counts.

TABLE 19-12.

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Composite Skin Test Diagnosis	Officer	n	92	94	102	Overall		0.131**
						M vs. L	0.52 (0.14,1.88)**	0.321**
						H vs. L	0.23 (0.05,1.13)**	0.070**
	Enlisted Flyer	n	39	43	40	Overall		0.014**
						M vs. L	—**	—**
						H vs. L	0.57 (0.12,2.70)**	0.482**
	Enlisted Groundcrew	n	115	105	108	Overall		****
						M vs. L	****	****
						H vs. L	****	****
CD2 Cells	Officer	n	51	53	48	Overall		0.559
		Adj. Mean[a]	1,446.9	1,558.1	1,521.7	M vs. L	—	0.288
		95% C.I.[a]	(1,016.3, 2,059.9)	(1,112.2, 2,182.7)	(1,071.5, 2,161.0)	H vs. L	—	0.478
	Enlisted Flyer	n	20	24	24	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
	Enlisted Groundcrew	n	42	64	47	Overall		0.961**
		Adj. Mean**[a]	1,635.9	1,616.5	1,601.2	M vs. L	—	0.867**
		95% C.I.**[a]	(1,432.0, 1,868.9)	(1,432.9, 1,823.5)	(1,412.3, 1,815.4)	H vs. L	—	0.780**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
CD4 Cells	Officer	n	51	53	48	Overall		0.188
		Adj. Mean[a]	686.0	789.8	694.6	M vs. L	—	0.104
		95% C.I.[a]	(442.9, 1,062.5)	(520.2, 1,199.1)	(449.9, 1,072.6)	H vs. L	—	0.887
	Enlisted Flyer	n	20	24	25	Overall		0.724**
		Adj. Mean**[a]	929.1	958.2	1,012.0	M vs. L	—	0.778**
		95% C.I.**[a]	(734.0, 1,176.2)	(758.5, 1,210.5)	(798.0, 1,283.5)	H vs. L	—	0.438**
	Enlisted Groundcrew	n	42	63	47	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
CD8 Cells	Officer	n	51	53	47	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
	Enlisted Flyer	n	20	24	25	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
	Enlisted Groundcrew	n	42	64	46	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
CD20 Cells	Officer	n	51	53	48	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
	Enlisted Flyer	n	20	24	25	Overall		0.783
		Adj. Mean[a]	186.8	175.1	166.4	M vs. L	—	0.694
		95% C.I.[a]	(131.0, 266.3)	(123.2, 248.8)	(116.4, 237.9)	H vs. L	—	0.486
	Enlisted Groundcrew	n	42	64	47	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
CD14 Cells	Officer	n	51	54	48	Overall		0.638
		Adj. Mean[a]	31.7	29.5	33.6	M vs. L	—	0.601
		95% C.I.[a]	(15.6,64.7)	(14.9,58.1)	(16.6,68.1)	H vs. L	—	0.690
	Enlisted Flyer	n	20	24	25	Overall		0.185
		Adj. Mean[a]	32.0	26.9	20.3	M vs. L	—	0.491
		95% C.I.[a]	(18.6,54.9)	(15.7,45.9)	(11.8,35.0)	H vs. L	—	0.075
	Enlisted Groundcrew	n	42	64	48	Overall		0.813**
		Adj. Mean**[a]	26.2	24.6	26.7	M vs. L	—	0.654**
		95% C.I.**[a]	(20.2,34.0)	(19.4,31.1)	(21.0,34.1)	H vs. L	—	0.891**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
CD25 Cells[b]	Officer	n	39	37	30	Overall		0.852**
		Adj. Mean**[a]	13.8	13.6	15.6	M vs. L	—	0.966**
		95% C.I.**[a]	(4.6,41.7)	(4.8,38.7)	(5.1,47.6)	H vs. L	—	0.630**
	Enlisted Flyer	n	13	15	18	Overall		0.702
		Adj. Mean[a]	11.1	8.8	8.2	M vs. L	—	0.547
		95% C.I.[a]	(5.1,24.2)	(3.7,20.8)	(3.8,17.8)	H vs. L	—	0.413
	Enlisted Groundcrew	n	30	48	37	Overall		0.433
		Adj. Mean[a]	12.5	10.5	8.9	M vs. L	—	0.477
		95% C.I.[a]	(7.7,20.4)	(7.0,15.8)	(5.7,14.0)	H vs. L	—	0.197
HLA-DR Cells	Officer	n	51	54	48	Overall		0.664
		Adj. Mean[a]	391.2	416.3	420.9	M vs. L	—	0.468
		95% C.I.[a]	(253.3, 604.2)	(275.0, 630.1)	(273.4, 648.1)	H vs. L	—	0.402
	Enlisted Flyer	n	20	24	25	Overall		0.511
		Adj. Mean[a]	476.3	435.1	408.7	M vs. L	—	0.491
		95% C.I.[a]	(359.0, 632.0)	(328.8, 575.9)	(307.4, 543.6)	H vs. L	—	0.249
	Enlisted Groundcrew	n	42	64	48	Overall		0.629**
		Adj. Mean**[a]	447.4	419.4	444.4	M vs. L	—	0.397**
		95% C.I.**[a]	(388.2, 515.5)	(368.9, 476.8)	(389.1, 507.6)	H vs. L	—	0.934**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
CD4/CD8 Ratio	Officer	n	51	53	47	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
	Enlisted Flyer	n	20	24	25	Overall		0.211
		Adj. Mean[a]	1.98	1.76	1.58	M vs. L	—	0.369
		95% C.I.[a]	(1.50,2.60)	(1.34,2.31)	(1.20,2.08)	H vs. L	—	0.080
	Enlisted Groundcrew	n	42	63	46	Overall		0.450**
		Adj. Mean**[a]	2.08	2.14	1.92	M vs. L	—	0.754**
		95% C.I.**[a]	(1.78,2.44)	(1.84,2.48)	(1.65,2.24)	H vs. L	—	0.386**
TLC	Officer	n	51	54	48	Overall		0.534
		Adj. Mean[a]	1,844.3	1,966.0	1,931.6	M vs. L	—	0.276
		95% C.I.[a]	(1,695.8, 2,005.7)	(1,812.0, 2,133.1)	(1,771.5, 2,106.2)	H vs. L	—	0.444
	Enlisted Flyer	n	20	24	25	Overall		0.666
		Adj. Mean[a]	2,041.5	2,022.0	2,154.0	M vs. L	—	0.906
		95% C.I.[a]	(1,810.3, 2,302.2)	(1,817.8, 2,249.2)	(1,939.5, 2,392.3)	H vs. L	—	0.511
	Enlisted Groundcrew	n	43	64	48	Overall		****
		Adj. Mean[a]	****	****	****	M vs. L	—	****
		95% C.I.[a]	****	****	****	H vs. L	—	****

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
IgG	Officer	n	125	119	118	Overall		0.032
		Adj. Mean	962.6	1,032.7	1,242.6	M vs. L	—	0.492
		95% C.I.	(804.8, 1,120.3)	(903.4, 1,162.1)	(1,034.8, 1,800.4)	H vs. L	—	0.012
	Enlisted Flyer	n	53	62	53	Overall		0.344
		Adj. Mean	1,039.0	1,020.1	975.5	M vs. L	—	0.660
		95% C.I.	(976.0, 1,102.0)	(961.8, 1,078.5)	(912.3, 1,038.6)	H vs. L	—	0.156
	Enlisted Groundcrew	n	145	150	138	Overall		****
		Adj. Mean	****	****	****	M vs. L	—	****
		95% C.I.	****	****	****	H vs. L	—	****
IgA	Officer	n	125	119	118	Overall		0.508**
		Adj. Mean**[a]	207.42	199.05	193.25	M vs. L	—	0.500**
		95% C.I.**[a]	(191.65, 224.50)	(180.98, 218.92)	(177.39, 210.54)	H vs. L	—	0.248**
	Enlisted Flyer	n	53	62	53	Overall		0.218
		Adj. Mean[a]	225.57	195.85	215.75	M vs. L	—	0.091
		95% C.I.[a]	(200.60, 253.64)	(174.65, 219.62)	(190.56, 244.27)	H vs. L	—	0.606
	Enlisted Groundcrew	n	142	150	136	Overall		0.423**
		Adj. Mean**[a]	207.48	220.96	209.32	M vs. L	—	0.223**
		95% C.I.**[a]	(192.79, 223.28)	(205.56, 237.52)	(194.06, 225.79)	H vs. L	—	0.866**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
IgM	Officer	n	125	119	117	Overall		0.694
		Adj. Mean[a]	88.92	93.01	93.16	M vs. L	—	0.469
		95% C.I.[a]	(72.88, 108.49)	(76.39, 113.25)	(76.29, 113.77)	H vs. L	—	0.455
	Enlisted Flyer	n	53	62	53	Overall		0.290
		Adj. Mean[a]	111.53	99.29	112.16	M vs. L	—	0.188
		95% C.I.[a]	(98.05, 126.87)	(88.10, 111.90)	(98.59, 127.60)	H vs. L	—	0.951
	Enlisted Groundcrew	n	145	150	138	Overall		0.479
		Adj. Mean[a]	101.29	107.47	102.61	M vs. L	—	0.249
		95% C.I.[a]	(92.35, 111.10)	(97.87, 118.02)	(93.22, 112.94)	H vs. L	—	0.805
Unstimulated PHA Response	Officer	n	50	53	46	Overall		0.335
		Adj. Mean[a]	4,449	3,891	4,430	M vs. L	—	0.201
		95% C.I.[a]	(2,632, 7,521)	(2,359, 6,419)	(2,629, 7,466)	H vs. L	—	0.968
	Enlisted Flyer	n	20	23	25	Overall		0.171
		Adj. Mean[a]	1,477	1,250	1,627	M vs. L	—	0.270
		95% C.I.[a]	(1,070, 2,038)	(907, 1,722)	(1,176, 2,253)	H vs. L	—	0.518
	Enlisted Groundcrew	n	40	63	47	Overall		0.690**
		Adj. Mean**[a]	2,635	2,412	2,529	M vs. L	—	0.395**
		95% C.I.**[a]	(2,173, 3,196)	(2,029, 2,866)	(2,115, 3,025)	H vs. L	—	0.711**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
PHA Net Response (day 1, conc. 1)	Officer	n	50	52	47	Overall		0.433
		Adj. Mean	86,335	98,207	86,596	M vs. L	—	0.265
		95% C.I.	(32,891, 139,779)	(47,238, 149,176)	(33,514, 139,679)	H vs. L	—	0.981
	Enlisted Flyer	n	20	24	25	Overall		0.393
		Adj. Mean	76,112	58,796	78,920	M vs. L	—	0.308
		95% C.I.	(39,658, 112,566)	(22,663, 94,928)	(42,179, 115,661)	H vs. L	—	0.869
	Enlisted Groundcrew	n	42	64	48	Overall		0.525
		Adj. Mean	100,607	95,694	108,737	M vs. L	—	0.675
		95% C.I.	(78,824, 122,390)	(75,980, 115,407)	(88,314, 129,160)	H vs. L	—	0.514
PHA Net Response (day 1, conc. 2)	Officer	n	50	52	47	Overall		0.296
		Adj. Mean	139,055	162,259	148,140	M vs. L	—	0.124
		95% C.I.	(63,435, 214,675)	(90,141, 234,377)	(73,033, 223,249)	H vs. L	—	0.554
	Enlisted Flyer	n	20	24	25	Overall		0.053
		Adj. Mean	149,371	110,819	151,799	M vs. L	—	0.053
		95% C.I.	(107,014, 191,727)	(68,836, 152,801)	(109,110, 194,489)	H vs. L	—	0.902
	Enlisted Groundcrew	n	42	64	48	Overall		0.863
		Adj. Mean	171,479	168,295	176,226	M vs. L	—	0.831
		95% C.I.	(143,737, 199,221)	(143,189, 193,401)	(150,217, 202,236)	H vs. L	—	0.765

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
PHA Net Response (day 1, conc. 3)	Officer	n	50	52	47	Overall		0.290
		Adj. Mean	122,226	143,061	133,568	M vs. L	—	0.116
		95% C.I.	(55,726, 188,727)	(79,640, 206,482)	(67,517, 199,619)	H vs. L	—	0.401
	Enlisted Flyer	n	20	24	25	Overall		0.056
		Adj. Mean	143,234	109,316	145,490	M vs. L	—	0.057
		95% C.I.	(105,462, 181,005)	(71,878, 146,754)	(107,421, 183,558)	H vs. L	—	0.898
	Enlisted Groundcrew	n	42	64	48	Overall		0.889
		Adj. Mean	172,265	168,127	165,482	M vs. L	—	0.755
		95% C.I.	(147,577, 196,953)	(145,785, 190,470)	(142,335, 188,629)	H vs. L	—	0.631
PHA Net Response (day 2, conc. 1)	Officer	n	50	54	47	Overall		0.103
		Adj. Mean	146,025	154,299	125,562	M vs. L	—	0.552
		95% C.I.	(75,758, 216,292)	(87,285, 221,313)	(55,721, 195,403)	H vs. L	—	0.151
	Enlisted Flyer	n	20	23	25	Overall		0.226
		Adj. Mean	136,615	102,547	128,967	M vs. L	—	0.111
		95% C.I.	(91,292, 181,937)	(57,467, 147,626)	(83,216, 174,718)	H vs. L	—	0.717
	Enlisted Groundcrew	n	40	63	46	Overall		0.787**
		Adj. Mean**	167,346	157,783	165,018	M vs. L	—	0.521**
		95% C.I.**	(139,776, 194,916)	(133,097, 182,469)	(139,354, 190,682)	H vs. L	—	0.884**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
PHA Net Response (day 2, conc. 2)	Officer	n	50	54	47	Overall		0.130
		Adj. Mean	163,115	173,869	149,009	M vs. L	—	0.388
		95% C.I.	(100,237, 225,992)	(113,903, 233,835)	(86,513, 211,506)	H vs. L	—	0.268
	Enlisted Flyer	n	20	23	25	Overall		0.225
		Adj. Mean	161,115	136,315	167,492	M vs. L	—	0.220
		95% C.I.	(118,107, 204,123)	(93,537, 179,092)	(124,077, 210,906)	H vs. L	—	0.750
	Enlisted Groundcrew	n	40	63	46	Overall		0.979
		Adj. Mean	194,693	194,349	197,217	M vs. L	—	0.982
		95% C.I.	(167,086, 222,301)	(169,630, 219,069)	(171,518, 222,916)	H vs. L	—	0.874
PHA Net Response (day 2, conc. 3)	Officer	n	50	54	47	Overall		0.315**
		Adj. Mean**	118,963	124,010	108,261	M vs. L	—	0.636**
		95% C.I.**	(65,096, 172,829)	(72,637, 175,382)	(54,721, 161,801)	H vs. L	—	0.327**
	Enlisted Flyer	n	20	23	25	Overall		0.393
		Adj. Mean	111,834	105,130	127,972	M vs. L	—	0.714
		95% C.I.	(72,694, 150,974)	(66,199, 144,060)	(88,461, 167,482)	H vs. L	—	0.378
	Enlisted Groundcrew	n	40	63	46	Overall		0.780
		Adj. Mean	152,385	148,116	143,553	M vs. L	—	0.716
		95% C.I.	(130,631, 174,140)	(128,637, 167,595)	(123,302, 163,803)	H vs. L	—	0.482

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Overall PHA Net Response	Officer	n	49	52	46	Overall		0.320
		Adj. Mean	129,589	142,335	126,748	M vs. L	—	0.255
		95% C.I.	(73,758, 185,420)	(89,096, 195,574)	(71,241, 182,255)	H vs. L	—	0.803
	Enlisted Flyer	n	20	23	25	Overall		0.109
		Adj. Mean	129,862	104,152	133,554	M vs. L	—	0.109
		95% C.I.	(95,920, 163,803)	(70,392, 137,912)	(99,291, 167,817)	H vs. L	—	0.815
	Enlisted Groundcrew	n	40	63	46	Overall		0.860
		Adj. Mean	160,090	154,928	160,093	M vs. L	—	0.650
		95% C.I.	(139,057, 181,124)	(136,095, 173,762)	(140,514, 179,672)	H vs. L	—	0.999
Maximum PHA Net Response	Officer	n	49	52	46	Overall		0.351
		Adj. Mean	188,315	199,596	179,981	M vs. L	—	0.401
		95% C.I.	(169,815, 206,816)	(181,336, 217,856)	(158,967, 200,995)	H vs. L	—	0.547
	Enlisted Flyer	n	20	23	25	Overall		0.122
		Adj. Mean	176,036	149,623	184,617	M vs. L	—	0.149
		95% C.I.	(134,833, 217,239)	(109,261, 189,986)	(143,857, 225,377)	H vs. L	—	0.664
	Enlisted Groundcrew	n	41	63	46	Overall		0.999
		Adj. Mean	219,613	220,208	219,669	M vs. L	—	0.968
		95% C.I.	(196,953, 242,273)	(201,858, 238,559)	(198,322, 241,017)	H vs. L	—	0.997

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Unstimulated MLC Response	Officer	n	49	54	47	Overall		0.419
		Adj. Mean[a]	5,102	5,050	4,185	M vs. L	—	0.951
		95% C.I.[a]	(2,189, 11,894)	(2,255, 11,313)	(1,806, 9,699)	H vs. L	—	0.250
	Enlisted Flyer	n	20	23	24	Overall		0.248**
		Adj. Mean**[a]	2,980	2,379	3,613	M vs. L	—	0.382**
		95% C.I.**[a]	(1,725, 5,148)	(1,380, 4,101)	(2,060, 6,338)	H vs. L	—	0.457**
	Enlisted Groundcrew	n	42	62	48	Overall		0.629
		Adj. Mean[a]	6,017	5,172	5,734	M vs. L	—	0.355
		95% C.I.[a]	(4,449, 8,136)	(3,929, 6,809)	(4,320, 7,610)	H vs. L	—	0.780
MLC Net Response	Officer	n	49	54	47	Overall		0.955
		Adj. Mean	89,613	88,876	86,664	M vs. L	—	0.941
		95% C.I.	(39,335, 139,890)	(40,971, 136,781)	(36,739, 136,589)	H vs. L	—	0.773
	Enlisted Flyer	n	20	23	24	Overall		0.201
		Adj. Mean	82,103	69,394	92,162	M vs. L	—	0.332
		95% C.I.	(54,314, 109,891)	(41,725, 97,064)	(63,598, 120,727)	H vs. L	—	0.445
	Enlisted Groundcrew	n	42	62	48	Overall		0.605
		Adj. Mean	92,968	85,497	93,926	M vs. L	—	0.432
		95% C.I.	(75,424, 110,512)	(69,517, 101,477)	(77,469, 110,384)	H vs. L	—	0.924

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index Low	Exposure Index Medium	Exposure Index High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
NKCA 50/1 Net Response	Officer	n	51	53	48	Overall		0.559
		Adj. Mean	476.5	428.1	441.4	M vs. L	—	0.293
		95% C.I.	(244.0, 709.0)	(206.6, 649.5)	(210.7, 672.2)	H vs. L	—	0.452
	Enlisted Flyer	n	19	24	25	Overall		0.813**
		Adj. Mean**	471.2	495.8	465.1	M vs. L	—	0.658**
		95% C.I.**	(354.7, 587.7)	(380.3, 611.2)	(348.2, 581.9)	H vs. L	—	0.912**
	Enlisted Groundcrew	n	41	62	46	Overall		0.827
		Adj. Mean	432.3	442.7	456.4	M vs. L	—	0.778
		95% C.I.	(363.9, 500.7)	(381.0, 504.4)	(392.2, 520.6)	H vs. L	—	0.541
NKCA 50/1 Percent Release	Officer	n	51	53	48	Overall		0.711
		Adj. Mean	38.0	35.8	35.5	M vs. L	—	0.503
		95% C.I.	(21.2,54.9)	(19.8,51.8)	(18.7,52.2)	H vs. L	—	0.448
	Enlisted Flyer	n	19	24	25	Overall		0.731
		Adj. Mean	37.9	39.5	36.5	M vs. L	—	0.707
		95% C.I.	(28.8,47.0)	(30.5,48.5)	(27.4,45.5)	H vs. L	—	0.738
	Enlisted Groundcrew	n	41	62	46	Overall		0.910**
		Adj. Mean**	36.0	37.1	37.0	M vs. L	—	0.682**
		95% C.I.**	(30.7,41.2)	(32.4,41.9)	(32.1,42.0)	H vs. L	—	0.732**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

Variable	Occupation	Statistic	Exposure Index: Low	Exposure Index: Medium	Exposure Index: High	Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
NKCI 50/1 Net Response	Officer	n	50	53	45	Overall		0.243
		Adj. Mean	874.1	868.6	936.8	M vs. L	—	0.900
		95% C.I.	(651.8, 1,096.4)	(656.7, 1,080.5)	(715.4, 1,158.2)	H vs. L	—	0.170
	Enlisted Flyer	n	20	24	25	Overall		0.270
		Adj. Mean	853.5	747.2	821.7	M vs. L	—	0.126
		95% C.I.	(705.3, 1,001.7)	(600.3, 894.1)	(672.4, 971.1)	H vs. L	—	0.646
	Enlisted Groundcrew	n	41	64	48	Overall		0.307
		Adj. Mean	895.5	824.0	874.6	M vs. L	—	0.145
		95% C.I.	(804.6, 986.4)	(742.3, 905.7)	(790.1, 959.1)	H vs. L	—	0.687
NKCI 50/1 Percent Release	Officer	n	50	53	45	Overall		0.688
		Adj. Mean	70.9	69.3	69.5	M vs. L	—	0.421
		95% C.I.	(60.3,81.6)	(59.1,79.4)	(58.9,80.0)	H vs. L	—	0.495
	Enlisted Flyer	n	20	24	25	Overall		0.705
		Adj. Mean	66.3	64.3	66.9	M vs. L	—	0.567
		95% C.I.	(58.9,73.6)	(57.0,71.6)	(59.4,74.3)	H vs. L	—	0.864
	Enlisted Groundcrew	n	41	64	48	Overall		0.801**
		Adj. Mean**	66.1	66.5	67.6	M vs. L	—	0.836**
		95% C.I.**	(62.0,70.1)	(62.9,70.2)	(63.8,71.3)	H vs. L	—	0.521**

TABLE 19-12. (continued)

Adjusted Exposure Index for Immunologic Variables by Occupation

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**Exposure index-by-covariate interaction ($0.01<p<0.05$)—adjusted mean or relative risk, confidence interval, and p-value derived from a model fitted after deletion of this interaction.

—Adjusted relative risk not applicable for continuous analysis of a variable; relative risk/confidence interval/ p-value not given due to cells with zero frequency.

[a]Transformed from natural logarithm scale.

***Exposure index-by-covariate interaction ($p<0.01$)—adjusted mean or relative risk, confidence interval, and p-value not presented.

[b]Exposure index categories compared on adjusted means of positive cell counts.

TABLE 19-13.

Summary of Exposure Index-by-Covariate Interactions From Adjusted Analyses for Immunologic Variables*

Variable	Occupation	Covariate	p-Value
Composite Skin Test Diagnosis	Officer	Lifetime Cigarette Smoking History	0.017
		Current Alcohol Use	0.018
Composite Skin Test Diagnosis	Enlisted Flyer	Lifetime Alcohol History	0.037
Composite Skin Test Diagnosis	Enlisted Groundcrew	Lifetime Alcohol History	0.002
		Current Alcohol Use	<0.001
CD2 Cells	Enlisted Flyer	Current Alcohol Use	0.001
CD2 Cells	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.017
CD4 Cells	Enlisted Flyer	Current Alcohol Use	0.035
CD4 Cells	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.005
CD8 Cells	Officer	Age	0.002
CD8 Cells	Enlisted Flyer	Current Alcohol Use	<0.001
CD8 Cells	Enlisted Groundcrew	Current Alcohol Use	0.012
		Lifetime Alcohol History	0.008
CD20 Cells	Officer	Current Cigarette Smoking	0.013
		Lifetime Cigarette Smoking History	0.009
CD20 Cells	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.004
CD14 Cells	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.020
		Current Alcohol Use	0.043
CD25 Cells	Officer	Lifetime Alcohol History	0.012
HLA-DR Cells	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.011
CD4/CD8 Ratio	Officer	Age	<0.001
CD4/CD8 Ratio	Enlisted Groundcrew	Current Alcohol Use	0.015
TLC	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.004
IgG	Enlisted Groundcrew	Lifetime Cigarette Smoking History	0.001
IgA	Officer	Current Cigarette Smoking	0.032
IgA	Enlisted Groundcrew	Lifetime Alcohol History	0.012
Unstimulated PHA Response	Enlisted Groundcrew	Current Alcohol Use	0.047
		Lifetime Alcohol History	0.027
PHA Net Response (day 2, conc. 1)	Enlisted Groundcrew	Age	0.035
PHA Net Response (day 2, conc. 3)	Officer	Current Cigarette Smoking	0.014

TABLE 19-13. (continued)

Summary of Exposure Index-by-Covariate Interactions
From Adjusted Analyses for Immunologic Variables*

Variable	Occupation	Covariate	p-Value
Unstimulated MLC Response	Enlisted Flyer	Age	0.046
NKCA 50/1 Net Response	Enlisted Flyer	Lifetime Cigarette Smoking History	0.015
NKCA 50/1 Percent Release	Enlisted Groundcrew	Age	0.014
NKCI 50/1 Percent Release	Enlisted Groundcrew	Age	0.042

*Refer to Table P-4 for a further investigation of these interactions.