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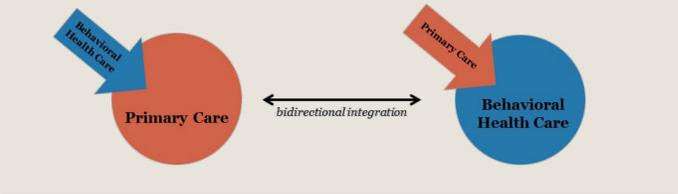


## INTRODUCTION

**Fact:** 43.8 million adults experience mental illness in a given year.



- 18 to 25 percent of older adults are in need of mental health care<sup>1</sup>. Yet, few seem to receive proper care and treatment for their mental health conditions<sup>2</sup>.
- Since the passage of the Affordable Care Act, emphasis has been placed on the integration of primary care and behavioral health as a major strategy in reaching persons with mental health conditions.
- Often times, this integration is depicted by the placement of behavioral health providers in primary care settings, and vice versa, at different engagement levels<sup>2</sup>.



## STUDY OBJECTIVE

- To assess the relationship between mental health status and healthcare utilization among adults 65 and older. We focus on healthcare utilization settings and determine whether existing systems are designed to meet seniors' mental healthcare needs.

## METHODS

- Data: 2012 and 2013 Medical Expenditure Panel Survey data, obtained from the U.S. Agency for Healthcare Research and Quality
- Subjects: Individuals 65 and older. Sample size: 1,863 and 1919 in 2012 and 2013 respectively.
- Design: Retrospective cohort analysis of subjects followed over a 2-year period
- Analyses: For each year, three zero-inflated negative binomial regression models were used to assess the relationship between mental health status and healthcare utilization related to
  - emergency department use,
  - inpatient visit, and
  - office-based physician visits.
- In 2013, utilization settings was assessed as a factor of longitudinal mental health status:
  - 00 (no mental problems in both years), 01 (No in 2013, Yes in 2013), 10 (Yes in 2012, No in 2013), 11 (Yes in both years)
- Results were adjusted for predisposing, enabling and health needs factors.
- Survey weights were applied; all analysis was conducted in STATA 12.

## RESULTS, SUPPORTING TABLES, KEY FINDINGS

Table 1. Socio-demographic Characteristics of Adults ≥65 Years of Age, by Mental Health Status in 2012

	2012 Mental Health Status			p value *
	Overall	No Mental Health Problems	Mental Health Problems	
<b>Sample (n)</b>	1,850	1,234	616	
<b>Weighted sample</b>	43,460,866	30,965,867	12,494,998	
<b>Age strata, n (%)</b>				<0.001
65-70	709 (38.3)	522 (42.3)	187 (30.4)	
71-80	686 (37.1)	435 (35.2)	251 (40.8)	
≥81	455 (24.6)	277 (22.5)	178 (28.9)	
<b>Female, n (%)</b>	1,066 (57.6)	694 (56.2)	372 (60.4)	0.09
<b>Rural, n (%)</b>	276 (14.9)	179 (14.5)	97 (15.6)	0.48
<b>Married, n (%)</b>	913 (49.3)	638 (51.7)	275 (44.6)	0.004
<b>Race/ Ethnicity, n (%)</b>				<0.001
Hispanic	317 (17.1)	164 (13.3)	153 (24.8)	
Non-Hispanic White	988 (53.4)	724 (58.7)	264 (42.9)	
Non-Hispanic Black	342 (18.5)	207 (16.7)	135 (21.9)	
Non-Hispanic Asian	164 (8.9)	113 (9.2)	51 (8.3)	
Non-Hispanic other/ multiple races	39 (2.1)	26 (2.1)	13 (2.1)	
<b>Income strata, n (%)</b>				<0.001
≤\$25,000	1,169 (63.2)	699 (56.6)	470 (76.3)	
\$25,001-\$50,000	408 (22.1)	312 (25.3)	96 (15.6)	
\$50,001-\$75,000	152 (8.2)	114 (9.2)	38 (6.2)	
≥\$75,001	121 (6.5)	109 (8.8)	12 (1.9)	
<b>Education</b>				<0.001
≤ High School	1034 (57.1)	618 (51.1)	416 (69.1)	
Some College, College	591 (32.6)	443 (36.6)	148 (24.2)	
Graduate Level	186 (10.3)	148 (12.2)	38 (6.3)	
<b>Insurance coverage</b>				<0.001
Any Private	798 (43.14)	595 (48.2)	203 (32.9)	
Public only	1,027 (55.5)	621 (50.3)	406 (65.9)	
Uninsured	25 (1.4)	18 (1.5)	7 (1.1)	
<b>Overall health in general, n (%)</b>				<0.001
Excellent	120 (7.0)	109 (9.8)	11 (1.8)	
Very Good	445 (25.9)	396 (35.7)	49 (8.1)	
Good	656 (38.3)	441 (39.7)	215 (35.5)	
Fair	389 (22.7)	146 (13.2)	243 (40.2)	
Poor	105 (6.1)	18 (1.6)	87 (14.4)	
<b>Count of Comorbidities<sup>1</sup>, mean (SD)</b>	0.8 (0.2)	0.7 (0.9)	1.1 (1.0)	<0.001
<b>Have usual care provider, n (%)</b>	1,617 (91.4)	1,053 (90.5)	564 (93.1)	0.06
<b>No difficulty getting to usual provider, n (%)</b>	1,195 (74.1)	828 (78.8)	367 (65.4)	<0.001
<b>No cognitive limitations, n (%)</b>	1,616 (87.6)	1,128 (91.5)	488 (79.6)	<0.001
<b>ER Visits, mean (SD)</b>	0.3 (0.7)	0.2 (0.6)	0.3 (0.8)	0.001
<b>IP Admits, mean (SD)</b>	0.2 (0.6)	0.2 (0.5)	0.3 (0.8)	<0.001
<b>Office-based visits, mean (SD)</b>	10.5 (14.6)	9.6 (12.6)	12.3 (18.0)	<0.001

Table 2. Regression Models Separately Predicting Healthcare Utilization Settings for Adults ≥65 in 2012: ER, Inpatient Hospital and Office-based Provider settings (N =1,161)\*

Predictor	Setting 1: Emergency Room			Setting 2: Inpatient Hospital			Setting 3: Office-based		
	Coef.	(95% CI)	P-value	Coef.	(95% CI)	P-value	Coef.	(95% CI)	P-value
<b>Mental Health Problems (ref= No)</b>	0.21	0.14, 0.28	0.00	0.33	-0.11, 0.78	0.09	0.02	-0.21, 0.26	0.70
<b>Age strata</b>									
65-70 (ref)									
71-80	-0.06	-1.02, 0.89	0.81	-0.06	-1.16, 1.60	0.98	0.12	-0.15, 0.25	0.06
≥81	0.06	-0.64, 0.75	0.76	0.23	-0.65, 1.11	0.38	0.12	0.02, 0.22	0.03
<b>Gender (ref = Female)</b>	0.12	-0.12, 0.36	0.17	-0.17	-1.01, 0.67	0.47	0.11	0.05, 0.17	0.02
<b>Rural (ref= No)</b>	0.08	-0.22, 0.39	0.39	0.16	-0.31, 0.63	0.27	-0.12	-0.20, -0.33	0.03
<b>Married (ref= Not Married)</b>	0.27	-0.05, 0.48	0.03	0.21	-0.33, 0.76	0.23	0.14	-0.13, 0.41	0.16
<b>Race/ Ethnicity</b>									
Hispanic	-0.79	-1.45, -0.14	0.03	-0.04	-1.97, 1.89	0.94	-0.23	-0.45, -0.02	0.04
Non-Hispanic White (ref)									
Non-Hispanic Black	-0.07	-0.42, 0.27	0.47	-0.11	-1.04, 0.81	0.64	-0.18	-0.35, -0.02	0.04
Non-Hispanic Asian	-1.62	-2.14, -1.09	0.00	-1.02	-2.61, 0.55	0.12	-0.12	-0.51, 0.26	0.29
Non-Hispanic Other/Multiple races	-0.93	-2.29, 0.43	0.10	0.24	-0.66, 1.14	0.36	-0.22	-0.59, 0.16	0.13
<b>Income strata</b>									
≤\$25,000 (ref)									
\$25,001-\$50,000	-0.41	-0.95, 0.12	0.08	-0.30	-0.76, 0.16	0.11	0.03	-0.22, 0.28	0.69
\$50,001-\$75,000	-0.20	-1.71, 1.30	0.62	-1.09	-2.90, 0.71	0.12	0.15	-0.41, 0.72	0.35
≥\$75,001	-0.29	-0.80, 0.22	0.14	0.15	-2.82, 3.13	0.85	0.00	-0.57, 0.57	0.99
<b>Education</b>									
≤ High School (ref)									
Some College, College	0.12	-0.18, 0.42	0.24	0.33	-0.57, 1.24	0.25	0.05	-0.05, 0.15	0.15
Graduate Level	0.41	-0.34, 1.16	0.14	-0.22	-1.19, 0.76	0.44	1.17	0.04, 0.30	0.03
<b>Insurance coverage</b>									
Any Private (ref)									
Public only	0.04	-0.82, 0.91	0.85	0.08	-0.19, 0.35	0.34	-0.07	-0.16, 0.00	0.06
Uninsured	-22.21	-25.51, -18.90	0.00	-35.08	-38.62, -31.54	0.00	-3.65	-4.81, -2.49	0.00
<b>Overall health in general</b>									
Excellent (ref)									
Very Good	-0.43	-1.19, 0.33	0.13	0.61	-3.75, 4.97	0.61	-0.02	-0.49, 0.46	0.89
Good	0.17	-0.32, 0.68	0.27	1.05	-2.98, 5.08	0.38	0.13	-0.51, 0.78	0.46
Fair	0.84	-0.84, 2.52	0.16	1.46	-2.72, 5.64	0.27	0.24	-0.61, 1.09	0.35
Poor	0.48	-0.93, 1.88	0.28	1.50	-0.99, 3.99	0.12	0.35	-0.75, 1.45	0.30
<b>Count of Comorbidities</b>	0.16	0.00, 0.33	0.05	0.06	-0.37, 0.15	0.12	0.14	0.02, 0.26	0.04
<b>Difficulty getting to usual (ref= no difficulty)</b>	-0.21	-0.60, 0.18	0.15	0.01	-0.57, 0.60	0.93	0.00	-0.08, 0.09	0.86
<b>Cognitive limitations (ref= No dx)</b>	0.35	-0.55, 1.26	0.24	0.48	-1.66, 2.64	0.43	0.13	0.02, 0.25	0.04

Table 3. Regression Models Assessing Longitudinal\* Mental Health Effect on Healthcare Utilization Settings for Adults ≥65 in 2013: ER, Inpatient Hospital and Office-based Provider settings (N =1,463)

Predictor	Setting 1: Emergency Room			Setting 2: Inpatient Hospital			Setting 3: Office-based		
	Coef.	(95% CI)	P-value	Coef.	(95% CI)	P-value	Coef.	(95% CI)	P-value
<b>Mental Health Problems, 2012-13</b>									
00 (No in both years) (ref)									
01 (No in 2012, Yes in 2013)	0.18	-0.17, 0.52	0.32	0.25	-0.05, 0.56	0.07	0.16	-0.01, 0.33	0.06
10 (Yes in 2012, No in 2013)	0.38	0.04, 0.73	0.02	0.32	-0.68, 1.32	0.31	0.07	-0.22, 0.37	0.39
11 (Yes in both years)	0.31	0.00, 0.61	0.05	0.10	-0.42, 0.62	0.49	0.15	-0.03, 0.32	0.07
<b>Age strata</b>									
65-70 (ref)									
71-80	0.00	-0.26, 0.27	0.06	0.27	-0.60, 1.15	0.31	0.13	0.05, 0.21	0.02
≥81	0.15	-0.15, 0.46	0.99	0.52	-0.15, 1.19	0.08	0.12	-0.08, 0.32	0.12
<b>Gender (ref = Female)</b>	0.07	-0.18, 0.32	0.58	0.07	-0.36, 0.50	0.55	0.05	-0.04, 0.14	0.12
<b>Rural (ref= No)</b>	0.02	-0.28, 0.32	0.89	0.42	0.18, 0.66	0.02	-0.17	-0.22, -0.11	0.00
<b>Married (ref= Not Married)</b>	-0.11	-0.36, 0.14	0.40	-0.07	-0.67, 0.51	0.63	0.07	0.00, 0.15	0.05
<b>Race/ ethnicity</b>									
Hispanic	-0.24	-0.59, 0.11	0.17	-0.31	-0.65, 0.02	0.06	-0.20	-0.38, -0.02	0.04
Non-Hispanic White (ref)									
Non-Hispanic Black	0.22	-0.07, 0.51	0.13	0.22	-0.84, 1.28	0.46	-0.07	-0.48, 0.34	0.54
Non-Hispanic Asian	-0.78	-1.32, -0.25	0.00	-0.52	-1.67, 0.63	0.19	-0.09	-0.41, 0.22	0.33
Non-Hispanic Other/Multiple races	-0.07	-0.88, 0.69	0.85	0.14	-2.19, 2.46	0.83	-0.09	-0.35, 0.17	0.28
<b>Income strata</b>									
≤\$25,000 (ref)									
\$25,001-\$50,000	-0.13	-0.42, 0.17	0.40	0.00	-1.15, 1.15	0.99	0.01	-0.16, 0.19	0.83
\$50,001-\$75,000	-0.49	-0.99, 0.00	0.05	0.11	-3.00, 3.23	0.89	-0.03	-0.22, 0.16	0.56
≥\$75,001	0.19	-0.31, 0.71	0.44	0.64	-2.49, 3.77	0.47	0.11	-0.21, 0.42	0.28
<b>Education</b>									
≤ High School (ref)									
Some College, College	0.22	-0.05, 0.49	0.11	0.11	-0.30, 0.53	0.36	0.11	0.02, 0.21	0.04
Graduate Level	-0.01	-0.47, 0.45	0.97	-0.59	-2.41, 3.77	0.30	0.08	-0.16, 0.32	0.28
<b>Insurance coverage</b>									
Any Private (ref)									
Public only	0.01	-0.23, 0.26	0.91	0.13	-0.37, 0.64	0.36	-0.02	-0.22, 0.16	0.59
Uninsured	-13.38	-140, 138	0.98	-0.58	-4.72, 0.51	0.60	-1.75	-2.51, -0.98	0.01
<b>Overall health in general</b>									
Excellent (ref)									
Very Good	-0.14	-1.22, 0.93	0.78	-0.79	-2.09, 0.51	0.12	-0.11	-3.98, 3.75	0.91
Good	-0.55	-1.65, 0.54	0.32	-2.01	-2.93, -1.09	0.01	-0.57	-5.77, 4.61	0.68
Fair	-2.30</								