



MLDC Research Areas

Definition of Diversity
Legal Implications
Outreach & Recruiting
Leadership & Training
Branching & Assignments
Promotion
Retention
Implementation & Accountability
Metrics
National Guard & Reserve

This issue paper aims to aid in the deliberations of the MLDC. It does not contain the recommendations of the MLDC.

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Reserve Component Enlisted Continuation Rates by Gender and Race/Ethnicity

Abstract

The MLDC charter directs the commission to “Measure the ability of current activities to increase continuation rates for ethnic- and gender-specific members of the Armed Forces.” To help with this task, this issue paper (IP) looks at continuation rates for enlisted personnel in the Reserve Component (RC). The main goal is to identify continuation differences by gender and race/ethnicity. We identify three major patterns. First, continuation rates for women are consistently lower than the rates for their male counterparts. Second, continuation rates for Hispanics and for non-Hispanic Asians and Pacific Islanders (API) are higher than rates for non-Hispanic whites. In general, API continuation rates are the highest across all race/ethnicity categories. Third, continuation rates are consistently lower for non-Hispanic blacks and for those in the “other” category, although less consistently. This IP also reports results by Service and, to help identify patterns across enlisted personnel careers, by years of service.

In this issue paper (IP), we examine whether there are gender and race/ethnicity differences in continuation rates for enlisted personnel in the Reserve Component (RC). Congress tasked the Military Leadership Diversity Commission (MLDC) with examining the ability of current activities to increase continuation rates for women and minorities. We look at general continuation patterns across the career of enlisted personnel. We also test for average differences between enlisted men and women and between enlisted minorities and non-Hispanic whites in the RC. In an effort to ensure consistency in our results, we use the same definitions and formulas for all seven components. This allows us to make comparisons across

Services and helps us identify patterns across the RC. We focus on Selected Reserve (SelRes) personnel not on active duty,¹ including personnel from the

- Army National Guard (ARNG)
- Air National Guard (ANG)
- U.S. Army Reserve (USAR)
- U.S. Navy Reserve (USNR)
- U.S. Marine Corps Reserve (USMCR)
- U.S. Air Force Reserve (USAFR)
- U.S. Coast Guard Reserve (USCGR)

Our results show a general pattern of continuation rates that are lower for women than men across their careers and for all components. We report continuation rates that are higher for minorities than whites, with few exceptions. However, we also point out that there are many nuances to these results and we discuss them below.

We emphasize that the results presented here are descriptive rather than explanatory. There are methodological limitations to using descriptive results to inform policy decisions. Effective policies should be directed at the causes of these patterns in order to effect change successfully.²

Data

We base our calculations on data from the Reserve Components Common Personnel Data System (RCCPDS) provided by the Defense Manpower Data Center (DMDC). We use data from FY 2004 through FY 2009 to construct average continuation rates over the years included in our sample.

For race/ethnicity, the data are reported in the following categories:

- Non-Hispanic Asians and Pacific Islanders (API)
- Non-Hispanic blacks (black)

- Hispanics
- Non-Hispanic others (other), which includes American Indians, Alaska natives, “more than one race,” and “unknown.”
- Non-Hispanic whites (white).

These race/ethnicity categories are consistent with the RC officer IP (Military Leadership Diversity Commission, 2011), so it is possible to make comparisons between enlisted personnel and commissioned officers. However, to maintain consistency within our data, in both of the RC retention IPs, we deviate slightly from the MLDC race/ethnicity categories presented in Military Leadership Diversity Commission (2009). In our data, Pacific Islanders are grouped with “Asians” instead of with the “other” category, and the unknown category is included with “other” rather than as its own category.

Conditional Continuation Rates

To measure retention, we compute conditional continuation rates. These rates measure the percentage of individuals that remain in the RC in a given year, conditioned on that these individuals were observed in the data during the previous year.

Since we are interested in how continuation rates for different demographic groups vary across servicemembers’ careers, we report our results by Year of Service (YOS). Moreover, our data cover FY 2004 through FY 2009. This allows us to average our continuation rates over these years to obtain a more robust estimate of continuation rates at each YOS. This averages out any year-to-year random variation in the data that may confound the trends in our results.

However, even though we can average out random fluctuations in our data, there are other confounding factors that affect continuation rates. Beyond retention decisions, there are external reasons and institutional dynamics that affect whether a servicemember stays in the RC. These reasons include lack of promotion opportunities, health or behavioral issues, legal problems or failure to obtain necessary qualifications, among others. These are all accounted for in the continuation rate numbers we present below—if a servicemember leaves for any reason, he or she is counted as not continuing. Therefore, these rates also include a measure of overall career progression that accounts for the factors mentioned above.

Whenever possible we point out whether one or more of these factors may be driving the results. However, we are limited to making inferences about institutional factors that may affect our continuation rates. Other personal factors are not identifiable in our data.

Additionally, to facilitate the interpretation of the continuation rates presented below, we report them as deviations from a given baseline category. For gender, we use the male category as the baseline for comparisons. For the race/ethnicity comparisons, we use the white category. This means

That for women, we present continuation rates as a percentage point difference from the male rates. For race/ethnicity, we present these comparisons as percentage point differences from the white category. To give a complete picture, we also report raw continuation rates in the appendix.

Lastly, as a point of reference and to give a context for the continuation rates we present below, Table 1 shows the average YOS corresponding to each pay grade. We note that RC servicemembers may have had prior service time in the Active Component (AC) before joining the Reserve Component, and they may come in already having achieved certain career milestones. For this reason, we use YOS Pay Entry Base Date (PEBD) as a measure of total years of service and not just YOS in the RC. The YOS PEBD metric measures YOS from the time a servicemember first joins the armed forces, and thus puts all of our observations on the same time scale relative to first enlistment into the armed forces. This facilitates identifying certain milestones in the data, such as reaching retirement eligibility. However, YOS PEBD is not a perfect indicator of where in a career an RC servicemember may be at a particular YOS. To help the reader identify career milestones in the charts in this IP, Table 1 presents the average years of service at each pay grade for individuals in our sample. We note, however, that these are averages and that there may be great variation across individuals.

Enlisted Continuation Rates by Gender

We begin our examination of retention by looking at continuation rates by gender. As mentioned above, we use data from FY 2004 through FY 2009 to create composite cohorts that allow us to present average continuation rates across a number of years. Also, we present continuation rates for women as percentage point deviations from male continuation rates.

Table 1. Average YOS, by Pay Grade

Pay Grade	Average
E-1	0.37
E-2	1.04
E-3	1.93
E-4	5.66
E-5	10.46
E-6	16.18
E-7	20.72
E-8	23.17
E-9	25.34

Source: DMDC RCCPDS FY 2004–FY 2009 (DMDC, 2008)

*Some of the numbers in earlier years are based on a small number of observations.

As we show in Table 2, on average and for all Services, female enlisted continuation rates are lower than male enlisted continuation rates. The differences in these rates are statistically significant for all Services and range from 1.7 to 4 percent below their male counterparts. Moreover, as we show in Figures 1 and 2, while there is some variation by YOS and Service, female continuation rates are below male rates for most of these servicemembers' careers and for all Services. We explore general patterns and show two examples from the Services below. For the reader interested in details, we report continuation rate differentials and raw rates in figures and tables in the appendix.

To illustrate these patterns, we use gender continuation rate differentials for the Air Force Reserve and the Marine Corps Reserve. Both of these figures, as well as figures for the other Services included in the appendix, reflect the overall pattern of lower continuation rates for women. However, the Marine Corps Reserve data are much noisier.³

In general, continuation rates for enlisted women remain below their male counterparts with some increase toward the end of their career, past YOS 20. The main exceptions to this pattern are the Army National Guard and the Navy Reserve. For the Navy Reserve, female continuation rates are above their male counterparts between YOS 4 and YOS 8. For the Army National Guard, female continuation rates are above male rates after YOS 20.

In the early years, between YOS 0 and YOS 10, the general pattern across the Services is that female continuation rates are lower than male rates, but trending upward. For most Services, there is a peak around YOS 4 and YOS 5. These may be years in which many prior service female servicemembers are finishing the final portion of their service obligation.⁴ While both male and female enlisted may do this, we also know that retention in the AC is lower for women, and this fact may be driving our results.⁵

While for officers, mid-career female continuation rates rise above their male counterparts, for enlisted, they remain below the rates for men. We observe a slight uptick before YOS 20 but a noticeable decrease at YOS 20. After this point, enlisted personnel became eligible for retirement benefits. Note that the Army National Guard is the only exception to this drop.

Later in their careers, continuation rates for females tend to fluctuate below the rates for their male counterparts. Exceptions to this pattern are the Army National Guard and the Army Reserve, where female continuation rates tend to increase above their male counterparts after YOS 20. We do note that because of a smaller sample size above YOS 20, results tend to become more erratic.

Figure 1 on the Air Force Reserve and Figure 2 on the Marine Corps Reserve are generally representative of RC data on relative female enlisted continuation rates, and we use them as examples here.

Statistical Significance by Gender

While the continuation patterns for female Reserve officers described above seem robust both across YOS and all components, we tested for statistical significance of these results to ensure that these patterns were robust by scientific standards.

We used regression analysis to determine whether gender plays a significant role in explaining continuation rates. We report our results in Table 2.

As in the previous section, we use the male gender category as the baseline to report average gender differences in continuation rates by Service. Standard errors are shown in parentheses and significant levels are marked with asterisks.

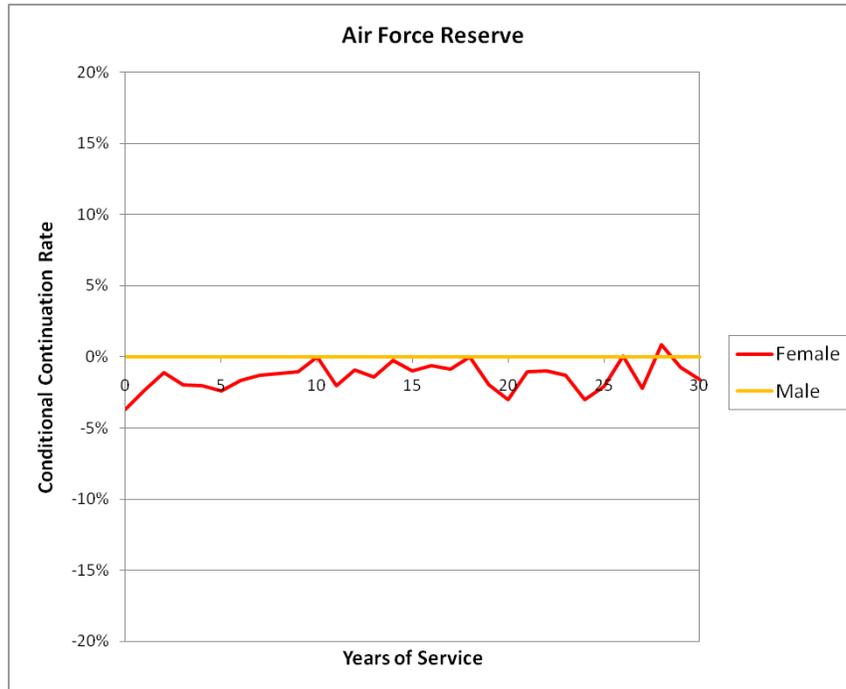
The standard errors reported above give us a measure of the accuracy of our results given the sample of data used to construct the estimates (smaller standard errors are associated with more accurate estimates). Likewise, more stars

Table 2. Average Effect of Gender on Conditional Continuation Rates, by Service

	Air Force Reserve	Air National Guard	Army National Guard	Army Reserve	Coast Guard Reserve	Marine Corps Reserve	Navy Reserve
Female	-0.0177*** (0.00)	-0.0272*** (0.00)	-0.0406*** (0.00)	-0.0203*** (0.00)	-0.0281*** (0.01)	-0.0276*** (0.00)	-0.0169*** (0.00)
Baseline (Male)	0.8831*** (0.00)	0.9051*** (0.00)	0.8328*** (0.00)	0.8144*** (0.00)	0.8527*** (0.00)	0.8002*** (0.00)	0.7875*** (0.00)
N	320453	474644	1716119	875876	38876	204232	284849
F	170.5018	569.1499	2333.2497	423.5561	29.3769	40.4876	78.7512
d.f.	1	1	1	1	1	1	1
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

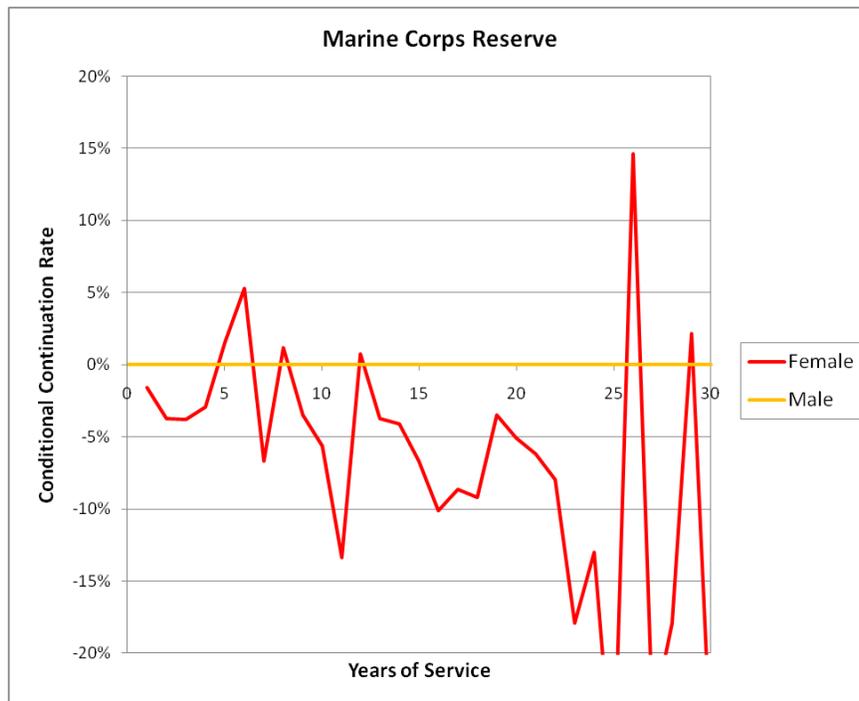
* p<0.10, ** p<0.05, *** p<0.01

Figure 1. Air Force Reserve: Female Conditional Continuation Rates as Deviations from the Baseline (Percentage Points)



Source: DMDC RCCPDS FY 2004–FY 2009 (DMDC, 2008)
 The male category is used as the baseline for comparisons.

Figure 2. Marine Corps Reserve: Female Conditional Continuation Rates as Deviations from the Baseline (Percentage Points)



Source: DMDC RCCPDS FY 2004–FY 2009 (DMDC, 2008)
 The male category is used as the baseline for comparisons.

point to a smaller probability that our results appear different from zero due to chance alone. For example, a single * means that there is at most a 10 percent probability that our gender results are due to chance alone, ** shows that this probability is 5 percent, and for *** this probability is only 1 percent.

The baseline row in Table 2 reports the average retention rate for men. The row marked Female reports the average deviation from the baseline rate. For example, in Table 2 the average continuation rate for men enlisted in the Army Reserve is 87.5 percent. The average continuation rate for women is 2.0 percentage points below that.

As we can see from this table, our results show that on average across all years of service, females have lower continuation rates than males for all Services and that all results are highly significant.

Enlisted Continuation Rates by Race/Ethnicity

We present conditional continuation rates by race/ethnicity as the difference between each category and the baseline category—white. Overall, minority continuation rates spike above white rates around YOS 5, fluctuate around white continuation rates until YOS 20, and become erratic after that. For blacks, continuation rates remain below those of whites consistently across our timeline. For Hispanics and those in the “other” category, continuation rates fluctuate around white continuation rates. For API, continuation rates are consistently above white rates. We note that these generalizations include

results from all Services. Service-specific data are included in the appendix.

In the early years, API continuation rates tend to fluctuate at a level a few percentage points above white rates. For blacks, this pattern is the opposite. Their continuation rates stay below white rates, with a slight peak at, or soon after, YOS 10. Continuation rates in the Hispanic and the “other” category fluctuate at around or above white rates for this period.

Between YOS 10 and YOS 20, the rates converge to the level of rates for whites; however, the general pattern remains. Rates for Hispanics and “other” fluctuate at around the rates for whites. API rates tend to be above white rates, and rates for blacks tend to be below the rates for whites.

This pattern continues after YOS 20, but the fluctuations become more erratic. There is also a spike in relative minority continuation rates at YOS 20. After this point, servicemembers become eligible for retirement, so we see an overall decrease in continuation rates. However, continuation rates for whites fall by more than they do for the other racial/ethnic categories. This shows up as a spike in relative continuation rates for minorities.

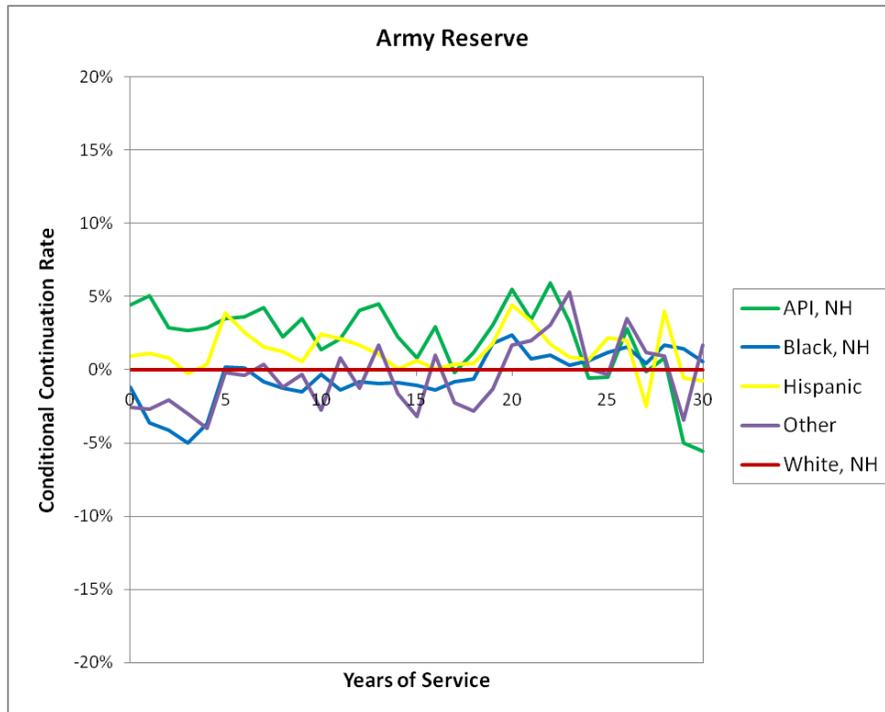
We show continuation rate differentials for minorities in Figures 3 and 4. We use the Army National Guard and the Navy Reserve as examples of the patterns described above. For more information about these and the other Reserve Components, please see the appendix.

Table 3. Average Effect of Race/Ethnicity on Conditional Continuation Rates, by Service

	Air Force Reserve	Air National Guard	Army National Guard	Army Reserve	Coast Guard Reserve	Marine Corps Reserve	Navy Reserve
API, NH	0.0081*** (0.00)	0.0142*** (0.00)	0.0135*** (0.00)	0.0303*** (0.00)	0.0192** (0.01)	-0.0036 (0.00)	-0.0018 (0.00)
Black, NH	-0.0146*** (0.00)	-0.0221*** (0.00)	-0.0174*** (0.00)	-0.0075*** (0.00)	0.0002 (0.01)	-0.0399*** (0.00)	-0.0428*** (0.00)
Hispanic	0.0050** (0.00)	0.0008 (0.00)	0.0146*** (0.00)	0.0107*** (0.00)	0.0096 (0.01)	-0.0368*** (0.00)	-0.0013 (0.00)
Other	0.0015 (0.00)	-0.0021 (0.00)	-0.0155*** (0.00)	-0.0131*** (0.00)	0.0110 (0.01)	0.0034 (0.00)	-0.0274*** (0.00)
Baseline (White, NH)	0.8809*** (0.00)	0.9017*** (0.00)	0.8287*** (0.00)	0.8089*** (0.00)	0.8466*** (0.00)	0.8071*** (0.00)	0.7932*** (0.00)
N	320453	474644	1716119	875876	38876	204232	284849
F	30.7661	67.0050	209.3027	102.1680	1.8564	77.9737	113.7692
d.f.	4	4	4	4	4	4	4
p-value	0.0000	0.0000	0.0000	0.0000	0.1151	0.0000	0.0000

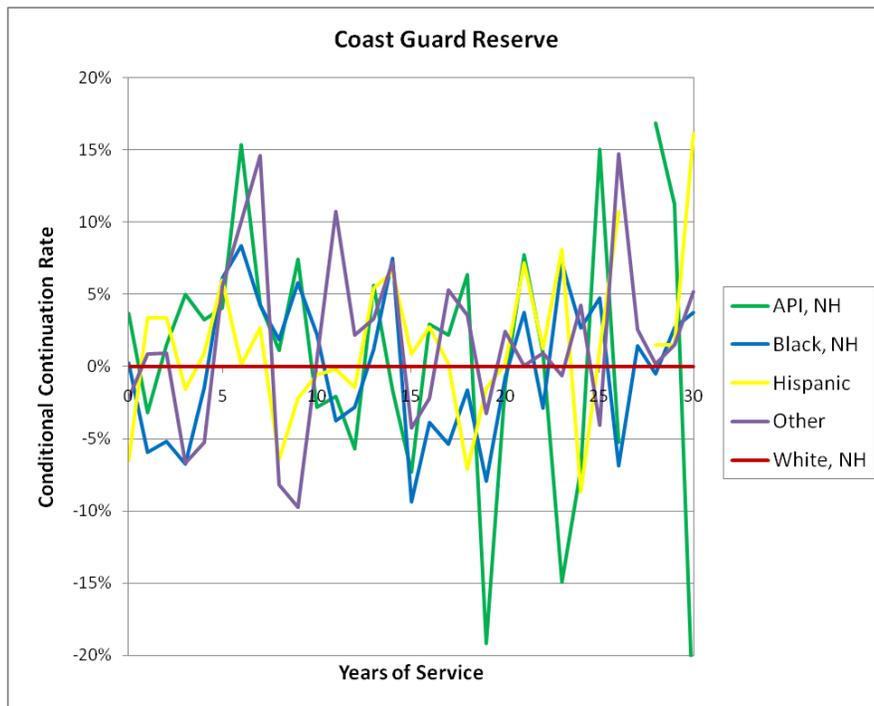
* p<0.10, ** p<0.05, *** p<0.01

Figure 3. Army Reserve: Race/Ethnicity Conditional Continuation Rates as Deviations from the Baseline (Percentage Points)



Source: DMDC RCCPDS FY 2004–FY 2009 (DMDC, 2008)
 The white, NH category is used as the baseline for comparisons.

Figure 4. Coast Guard Reserve: Race/Ethnicity Conditional Continuation Rates as Deviations from the Baseline (Percentage Points)



Source: DMDC RCCPDS FY 2004–FY 2009 (DMDC, 2008)
 The white, NH category is used as the baseline for comparisons.

Statistical Significance by Race/Ethnicity

As we did for gender, we use regression analysis to test for significant differences in average continuation rates by race/ethnicity. The row labeled baseline on Table 3 indicates the average retention rates for whites for all the years of service included in our sample. The rows labeled with each of the race/ethnicity categories indicate deviations from that average.

On average, API and Hispanics tend to have higher continuation rates than whites, blacks have consistently lower rates, and for the “other” category this depends on the Service. Most of these results are statistically significant, as shown by the asterisks after each estimate. This indicates that on average, we can be confident that the patterns we describe here are not a result of randomness.

Conclusions

In this IP, we show continuation rates for the different gender and race/ethnicity categories in our sample. We report conditional continuation rates that count the percentage of individuals present in a given YOS, given that they were also present in the previous YOS. We use data from FY 2004 through FY 2009 to construct average continuation rates that smooth year-to-year anomalies. To facilitate interpretation of differences, we present these rates as the difference between each category and a baseline. We use men and whites for the gender and the race/ethnicity baselines, respectively.

Our results lead us to three conclusions. First, continuation rates for women are consistently lower than the rates for their male counterparts. Second, Hispanic and API continuation rates are higher than white rates. API continuation rates are in general the highest across all race/ethnicity categories. Third, continuation rates are consistently lower for blacks and for those in the “other” category, although less consistently.

While these conclusions help us identify systematic problems, they do not tell us much about the causes of these problems. The information presented in this IP is intended to be descriptive of the situation and help identify potential areas of improvement.

Notes

¹IP #53 (Military Leadership Diversity Commission, 2010e) presents a description of RC manpower including a definition of the SelRes and its importance to the RC and the armed forces in general.

²Please see Military Leadership Diversity Commission (2010a) for a review of these methodological limitations for policymaking.

³The female-to-male ratio in the Marine Corps Reserve is much lower than in the other Services. Please see Military Leadership Diversity Commission (2010b) and (2010c) for more details.

⁴About one-third of the enlisted force in the RC comes from prior service personnel. While this figure is around 25 percent for the Army National Guard, it is significantly higher for other Services, including the Air Force Reserve and the Navy Reserve with 65 and 69 percent of their enlisted personnel coming from prior service, respectively. Of these, about 40 percent of them join the RC around the E-4 pay grade. For more details on the prior service pool, please see Military Leadership Diversity Commission (2010f).

⁵IP #31 (Military Leadership Diversity Commission, 2010d) documents lower reenlistment rates for enlisted women in the AC.

References

- DMDC. (2008, September). *Reserve Components Common Personnel Data System (RCCPDS)*. Arlington, VA: Defense Manpower Data Center. [Dataset].
- Military Leadership Diversity Commission. (2009, November). *How we define race and ethnic categories for MLDC research*. [Issue Paper #1]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2010a, March). *Key considerations in interpreting promotion and retention rates*. [Issue Paper #17]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2010b, November). *Demographic profile of the officer, enlisted, and warrant officer populations of the Reserve Components*. [Issue Paper #54]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2010c, November). *Demographic profile of the officer, enlisted, and warrant officer populations of the National Guard*. [Issue Paper #55]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2010d, March). *Reenlistment rates across the Services by gender and race/ethnicity*. [Issue Paper #31]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2010e, November). *National Guard and Reserve manpower*. [Issue Paper #53]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2010f, November). *The prior service recruiting pool for National Guard and Reserve Selected Reserve (SelRes) officers*. [Issue Paper #57]. Arlington, VA: Military Leadership Diversity Commission.
- Military Leadership Diversity Commission. (2011, February). *The prior service recruiting pool for National Guard and Reserve Selected Reserve (SelRes) enlisted personnel*. [Issue Paper #61]. Arlington, VA: Military Leadership Diversity Commission.