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Analysis of FADAP Database

Cara Nordberg

The purpose of this memo is to present the results of my analyses of the Flight Attendant Drug and Alcohol Program (FADAP) database. Analyses were performed as discussed with the data analysis committee members. The appendix includes tables for representation of airlines in FADAP (Table A1), missingness of primary treatment summary data by treatment program (Table A2), and a comparison of statistics presented in the FADAP 2022 Annual Report to this present analytical data (Table A3).

METHODS

The FADAP database was received on November 8, 2022 as a Microsoft Access database. The data was exported and contained $n=1,609$ observations of data. After it became known that the data did not export from the Access database correctly, which reportedly is an issue that the FADAP coordinators had experienced in the past but not recently, problems with the data were cleaned up and corrected, resulting in $n=1,488$ observations of data. To further clean the data, observations for flight attendants (FAs) with treatment dates <28 days apart (calculated as days from treatment discharge date to the next treatment admission date) were combined and considered to be one continuous treatment episode, resulting in a final count of $n=1,475$ observations of data for $n=1,196$ unique FAs.

Data in the dataset include several administrative/demographic variables (e.g., airline, domicile airport, gender, birth year, date of first contact with the peer rep) and data from four surveys/forms: 1) the FA initial self-report survey, 2) the provider-reported primary treatment summary, 3) the FA follow-up self-report survey, and 4) the FA self-report post-treatment survey.

For the purposes of this analysis, treatment episodes were defined as observations of data with non-missing treatment dates (admission and discharge dates from the primary treatment summary). Length of treatment episodes was calculated as the number of days from admission to discharge date. For treatment episodes that were combined due to being <28 days apart, the number of days between the original separate observations of data was subtracted from the length of treatment.

Relapse observations were defined as observations that followed a FA's previous observation with at least 28 days in between the prior treatment discharge date and the new treatment admission date. The number of prior treatments as of each new treatment episode was calculated using the FA's self-reported number of prior treatments on the initial self-report survey, as well as the number of observed prior treatment episodes in the data for FAs who did not respond to the initial self-report survey. Since many FAs only completed the initial self-

report survey at one treatment episode, one treatment episode was added to the self-reported number of prior treatments for each new treatment that the FA had in the dataset.

Lost to follow-up was defined at the person-level as having never responded to a follow-up self-report survey or post-treatment survey and being discharged from their most recent treatment episode by May 31, 2021. This coincides with how loss to follow-up was defined in the FFADAP 2022 Annual Report.

In addition to the question on the primary treatment summary about what the FA was being treated for, non-mutually exclusive indicators for several more specific issues being treated for were created based on the primary diagnoses listed on the primary treatment summary, which were largely ICD-9 and ICD-10 codes.

Indicators for FA's engagement with the treatment and self-reported experience with FADAP were created from the survey questions' original five-level Likert scales. FAs were considered to be engaged with the treatment if the response was "very engaged" or "extremely engaged". Similarly, for questions regarding the FA's experience with FADAP (e.g., "I am satisfied with the Flight Attendant peer assistance program"), responses of "agree" or "strongly agreed" were considered to be "yes".

Statistical Analysis Plan

Person-level measures were analyzed using one observation per person, while treatment-level measures were analyzed using one observation per treatment episode. For univariate descriptive statistics, categorical measures are presented as frequencies and percentages, while continuous measures are presented as mean (SD) if normally distributed or median (IQR) if not. Significance testing of bivariate associations used chi-square tests for categorical measures, t-tests for normally distributed continuous measures, and Kruskal-Wallis tests for nonparametric continuous measures.

Mixed-effect multivariable logistic regression models were used to predict the associations between a FA relapsing after the current treatment episode and various measures of FA satisfaction/engagement with the treatment, adjusting for person-level and treatment-level measures. A random intercept for FA ID was used to account for some FAs having multiple observations. Models were adjusted for demographics (i.e., age at the start of treatment and gender), as well as other covariates that were significantly associated with an FA having at least one relapse episode in the bivariate associations.

FINDINGS

The data included 1,196 unique FAs, 990 (82.8%) of whom had treatment data for at least one treatment episode. Person-level descriptive statistics among all unique FAs is presented in Table 1. On average, FAs were 44.4 years old (SD=11.6) when first contacted by their FADAP peer rep. The majority of FAs (57.4%) were female, with 42.4% being male and 0.25% missing gender data. The most common airlines that employed the FAs were Airline 1 (25.0%) and Airline 2 Airlines (20.9%).¹ Most (73.6%) FAs had completed at least one initial self-report survey, while only 23.2% completed at least one follow-up self-report survey and only 9.6% ever

¹ After a prepublication version of the report was provided to FAA, this paper was edited to anonymize the airline names.

completed a post-treatment survey. Loss to follow-up (LTFU) was common, with 42.1% of FAs being considered to be LTFU.

TABLE 1 Descriptive Statistics Among Unique Flight Attendants

Characteristic	Unique Flight Attendants N (column %)
Total Count	1,196
Data for ≥ 1 treatment episode	990 (82.8)
≥ 1 relapse episode	139 (11.6)
Number of contact observations per person, mean (SD)	1.2 (0.57)
Number of treatment episodes with primary treatment summary data, mean (SD)	0.93 (0.65)
Age at first contact, mean (SD)	44.4 (11.6)
Gender	
	Female 686 (57.4)
	Male 508 (42.4)
	Missing 3 (0.25)
Airline	
	Airline 3 96 (8.0)
	Airline 8 46 (3.8)
	Airline 9 37 (3.1)
	Airline 7 58 (4.8)
	Airline 5 90 (7.5)
	Airline 1 299 (25.0)
	Airline 4 96 (8.0)
	Airline 6 69 (5.8)
	Airline 2 250 (20.9)
	Other 155 (13.0)
Completed ≥ 1 initial self-report survey	880 (73.6)
Completed ≥ 1 primary treatment report summary	990 (82.8)
Completed ≥ 1 followup self-report survey	277 (23.2)
Completed ≥ 1 post-treatment survey	115 (9.6)
Lost to followup	503 (42.1)

Treatment episode-level descriptive statistics show FAs had a total of 1,172 treatment episodes with non-missing treatment data (see Table 2). Of these, 182 (15.5%) were considered to be relapse treatments. Of the 1,172 treatment episodes, 84.7% had a completed initial self-report survey, 21.1% had a completed follow-up self-report survey, and only 7.4% had a completed post-treatment survey. The median length of treatment was 31 days (IQR=29-43). Treatment was considered to be completed for 84.8% of treatment episodes. In 69.9% of treatment episodes, specific MATs were offered to the FA, and among those, 67.8% had MATs actually written into the treatment plan. Most treatment episodes were treating alcohol use, either alone (14.2%) or in combination with drugs (2.6%), mental health (49.0%) or both (17.3%). Following alcohol (78.6%), the most common issues being treated for based on diagnosis codes were depression (44.3%) and anxiety (35.8%). The most common specific type of drug being treated for was stimulants (10.6%). On the initial self-report survey, 49.2% of treatment episodes reported that the FA was not facing any disciplinary actions in the 12 months prior to treatment, and 15.3% were missing disciplinary data due to not responding to the survey. The most

common disciplinary action being faced was a written discipline/corrective action (18.6%), followed by being under investigation (11.3%). The five questions on the initial self-report survey regarding FAs' experience with FADAP were consistently met with positive responses (~73-78%), with about 17% missing each of the questions. Among treatment episodes with 1-year follow-up self-report survey data, 206 reported that the FA was in recovery, with most still being employed as a FA and returned to work with either the same or different airline (60.7% and 1.5%, respectively). Among the 128 treatment episodes with the FA in recovery and returned to work as of the 1-year follow-up, only 13.3% reported being placed in a drug testing program as part of their return to work agreement, while 18.8% reported not and 68.0% not responding to the survey question.

TABLE 2 Descriptive statistics among unique treatment episodes with primary treatment summary data

Characteristic	Treatment episodes N (column %)
Total Count	1,172
Relapse episodes	182 (15.5)
Timing of relapse from end of prior treatment	
Not a relapse	990 (84.5)
≤1 year	95 (8.1)
>1 year	87 (7.4)
Age at start of treatment, mean (SD)	44.3 (11.4)
Treatment Facility	
Breathe Life Healing Centers (LAX, CA)	285 (24.3)
Brighton Recovery Center (Salt Lake City, UT)	209 (17.8)
FHHealth (Deerfield, FL)	66 (5.6)
Lakeview Health (Jacksonville, FL)	165 (14.1)
Recovery Ways (Salt Lake, UT)	285 (24.3)
Other	162 (24.3)
Airline	
Airline 3	100 (8.5)
Airline 8	45 (3.8)
Airline 9	36 (3.1)
Airline 7	57 (4.9)
Airline 5	72 (6.1)
Airline 1	302 (25.8)
Airline 4	107 (9.1)
Airline 6	67 (5.7)
Airline 2	238 (20.3)
Other	148 (12.6)
Domicile	
Chicago O'Hare International	64 (5.5)
Fort Lauderdale-Hollywood International	61 (5.2)
Harry Reid International	98 (8.4)
Los Angeles International	66 (5.6)
Newark Liberty International	67 (5.7)
Orlando International	60 (5.1)
Seattle Tacoma International	61 (5.2)

	Other	695 (59.3)
Completed initial self-report survey		993 (84.7)
Completed followup self report survey		247 (21.1)
Completed post-treatment survey		87 (7.4)
Time from first peer contact to admission date, median (IQR)		0 (0.3)
Length of treatment (days), median (IQR)		31 (29, 43)
FA completed treatment	Yes	993 (84.7)
	No	87 (7.4)
	Missing	91 (7.8)
Specific MATs offered	Yes	819 (69.9)
	No	65 (5.6)
	Missing	288 (24.6)
MATs written into treatment plan (among 819 offered)	Yes	555 (67.8)
	No	177 (21.6)
	Missing	87 (10.6)
Broad issue treated for	Alcohol only	166 (14.2)
	Drugs only	16 (1.4)
	Mental health only	41 (3.5)
	Alcohol and drugs	31 (2.6)
	Alcohol and mental health	574 (49.0)
	Drugs and mental health	79 (6.7)
	Alcohol, drugs, and mental health	203 (17.3)
	Missing	62 (5.3)
Specific issues treated for, yes (not mutually exclusive)	Alcohol	921 (78.6)
	Opioids	49 (4.2)
	Cannabis	62 (5.3)
	Sedatives	109 (9.3)
	Cocaine	49 (4.2)
	Stimulants	124 (10.6)
	Other drug abuse	20 (1.7)
	Depression	519 (44.3)
	Bipolar disorder	42 (3.6)
	Anxiety	419 (35.8)
	PTSD	112 (9.6)
	ADHD	30 (2.6)
	Other mental health	118 (10.1)
Number of prior alcohol/drug treatments, mean (SD)		0.82 (1.4)
Number of prior alcohol/drug treatments as of FA's most recent		0.75 (1.4)
Treatment episode (n=990), mean (SD)		
Self-reported disciplinary actions faced prior to treatment, yes (not mutually exclusive)	Written discipline/corrective action	218 (18.6)
	Termination	90 (7.7)
	Disciplinary suspension	47 (4.0)
	Under investigation	132 (11.3)
	Placed under a last chance agreement	30 (2.6)

	Other	34 (2.9)
	None of the above	577 (49.2)
	Missing	179 (15.3)
At time of initial self-report survey, FA would recommend FADAP to another FA		
	Yes	913 (77.9)
	No	60 (5.1)
	Missing	199 (17.0)
At time of initial self-report survey, FA would use FADAP again in the future		
	Yes	907 (77.4)
	No	66 (5.6)
	Missing	199 (17.0)
At time of initial self-report survey, FA satisfied with FADAP		
	Yes	881 (75.2)
	No	91 (7.8)
	Missing	200 (17.1)
At time of initial self-report survey, FADAP made it possible for FA to ask for help for substance use problem		
	Yes	875 (74.7)
	No	94 (8.0)
	Missing	203 (17.3)
At time of initial self-report survey FA claims would not have made It into treatment without FADAP		
	Yes	852 (72.7)
	No	119 (10.2)
	Missing	201 (17.2)
Self reported as being in recovery at 1-year followup		
	Yes	206 (17.6)
	No	4 (0.43)
	Missing	961 (82.0)
Current employee status at 1-year followup (among 206 in recovery)		
	Employed as FA and returned to work with same airline	125 (60.7)
	Employed as FA and returned to work with different airline	3 (1.5)
	Employed as FA but not yet returned to work	7 (3.4)
	Resigned	16 (7.8)
	Retired	7 (3.4)
	Terminated	28 (13.6)
	Missing	20 (9.7)
Placed in drug testing program as part of return to work agreement After treatment (among 128 in recovery and returned to work)		
	Yes	17 (13.3)
	No	24 (18.8)
	Missing	87 (68.0)

Bivariate associations of person- and treatment-level measures with whether the FA has had at least one relapse episode (N=139) were also calculated (see Table 3). Among person-level measures, significant associations were found with whether the FA has completed at least one initial self-report survey, whether the FA has at least one treatment episode with primary treatment summary data, and whether the FA has been lost to follow up (LTFU). Among

treatment-level measures, FA's airline, whether the FA completed treatment, whether specific medically assisted therapies (MATs) were offered, and issue being treated for were all significantly associated with whether an FA has had at least one relapse episode.

TABLE 3 Bivariate associations of select person- and treatment-level characteristics with whether FA has had at least one relapse treatment episode

Characteristic		No Relapse Episodes N (row %)	At least one relapse episode N (row %)	P-value
<i>Person-level</i>		<i>N=1,057</i>	<i>N=139</i>	
Age at first contact, mean (SD)		44.5 (11.7)	43.7 (10.8)	0.491
Gender				0.809
	Female	607 (88.5)	79 (11.5)	
	Male	447 (88.2)	60 (11.8)	
	Missing	3 (100)	0	
Airline				0.166
	Airline 3	80 (83.3)	16 (16.7)	
	Airline 8	39 (84.8)	7 (15.2)	
	Airline 9	32 (86.5)	5 (13.5)	
	Airline 7	52 (89.7)	6 (10.3)	
	Airline 5	87 (96.7)	3 (3.3)	
	Airline 1	262 (87.6)	37 (12.4)	
	Airline 4	80 (83.3)	16 (16.7)	
	Airline 6	61 (88.4)	8 (11.6)	
	Airline 2	223 (89.2)	27 (10.8)	
	Other	141 (91.0)	14 (9.0)	
Completed ≥ 1 initial self-report survey		746 (84.8)	134 (15.2)	<.001
Completed ≥ 1 primary treatment survey		851 (86.0)	139 (14.0)	<.001
Completed ≥ 1 followup self-report survey		245 (88.4)	32 (11.2)	0.967
Completed ≥ 1 post-treatment survey		105 (91.3)	10 (8.7)	0.303
Lost to followup		631 (91.0)	62 (9.0)	0.001
<i>Treatment-level</i>		<i>N=851</i>	<i>N=321</i>	
Age at start of treatment, mean (SD)		44.1 (11.6)	44.9 (10.9)	0.258
Treatment Facility				0.152
	Breathe Life Healing Centers (LAX, CA)	194 (68.1)	91 (31.9)	
	Brighton Recovery Center (Salt Lake City, UT)	161 (77.0)	48 (23.0)	
	FHHealth (Deerfield, FL)	48 (72.7)	18 (27.3)	
	Lakeview Health (Jacksonville, FL)	117 (70.9)	48 (29.1)	
	Recovery Ways (Salt Lake, UT)	218 (76.5)	67 (23.5)	
	Other	113 (69.8)	49 (30.2)	
Airline				0.002
	Airline 3	65 (65.0)	35 (35.0)	
	Airline 8	30 (66.7)	15 (33.3)	
	Airline 9	22 (61.1)	14 (38.9)	
	Frontier	44 (77.2)	13 (22.8)	
	Airline 5	65 (90.3)	7 (9.7)	
	Airline 1	219 (72.5)	83 (27.5)	
	Airline 4	68 (63.6)	39 (36.4)	
	Airline 6	49 (73.1)	18 (26.9)	

	Airline 2	172 (72.3)	66 (27.7)	
	Other	117 (79.0)	31 (21.0)	
Length of treatment (days), median (IQR)		31 (29, 43)	31 (29, 43)	0.513
FA completed treatment				0.001
	Yes	731 (73.5)	263 (26.5)	
	No	49 (56.3)	38 (43.7)	
	Missing	71 (78.0)	20 (22.0)	
Specific MATs offered				0.007
	Yes	591 (72.2)	228 (27.8)	
	No	58 (89.2)	7 (10.8)	
	Missing	202 (70.1)	86 (29.9)	
MATs written into treatment plan (among 819 offered)				0.948
	Yes	399 (71.9)	156 (28.1)	
	No	128 (72.3)	49 (27.7)	
	Missing	64 (73.6)	23 (26.4)	
Broad issue treated for				0.013
	Alcohol only	121 (72.9)	45 (27.1)	
	Drugs only	16 (100)	0	
	Mental health only	37 (90.2)	4 (9.8)	
	Alcohol and drugs	25 (80.6)	6 (19.4)	
	Alcohol and mental health	406 (70.7)	168 (29.3)	
	Drugs and mental health	54 (68.4)	25 (31.6)	
	Alcohol, drugs, and mental health	152 (74.9)	51 (25.1)	
	Missing	40 (64.5)	22 (35.5)	
Self-reported disciplinary actions faced prior to treatment, yes (not mutually exclusive)				
	Written discipline/corrective action	150 (68.8)	68 (31.2)	0.223
	Termination	71 (78.9)	19 (21.1)	0.326
	Disciplinary suspension	35 (74.5)	12 (25.5)	0.750
	Under investigation	106 (80.3)	26 (19.7)	0.101
	Placed under a last chance agreement	24 (80.0)	6 (20.0)	0.526
	Other	25 (73.5)	9 (26.5)	0.768
	None of the above	413 (71.6)	164 (28.4)	0.378
	Missing	126 (70.4)	43 (29.6)	0.469
At time of initial self-report survey, FA would recommend FADAP to another FA				0.599
	Yes	667 (73.1)	246 (26.9)	
	No	45 (75.0)	15 (22.7)	
	Missing	139 (69.8)	60 (30.2)	
At time of initial self-report survey, FA would use FADAP again in the future				0.468
	Yes	661 (72.9)	246 (27.1)	
	No	51 (77.3)	15 (22.7)	
	Missing	139 (69.8)	60 (30.2)	
At time of initial self-report survey, FA satisfied with FADAP				0.511
	Yes	647 (73.3)	234 (26.7)	
	No	65 (71.4)	26 (28.6)	
	Missing	139 (69.5)	61 (30.5)	
At time of initial self-report survey, FADAP made it possible for FA to ask for help for substance use problem				0.541

	Yes	641 (73.3)	234 (26.7)	
	No	69 (73.4)	25 (26.6)	
	Missing	141 (69.5)	62 (30.5)	
At time of initial self-report survey, FA claims would not have made it into treatment without FADAP				0.586
	Yes	624 (73.2)	228 (26.8)	
	No	87 (73.1)	31 (26.9)	
	Missing	140 (69.6)	61 (30.4)	

Similar to above, bivariate analyses with whether the FA has been LTFU (see Table 4) showed significant associations with whether the FA has completed at least one initial self-report survey and whether the FA has at least one treatment episode with primary treatment summary data. Treatment facility was found to be significantly associated with LTFU, although this is driven largely by one facility (FHHealth) that has much lower LTFU than the other facilities. Airline was also significantly associated with LTFU, with Airline 4 and Airline 6 having the highest proportions of LTFU. Treatment length was longer on average among those not LTFU. Other treatment-level measures that were significantly associated with LTFU were whether the FA completed treatment, whether specific MATs were offered and written into the treatment plan, various self-reported disciplinary actions prior to treatment (under investigation, place under last chance agreement, other, and missing data), and all five questions about the FA's experience with FADAP on the initial self-report survey.

TABLE 4 Bivariate associations of select person- and treatment-level characteristics with whether flight attendant (FA) was lost to follow up

Characteristic	Not lost to follow up N (row %)	Lost to follow up N (row %)	P-value
<i>Person-level</i>	<i>N=693</i>	<i>N=503</i>	
Age at first contact, mean (SD)	44.4 (11.7)	44.3 (11.5)	0.938
Gender			0.809
	Female	390 (56.8)	296 (43.2)
	Male	300 (59.2)	207 (40.8)
	Missing	3 (100)	0
Airline			0.235
	Airline 3	59 (61.5)	37 (38.5)
	Airline 8	26 (56.5)	20 (43.5)
	Airline 9	21 (56.8)	16 (43.2)
	Airline 7	30 (51.7)	28 (48.3)
	Airline 5	53 (58.9)	37 (41.1)
	Airline 1	171 (57.2)	128 (42.8)
	Airline 4	47 (49.0)	49 (51.0)
	Airline 6	35 (50.7)	34 (49.3)
	Airline 2	147 (58.8)	103 (41.2)
	Other	104 (67.1)	51 (32.9)
Completed ≥ 1 initial self-report survey	448 (50.9)	432 (49.1)	<.001
Completed ≥ 1 primary treatment survey	487(49.2)	503 (50.8)	<.001
<i>Treatment-level</i>	<i>N=569</i>	<i>N=603</i>	
Age at start of treatment, mean (SD)	44.0 (11.6)	44.6 (11.3)	0.340

Treatment Facility				<.001
	Breathe Life Healing Centers (LAX, CA)	123 (43.2)	162 (56.8)	
	Brighton Recovery Center (Salt Lake City, UT)	99 (47.4)	110 (52.6)	
	FHHealth (Deerfield, FL)	54 (81.8)	12 (18.2)	
	Lakeview Health (Jacksonville, FL)	81 (49.1)	84 (50.9)	
	Recovery Ways (Salt Lake, UT)	142 (49.8)	143 (50.2)	
	Other	70 (43.2)	92 (56.8)	
Airline				0.013
	Airline 3	52 (52.0)	48 (48.0)	
	Airline 8	21 (46.7)	24 (53.3)	
	Airline 9	18 (50.0)	18 (50.0)	
	Airline 7	25 (43.9)	32 (56.1)	
	Airline 5	34 (47.2)	38 (52.8)	
	Airline 1	148 (49.0)	154 (51.0)	
	Airline 4	40 (37.4)	67 (62.6)	
	Airline 6	25 (37.3)	42 (62.7)	
	Airline 2	114 (47.9)	124 (52.1)	
	Other	92 (62.2)	56 (37.8)	
Length of treatment (days), median (IQR)		32 (29, 44)	31 (29, 42)	0.036
FA completed treatment				0.010
	Yes	500 (50.3)	494 (49.7)	
	No	30 (34.5)	57 (65.5)	
	Missing	39 (42.9)	52 (57.1)	
Specific MATs offered				<.001
	Yes	427 (52.1)	392 (47.9)	
	No	48 (73.8)	14 (26.2)	
	Missing	94 (32.6)	194 (67.4)	
MATs written into treatment plan (among 819 offered)				<.001
	Yes	264 (47.6)	291 (52.4)	
	No	125 (70.6)	52 (29.4)	
	Missing	38 (43.7)	49 (56.3)	
Broad issue treated for				0.065
	Alcohol only	83 (50.0)	83 (50.0)	
	Drugs only	9 (56.2)	7 (43.8)	
	Mental health only	26 (63.4)	15 (36.6)	
	Alcohol and drugs	17 (54.8)	14 (45.2)	
	Alcohol and mental health	291 (50.7)	283 (49.3)	
	Drugs and mental health	33 (41.8)	46 (58.2)	
	Alcohol, drugs, and mental health	81 (39.9)	122 (60.1)	
	Missing	29 (46.8)	33 (53.2)	
Self-reported disciplinary actions faced prior to treatment, yes (not mutually exclusive)				
	Written discipline/corrective action	110 (50.5)	108 (49.5)	0.077
	Termination	47 (52.2)	43 (47.8)	0.070
	Disciplinary suspension	23 (48.9)	24 (51.1)	0.077
	Under investigation	72 (54.6)	60 (45.4)	0.041
	Placed under a last chance agreement	12 (40.0)	18 (60.0)	0.042
	Other	11 (32.4)	23 (67.6)	0.009
	None of the above	290 (50.3)	287 (49.7)	0.076
	Missing	73 (40.8)	106 (59.2)	0.024

At time of initial self-report survey, FA would recommend FADAP to another FA				0.023
	Yes	459 (50.3)	454 (49.7)	
	No	31 (51.7)	29 (48.3)	
	Missing	79 (39.7)	120 (60.3)	
At time of initial self-report survey, FA would use FADAP again in the future				0.020
	Yes	459 (50.6)	448 (49.4)	
	No	31 (47.0)	35 (53.0)	
	Missing	79 (39.7)	120 (60.3)	
At time of initial self-report survey, FA satisfied with FADAP				0.008
	Yes	450 (51.1)	431 (48.9)	
	No	40 (44.0)	51 (56.0)	
	Missing	79 (39.5)	121 (60.5)	
At time of initial self-report survey, FADAP made it possible for FA to ask for help for substance use problem				.005
	Yes	449 (51.3)	426 (48.7)	
	No	38 (40.4)	56 (59.6)	
	Missing	82 (40.4)	121 (59.6)	
At time of initial self-report survey, FA claims would not have made it into treatment without FADAP				0.005
	Yes	438 (51.4)	414 (48.6)	
	No	51 (42.9)	68 (57.1)	
	Missing	80 (39.8)	121 (60.2)	

Whether an FA completed at least one initial self-report survey was found to be significantly associated with several person- and treatment-level measures as well (see Table 5). Age at first contact with a peer rep, whether an FA had at least one treatment episode with primary treatment summary data, whether an FA ever completed a follow-up self-report survey, and whether an FA was LTFU were all significantly associated with an FA ever completing an initial self-report survey. Significant associations with treatment-level measures include treatment facility, length of treatment, whether an FA completed treatment, whether specific MATs were offered, and issue being treated for.

TABLE 5 Bivariate associations of select person- and treatment-level characteristics with whether flight attendant (FA) completed ≥ 1 initial self report survey

Characteristic	No completed initial self report survey N (row %)	≥ 1 completed initial self report survey N (row %)	p-value
<i>Person-level</i>	<i>N=316</i>	<i>N=880</i>	
Age at first contact, mean (SD)	45.9 (11.7)	43.8 (11.5)	0.007
Gender			0.105
	Female 197 (28.7)	489 (71.3)	
	Male 118 (23.3)	389 (76.7)	
	Missing 1 (33.3)	2 (66.7)	
Airline			0.164

	Airline 3	24 (25.0)	72 (75.0)	
	Airline 8	14 (30.4)	32 (69.6)	
	Airline 9	9 (24.3)	28 (75.7)	
	Airline 7	18 (31.0)	40 (69.0)	
	Airline 5	30 (33.3)	60 (66.7)	
	Airline 1	67 (22.4)	232 (77.6)	
	Airline 4	24 (25.0)	72 (75.0)	
	Airline 6	15 (21.7)	54 (78.3)	
	Airline 2	81 (32.4)	169 (67.6)	
	Other	34 (21.9)	121 (78.1)	
Completed ≥ 1 primary treatment summary		127 (12.8)	863 (87.2)	<.001
Completed ≥ 1 followup self-report survey		50 (18.0)	227 (82.0)	<.001
Completed ≥ 1 post-treatment survey		35 (30.4)	80 (69.6)	0.305
Lost to followup		71 (14.1)	432 (85.9)	<.001
<i>Treatment-level</i>		<i>N=132</i>	<i>N=1,040</i>	
Age at start of treatment, mean (SD)		45.8 (11.3)	44.1 (11.4)	0.121
Treatment Facility				0.011
	Breathe Life Healing Centers (LAX, CA)	28 (9.8)	257 (90.2)	
	Brighton Recovery Center (Salt Lake City, UT)	33 (15.8)	176 (84.2)	
	FHHHealth (Deerfield, FL)	3 (4.6)	63 (95.4)	
	Lakeview Health (Jacksonville, FL)	13 (7.9)	152 (92.1)	
	Recovery Ways (Salt Lake City, UT)	42 (14.7)	243 (85.3)	
	Other	13 (8.0)	149 (92.0)	
Airline				0.206
	Airline 3	9 (9.0)	91 (91.0)	
	Airline 8	7 (15.6)	38 (84.4)	
	Airline 9	1 (2.8)	35 (97.2)	
	Airline 7	10 (17.5)	47 (82.5)	
	Airline 5	9 (12.5)	63 (87.5)	
	Airline 1	29 (9.6)	273 (90.4)	
	Airline 4	12 (11.2)	95 (88.8)	
	Airline 6	5 (7.5)	62 (92.5)	
	Airline 2	36 (15.1)	202 (84.9)	
	Other	14 (9.5)	134 (90.5)	
Length of treatment (days), median (IQR)		30.5 (28, 41.5)	31 (29, 43)	0.024
FA completed treatment				<.001
	Yes	86 (8.6)	908 (91.4)	
	No	23 (26.4)	64 (73.6)	
	Missing	23 (25.3)	68 (74.7)	
Specific MATs offered				<.001
	Yes	69 (8.4)	750 (91.6)	
	No	14 (21.5)	51 (78.5)	
	Missing	23 (25.3)	68 (74.7)	
MATs written into treatment plan (among 819 offered)				0.643
	Yes	50 (9.0)	505 (91.6)	
	No	12 (6.8)	51 (78.5)	
	Missing	49 (17.0)	239 (83.0)	
Broad issue treated for				<.001
	Alcohol only	13 (7.8)	153 (92.2)	

Drugs only	0	16 (100)
Mental health only	14 (34.2)	27 (65.8)
Alcohol and drugs	3 (9.7)	28 (90.3)
Alcohol and mental health	52 (9.1)	522 (90.9)
Drugs and mental health	5 (6.3)	74 (93.7)
Alcohol, drugs, and mental health	19 (9.4)	184 (90.6)
Missing	26 (41.9)	36 (58.1)

Bivariate analyses were calculated between issue(s) being treated for and length of treatment episode (see Table 6). Length of treatment was significantly associated with the broad issue being treated for, with treatment being longest when being treated for drugs and mental health or alcohol, drugs, and mental health. Among the diagnosis-based indicators for specific issues being treated for, treatment was longer when being treated for cocaine, stimulants, depression, or anxiety.

TABLE 6 Bivariate associations of issue(s) treated for with length of treatment episode

Issue Treated For	Length of treatment (days)		p-value
	Median (IQR)		
Broad issue treated for			0.001
Alcohol only	30 (29,37)		
Drugs only	30 (28, 39)		
Mental health only	30 (28, 38)		
Alcohol and drugs	30 (29, 34)		
Alcohol and mental health	31 (29, 42)		
Drugs and mental health	34 (30, 52)		
Alcohol, drugs, and mental health	34 (29, 51)		
Missing	30 (10, 41)		
<i>Specific issues treated for (not mutually exclusive)</i>			
Alcohol			0.355
	Yes	31 (29, 42)	
	No	31 (38, 46)	
Opioids			0.342
	Yes	32 (29, 45)	
	No	31 (29, 43)	
Cannabis			0.061
	Yes	30 (29, 37)	
	No	31 (29, 43)	
Sedatives			0.085
	Yes	34 (29, 50)	
	No	31 (29, 42)	
Cocaine			0.048
	Yes	34 (30,51)	
	No	31 (29, 42)	
Stimulants			0.001
	Yes	35 (30, 59)	
	No	31 (29, 42)	

Other Drug Abuse			0.734
	Yes	30.5 (29, 40.5)	
	No	31 (29, 43)	
Depression			0.014
	Yes	32 (29, 45)	
	No	31 (29, 41)	
Bipolar Disorder			0.150
	Yes	40.5 (29, 47)	
	No	31 (29, 42)	
Anxiety			0.014
	Yes	32 (29, 47)	
	No	31 (29, 42)	
PTSD			0.247
	Yes	30 (29, 40.5)	
	No	31 (29, 43)	
ADHD			0.418
	Yes	32 (30, 44)	
	No	31 (29, 43)	
Other mental health			0.370
	Yes	30 (29, 40)	
	No	31 (29, 43)	

Bivariate analyses were also done between issue(s) being treated for and whether specific MATs were offered as part of treatment (see Table 7). Broad issue being treated for was significantly associated with whether specific MATs were offered, with MATs being offered most often among those being treated for alcohol only, alcohol and mental health, or alcohol and drugs. Specific MATs were also offered significantly more often for people being treated for alcohol and people not being treated for stimulants using diagnosis-based specific issues being treated for.

TABLE 7 Bivariate associations of issue(s) treated for with whether specific MATs were offered as part of treatment plan (yes vs. no/missing)

Issue treated for	Specific MATs offered,	p-value
	yes N (row %)	
Broad issue treated for		<.001
Alcohol only	126 (81.9)	
Drugs only	6 (37.5)	
Mental health only	7 (17.1)	
Alcohol and drugs	23 (74.2)	
Alcohol and mental health	454 (79.1)	
Drugs and mental health	49 (62.0)	
Alcohol, drugs, and mental health	135 (66.5)	
Missing	9 (14.5)	
<i>Specific issues treated for (not mutually exclusive)</i>		

Alcohol			<.001
	Yes	722 (78.4)	
	No	97 (38.6)	
Opioids			0.809
	Yes	35 (71.4)	
	No	784 (69.8)	
Cannabis			0.508
	Yes	41 (66.1)	
	No	778 (70.1)	
Sedatives			0.201
	Yes	82 (75.2)	
	No	737 (69.3)	
Cocaine			0.476
	Yes	32 (65.3)	
	No	787 (70.1)	
Stimulants			0.002
	Yes	72 (58.1)	
	No	747 (71.3)	
Other drug abuse			0.320
	Yes	16 (80.0)	
	No	803 (69.7)	
Depression			0.637
	Yes	359 (69.2)	
	No	460 (70.4)	
Bipolar disorder			0.905
	Yes	29 (69.0)	
	No	790 (69.9)	
Anxiety			0.441
	Yes	287 (68.5)	
	No	532 (70.6)	
PTSD			0.094
	Yes	86 (76.8)	
	No	733 (69.2)	
ADHD			0.412
	Yes	23 (76.7)	
	No	796 (69.7)	
Other mental health			0.744
	Yes	84 (71.2)	
	No	735 (69.7)	

Relapse rates were calculated stratified by whether an FA had a prior treatment. An overall treatment episode-level relapse rate of 15.5% was observed (see Table 2). Among treatment episodes with no prior reported/observed treatments (n=690), 11.0% relapse after the current treatment. Among treatment episodes with at least one prior reported/observed treatment (n=482), 22.0% relapse after the current treatment.

FA self-reported level of engagement with their treatment was compared to the FA's provider-reported level of engagement. Among 947 treatment episodes with non-missing self-reported (from the initial self-report survey) and provider-reported (from the primary treatment summary) level of engagement, 840 (88.7%) of FAs self-reported that they were very or

extremely engaged. Among these 840, 675 (80.4%) of providers also reported that the FA was very or extremely engaged.

Mixed-effect logistic regression models analyzed adjusted associations between whether an FA relapsed after treatment and an FA's satisfaction with FADAP or engagement with their treatment. All models were adjusted for demographics (age at treatment, gender) as well as measures that were significantly associated with whether an FA had at least one relapse: airline, whether an FA completed treatment, whether specific MATs were offered as part of the treatment plan, and the broad issue being treated for. After adjusting for these covariates, whether an FA self-reported being satisfied with FADAP on the initial self-report survey was not significantly associated with whether an FA relapsed after treatment. However, both self-reported (OR: 0.41; 95% CI: 0.21,0.80) and provider-reported (OR: 0.42; 95% CI: 0.24,0.74) FA being very or extremely engaged with treatment were significantly protective of whether an FA relapsed after treatment.

RECOMMENDATIONS

Potential ways to improve FADAP database:

- Ensure that data exports from database correct
- When asked to share FADAP data in the future, it would be best to share a file of the data already exported from the database, which has been quality checked for correctness
- Track survey dates
- Track contact attempts for self-report surveys
- Especially important for identifying who has been lost to follow-up
- Provide some kind of incentive to FAs and providers for completing surveys, if not already doing so
- Track whether a second treatment is a relapse or a continuation of a recent treatment
- Perhaps also add a question or two to Primary Treatment Summary about whether the FA is in treatment because of relapsing, and if so, get some basic details about the relapse (e.g., was it alcohol or drugs, how long after last treatment did the relapse start, etc).

APPENDIX

TABLE A-1: Representation of Airlines in FADAP

Airline	FADAP participants N (column %)	Total full-time employees ¹ N (column %)
Airline 10	1 (0.08)	1,097 (0.26)
Airline 3	96 (8.0)	17,804 (4.2)
Airline 11	14 (1.2)	4,961 (1.2)
Airline 9	37 (3.1)	33,795 (8.0) ²
Airline 12	10 (0.84)	92,459 (22.0)
Airline 13	21 (1.8)	4,865 (1.2)
Airline 14	15 (1.2)	11,628 (2.8)
Airline 7	58 (4.8)	6,275 (1.5)
Airline 15	4 (0.33)	6,156 (1.5)
Airline 16	19 (1.6)	2,752 (0.65)
Airline 17	11 (0.92)	18,786 (4.5)
Airline 18	12 (1.0)	2,357 (0.56)
Airline 19	1 (0.08)	326 (0.08) ³
Airline 20	2 (0.17)	3,310 (0.79) ⁴
Airline 21	2 (0.17)	1,157 (0.27)
Airline 22	22 (1.8)	4,262 (1.0)
Airline 23	6 (0.50)	5,684 (1.4)
Airline 24	5 (0.42)	5,904 (1.4)
Airline 5	90 (7.5)	11,761 (2.8)
Airline 1	299 (25.0)	64,297 (15.3)
Airline 4	96 (8.0)	11,397 (2.7)
Airline 25	6 (0.50)	1,893 (0.45)
Airline 6	69 (5.8)	30,816 (7.3) ⁵
Airline 2	250 (20.9)	74,163 (17.6)
Airline 26	3 (0.25)	2,892 (0.69) ⁶
Unknown	1 (0.08)	--
TOTAL	1,196	420,797

SOURCE: US Department of Transportation Bureau of Transportation Statistics

(<https://www.transtats.bts.gov/employment/>). Data taken from October 2022 unless otherwise noted.

Notes: Airline 9 is now part of Airline 2. Employment data taken from December 2011; Airline 19 is no longer in operation. Employment data taken from February 2020; Employment data not available for Airline 20 in USDOT BTS database. Data taken from Airline 20's 2021 annual report

(<https://www.norwegian.com/us/about/company/investor-relations/reports-and-presentations/>). Airline 6 is now part of Airline 8. Employment data taken from June 2015. Airline 26 is now part of Airline 3. Employment data taken from December 2017.

TABLE A-2: Missingness of Primary Treatment Summary Data by Treatment Program

Treatment Program	Total contact observations N	Contact observations missing Primary Treatment Summary N (row %)
Breathe Life Healing Centers (LAX, CA)	364	79 (21.7)
Recovery Ways (Salt Lake, UT)	346	61 (17.6)
Brighton Recovery Center (Salt Lake City, UT)	280	71 (25.4)

Lakeview Health (Jacksonville, FL)	181	16 (8.8)
FHHealth (Deerfield, FL)	84	18 (21.4)
Cornerstone of Recovery (Knoxville, TN)	51	8 (15.7)
Retreat at Lancaster County (Ephrata, PA)	40	8 (20.0)
Rosecrance (Rockford, IL)	16	5 (31.2)
La Hacienda Treatment Center (Hunt, TX)	13	3 (23.1)
Beach House Center (Juno Beach, FL)	11	0
Michael's House (Palm Springs, CA)	10	2 (20.0)
Retreat in West Palm (West Palm Beach, FL)	10	0
Black Bear (Santee Nacoochee, GA)	9	0
Serenity View (Princeton, TX)	8	3 (37.5)
Ashley (Harve de Grace, MD)	6	2 (33.3)
Cumberland Heights (Nashville, TN)	6	2 (33.3)
Ohana Treatment Program (Los Angeles, CA)	5	3 (60.0)
The Hills (Hollywood Hills, CA)	3	1 (33.3)
The Ranch (Nashville, TN)	3	0
Gay Men's Institute (Palm Springs, CA)	2	0
Recovery Village Palmer Lake (Palmer Lake, CO)	2	2 (100)
The Canyon (Malibu, CA)	2	0
The Meadows Ranch (Wickenburg, AZ)	2	2 (100)
Valley Recovery Center (Sacramento, CA)	2	2 (100)
Belle Monte (Palm Springs, CA)	1	1 (100)
Casa Palmera (San Diego, CA)	1	1 (100)
Cottonwood (Tucson, AZ)	1	0
Dream Recovery (Boca Raton, FL)	1	1 (100)
Hazelden (Newberg, OR)	1	0
Meridian Treatment (Ft. Lauderdale, FL)	1	1 (100)
New Start Recovery (Santa Ana, CA)	1	1 (100)
Orella (Cleveland, OH)	1	1 (100)
Ridgeview Institute (Smyrna, GA)	1	0
Sierra Tucson (Tucson, AZ)	1	1 (100)
Talbott Recovery Campus (Atlanta, GA)	1	0
Not recorded	8	8 (100)

TABLE A-3: Comparison of Statistics from FADAP 2022 Annual Report and This Analysis, for Data Not Already Reported in Previous Tables

Measure	FADAP 2022 Annual Report ¹	Analysis, unique FAs with non-missing treatment data ²	Analysis, all treatment episodes
FAs with cases in the database	1,117	990	--
Total number of observations in database	--	--	1,172
Treatment episodes with completed and returned data from treatment provider	884 (79%)	990 (100%)	1,172 (100%)

FAs eligible to complete 1-year follow-up surveys by May 31, 2022	889 (80%)	758 (77%)	931 (79.4)
Of those eligible, completed 1-year follow-up survey	243 (27%)	213 (28%)	236 (25%)
Of those who completed 1-year follow-up, self-report as in recovery	191 (79%)	180 (85%)	197 (83%)
Of those who self-report as in recovery, in recovery for >30 days	169 (88%)	172 (96%)	188 (95%)
Of those who self-report as in recovery for >30 days, current employment status			
Employed as FA and returned to work with same or different airline	114 (67%)	106 (62%)	118 (63%)
Employed as FA but not yet returned to work	7 (4%)	6 (3%)	7 (4%)
Resigned	14 (8%)	16 (9%)	16 (9%)
Retired	7 (4%)	7 (4%)	7 (4%)
Terminated	25 (15%)	26 (15%)	27 (14%)
Missing	4 (2%)	11 (6%)	13 (7%)
Source of referral to FADAP			
Union	83%	813 (82%)	967 (83%)
Self	12%	110 (11%)	135 (12%)
Company, other than EAP	4%	44 (4%)	46 (4%)
Other	<1%	11 (1%)	11 (1%)
Missing	--	12 (1%)	13 (1%)
Self-reported drug or alcohol violation at time of referral to FADAP	~15%	10%	10%
Referred to inpatient treatment	98.6%	962 (97.2%)	1,140 (97.3%)
Reasons for not completing treatment, if given			

Left against medical advice	44 (77%)	46 (70%)	59 (70%)
Transferred to different setting	6 (11%)	9 (14%)	11 (13%)
Discharged for non-compliance	3 (5%)	7 (11%)	7 (8%)
Other	4 (7%)	4 (6%)	7 (8%)
FA was offered social support programming while in treatment	68%	638 (64%)	747 (64%)
Treatment episode started after 2/28/2020 and completed by 5/30/2022	256	276	305
Among treatment episodes between 2/28/20 and 5/30/22, FA offered specific MATs	222 (87%)	228 (83%)	256 (84%)
Among treatment episodes between 2/28/20 and 5/30/22 with FA offered specific MATs, MATs written into treatment plan	62%	129 (57%)	147 (57%)
Among treatment episodes between 2/28/20 and 5/30/22 with FA offered specific MATs and MATs written into treatment plan, FA agreed to take medication	81%	117 (91%)	134 (91%)
Provider-reported FA engagement with current treatment, mean (SD)	4.0 (0.91)	4.0 (0.96)	4.0 (0.97)
Self-reported FA engagement with current treatment as of initial self-report survey, mean (SD)	4.5 (0.77)	4.5 (0.78)	4.4 (0.79)
Self-reported FA engagement with most recent treatment in hindsight as of follow-up self-report survey, mean (SD)	4.0 (1.1)	4.1 (1.1)	4.0 (1.1)
Self-reported FA engagement with current treatment as of follow-up self-report survey, mean (SD)	3.9 (1.2)	3.9 (1.2)	3.8 (1.2)
FA would recommend treatment program to another FA, among those with non-missing post-treatment survey	92.5%	94%	93%

FA would use treatment program again, among those with non-missing post-treatment survey	88%	90%	89%
FA satisfied with treatment program, among those with non-missing post-treatment survey	92.5%	94%	93%
Treatment program helped FA abstain from alcohol/drug use, among those with non-missing post-treatment survey	96%	96%	95%
Treatment program helped to improve FA's emotional well-being, among those with non-missing post-treatment survey	95%	95%	94%
FA "often eager to get to the work site to start the day", as reported on initial self-report survey, mean (SD)	3.77 (1.0)	3.77 (1.1)	3.75 (1.1)
FA "often eager to get to the work site to start the day", as reported on follow-up self-report survey, mean (SD)	3.90 (1.1)	3.89 (1.0)	3.88 (1.0)
Average work time lost due to alcohol/drug problems (hours/month) as reported on initial self-report survey, mean (SD)	10.9 (22.8)	11.4 (30.0)	11.4 (28.1)
Average work time lost due to other reasons (hours/month) as reported on initial self-report survey, mean (SD)	7.2 (??)	6.3 (14.1)	6.7 (15.9)
Average work time lost due to alcohol/drug problems (hours/month) as reported on follow-up self-report survey, mean (SD)	0.48 (??)	0.47 (0.46)	2.1 (9.0)
Average work time lost due to other reasons (hours/month) as reported on follow-up self-report survey, mean (SD)	2.2 (??)	0.48 (0.46)	1.9 (8.5)

¹Unless otherwise noted, FADAP 2022 Annual Report used only an FA's most recent treatment episode.

²Data presented here is from each FA's most recent observation that is not missing treatment episode data

