

SUPPORTING STATEMENT – PART B

B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

If the collection of information employs statistical methods, it should be indicated in Item 17 of OMB Form 83-I, and the following information should be provided in this Supporting Statement:

1. Description of the Activity

Describe the potential respondent universe and any sampling or other method used to select respondents. Data on the number of entities covered in the collection should be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate the expected response rates for the collection as a whole, as well as the actual response rates achieved during the last collection, if previously conducted.

The population of interest for the 2021 SOFA consists of active duty members who are below flag rank and in the Army, Navy, Marine Corps, Air Force, or Coast Guard. OPA uses a sampling tool developed by the Research Triangle Institute (RTI) to determine the sample size needed to achieve 95% confidence and an associated precision of 5% or less on each reporting domain. We select a single-stage, non-proportional stratified random sample to ensure statistically adequate expected number of responses for the reporting categories (i.e., domains). For SOFA, OPA uses Service, paygrade, gender, family status, and duty location to define the initial strata. We collapse these strata when there are fewer than 300 individuals in the stratum. There were 175 final strata in the 2020 SOFA. Attachment A contains a table with the number of individuals in the population and sample by strata. The expected weighted response rate for this survey is about 12%, which is the same as the weighted response rate for this survey in 2020.

2. Procedures for the Collection of Information

Describe any of the following if they are used in the collection of information:

a. Statistical methodologies for stratification and sample selection;

As described above, OPA uses a sampling tool developed by the Research Triangle Institute (RTI) to determine the sample size needed to achieve 95% confidence and an associated precision of 5% or less on each reporting category domain. We select a single-stage, non-proportional stratified random sample to ensure statistically adequate expected number of responses for the reporting domains. For SOFA, OPA uses Service, paygrade, gender, family status, and duty location to define the initial strata. We collapse these strata when there are fewer than 300 individuals in the stratum. Once OPA determines the stratum-level sample sizes, a random number is assigned to every member of the population and the population is sorted by

stratum and random number prior to sampling, which results in a randomly-ordered population within each stratum. We then select the appropriate number of members from each stratum.

b. Estimation procedures;

OPA weights the eligible respondents in order to make inferences about the entire population of active duty members. The weighting methodology utilizes standard weighting processes. First, we assign a base weight to the sampled member based on the reciprocal of the selection probability. Second, OPA uses 20-30 administrative variables in the XGBoost application of Generalized Boosted Model (GBM) to predict survey eligibility and completion. OPA's accurate and detailed administrative data on both survey respondents and nonrespondents provides confidence in our survey estimates. We adjust the sampling weights and then all prior-stage weights by the inverse of these model-predicted probabilities to adjust for nonresponse. Finally, we rake these adjusted weights to known population totals to further reduce the variance and bias of the estimates.

c. Degree of accuracy needed for the Purpose discussed in the justification;

OPA creates variance strata so precision measures can be associated with each estimate. We produce precision measures for reporting categories using 95% confidence intervals with the goal of achieving a precision of 5% or less (e.g, 80% (+/- 5%) of Army E1-E4 are satisfied with their job).

d. Unusual problems requiring specialized sampling procedures; and

OPA recognizes the response rates vary for certain domains of interest such as Service component and paygrade. To account for this, we average the response rates for the previous three surveys at the stratum level and these response rates are utilized by the sampling tool to adjust the sample and compute expected sample sizes.

e. Use of periodic or cyclical data collections to reduce respondent burden.

To reduce burden on active duty members, OPA conducts the SOFA survey annually, whereas in the past it was conducted twice per year.

3. Maximization of Response Rates, Non-response, and Reliability

Discuss methods used to maximize response rates and to deal with instances of non-response. Describe any techniques used to ensure the accuracy and reliability of responses is adequate for intended purposes. Additionally, if the collection is based on sampling, ensure that the data can be generalized to the universe under study. If not, provide special justification.

To maximize response rates, OPA offers the survey via the Web and uses reminder letters and emails to maximize response rates. To reduce respondent burden, web-based surveys use “smart skip” technology to ensure respondents only answer questions that are applicable to them. To deal with instances of nonresponse, OPA adjusts for nonresponse in the weighting methodology. To ensure the accuracy and reliability of responses, OPA conducts a nonresponse bias (NRB) analysis every third survey cycle and will conduct one in 2022. Historically OPA has found little evidence of significant NRB during these studies; however, OPA statisticians consider the risk of NRB high and consider it likely the largest source of error in OPA surveys. OPA uses probability sampling and appropriate weighting to ensure the survey data can be generalized to the universe under study.

4. Tests of Procedures

Describe any tests of procedures or methods to be undertaken. Testing of potential respondents (9 or fewer) is encouraged as a means of refining proposed collections to reduce respondent burden, as well as to improve the collection instrument utility. These tests check for internal consistency and the effectiveness of previous similar collection activities.

Not applicable.

5. Statistical Consultation and Information Analysis

a. Provide names and telephone number of individual(s) consulted on statistical aspects of the design.

Mr. David McGrath, Branch Chief; Statistical Methods Team, Methods, Analysis, and Systems Support, Office of People Analytics (OPA); (571) 372-0983.

Ms. Wendy Barboza, Team Lead; Statistical Methods Team, Methods, Analysis, and Systems Support, Office of People Analytics (OPA); (571) 372-1099.

b. Provide name and organization of person(s) who will actually collect and analyze the collected information.

The data will be collected by Data Recognition Corporation (DRC), which is OPA’s operations contractor. Ms. Valerie Waller is the Senior Managing Director at DRC.

The data will be analyzed by OPA analysts. Lindsay Rock, Monica Wiedemann, and Amy Campbell are the lead operations analysts.

Attachment A. SOFA 2001 - Population and Sample Size by Strata

Stratum	Stratum Definitions	Population Size	Sample Size
All	Total	1,360,151	125,765
1	001= 001 ARMY_E1-E4_MALE_SING+CHILD_US&T&OT	4,232	963
2	002= 002 ARMY_E1-E4_MALE_SING+CHILD_OVERSEA	331	77
3	003= 003 ARMY_E1-E4_MALE_DUALSVCS_US&T&OT	2,432	283
4	004= 004 ARMY_E1-E4_MALE_DUALSVCS_OVERSEA	330	52
5	005= 005 ARMY_E1-E4_MALE_OTHERFAMIL_US&T&OT	146,510	18,237
6	006= 006 ARMY_E1-E4_MALE_OTHERFAMIL_EUROPE	7,634	1,107
7	007= 007 ARMY_E1-E4_MALE_OTHERFAMIL_ASIAPI	7,530	753
8	008= 008 ARMY_E1-E4_FEMALE_SING+CHILD_AIIREGION	1,692	342
9	009= 009 ARMY_E1-E4_FEMALE_DUALSVCS_US&T&OT	3,434	363
10	010= 010 ARMY_E1-E4_FEMALE_DUALSVCS_OVERSEA	394	72
11	011= 011 ARMY_E1-4_FEMALE_OTHERFAMIL_US&T&OT	23,886	2,334
12	012= 012 ARMY_E1-E4_FEMALE_OTHERFAMIL_EUROPE	1,231	160
13	013= 013 ARMY_E1-E4_FEMALE_OTHERFAMIL_ASIAPI	1,654	167
14	014= 014 ARMY_E5-E9_MALE_SING+CHILD_US&T&OT	8,640	958
15	015= 015 ARMY_E5-E9_MALE_SING+CHILD_EUROPE	387	56
16	016= 016 ARMY_E5-E9_MALE_SING+CHILD_ASIAPI	312	34
17	017= 017 ARMY_E5-E9_MALE_DUALSVCS_US&T&OT	5,770	372
18	018= 018 ARMY_E5-E9_MALE_DUALSVCS_OVERSEA	625	56
19	019= 019 ARMY_E5-E9_MALE_OTHERFAMIL_US&T&OT	125,038	7,290
20	020= 020 ARMY_E5-E9_MALE_OTHERFAMIL_EUROPE	8,347	683
21	021= 021 ARMY_E5-E9_MALE_OTHERFAMIL_ASIAPI	5,565	302
22	022= 022 ARMY_E5-E9_FEMALE_SING+CHILD_US&T&OT	4,125	454
23	023= 023 ARMY_E5-E9_FEMALE_SING+CHILD_OVERSEA	365	54
24	024= 024 ARMY_E5-E9_FEMALE_DUALSVCS_US&T&OT	4,915	310

25	025= 025 ARMY_E5-E9_FEMALE_DUALSVCS_OVERSEA	526	53
26	026= 026 ARMY_E5-9_FEMALE_OTHERFAMIL_US&T&OT	12,370	719
27	027= 027 ARMY_E5-E9_FEMALE_OTHERFAMIL_EUROPE	989	92
28	028= 028 ARMY_E5-E9_FEMALE_OTHERFAMIL_ASIAPI	729	47
29	029= 029 ARMY_W1-W5_MALE_SING+CHILD_AIIREGION	776	162
30	030= 030 ARMY_W1-W5_MALE_DUALSVCS_AIIREGION	395	78
31	031= 031 ARMY_W1-W5_MALE_OTHERFAMIL_US&T&OT	10,280	1,755
32	032= 032 ARMY_W1-W5_MALE_OTHERFAMIL_EUROPE	671	112
33	033= 033 ARMY_W1-W5_MALE_OTHERFAMIL_ASIAPI	696	114
34	034= 034 ARMY_W1-W5_FEMALE_NotOther_AIIREGION	566	119
35	035= 035 ARMY_W1-W5_FEMALE_OTHERFAMIL_AIIREGION	867	158
36	036= 036 ARMY_O1-O3_MALE_SING+CHILD_AIIREGION	816	81
37	037= 037 ARMY_O1-O3_MALE_DUALSVCS_AIIREGION	1,398	92
38	038= 038 ARMY_O1-O3_MALE_OTHERFAMIL_US&T&OT	33,899	1,916
39	039= 039 ARMY_O1-O3_MALE_OTHERFAMIL_EUROPE	1,751	115
40	040= 040 ARMY_O1-O3_MALE_OTHERFAMIL_ASIAPI	1,216	67
41	041= 041 ARMY_O1-O3_FEMALE_SING+CHILD_AIIREGION	472	45
42	042= 042 ARMY_O1-O3_FEMALE_DUALSVCS_AIIREGION	1,762	115
43	043= 043 ARMY_O1-O3_FEMALE_OTHERFAMIL_US&T&OT	7,308	428
44	044= 044 ARMY_O1-O3_FEMALE_OTHERFAMIL_EUROPE	392	33
45	045= 045 ARMY_O1-O3_FEMALE_OTHERFAMIL_ASIAPI	311	20
46	046= 046 ARMY_O4-O6_MALE_SING+CHILD_AIIREGION	844	79
47	047= 047 ARMY_O4-O6_MALE_DUALSVCS_AIIREGION	987	68
48	048= 048 ARMY_O4-O6_MALE_OTHERFAMIL_US&T&OT	19,537	1,206
49	049= 049 ARMY_O4-O6_MALE_OTHERFAMIL_EUROPE	1,707	120
50	050= 050 ARMY_O4-O6_MALE_OTHERFAMIL_ASIAPI	950	62
51	051= 051 ARMY_O4-O6_FEMALE_SING+CHILD_AIIREGION	509	50

52	052= 052 ARMY_O4-O6_FEMALE_DUALSVCS_AIIREGION	1,002	69
53	053= 053 ARMY_O4-O6_FEMALE_OTHERFAMIL_US&T&OT	3,201	197
54	054= 054 ARMY_O4-O6_FEMALE_OTHERFAMIL_OVERSEA	373	31
55	055= 055 NAVY_E1-E4_MALE_SING+CHILD_AIIREGION	578	115
56	056= 056 NAVY_E1-E4_MALE_DUALSVCS_AIIREGION	2,829	344
57	057= 057 NAVY_E1-E4_MALE_OTHERFAMIL_US&T&OT	82,795	10,088
58	058= 058 NAVY_E1-E4_MALE_OTHERFAMIL_EUROPE	1,225	193
59	059= 059 NAVY_E1-E4_MALE_OTHERFAMIL_ASIAPI	5,825	620
60	060= 060 NAVY_E1-E4_FEMALE_SING+CHILD_AIIREGION	1,045	196
61	061= 061 NAVY_E1-E4_FEMALE_DUALSVCS_AIIREGION	3,813	452
62	062= 062 NAVY_E1-E4_FEMALE_OTHERFAMIL_US&T&OT	22,687	2,615
63	063= 063 NAVY_E1-E4_FEMALE_OTHERFAMIL_EUROPE	479	73
64	064= 064 NAVY_E1-E4_FEMALE_OTHERFAMIL_ASIAPI	1,740	186
65	065= 065 NAVY_E5-E9_MALE_SING+CHILD_US&T&OT	5,363	566
66	066= 066 NAVY_E5-E9_MALE_SING+CHILD_OVERSEA	331	43
67	067= 067 NAVY_E5-E9_MALE_DUALSVCS_AIIREGION	5,597	347
68	068= 068 NAVY_E5-E9_MALE_OTHERFAMIL_US&T&OT	107,142	5,982
69	069= 069 NAVY_E5-E9_MALE_OTHERFAMIL_EUROPE	2,817	219
70	070= 070 NAVY_E5-E9_MALE_OTHERFAMIL_ASIAPI	7,743	440
71	071= 071 NAVY_E5-E9_FEMALE_SING+CHILD_AIIREGION	3,791	396
72	072= 072 NAVY_E5-E9_FEMALE_DUALSVCS_AIIREGION	5,320	322
73	073= 073 NAVY_E5-E9_FEMALE_OTHERFAMIL_US&T&OT	16,449	942
74	074= 074 NAVY_E5-E9_FEMALE_OTHERFAMIL_EUROPE	550	49
75	075= 075 NAVY_E5-E9_FEMALE_OTHERFAMIL_ASIAPI	1,027	64
76	076= 076 NAVY_W1-W5_ALLGEN_AllFamily_AIIREGION	1,911	331
77	077= 077 NAVY_O1-O3_MALE_SING+CHILD_AIIREGION	412	42
78	078= 078 NAVY_O1-O3_MALE_DUALSVCS_AIIREGION	971	84

79	079= 079 NAVY_O1-O3_MALE_OTHERFAMIL_US&T&OT	23,191	1,726
80	080= 080 NAVY_O1-O3_MALE_OTHERFAMIL_EUROPE	417	37
81	081= 081 NAVY_O1-O3_MALE_OTHERFAMIL_ASIAPI	1,249	92
82	082= 082 NAVY_O1-O3_FEMALE_NotOther_AllREGION	1,579	139
83	083= 083 NAVY_O1-O3_FEMALE_OTHERFAMIL_US&T&OT	5,634	433
84	084= 084 NAVY_O1-O3_FEMALE_OTHERFAMIL_OVERSEA	544	49
85	085= 085 NAVY_O4-O6_MALE_SING+CHILD_AllREGION	439	51
86	086= 086 NAVY_O4-O6_MALE_DUALSVCS_AllREGION	584	55
87	087= 087 NAVY_O4-O6_MALE_OTHERFAMIL_US&T&OT	14,289	1,150
88	088= 088 NAVY_O4-O6_MALE_OTHERFAMIL_EUROPE	707	70
89	089= 089 NAVY_O4-O6_MALE_OTHERFAMIL_ASIAPI	859	70
90	090= 090 NAVY_O4-O6_FEMALE_NotOther_AllREGION	876	87
91	091= 091 NAVY_O4-O6_FEMALE_OTHERFAMIL_AllREGION	2,369	202
92	092= 092 USMC_E1-E4_MALE_SING+CHILD_AllREGION	365	103
93	093= 093 USMC_E1-E4_MALE_DUALSVCS_AllREGION	1,837	268
94	094= 094 USMC_E1-E4_MALE_OTHERFAMIL_US&T&OT	82,174	15,860
95	095= 095 USMC_E1-E4_MALE_OTHERFAMIL_EUROPE	1,123	204
96	096= 096 USMC_E1-E4_MALE_OTHERFAMIL_ASIAPI	12,063	1,441
97	097= 097 USMC_E1-E4_FEMALE_NotOther_AllREGION	2,032	268
98	098= 098 USMC_E1-E4_FEMALE_OTHERFAMIL_US&T&OT	6,804	1,004
99	099= 099 USMC_E1-E4_FEMALE_OTHERFAMIL_OVERSEA	1,190	114
100	100= 100 USMC_E5-E9_MALE_SING+CHILD_AllREGION	2,074	249
101	101= 101 USMC_E5-E9_MALE_DUALSVCS_AllREGION	1,846	178
102	102= 102 USMC_E5-E9_MALE_OTHERFAMIL_US&T&OT	39,232	3,524
103	103= 103 USMC_E5-E9_MALE_OTHERFAMIL_EUROPE	663	75
104	104= 104 USMC_E5-E9_MALE_OTHERFAMIL_ASIAPI	4,832	343
105	105= 105 USMC_E5-E9_FEMALE_SING+CHILD_AllREGION	653	84

106	106= 106 USMC_E5-E9_FEMALE_DUALSVCS_AllREGION	1,275	119
107	107= 107 USMC_E5-E9_FEMALE_OTHERFAMIL_US&T&OT	2,320	221
108	108= 108 USMC_E5-E9_FEMALE_OTHERFAMIL_OVERSEA	303	30
109	109= 109 USMC_W1-W5_ALLGEN_AllFamily_US&T&OT	1,896	316
110	110= 110 USMC_W1-W5_ALLGEN_AllFamily_OVERSEA	346	48
111	111= 111 USMC_O1-O3_MALE_NotOther_AllREGION	496	121
112	112= 112 USMC_O1-O3_MALE_OTHERFAMIL_US&T&OT	9,953	2,217
113	113= 113 USMC_O1-O3_MALE_OTHERFAMIL_OVERSEA	1,209	230
114	114= 114 USMC_O1-O3_FEMALE_AllFamily_AllREGION	1,342	298
115	115= 115 USMC_O4-O6_MALE_NotOther_AllREGION	361	117
116	116= 116 USMC_O4-O6_MALE_OTHERFAMIL_US&T&OT	5,130	1,533
117	117= 117 USMC_O4-O6_MALE_OTHERFAMIL_OVERSEA	718	211
118	118= 118 USMC_O4-O6_FEMALE_AllFamily_AllREGION	401	121
119	119= 119 USAF_E1-E4_MALE_SING+CHILD_AllREGION	1,122	149
120	120= 120 USAF_E1-E4_MALE_DUALSVCS_US&T&OT	3,401	231
121	121= 121 USAF_E1-E4_MALE_DUALSVCS_OVERSEA	550	57
122	122= 122 USAF_E1-E4_MALE_OTHERFAMIL_US&T&OT	81,060	4,589
123	123= 123 USAF_E1-E4_MALE_OTHERFAMIL_EUROPE	4,713	370
124	124= 124 USAF_E1-E4_MALE_OTHERFAMIL_ASIAPI	6,020	292
125	125= 125 USAF_E1-E4_FEMALE_SING+CHILD_AllREGION	1,094	128
126	126= 126 USAF_E1-E4_FEMALE_DUALSVCS_US&T&OT	4,521	253
127	127= 127 USAF_E1-E4_FEMALE_DUALSVCS_EUROPE	329	38
128	128= 128 USAF_E1-E4_FEMALE_DUALSVCS_ASIAPI	339	30
129	129= 129 USAF_E1-E4_FEMALE_OTHERFAMIL_US&T&OT	20,124	1,059
130	130= 130 USAF_E1-E4_FEMALE_OTHERFAMIL_EUROPE	1,264	103
131	131= 131 USAF_E1-E4_FEMALE_OTHERFAMIL_ASIAPI	1,064	56
132	132= 132 USAF_E5-E9_MALE_SING+CHILD_US&T&OT	4,531	340

133	133= 133 USAF_E5-E9_MALE_SING+CHILD_OVERSEA	578	48
134	134= 134 USAF_E5-E9_MALE_DUALSVCS_US&T&OT	9,178	402
135	135= 135 USAF_E5-E9_MALE_DUALSVCS_EUROPE	751	51
136	136= 136 USAF_E5-E9_MALE_DUALSVCS_ASIAPI	671	30
137	137= 137 USAF_E5-E9_MALE_OTHERFAMIL_US&T&OT	81,104	3,256
138	138= 138 USAF_E5-E9_MALE_OTHERFAMIL_EUROPE	7,868	439
139	139= 139 USAF_E5-E9_MALE_OTHERFAMIL_ASIAPI	8,042	300
140	140= 140 USAF_E5-E9_FEMALE_SING+CHILD_US&T&OT	3,040	230
141	141= 141 USAF_E5-E9_FEMALE_SING+CHILD_OVERSEA	334	29
142	142= 142 USAF_E5-E9_FEMALE_DUALSVCS_US&T&OT	7,723	322
143	143= 143 USAF_E5-E9_FEMALE_DUALSVCS_EUROPE	645	41
144	144= 144 USAF_E5-E9_FEMALE_DUALSVCS_ASIAPI	519	25
145	145= 145 USAF_E5-E9_FEMALE_OTHERFAMIL_US&T&OT	11,884	483
146	146= 146 USAF_E5-E9_FEMALE_OTHERFAMIL_EUROPE	1,125	66
147	147= 147 USAF_E5-E9_FEMALE_OTHERFAMIL_ASIAPI	892	37
148	148= 148 USAF_O1-O3_MALE_NotOther_AllREGION	2,240	130
149	149= 149 USAF_O1-O3_MALE_OTHERFAMIL_US&T&OT	23,670	1,182
150	150= 150 USAF_O1-O3_MALE_OTHERFAMIL_EUROPE	775	47
151	151= 151 USAF_O1-O3_MALE_OTHERFAMIL_ASIAPI	909	42
152	152= 152 USAF_O1-O3_FEMALE_NotOther_AllREGION	2,485	133
153	153= 153 USAF_O1-O3_FEMALE_OTHERFAMIL_US&T&OT	6,033	291
154	154= 154 USAF_O1-O3_FEMALE_OTHERFAMIL_OVERSEA	566	31
155	155= 155 USAF_O4-O6_MALE_SING+CHILD_AllREGION	500	41
156	156= 156 USAF_O4-O6_MALE_DUALSVCS_AllREGION	1,637	88
157	157= 157 USAF_O4-O6_MALE_OTHERFAMIL_US&T&OT	18,401	1,017
158	158= 158 USAF_O4-O6_MALE_OTHERFAMIL_EUROPE	1,281	82
159	159= 159 USAF_O4-O6_MALE_OTHERFAMIL_ASIAPI	753	37

160	160= 160 USAF_O4-O6_FEMALE_SING+CHILD_AllREGION	356	26
161	161= 161 USAF_O4-O6_FEMALE_DUALSVCs_AllREGION	1,243	66
162	162= 162 USAF_O4-O6_FEMALE_OTHERFAMIL_US&T&OT	3,230	185
163	163= 163 USAF_O4-O6_FEMALE_OTHERFAMIL_OVERSEA	393	22
164	164= 164 USCG_E1-E4_MALE_AllFamily_US&T&OT	10,653	2,543
165	165= 165 USCG_E1-E4_FEMALE_AllFamily_US&T&OT	1,815	345
166	166= 166 USCG_E5-E9_MALE_SING+CHILD_US&T&OT	774	59
167	167= 167 USCG_E5-E9_MALE_DUALSVCs_US&T&OT	527	39
168	168= 168 USCG_E5-E9_MALE_OTHERFAMIL_AllREGION	15,475	1,076
169	169= 169 USCG_E5-E9_FEMALE_NotOther_US&T&OT	692	49
170	170= 170 USCG_E5-E9_FEMALE_OTHERFAMIL_NOTEUR	1,884	130
171	171= 171 USCG_W1-W5_ALLGEN_AllFamily_AllREGION	1,783	107
172	172= 172 USCG_O1-O3_MALE_AllFamily_AllREGION	3,162	1,139
173	173= 173 USCG_O1-O3_FEMALE_AllFamily_NOTASIA	1,193	415
174	174= 174 USCG_O4-O6_MALE_AllFamily_AllREGION	2,207	933
175	175= 175 USCG_O4-O6_FEMALE_AllFamily_AllREGION	534	207