Combat Development and Integration
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ANALYSIS OF THE IMPACT OF EXCEPTIONAL FAMILY MEMBER PROGRAM ENROLLMENT ON INDIVIDUAL MARINE CAREER PROGRESSION AND PROMOTION

Final Report

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Preparation of this study cost the Department of Defense a total of approximately $88,000 in Fiscal Years 2016-2017.

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EXECUTIVE SUMMARY

Analysis of the Impact of Exceptional Family Member Program Enrollment on Individual Marine Career Progression and Promotion

The objective of this study was to analyze individual career progression of Exceptional Family Member Program (EFMP)-enrolled Marines compared to non-enrollees in order to determine if EFMP enrollment negatively affects career progression and promotion. EFMP is an enrollment program mandated by the Department of Defense (DoD) for any service member with a dependent who meets the qualifying criteria outlined in DoD Instruction (DODI) 1315.19.

A 2007 EFMP Functionality Assessment indicated 70% of Marines believed a stigma was associated with EFMP enrollment. EFMP participation was thought to limit assignment opportunities critical for promotion. In response to this finding, the EFMP adjusted its procedures to ensure EFMP-enrolled Marines are eligible for assignment worldwide. Subsequent surveys indicated the stigma persists. This study is the first effort to empirically investigate whether this negative belief is justified.

We received EFMP data from the Case Management System (CMS) and merged it with data from Total Force Data Warehouse (TFDW) from March1989 through December 2015. We used TFDW's monthly snapshots of pay grade to conduct a time series analysis comparing EFMP-enrolled Marines with non-enrolled Marines. The three measures we looked at were career length, high grade achieved, and time to achieve high grade.

Using the most rigorous analysis methods available, we determined there is little evidence of any negative impact of EFMP enrollment on Marine career progression and promotion. We found the career length of EFMP enrollees is, on average, slightly longer (several months) than non-EFMP active duty Marines. We also found EFMP enrollment has no distinguishable impact on high grade achieved.

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1 Background

A 2007-2008 Exceptional Family Member Program (EFMP) Functionality Assessment showed 70% of Marines had a perceived negative stigma associated with EFMP enrollment; the respondents indicated that enrollment limited assignment opportunities, which were critical for individual career progression and, therefore, promotion. EFMP transformed the program because of feedback. Prior to 2009, a category was assigned to each enrollee based on the level of medical and education needs. Geographic assignment restrictions were associated with the categories (e.g., Category 3 precluded overseas assignments; Category 4 required assignment to billets near major medical facilities). In 2009, EFMP eliminated the use of categories, and established the Informed Assignment Review process. This process allows every EFMP-enrolled Marine to remain eligible for worldwide assignment. Individual family medical and educational requirements are compared to services provided in the proposed location, ensuring availability and accessibility to necessary care. Since the program's transformation, EFMP enrollment has increased 88% (4,500 enrolled sponsors in 2008 to 8,480 enrolled sponsors as of August 2015). A 2011 Naval Audit Service Report showed that the perceived negative stigma associated with EFMP enrollment had decreased from 70% to 30%. While both enrollment increases and survey responses indicate less perceived stigma associated with EFMP enrollment, a study that specifically examines this issue had never been conducted.

EFMP is an enrollment program mandated by DoD for any service member with a dependent who meets the qualifying criteria outlined in DoD Instruction (DODI) 1315.19. The Marine Corps EFMP began the assignment coordination process in the mid-1980s. Headquarters Marine Corps (HQMC) EFMP staff accommodates the enrollment and assignment duties associated with the program. Per policy, EFMP-enrolled Marines and/or family members are contacted quarterly by an EFMP Family Case Worker to assess needs and provide information, referrals, support, education, and ongoing case management. The program also provides each family an assessment of needs and the development of service plans to support the family before, during, and after a permanent change of station (PCS). EFMP offers a respite care reimbursement program to families who have a member who is severely-to-profoundly affected by their diagnosis and treatment requirements. To address these requirements, Marines enrolled in EFMP may meet criteria for priority housing on base and/or housing accommodations and modifications. In 2009, EFMP established the *continuation on location* process option, in accordance with the National Defense Authorization Act (NDAA) 2010 stabilization requirement, which allows Marines to execute PCS orders, while families remain in place for continuity of care while receiving basic allowance for housing (BAH) for the family's location. Per policy, EFMP enrollment does not create entitlement for the sponsor or the sponsor's family; EFMP enrollment does not change career requirements, affect worldwide deployment status, or infringe on the privacy of the sponsor or the sponsor's family. EFMP enrollment information is confidential and is not reflected in service record books (SRBs), officer qualification records (OQRs), command records, or in performance appraisals.

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2 Purpose, Scope, Methodology

2.1 Purpose

The purpose of this study is to analyze individual career progression of EFMP-enrolled Marines compared to non-enrolled peers in order to determine if EFMP enrollment negatively affects career progression and promotion.

2.2 Scope

The sponsor provided current (as of December 2015) and historical EFMP enrollment data from the Case Management System (CMS). This data consisted of 10,544 open case records (Marines currently enrolled) and 13,148 closed case records dating back to March of 1989. Cases are closed when the Marine retires or separates or when the family member no longer meets the enrollment criteria.

The study team also collected data from the Total Force Data Warehouse (TFDW). TFDW is the official Marine Corps system of record for historical manpower data. Data is captured in monthly snapshots (quarterly, prior to October 1997), called *sequences*. For this study, 254 sequence files were collected: Sequence 69 (1989) to Sequence 322 (December 2015). This enabled the study team to track the career progression of all EFMP-enrolled Marines as well as their non-enrolled counterparts. The data fields shown in Table 2-1 were used in our analysis.

Table 2-1: Data collected from CMS and TFDW

Data Field	CMS Open Case	CMS Closed Case	TFDW
Social Security Number (SSN)	✓	✓	✓
Effective Date	✓	✓	
Date of Birth	✓		✓
Grade	✓		✓
Military Occupational Specialty (MOS)	✓		✓
Years of Service (YOS)	✓		✓
Closing Date		✓	
Sex			✓
Race			✓
Respite Type	✓		

2.3 Methodology and Study Dataset

2.3.1 Overview

The study team used the following methodology to conduct this study:

- Conduct literature review
- Collect EFMP open and closed case data
- Collect TFDW data for each relevant sequence

- Merge collected data and create study dataset
- Determine whether EFMP-enrollment negatively impacts career progression

2.3.2 Statistical Analysis

The following analytical techniques were used in this study:

- *Descriptive statistics* uses data to provide insights of a population, either through numerical calculations or graphically. We used histograms, Kernel density plots and scatterplots in this study. We also used mode, the most frequently occurring value, when examining pay grades.
- *Nonparametric matching* is a preprocessing technique used to create a new dataset that reduces the bias extraneous characteristics would have on the results. When *exact matching* is used, virtually all bias is eliminated. The new dataset, called the full matched sample, is composed of matched sets, where each matched set contains one treated unit and one or more controls. We used this method in the study by matching each EFMP participant to all nonparticipants with identical characteristics. We then conducted an analysis of outcomes using the full matched sample.
- *Time series analysis* comprises methods for analyzing time series data to extract from the data meaningful statistics and other characteristics. For this study, we collected pay grade data at each TFDW sequence to track career progression.
- *Multiple regression* is a statistical technique used to understand the relationship between one dependent variable and several independent variables. In this study, we used multiple regression to determine whether EFMP enrollment affects career length.

2.3.3 Construction of the Study Dataset

To create the dataset for this study, we first merged CMS with TFDW by SSN. Marines with more than one family member enrolled have a separate case for each. Therefore, we created a field for the number of family members enrolled, recorded the most severe respite type and deleted the duplicate records. This left 7,979 EFMP-enrolled cases and 12,713 closed cases for analysis.

Next, we used the nonparametric matching technique described in Section 2.3.2 to preprocess the data by matching each of the 20,692 EFMP participants to all nonparticipants that were an exact match at the time of enrollment for the following six characteristics:

- Age
- Sex
- Race
- YOS
- Grade
- MOS

This resulted in several enrolled Marines with no matching non-enrollees, so we matched again replacing MOS with occupational field (OccField). This resulted in each EFMP participant having at least one matching nonparticipant.

Next, the study team used Visual Basic for Applications (VBA) code to pull pay grade data from the 254 TFDW sequence files (see Appendix A). For each individual EFMP enrollee, and all matched Marines, pay grade data was extracted beginning with the sequence corresponding to the date of enrollment and including all subsequent sequences until the Marine was no longer on active duty. The previous sequence was then recorded as the Marine's last sequence. Once the career progression data was pulled, we assigned a study ID number in place of the SSN. The study dataset contains the following information for each record:

Table 2-2: Study dataset fields

Field	Description
Study ID Number	Unique identifier assigned by study team
Matched Set Number	Each matched set contains one EFMP participant and all Marines matched to him/her
EFMP-Enrolled (Y/N)?	Entered as a 1 (Enrolled) or 0 (Not Enrolled)
Starting Sequence	The TFDW sequence at which the time series analysis begins for a given match Corresponds to the enrollee's effective date
Starting Pay Grade	Pay grade at the initial month of EFMP enrollment
Pay Grade Changes with Sequence	Each time a Marine's pay grade changes, the grade and sequence are recorded
Last Sequence	The last sequence in which the Marine is on active duty

The dataset contains more than 4 million records: one for each of the 20,962 EFMP participants and more than 4 million matching non-enrolled Marines records. Non-enrolled Marines could be matched with more than one EFMP enrollee. When we refer to a *matched set*, we are referring to one particular EFMP enrollee along with all the Marines matched with him or her. The entire dataset is referred to as the *full matched sample*. Figures demonstrating the balance of this sample can be found in Appendix B.

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3 Analysis and Results

The study team first looked at the current (December 2015) active duty Marine population, comparing EFMP-enrolled Marines to those not enrolled. Table 3-1 shows the number of officers and enlisted Marines in each group. We used descriptive statistics to compare the populations by age, grade, YOS, and enrollment length. This graphical examination of the data (see Appendix C) indicated there is no substantive effect of EFMP enrollment on pay grade.

Table 3-1: December 2015 (Sequence 322) TFDW active duty Marine population

	EFMP-Enrolled	Not Enrolled
Enlisted	6,060	156,774
Officer	1,476	17,169

Next, we used our full matched sample (see Section 2.3.3) to compare enrolled and non-enrolled Marines by career length, high grade achieved, and time to achieve high grade.

3.1 Finding One: Career Length

Career length is an important measure when comparing careers. For the purposes of this study, career length is defined as the time from the beginning of the enrolled Marine's starting sequence (the sequence corresponding to the effective date) and the end of the first sequence the Marine is not on active duty. For example, if the starting sequence is 300 and the ending sequence is 301, then the career length is 2 months. Sequences before October of 1997 (Sequences 69 to 104) were quarterly snapshots. Therefore, the career length for a Marine with a starting sequence of 100 and ending sequence of 101 is 6 months.

3.1.1 Career Length Comparisons

First, we used the full matched sample to compare the career length of EFMP enrollees to nonparticipants. Figure 3-1 shows the density plot for each group. The EFMP plot is shifted slightly to the right, which indicates EFMP-enrolled Marines have a longer career on average than their non-enrolled peers do.

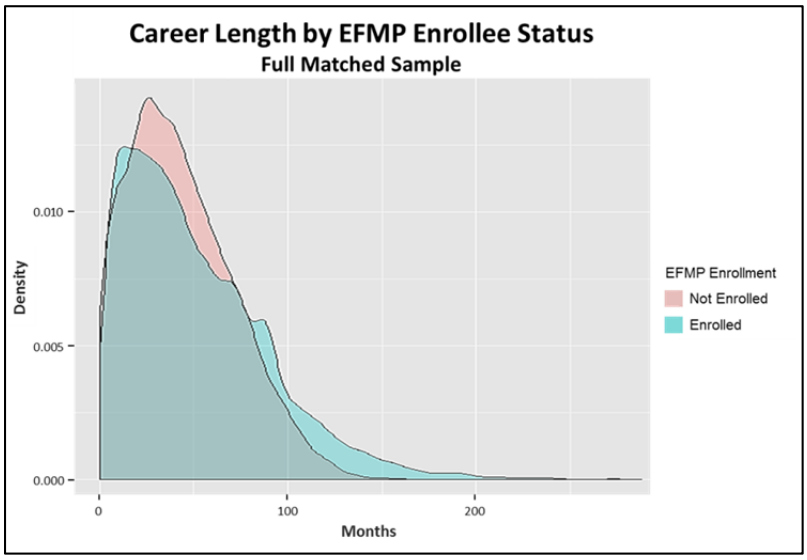

Figure 3-1: Full matched sample career length comparison

Next, we looked at officers only. Our sample contained 2,531 EFMP-enrolled officers and all Marines matched with them. Figure 3-2 shows the density plots. Again, the enrollee's plot is shifted to the right indicating a longer career for EFMP-enrolled Marines. Figure 3-3 shows the same is true for the 17,526 enlisted Marines.

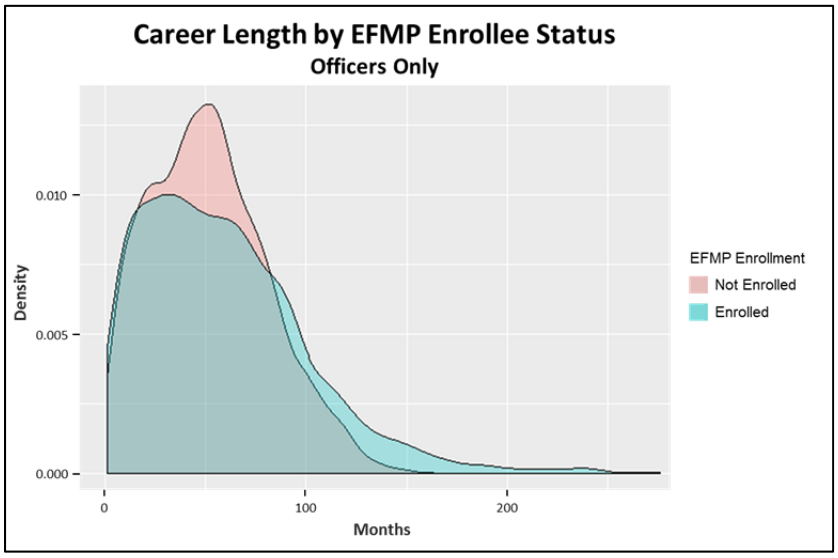

Figure 3-2: Officer career length comparison

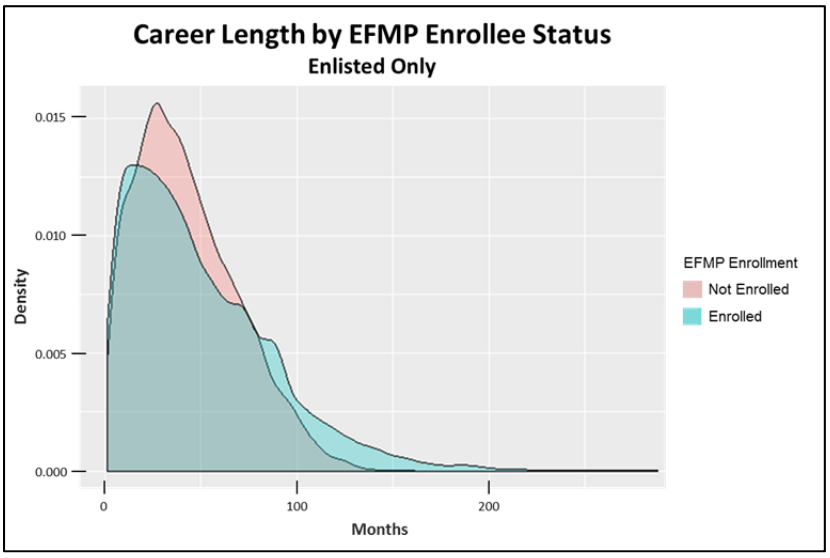

Figure 3-3: Enlisted career length comparison

3.1.2 Multiple Regression

Running regressions isn't necessary with data preprocessed via nonparametric matching since any bias extraneous characteristics would have on the results is essentially eliminated (Ho, Imai, King and Stewart, 2007, Winship and Morgan, 2007). The balance checking figures in Appendix B make it clear that the only real difference between the EFMP and non-EFMP populations in our full matched sample is EFMP participation. However, we decided to run regressions to be thorough.

We used *multiple regression* to see if the difference in career lengths is statistically significant for the different subgroups. The regressions were run in *R* controlling for race, sex, YOS, OccField and starting grade. Table 3-2 shows the career length averages and EFMP difference for each pay grade. The statistical significance determination in the far right column is based on a two-tailed T-test. We can see that for the majority of pay grade subgroups, the EFMP participants tend to have careers that are several months longer than careers of nonparticipants. The difference was found to be statistically significant in most cases. Small sample sizes in the O1, O7, and W4 subgroups prevent the differences from reaching statistical significance. Table 3-3 shows that the increased career length associated with EFMP participation is detectable for each broad category even when controlling for multiple other characteristics of the Marines.

Table 3-2: Career length differences by pay grade

Group*	EFMP Average (Months)	non-EFMP Average (Months)	EFMP Difference
Full Sample	51	43	+8
Officers	59	52	+7
O1	63	55	Not Significant
O2	59	46	+13
O3	60	60	Not Significant
O4	60	54	+6
O5	57	50	+7
O6	49	39	+10
O7	49	51	Not Significant
Enlisted	50	43	+7
E1	18	19	Not Significant
E2	42	38	Not Significant
E3	35	27	+8
E4	39	27	+12
E5	49	40	+9
E6	56	52	+4
E7	53	49	+4
E8	45	39	+6
E9	41	35	+6
Warrant	57	51	+6
W1	76	74	Not Significant
W2	54	50	Not Significant
W3	49	38	+11
W4	42	32	Not Significant

Table 3-3: EFMP effect on career length by category

Group	Estimated EFMP Effect (Months)
Full Sample	+6.8
Officers	+7.1
Enlisted	+6.7
Warrant Officers	+4.9

- Regression models included controls for Race, Sex, Years of Service, Occupational Field, and Starting Grade.
- All effects were statistically significant.

3.2 Finding Two: Career Progression

The two measures we chose for career progression were high grade achieved and time to achieve high grade. Using our study dataset detailed in Section 2.3.3, we were able to determine the highest grade achieved by each Marine along with the sequence at which the high grade occurred. The

high grade did not necessarily occur in the last sequence since some grade changes were demotions. For this analysis, we broke our sample into officer, enlisted, and warrant officer subgroups.

3.2.1 Officer Results

3.2.1.1 Overall Officer Comparison

First, we used descriptive statistics to examine the high grade of EFMP participants compared to their non-enrolled counterparts. The histogram in Figure 3-4 shows the high grades achieved by all officers in the sample with a starting grade of O1-O3. We can see that the EFMP enrollees achieved a slightly higher grade overall than nonparticipants.

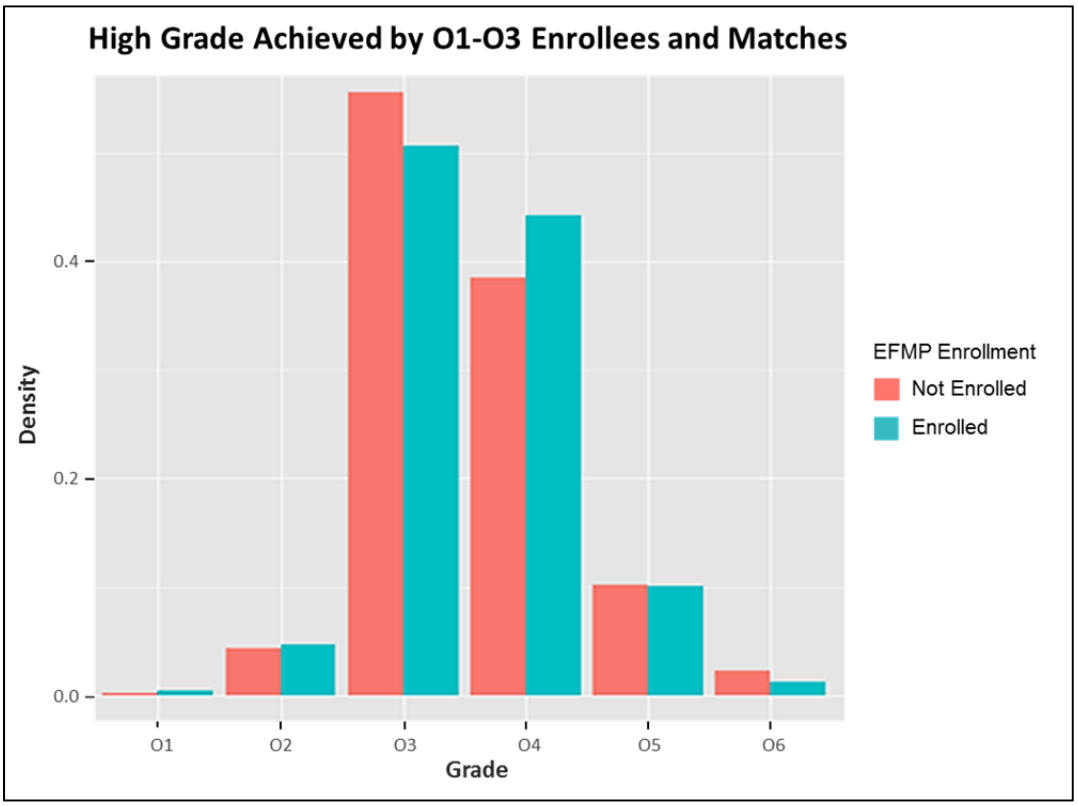

Figure 3-4: High grade comparison for O1-O3 starting grade

Figure 3-5 shows the results for officers in the sample with a starting grade of O4-O6. Once again, the EFMP enrollees reach a higher rank. The histogram for officers with a starting grade of O7+ is shown in Figure 3-6. Although the non-enrolled Marines show a slightly higher grade achieved, the sample contained only six EFMP enrollees.

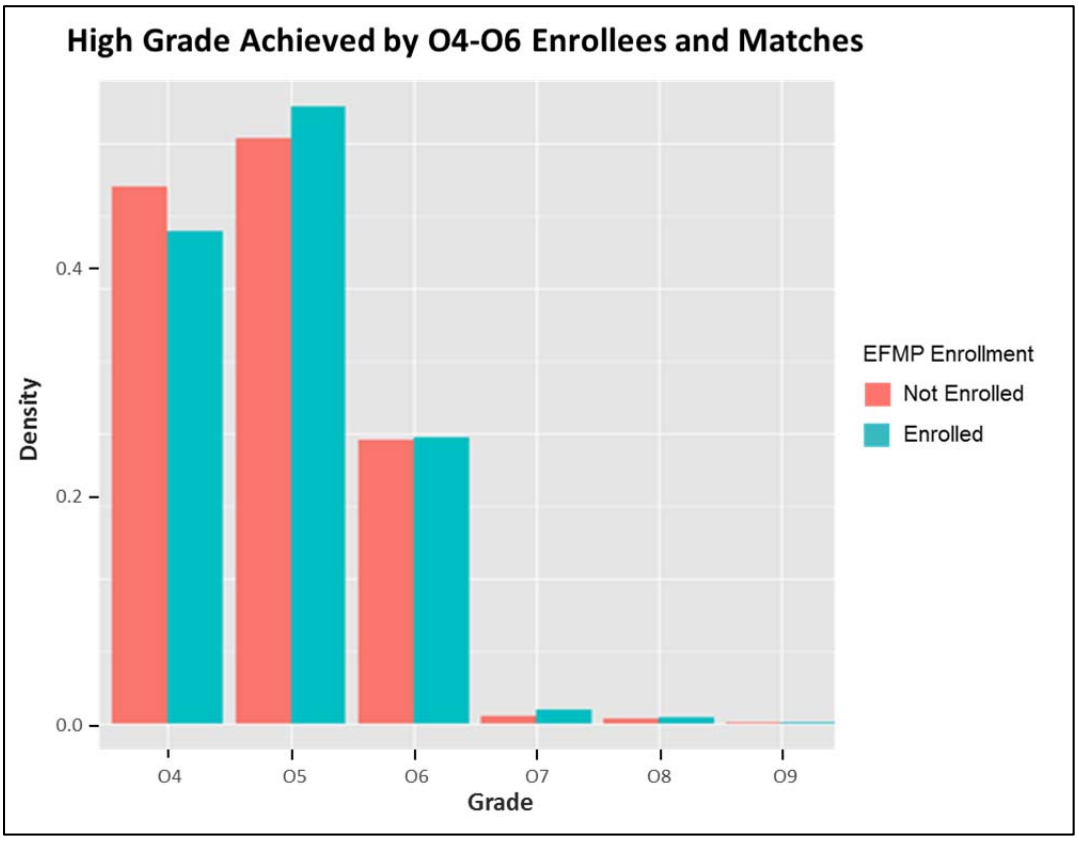

Figure 3-5: High grade comparison for O4-O6 starting grade

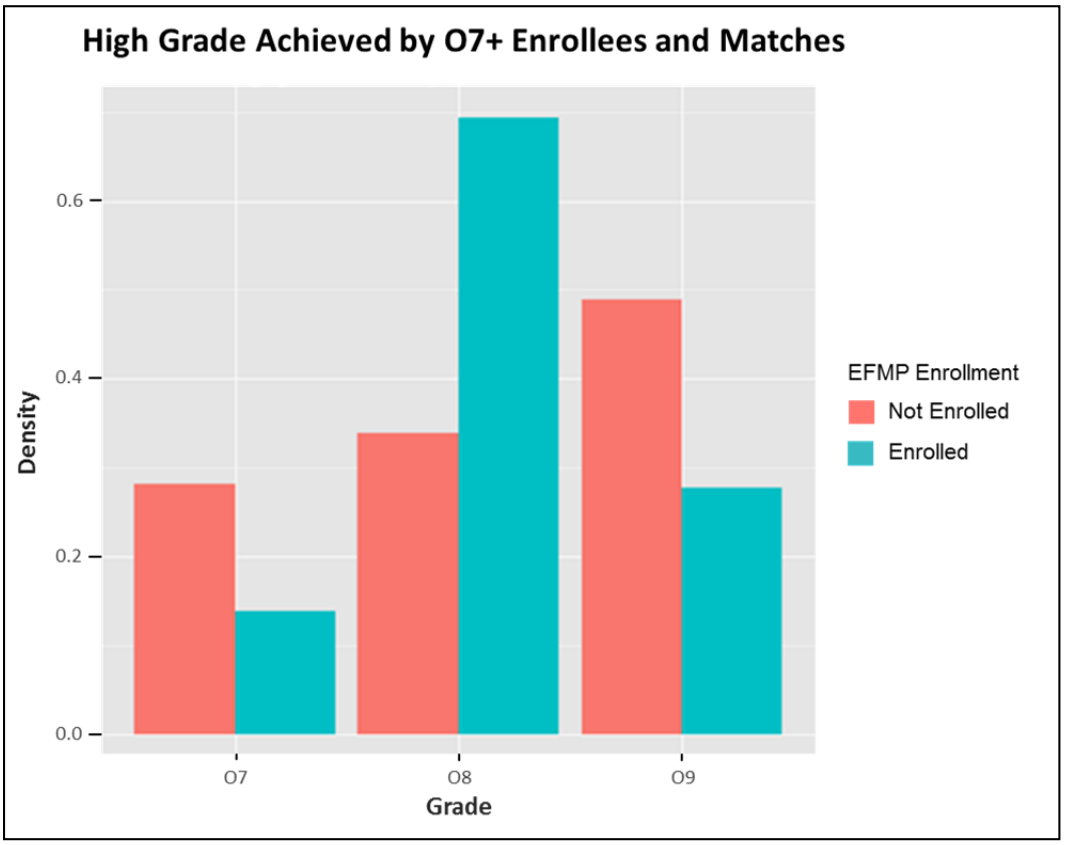

Figure 3-6: High grade comparison for O7+ starting grade

3.2.1.2 Direct Match Comparison of Officers

Next, we made a direct comparison by looking at the highest grade achieved by each of the EFMP-enrolled officers compared to the most likely high grade (mode) of all the officers matched to him/her.

Then, for each EFMP-enrolled officer with a high grade equal to the mode of his/her matched set, we compared the time it took to reach that high grade. We directly compared the EFMP participant's time (in months) to the average time of the matched Marines with the same high grade. We identified each EFMP enrollee's time to high grade as either shorter than, the same as, or longer than the time of the non-enrolled counterparts.

Figure 3-7 shows more than 80% of the EFMP-enrolled officers achieved a grade that was higher than or equal to the most likely grade of their matched counterparts. Figure 3-8 shows that more than 70% of the enrolled officers with a high grade equal to the mode of their peers reached that grade in the same, or shorter, amount of time.

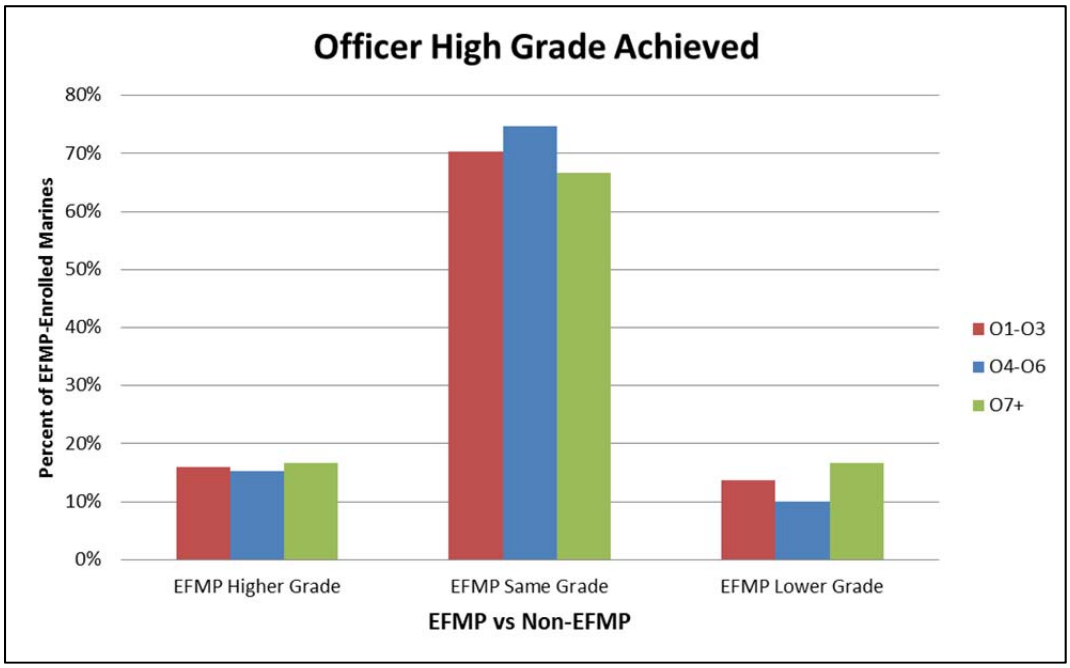

Figure 3-7: Officer direct comparison of high grade

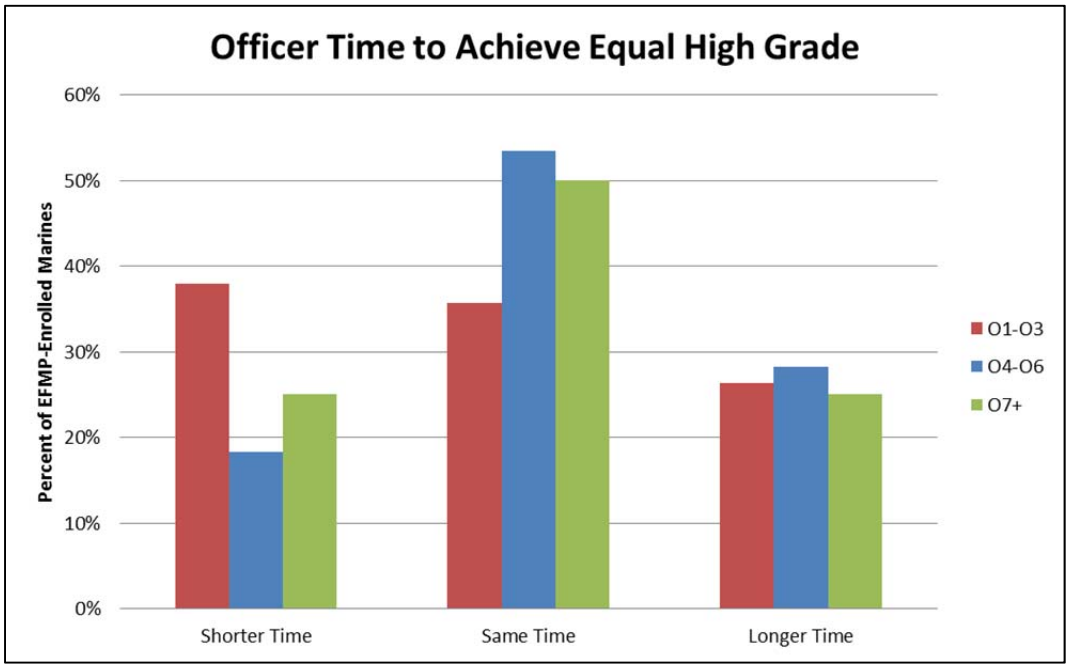

Figure 3-8: Officer time to achieve equal high grade

3.2.2 Enlisted Results

3.2.2.1 Overall Enlisted Comparison

We applied the same method to enlisted Marines as we did with officers. First, we used descriptive statistics to look at the high grade of the EFMP-enrolled enlisted Marines compared to their non-enrolled counterparts. The histogram in Figure 3-9 shows the high grades achieved by all Marines in this sample with a starting grade of E1-E3. We can see EFMP enrollees achieved a higher rank overall than nonparticipants did.

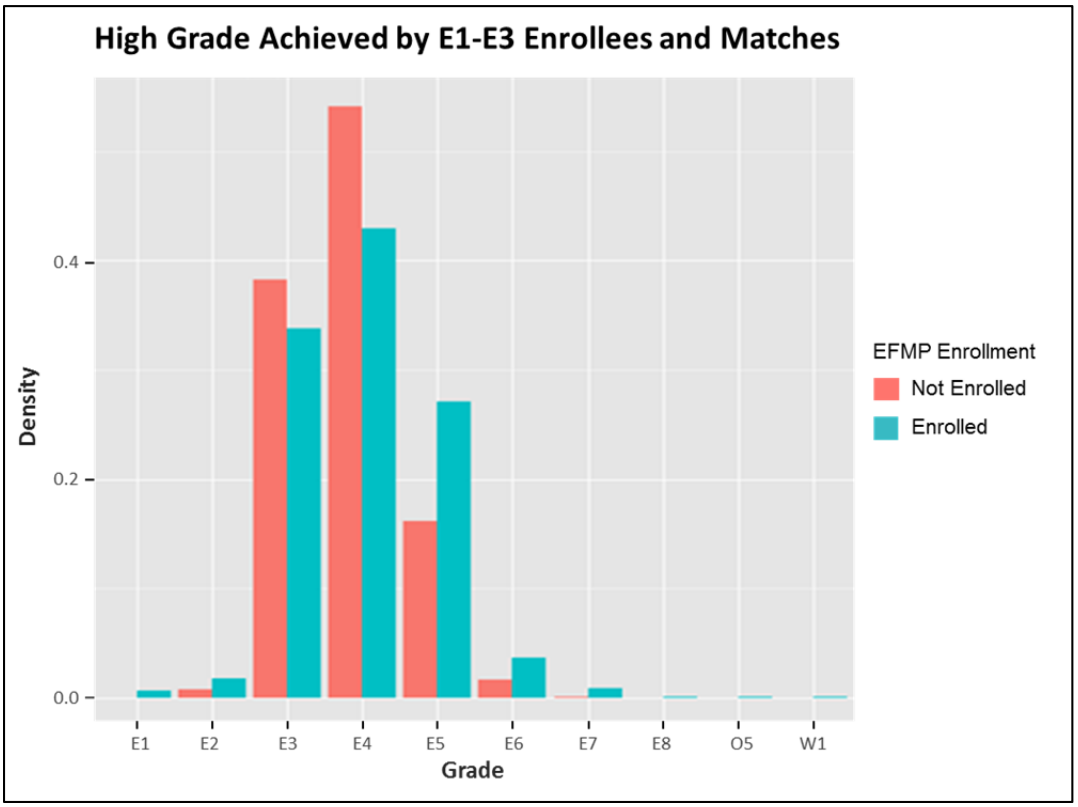

Figure 3-9: High grade comparison for E1-E3 starting grade

The results for enlisted Marines in the sample with a starting grade of E4-E6 are shown in Figure 3-10. Once again, the EFMP enrollees reach a higher grade overall. The histogram for officers with a starting grade of E7+ is shown in Figure 3-11. We can see the same holds true for this subgroup.

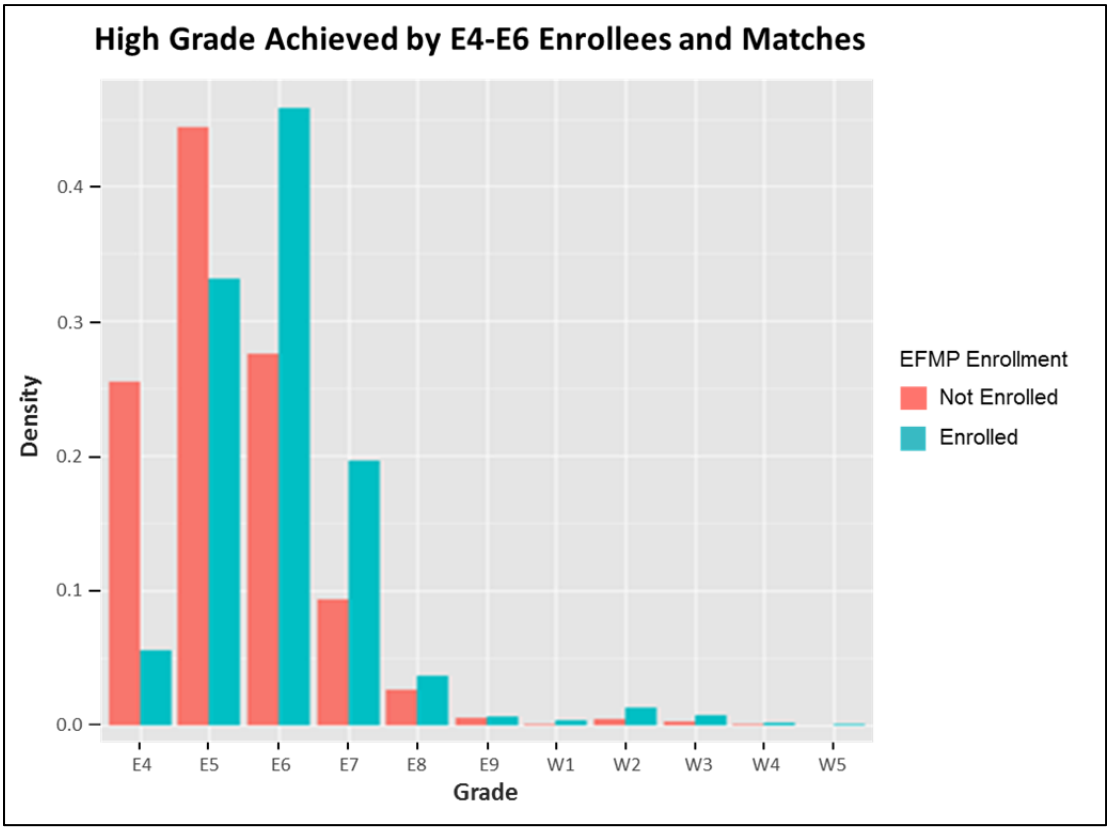

Figure 3-10: High grade comparison for E4-E6 starting grade

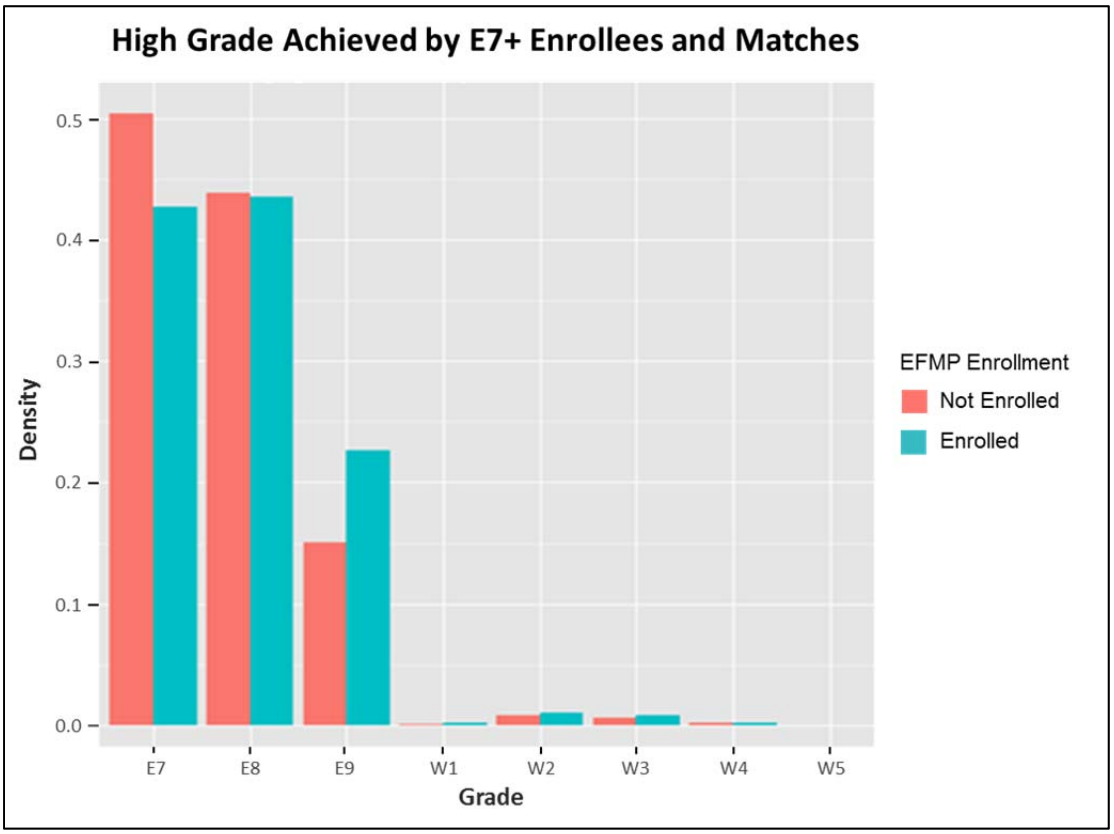

Figure 3-11: High grade comparison for E7+ starting grade

3.2.2.2 Direct Match Comparison of Enlisted Marines

Next, we made a direct comparison by looking at the highest grade achieved by each of the enlisted EFMP participants compared to the most likely high grade (mode) of all the Marines matched to him/her.

Then, for each enlisted EFMP participant with a high grade identical to the mode of his/her matched set, we compared time it took to reach that high grade. We directly compared the EFMP participant's time (in months) to the average time of the matched Marines with the same high grade. We identified each EFMP enrollee's time to high grade as either shorter than, the same as, or longer than the average time to high grade of the non-enrolled counterparts.

Figure 3-12 shows more than 80% of the enlisted EFMP participants achieved a grade that was higher than or equal to the most likely grade of their matched counterparts. In addition, almost 100% of EFMP participants who enroll while in the E4-E6 range achieve a grade as high as or higher than comparable nonparticipants. Figure 3-13 shows more than 60% of the EFMP participants with a high grade equal to the mode of their peers reached that grade in the same amount of time or shorter amount of time.

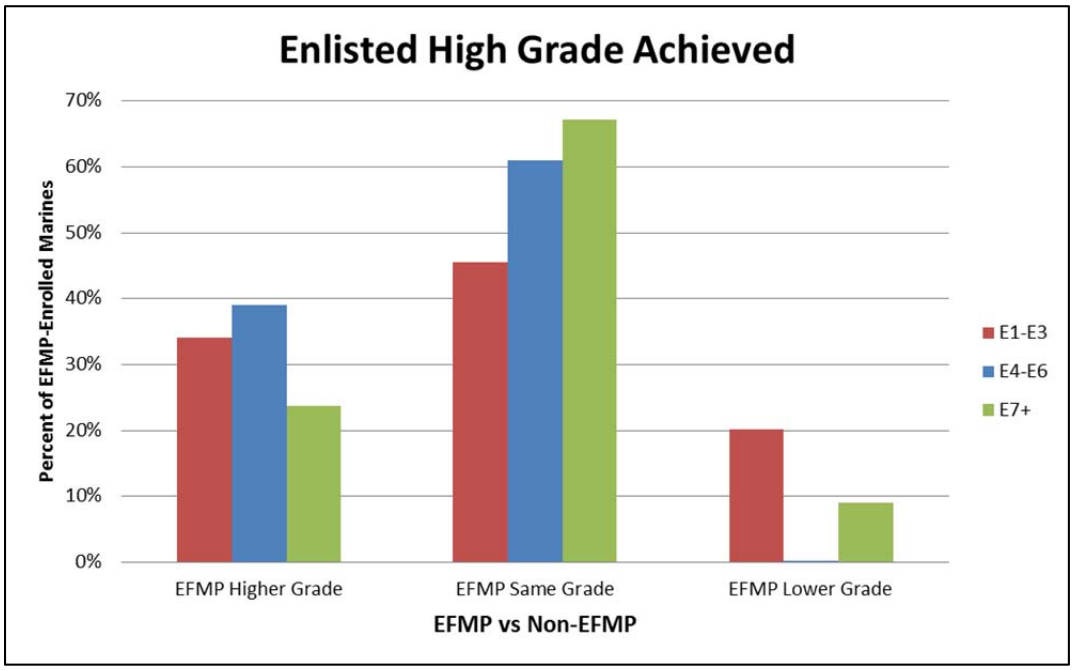

Figure 3-12: Enlisted Marine direct comparison of high grade

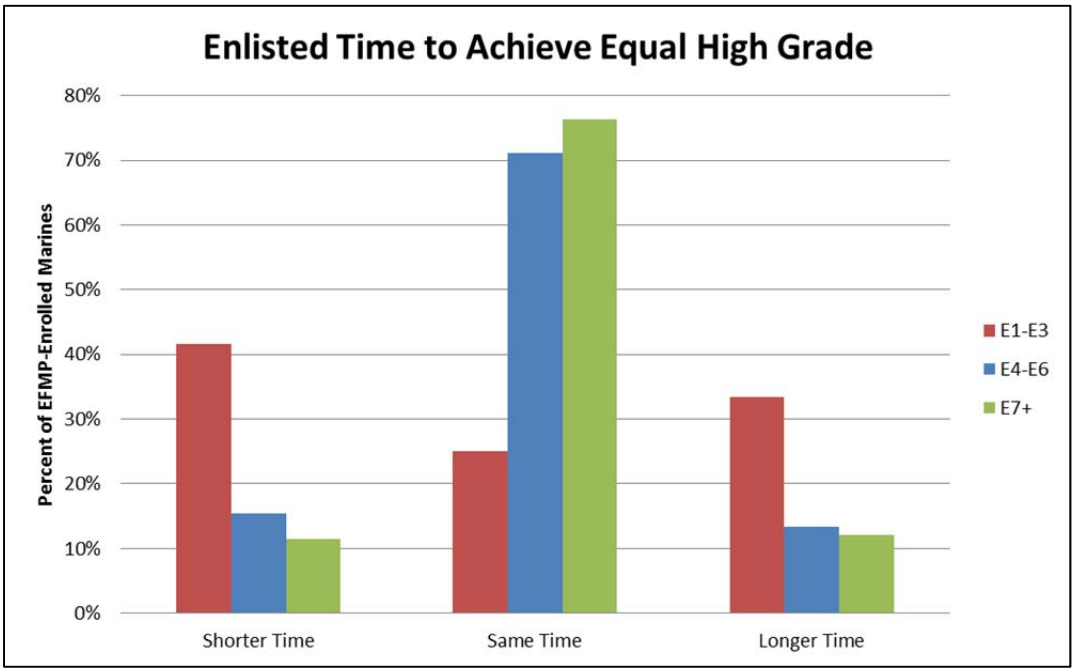

Figure 3-13: Enlisted Marine time to achieve equal high grade

3.2.3 Warrant Officer Results

3.2.3.1 Overall Warrant Officer Comparison

The next subgroup we looked at was warrant officers. Using the same methodology as decribed in the previous sections, we first looked at high grade achieved of the EFMP participants compared to their non-enrolled counterparts. The histogram in Figure 3-14 shows the high grades achieved by all warrant officers in our sample. We can see that the EFMP enrollees achieve a slightly higher rank than the nonparticipants.

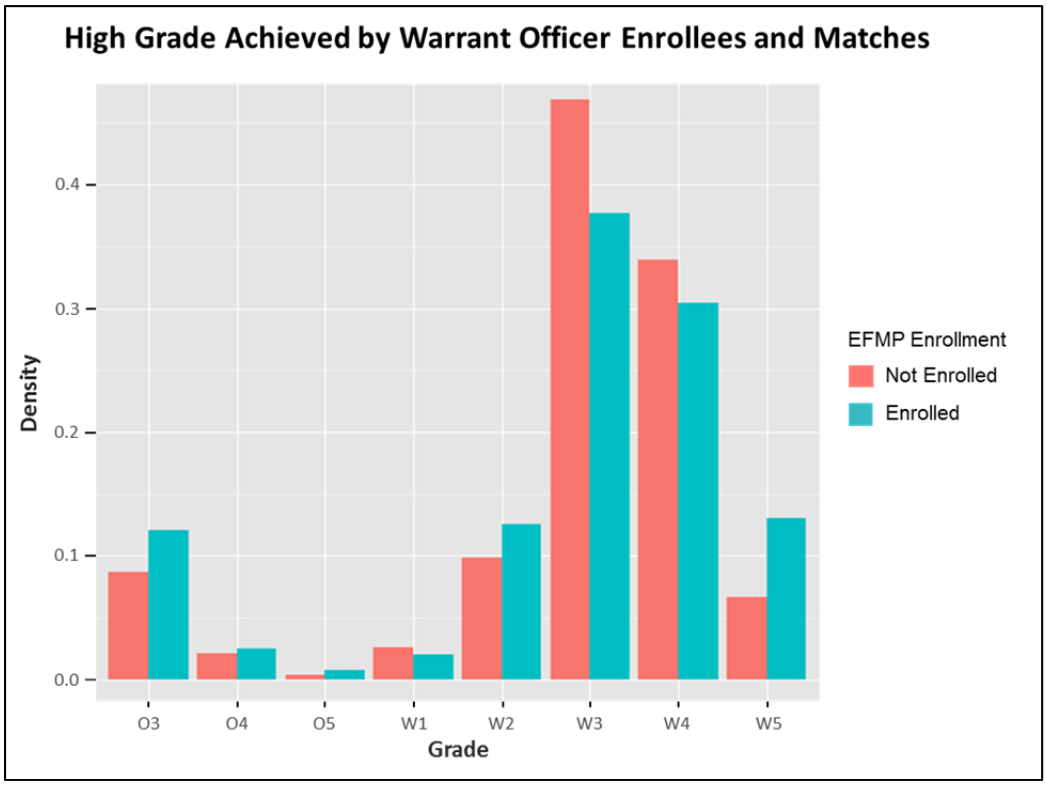

Figure 3-14: Warrant officer high grade comparison

3.2.3.2 Direct Match Comparison of Warrant Officers

Next, we compared the high grades of the EFMP-enrolled warrant officers directly to the most likely high grade (mode) of all the warrant officers matched to him/her.

Then, for each EFMP participant with a high grade identical to the mode of his/her matched set, we compared time it took to reach that high grade. We directly compared the EFMP participant's time (in months) to the average time of the matched Marines with the same high grade. We identified each EFMP enrollee's time as either shorter than, the same as, or longer than the average time of the non-enrolled counterparts.

Figure 3-15 shows more than 80% of the EFMP-enrolled warrant officers achieved a grade that was higher than or equal to the most likely grade of their matched counterparts. Figure 3-16 shows almost 70% of the enrolled warrant officers with a high grade equal to the mode of their peers reached that grade in the same, or shorter, amount of time.

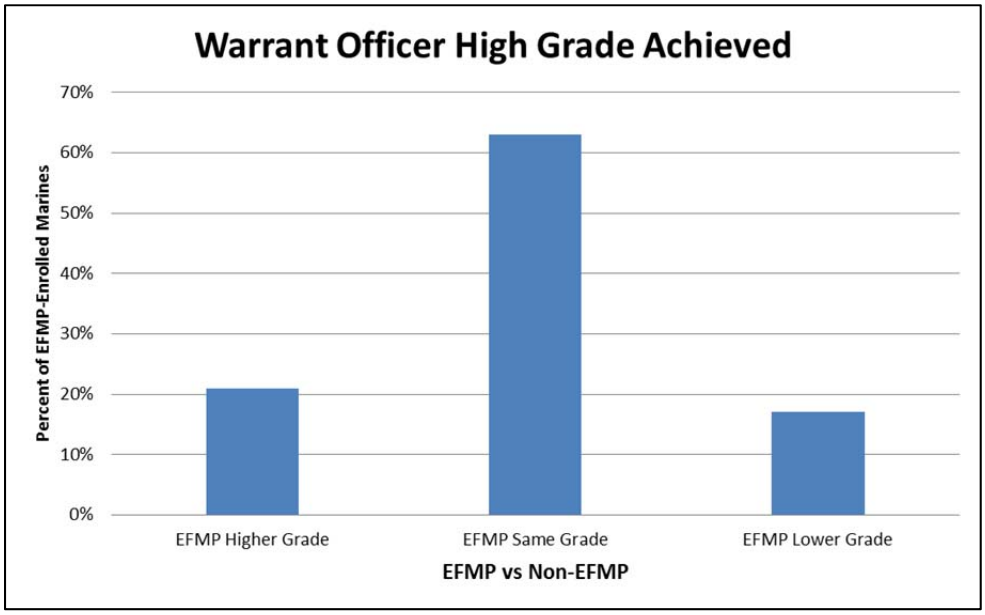

Figure 3-15: Warrant officer direct comparison of high grade

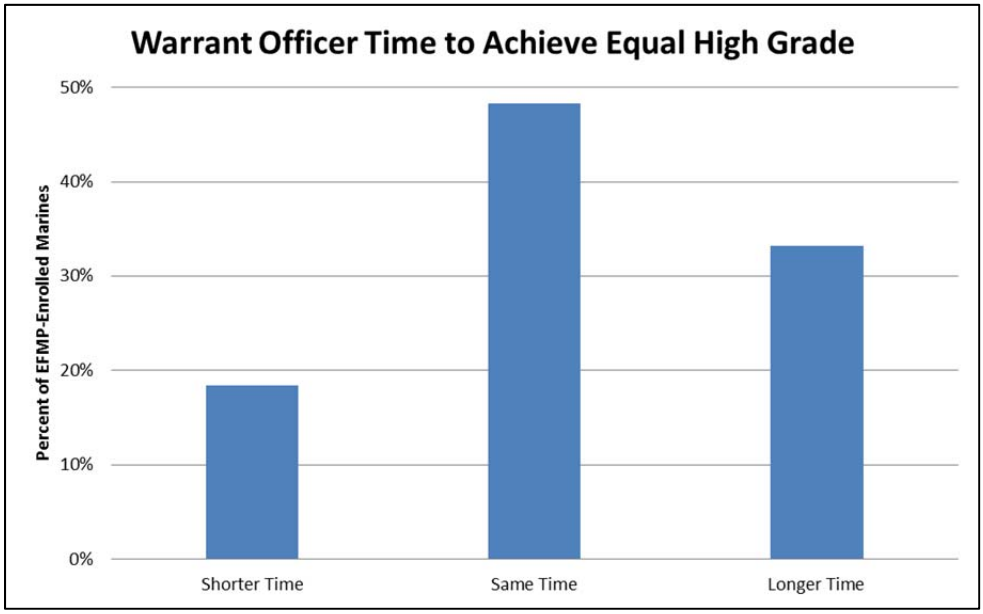

Figure 3-16: Warrant officer time to achieve equal high grade

3.3 Finding Three: 28XX OccField Analysis

A concern was expressed to the EFMP office regarding EFMP participants in OccField 28, Ground Electronics Maintenance. We analyzed the subgroup to see if the concern was warranted. First, we looked at career length. Figure 3-17 shows the career length comparison of Marines enrolled in EFMP to Marines who were not enrolled. The EFMP enrollees tend to have a slightly longer career. The mean career length for EFMP-enrolled was 51.8 months compared to 44 months for the non-enrolled.

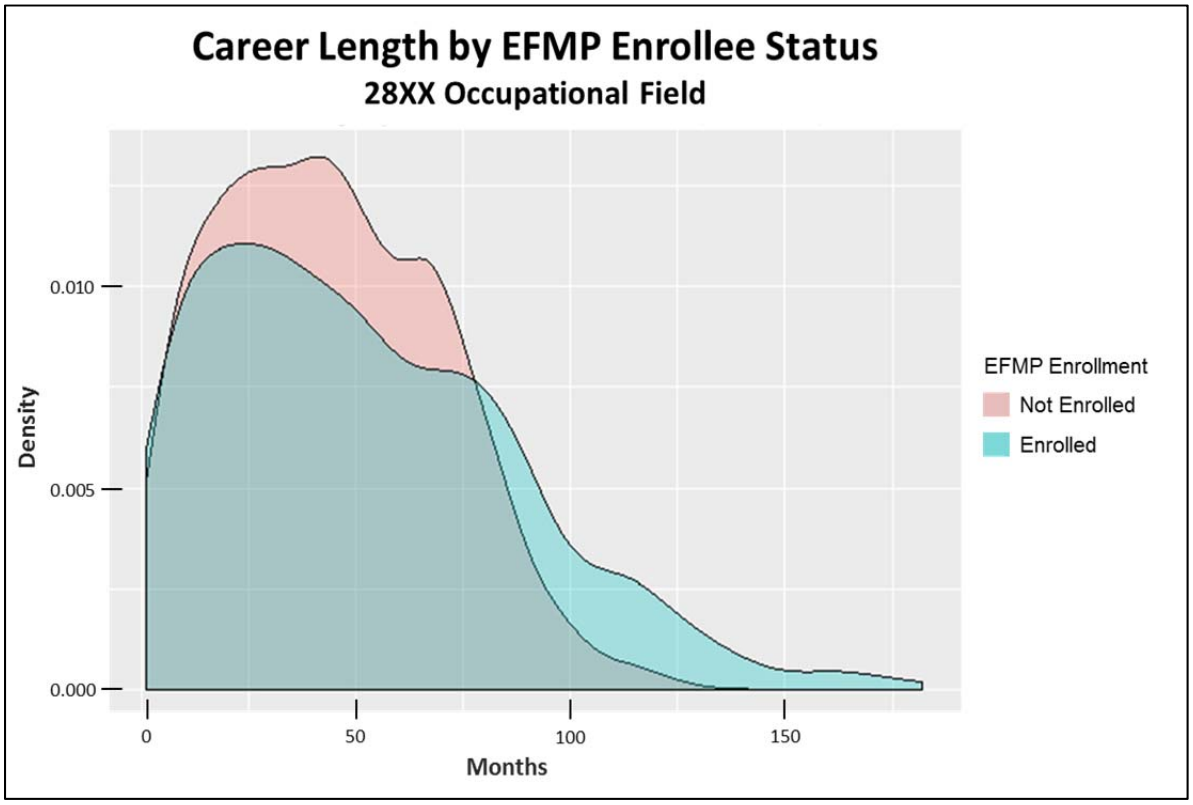

Figure 3-17: OccField 28 career length comparison

Next, we compared high grades of all 28XX Marines in our dataset. As shown in Figure 3-18, the EFMP participants tend to achieve higher grades by the end of their career than non-participants.

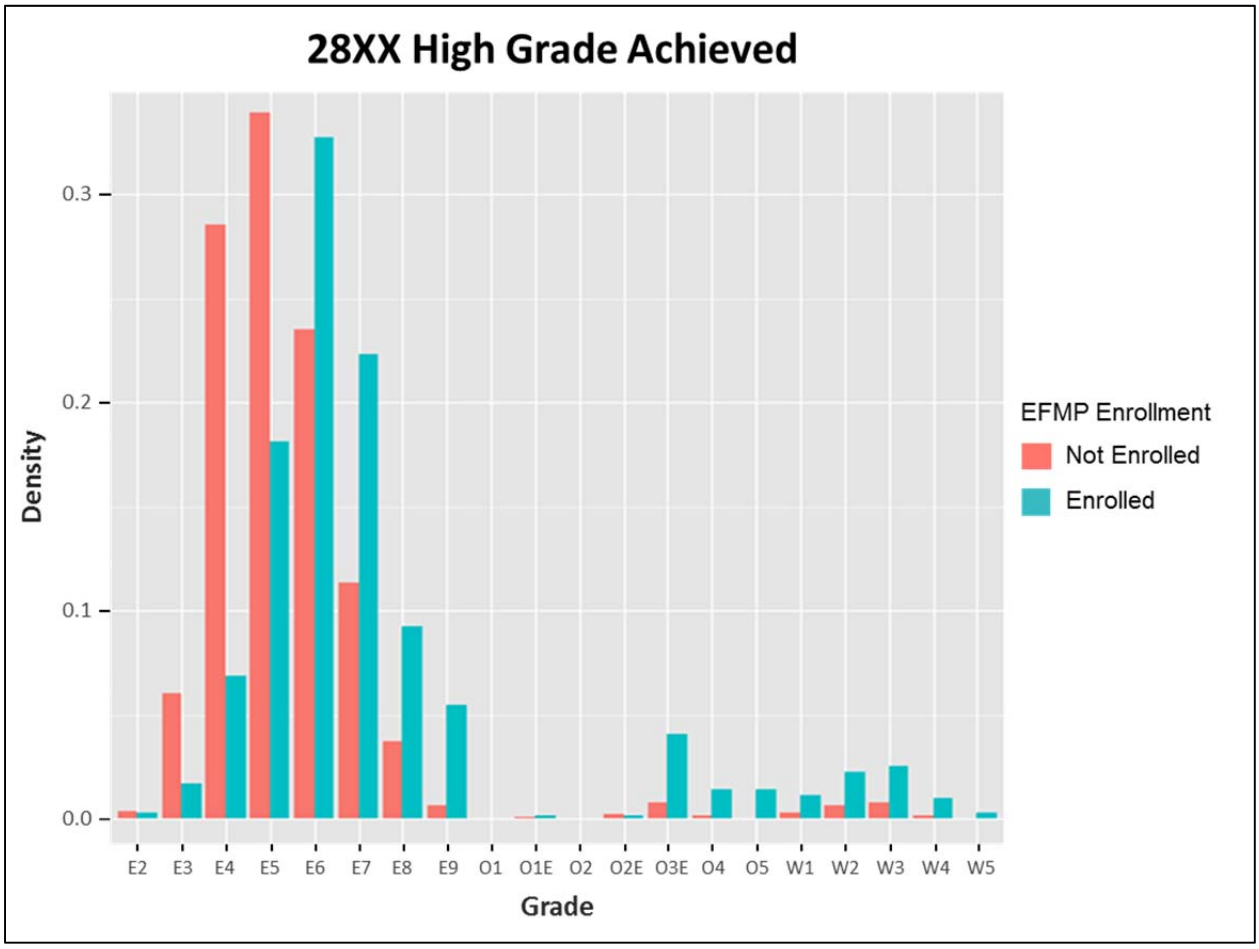

Figure 3-18: High grade comparison for OccField 28

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4 Conclusions

Based on a rigorous empirical analysis, we determined there is little evidence that EFMP enrollment negatively influences a Marine's career progression and promotion. There are no substantive differences between EFMP enrollees and non-enrollees in the various subgroups we examined. We found the current population of active duty EFMP participants is not significantly different from the general population of non-EFMP active duty Marines. We also found the career length of EFMP enrollees is, on average, slightly longer than the careers of non-enrollees active duty Marines. We then showed that EFMP enrollment has no distinguishable impact on high grade achieved. Future analyses could look at other subgroups, such as installation assigned or other MOSs.

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Appendix A – Visual Basic for Applications Code

The study team used VBA code to pull pay grade data by sequence from TFDW .csv files and write to an excel worksheet. (Comments are in green font):

```
Sub Career_Progression()
'Code loops through TFDW .csv files (one for each sequence (month or quarter) and pulls pay grade data into an excel worksheet.

‘Declare variables
Dim Seq As Integer
Dim MyFolder As String
Dim MyFile As String
Dim wb As Workbook
Dim i As Long
Dim j As Integer
Dim num As Integer
Dim StartSeq(2 To 1000002) As Variant
Dim SSN(2 To 1000002) As Variant
Dim CurrGrade(2 To 1000002) As String
Dim StartGrade(2 To 1000002) As String
Dim PromNum(2 To 1000002) As Integer
Dim NoMatch(2 To 1000002) As Integer
Dim PromGrade(2 To 1000002, 1 To 12) As String
Dim FindMatch As String
Dim PayArray As Variant
Dim ResultRange As Range
.
ReDim PayArray(2 To 1000002, 1 To 14)
‘PayArray is the two-dimensional array for the career progression data. Column 1 is the starting grade, 2 to 13 are pay grade changes, and 14 is the ending sequence.

For i = 2 To 1000002
   SSN(i) = Cells(i, 3)
   StartSeq(i) = Cells(i, 2)
   StartGrade(i) = Cells(i, 18)
   PromNum(i) = 0
   NoMatch(i) = 0
Next i
```

```
Application.ScreenUpdating = False
Application.EnableEvents = False
Application.Calculation = xlCalculationManual

MyFolder = "C:\"                        ‘Data path

Seq = 69                                'Starting sequence of the data set


Do Until Seq = 323                      'Loop through .csv files

   MyFile = Seq & ".csv"

   Set wb = Workbooks.Open(Filename:=MyFolder & MyFile)

   Application.ScreenUpdating = False
   Application.EnableEvents = False
   Application.Calculation = xlCalculationManual

   For i = 2 To 1000002

   If NoMatch(i) = 0 And Seq >= StartSeq(i) Then          ‘If the sequence equals or is higher than the starting sequence and NoMatch = 0 (NoMatch will be set to the first sequence number where the SSN is not found), then look up the SSN

      FindMatch = WorksheetFunction.IfError(Application.VLookup(SSN(i), Range("a:b"), 1, True), "N/A")                                    ‘Lookup SSN

‘If SSN is found, check for pay grade change
      If FindMatch = SSN(i) Then
       CurrGrade(i) = WorksheetFunction.IfError(Application.VLookup(SSN(i), Range("a:b"), 2, True), "N/A")
      Else
         CurrGrade(i) = "N/A"
      End If

      If CurrGrade(i) <> "N/A" Then
         If Seq = StartSeq(i) Then
            StartGrade(i) = CurrGrade(i)
            PayArray(i, 1) = StartGrade(i)
```

```
            End If
        Else
            NoMatch(i) = Seq          'If SSN is not found, get ending sequence number
            PayArray(i, 14) = NoMatch(i)
        End If

    'Pull promotion grade and sequence
        If NoMatch(i) = 0 And StartGrade(i) <> CurrGrade(i) Then
            If PromGrade(i, 1) = "" Then
                PromNum(i) = 1
                PromGrade(i, 1) = CurrGrade(i)
                PayArray(i, 2) = CurrGrade(i) & Seq
            Else
                For num = 2 To 12
                    If PromGrade(i, num) = "" Then
                        If CurrGrade(i) = PromGrade(i, num - 1) Then
                            Exit For
                        Else
                            PromNum(i) = PromNum(i) + 1
                            j = PromNum(i)
                            PromGrade(i, j) = CurrGrade(i)
                            PayArray(i, j + 1) = CurrGrade(i) & Seq
                            Exit For
                        End If
                    End If
                Next num
            End If
        End If
    End If
  Next i

wb.Close SaveChanges:=False

Seq = Seq + 1

Loop

Set ResultRange = Range(Cells(2, 18), Cells(1000002, 31))

ResultRange.Value = PayArray
```

```
'Write array to excel
Set ResultRange = Nothing

'Turn on screen updating
Application.ScreenUpdating = True
Application.EnableEvents = True

End Sub
```

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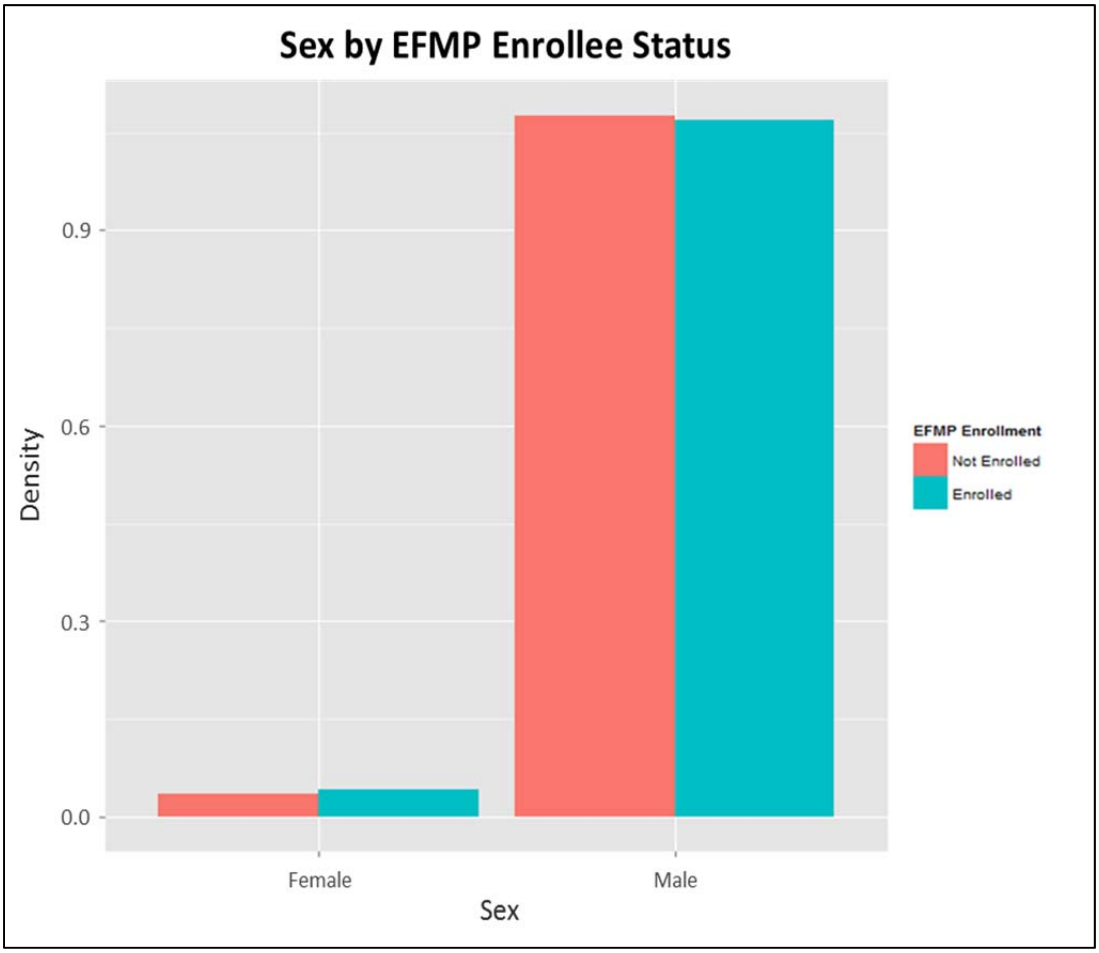
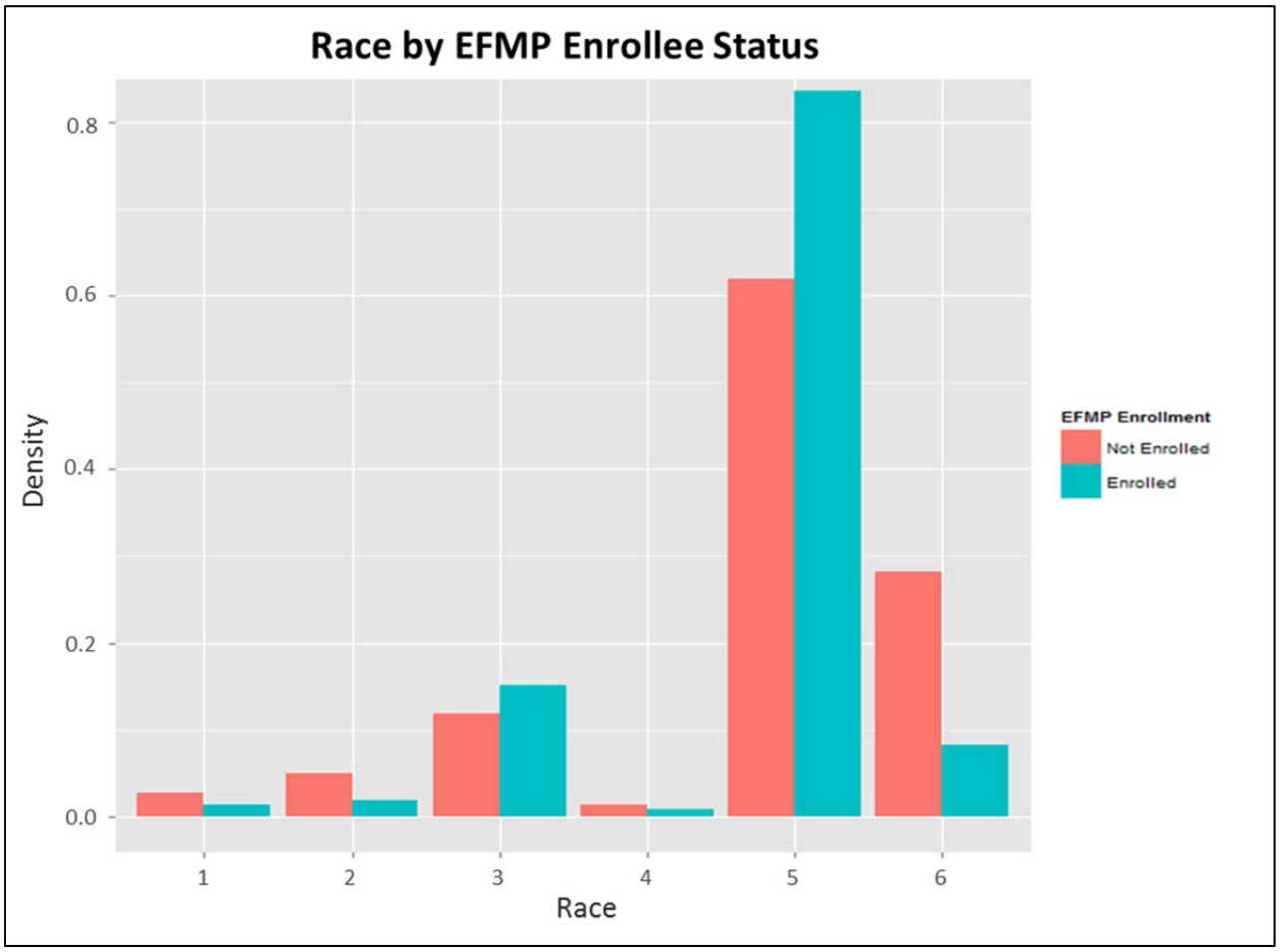
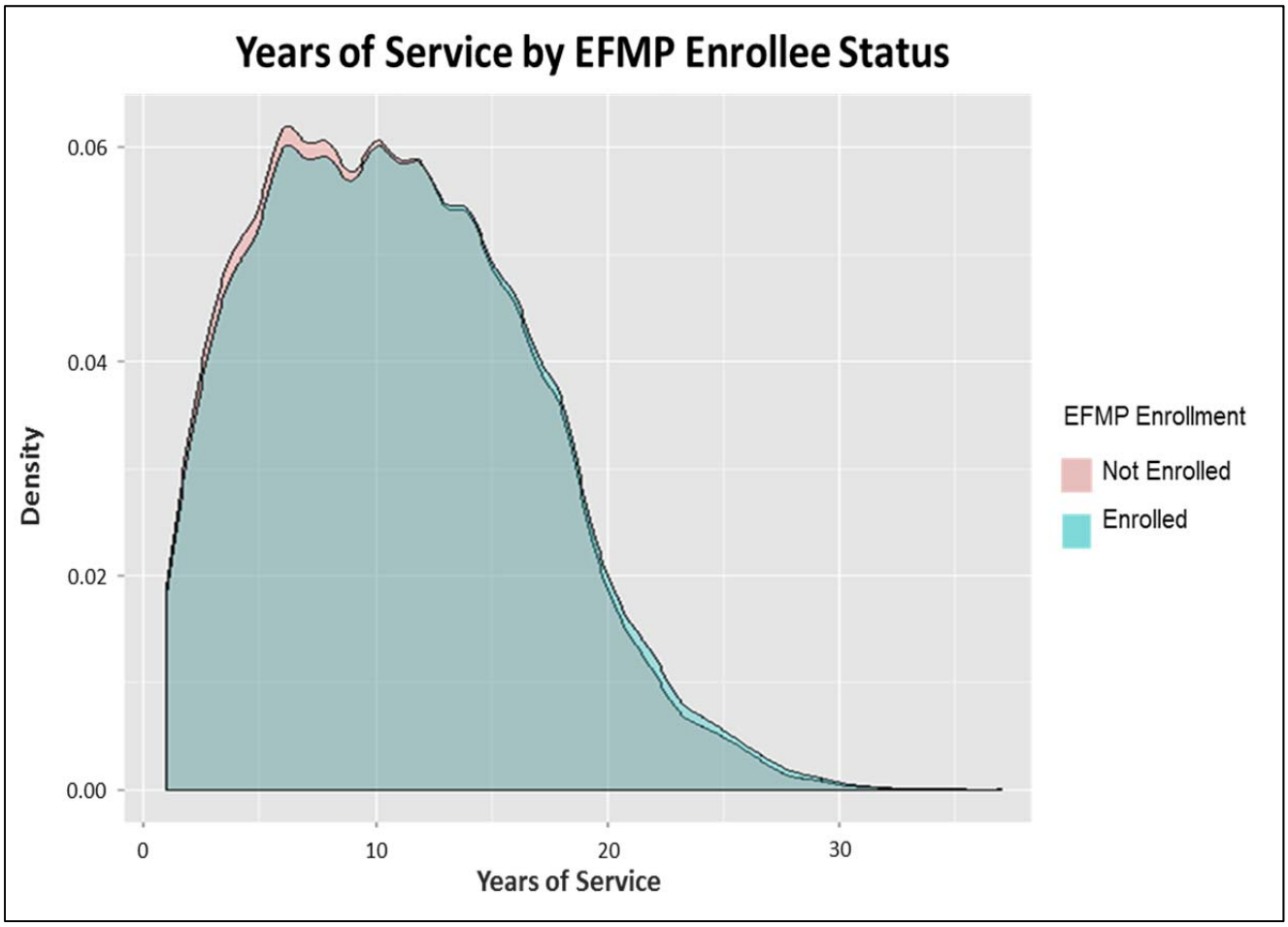
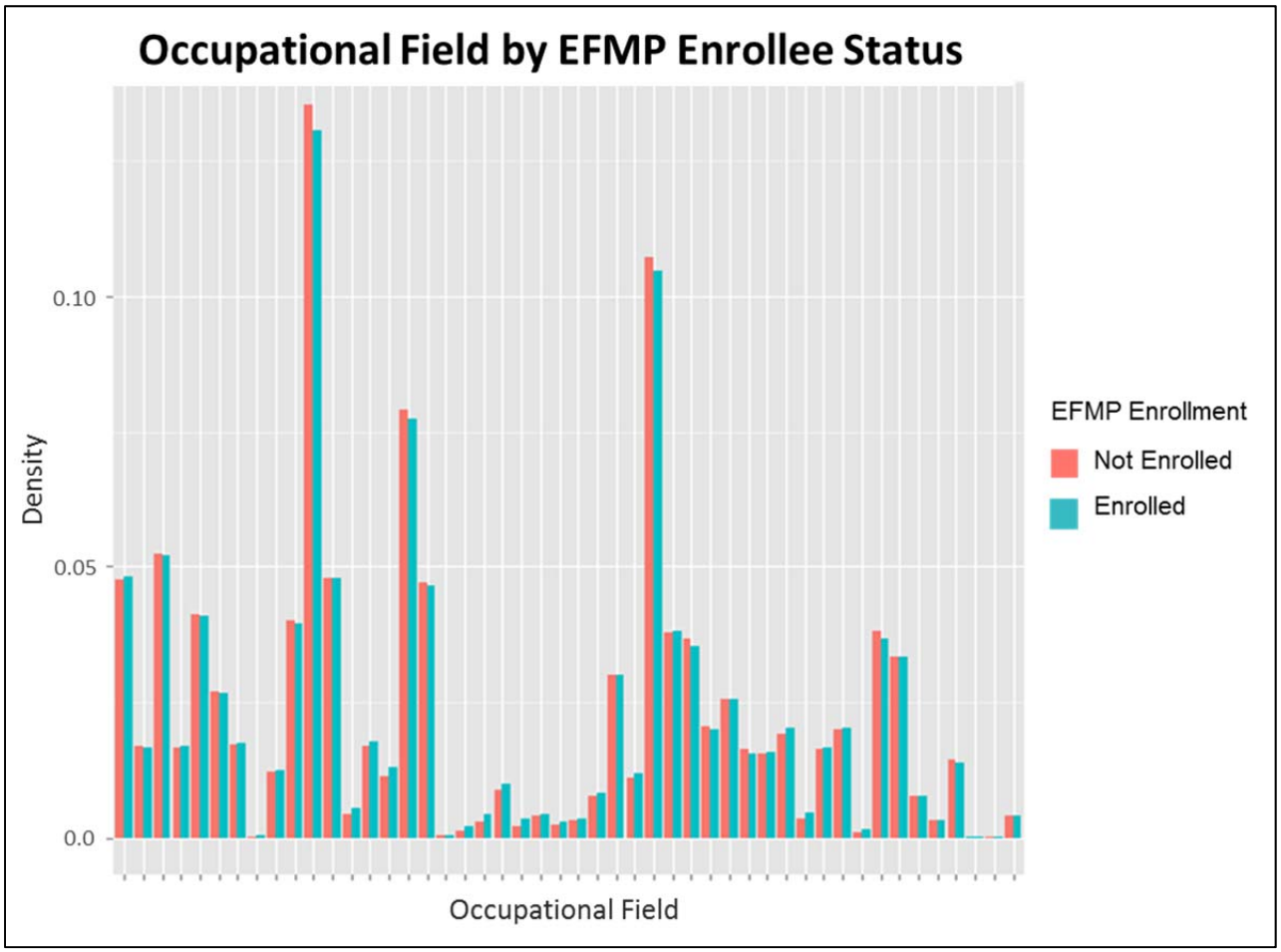
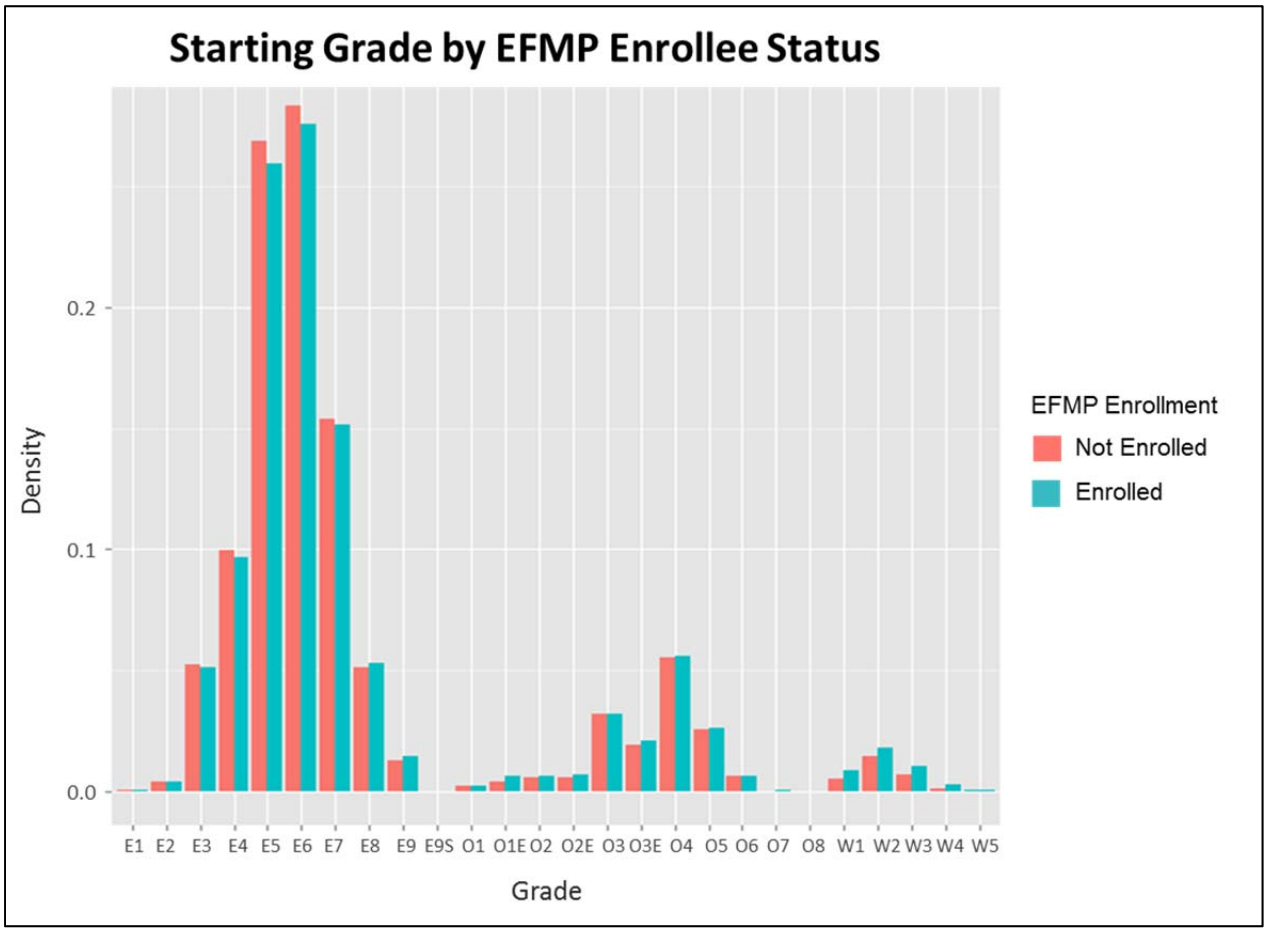
Appendix B – Matched Sample Balance Check




Race by EFMP Enrollee Status
Density
0.0
0.2
0.4
0.6
0.8
1
2
3
4
5
6
Race
EFMP Enrollment
Not Enrolled
Enrolled


Years of Service by EFMP Enrollee Status
0.06
0.04
0.02
0.00
Density
0
10
20
30
Years of Service
EFMP Enrollment
Not Enrolled
Enrolled


Occupational Field by EFMP Enrollee Status
0.10
0.05
0.0
Density
Occupational Field
EFMP Enrollment
Not Enrolled
Enrolled


Starting Grade by EFMP Enrollee Status
Density
0.2
0.1
0.0
E1 E2 E3 E4 E5 E6 E7 E8 E9 E9S O1 O1E O2 O2E O3 O3E O4 O5 O6 O7 O8 W1 W2 W3 W4 W5
Grade
EFMP Enrollment
Not Enrolled
Enrolled

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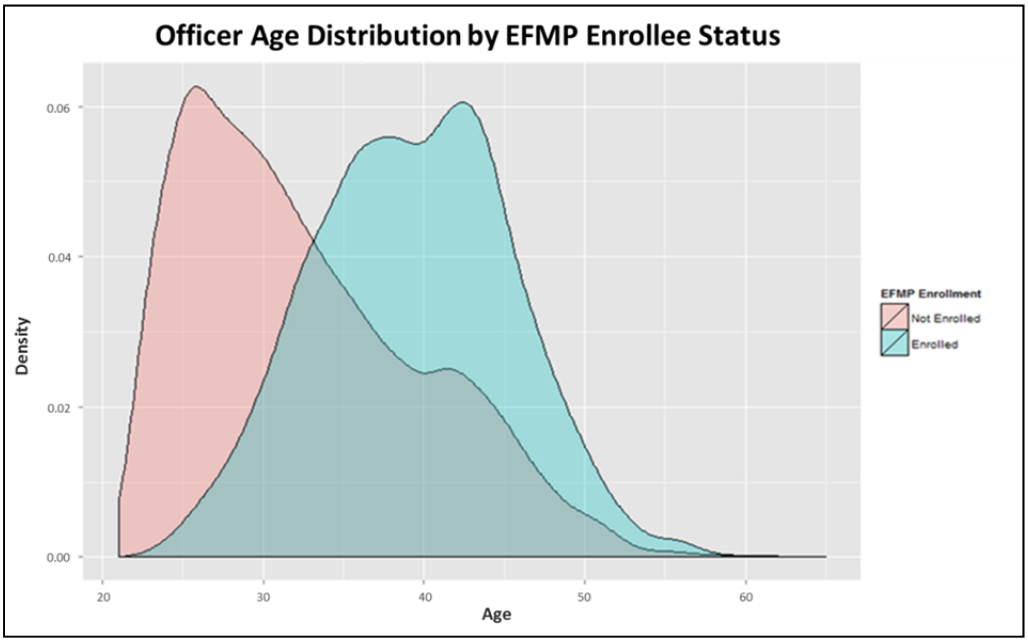
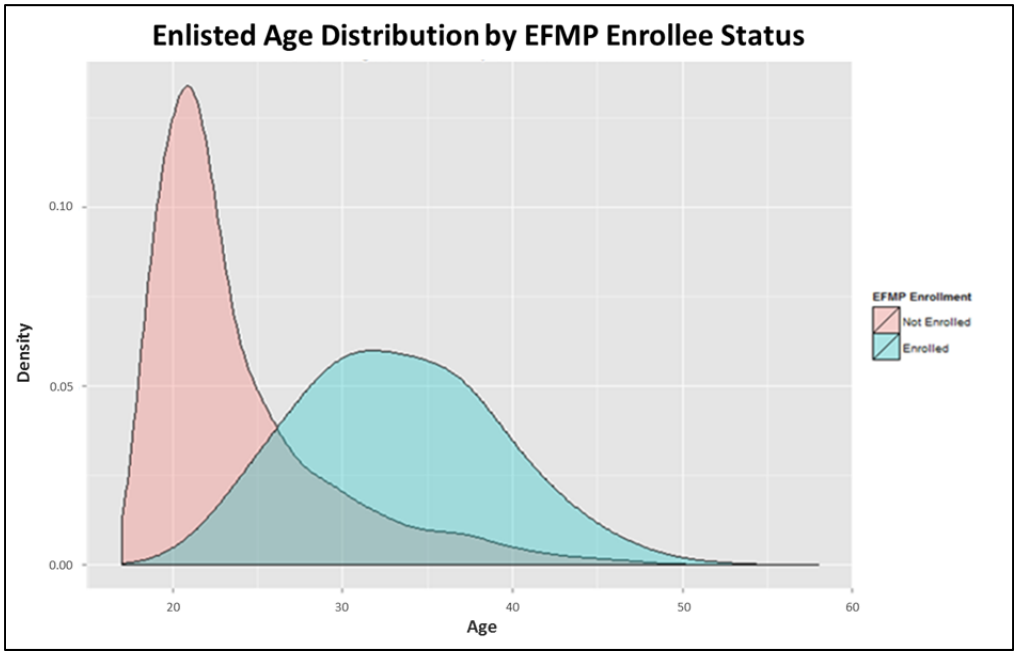
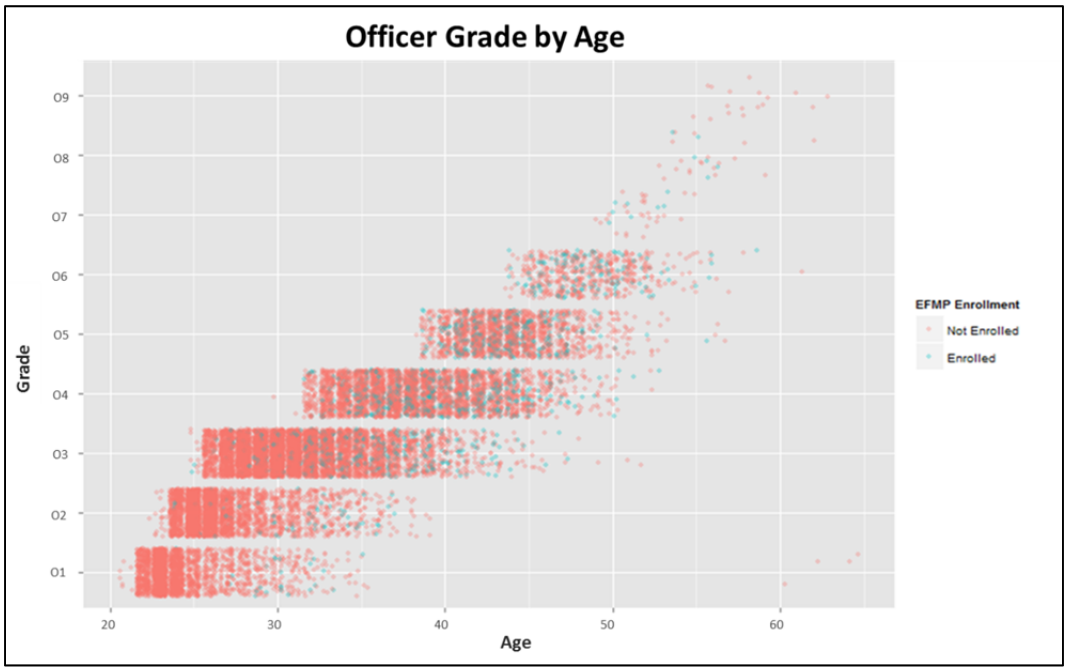
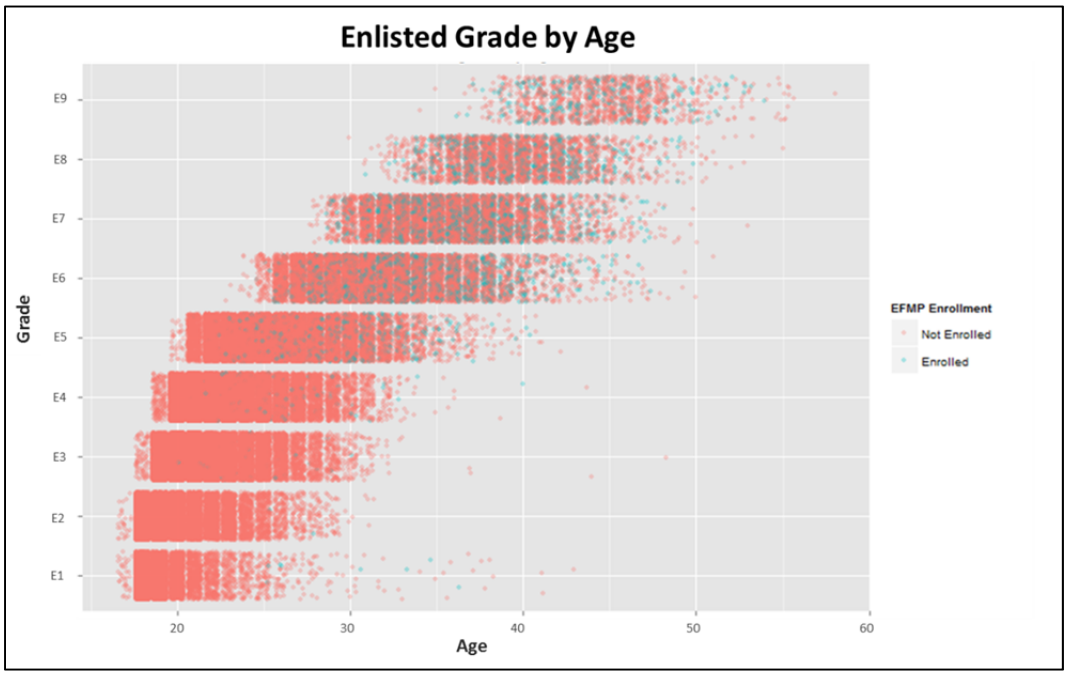
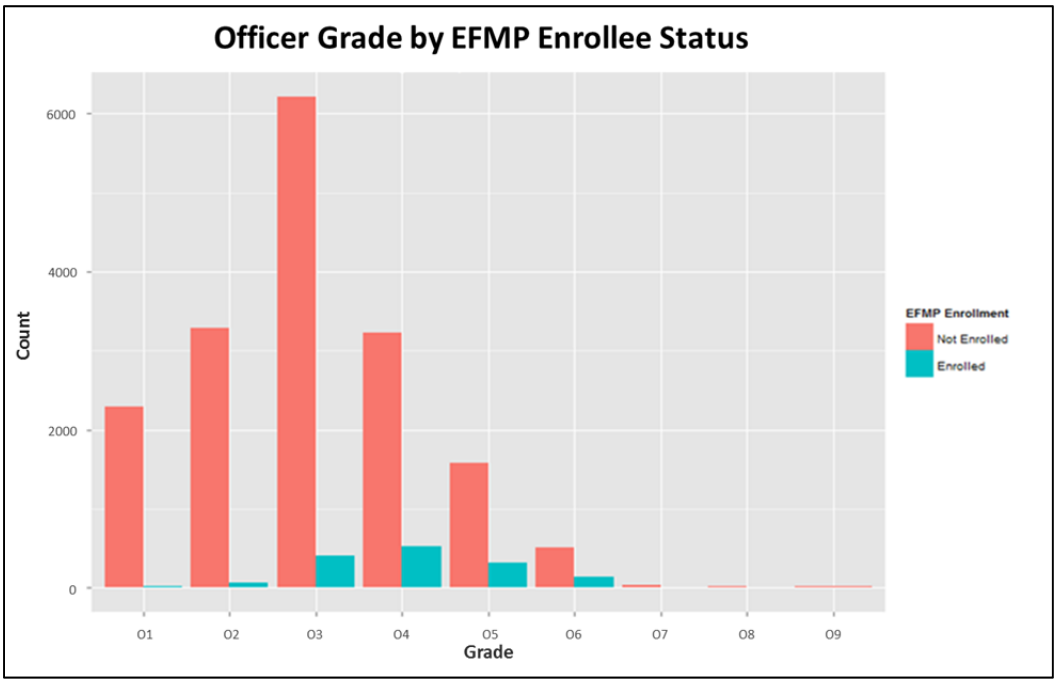
Appendix C – Descriptive Statistics

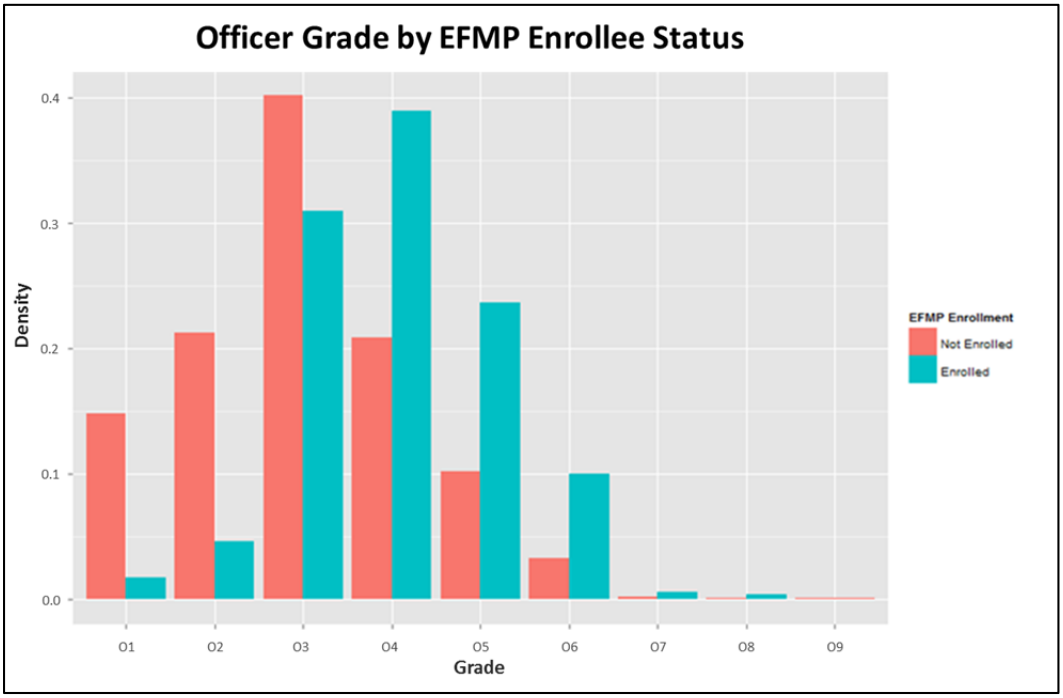


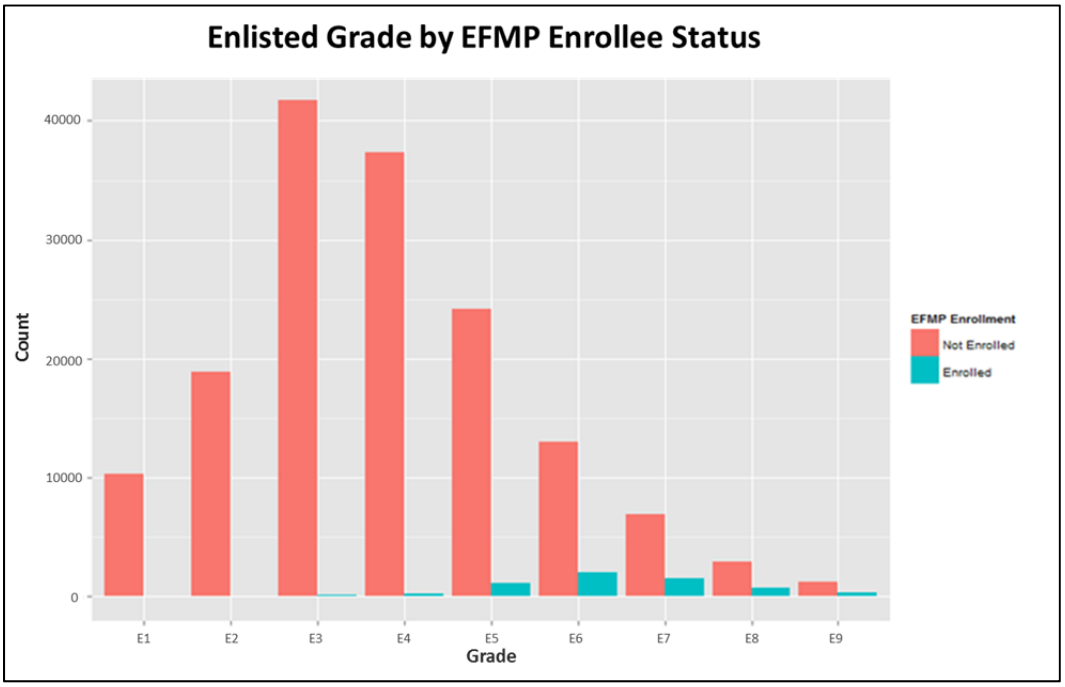


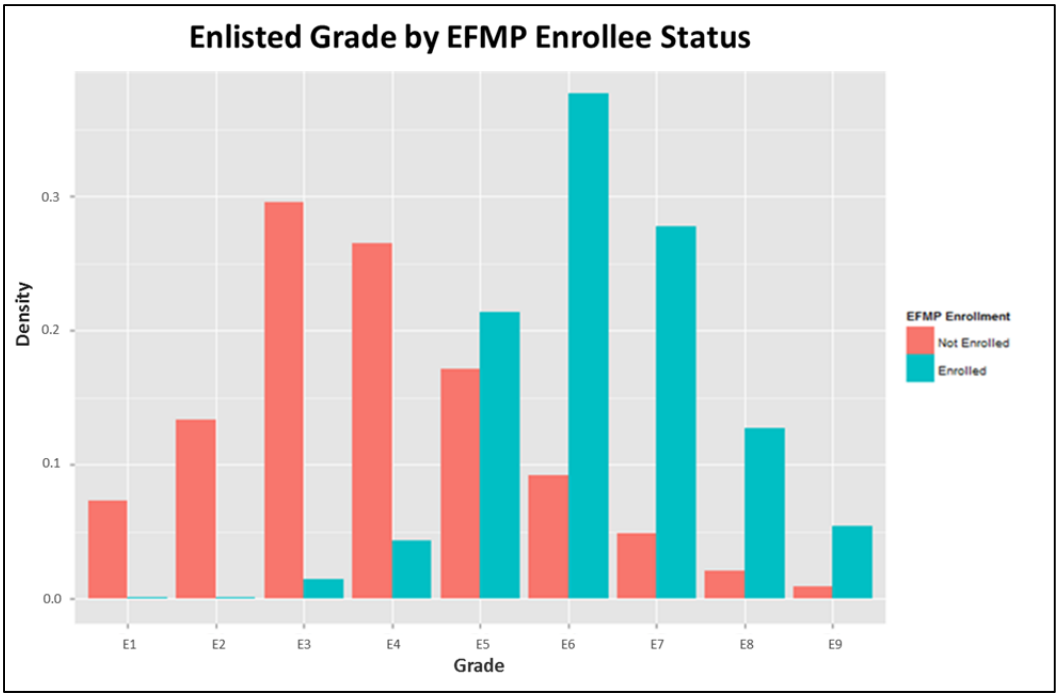

Officer Grade by Age
Grade
O9
O8
O7
O6
O5
O4
O3
O2
O1
20
30
40
50
60
Age
EFMP Enrollment
Not Enrolled
Enrolled

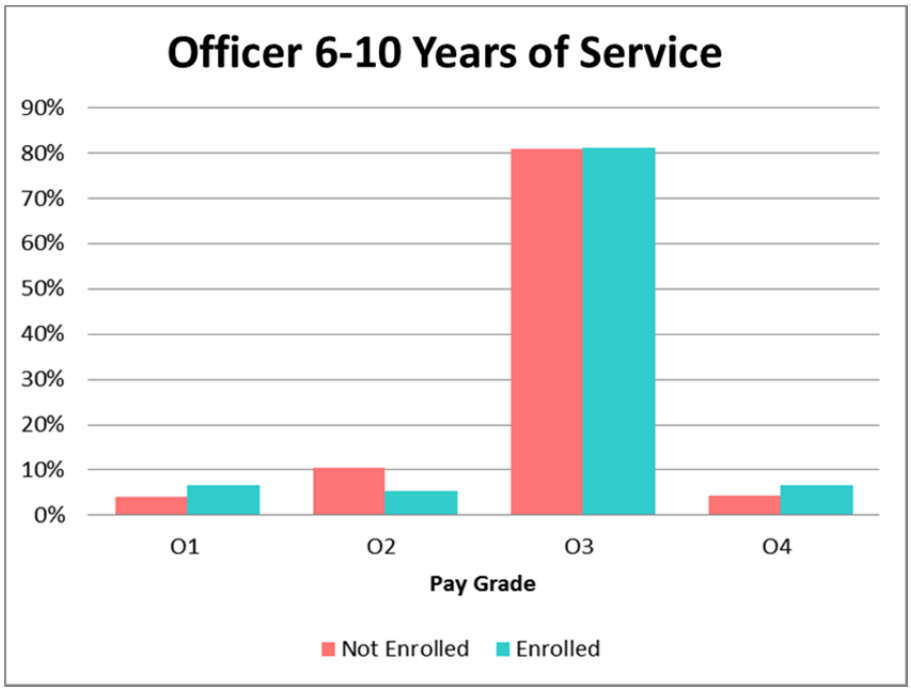

Enlisted Grade by Age
Grade
E9
E8
E7
E6
E5
E4
E3
E2
E1
20
30
40
50
60
Age
EFMP Enrollment
Not Enrolled
Enrolled

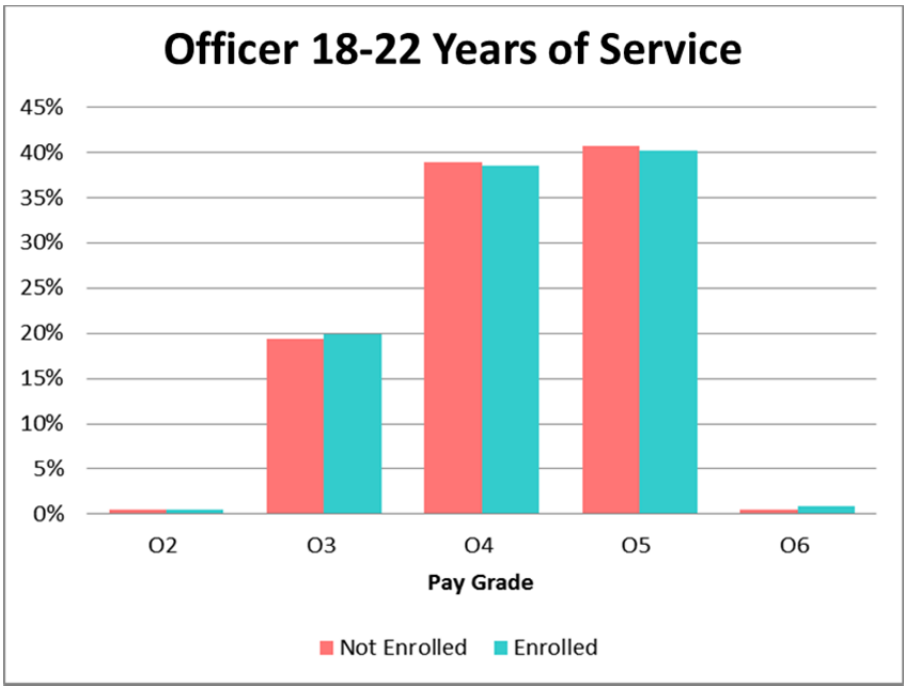

Officer Grade by EFMP Enrollee Status
Count
6000
4000
2000
0
O1
O2
O3
O4
O5
O6
O7
O8
O9
Grade
EFMP Enrollment
Not Enrolled
Enrolled

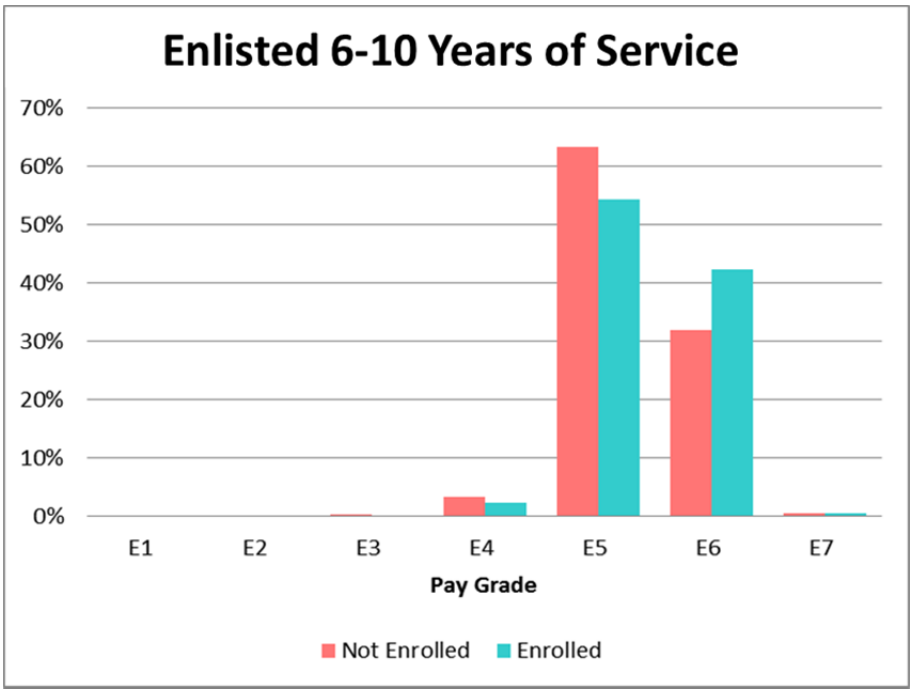

Officer Grade by EFMP Enrollee Status
Density
0.4
0.3
0.2
0.1
0.0
O1
O2
O3
O4
O5
O6
O7
O8
O9
Grade
EFMP Enrollment
Not Enrolled
Enrolled

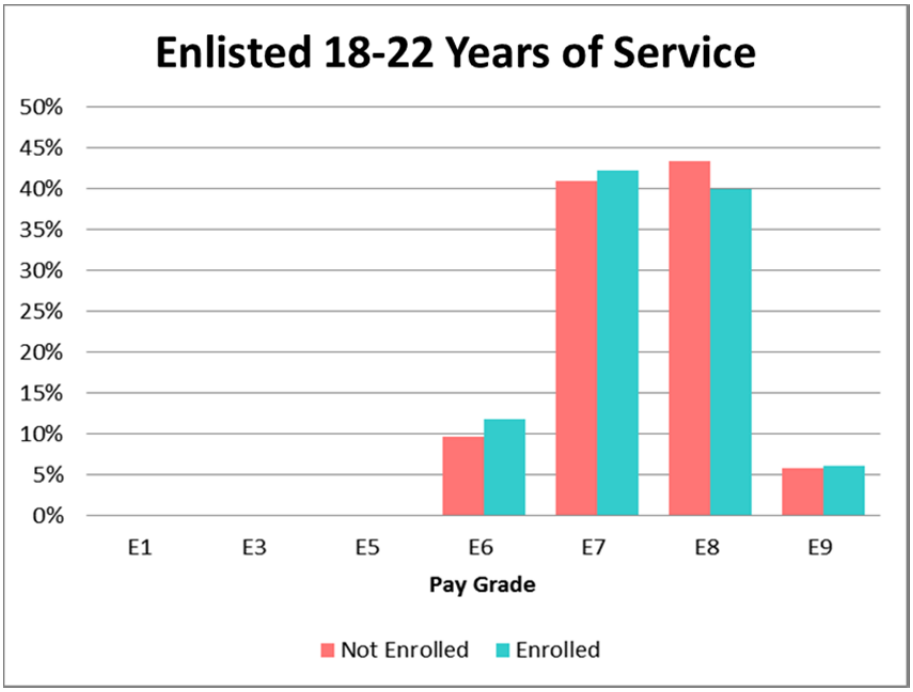

Enlisted Grade by EFMP Enrollee Status
Count
40000
30000
20000
10000
0
E1
E2
E3
E4
E5
E6
E7
E8
E9
Grade
EFMP Enrollment
Not Enrolled
Enrolled

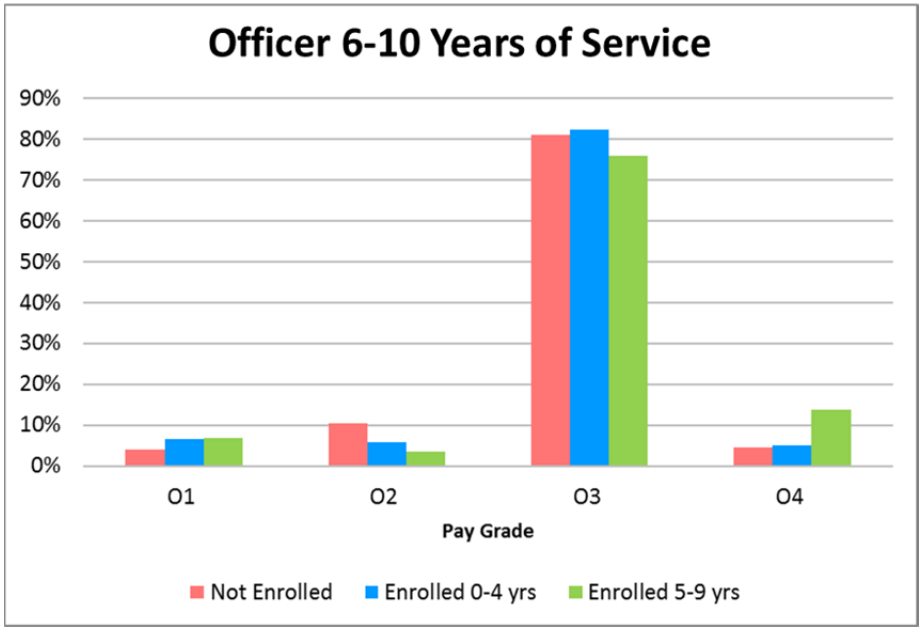

Enlisted Grade by EFMP Enrollee Status
Density
0.3
0.2
0.1
0.0
E1
E2
E3
E4
E5
E6
E7
E8
E9
Grade
EFMP Enrollment
Not Enrolled
Enrolled

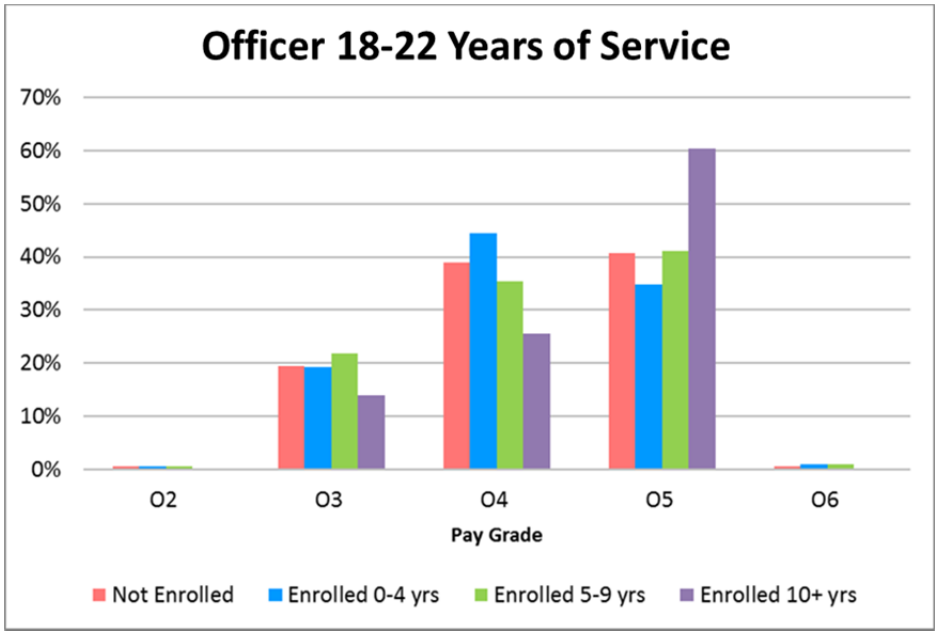

Officer 6-10 Years of Service
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
O1
O2
O3
O4
Pay Grade
Not Enrolled
Enrolled

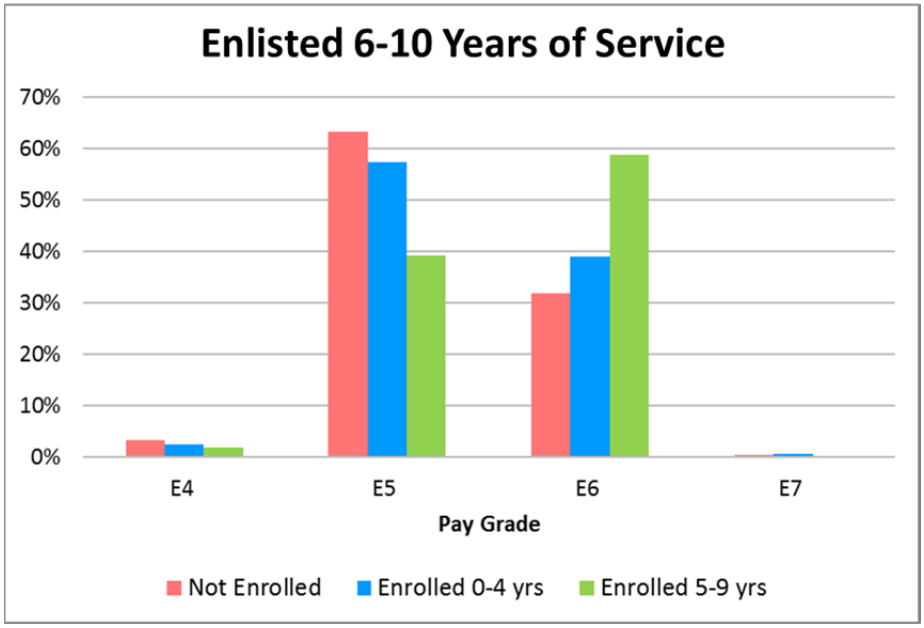

Officer 18-22 Years of Service
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
O2
O3
O4
O5
O6
Pay Grade
Not Enrolled
Enrolled

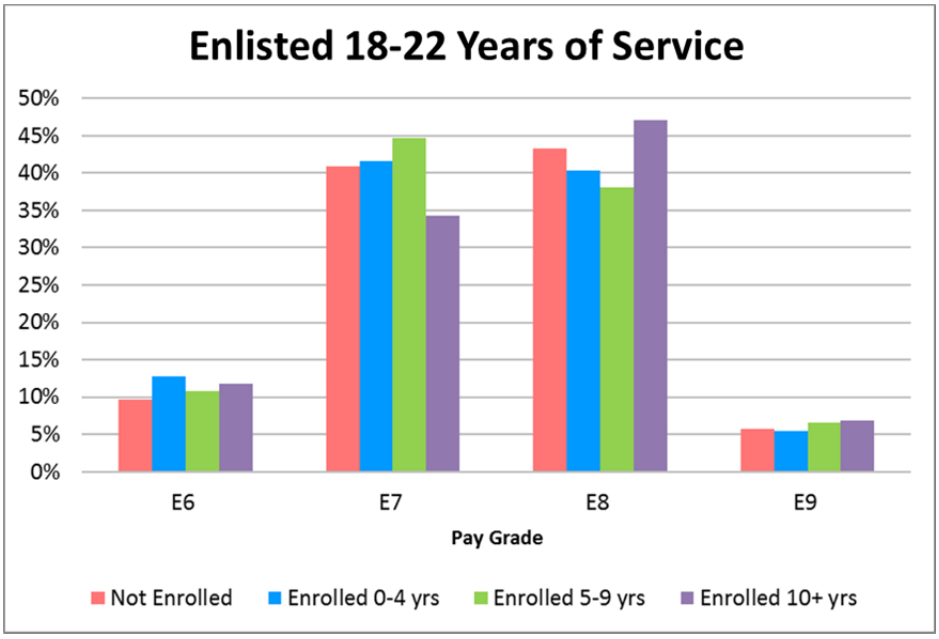

Enlisted 6-10 Years of Service
70%
60%
50%
40%
30%
20%
10%
0%
E1
E2
E3
E4
E5
E6
E7
Pay Grade
Not Enrolled
Enrolled


Enlisted 18-22 Years of Service
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
E1
E3
E5
E6
E7
E8
E9
Pay Grade
Not Enrolled
Enrolled


Officer 6-10 Years of Service
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
O1
O2
O3
O4
Pay Grade
Not Enrolled
Enrolled 0-4 yrs
Enrolled 5-9 yrs


Officer 18-22 Years of Service
70%
60%
50%
40%
30%
20%
10%
0%
O2
O3
O4
O5
O6
Pay Grade
Not Enrolled
Enrolled 0-4 yrs
Enrolled 5-9 yrs
Enrolled 10+ yrs


Enlisted 6-10 Years of Service
70%
60%
50%
40%
30%
20%
10%
0%
E4
E5
E6
E7
Pay Grade
Not Enrolled
Enrolled 0-4 yrs
Enrolled 5-9 yrs


Enlisted 18-22 Years of Service
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
E6
E7
E8
E9
Pay Grade
Not Enrolled
Enrolled 0-4 yrs
Enrolled 5-9 yrs
Enrolled 10+ yrs

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Appendix D – Acronyms

Acronym	Definition
BAH	Basic Allowance for Housing
CMS	Case Management System
DoDI	Department of Defense Instruction
EFMP	Exceptional Family Member Program
HQMC	Headquarters Marine Corps
HRPP	Human Research Protection Program
IRB	Institutional Review Board
MOS	Military Occupational Specialty
NAF	Non-Appropriated Fund
NDAA	National Defense Authorization Act
OccField	Occupational Field
OQR	Officer Qualification Record
PCS	Permanent Change of Station
SRB	Service Record Book
SSN	Social Security Number
TFDW	Total Force Data Warehouse
USMC	United States Marine Corps
VBA	Visual Basic for Applications
YOS	Years of Service

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Appendix E – References

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