

# Enhancing Coordination of Behavioral Health Services after Superstorm Sandy: Planning for Future Disasters

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## Updated Data Profile: South Amboy and Laurence Harbor Community Medicare Fee-for-Service Beneficiaries

*Demographics, Behavioral Health Conditions, and Utilization of Health Services (Medicare Fee-for-Service Beneficiaries)*

May 13, 2014



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**O**n October 29, 2012, Superstorm Sandy hit the Eastern Seaboard, impacting more than a dozen states. New Jersey, which took the brunt of the storm along its densely populated coastline, was devastated. Thousands of residents were displaced, their homes and communities damaged or destroyed.

Lessons learned from prior natural disasters showed that victims of storms like Superstorm Sandy are often at an elevated risk for acute or behavioral health issues such as post-traumatic stress disorder (PTSD), depression, and substance abuse.<sup>1,2</sup> While disaster-related issues subside over time, evidence shows that victims can experience a prolonged period of elevated risk, especially those with pre-existing mental health issues.<sup>3</sup> Older adults and disabled residents with mental health conditions are at increased risk of deteriorating health, depression, increased isolation, and breakdown in the continuum of health care. Additionally, past natural disasters also show that access to informational resources on disaster-related mental health disorders, outcomes, and service utilization are important factors to consider.<sup>4,5</sup>

This updated community profile – one of 10 being created for selected communities in the Federal Emergency Management Agency (FEMA)-declared disaster counties in New Jersey – explores potential county and community level health status and health determinants of post-disaster spikes in behavioral health issues and treatments. This update includes more comprehensive post-Sandy data than the initial profile, which was published in January 2014. A final update is planned for summer 2014, when additional data is available.

**E**nhancing Coordination of Behavioral Health Services after Superstorm Sandy: Planning for Future Disasters is a Special Innovation Project funded by the Centers for Medicare & Medicaid Services (CMS). As part of this project, Healthcare Quality Strategies, Inc. (HQSI), the CMS quality improvement organization (QIO) for New Jersey, studied data on prevalence and incidence of selected behavioral health conditions, the utilization of health services, and demographic information from the Medicare claims database for Medicare Fee-for-Service (FFS) beneficiaries residing in the 10 New Jersey FEMA-declared disaster counties after Superstorm Sandy. From its analysis, HQSI created data profiles for each of these FEMA-designated counties, as well as a subset of 10 selected communities.

This is the updated profile for the South Amboy and Laurence Harbor community in Middlesex County. The South Amboy and Laurence Harbor community was selected because it had high rates of Medicare FFS beneficiaries both with and at risk for depression or proxy disorders prior to Superstorm Sandy (January 1, 2011 – September 30, 2012).

This profile is based on Medicare FFS claims data and provides a glimpse into the prevalence and incidence of selected behavioral health conditions and risk factors for depression, as well as the utilization of Medicare-covered behavioral health services among Medicare beneficiaries residing in the community before and after Superstorm Sandy. Since patients with behavioral health conditions may receive other health services because of medical problems caused by their behavioral health conditions or they may avoid utilizing behavioral health services, this report also looks at the utilization of non-behavioral health services.

The county and community profiles are being shared with state and local governments and agencies, health care providers, community-based organizations, and the research community to support a community-based approach to enhance the coordination of behavioral health services after a natural disaster, and to increase utilization of the Medicare depression screening benefit which became a covered service in October 2011. This benefit is important for victims of major disasters like Superstorm Sandy who are often at an elevated risk for behavioral health issues and can experience a prolonged period of elevated risk after a disaster. Older adults and disabled residents with behavioral health conditions in particular are at increased risk of deteriorating health, depression, increased isolation, and breakdown in the continuum of health care. They are also less likely to report symptoms, which a depression screening can capture.

## WHAT'S NEW IN THIS UPDATE

This updated profile includes an additional six months of post-Sandy data. It focuses on a 12-month pre-Sandy time period as opposed to 21 months used in the initial profile and includes pre and post-Sandy analyses comparing the rates from the year before and during/after the storm. In this profile, we reference October 2011 to September 2012 as the year before Superstorm Sandy and October 2012 to September 2013 as the year after Superstorm Sandy.

This profile now includes:

- Annual trend charts for the selected behavioral health conditions to allow the comparison of changes in prevalence over time (pages 15 and 30)

- A summary of the prevalence of depression or proxy disorders rate by demographic characteristics (race, gender, and age) to allow the comparison of rates across different demographic groups (pages 16-17)
- State maps highlighting the 10 FEMA-declared disaster counties before and after Superstorm Sandy and county-specific maps reflecting changes in prevalence of depression or proxy disorder (pages 20 and 21), top five risk factors for depression (pages 31 and 32), and depression screening rates (pages 38 and 39)
- Summary tables that highlight changes in the community and its county before and after Superstorm Sandy on annual prevalence of selected behavioral health conditions (page 13), utilization of outpatient behavioral health services for assessment (page 35) and therapies (page 44), utilization of inpatient services (pages 49 and 54), and utilization of services in other settings (page 58)

## HOW TO USE THIS PROFILE

This profile includes an analysis of the eight behavioral health conditions which, based on literature review and feedback from the subject matter experts consulted for this project, were found to increase after natural disasters.

This profile is divided into the following sections, each of which is preceded by a user-friendly overview:

- Demographics (page 11)
- Prevalence and incidence of behavioral health conditions (page 13)
- Risk factors for depression or proxy disorders (page 29)
- Utilization of outpatient behavioral health services – assessments (page 35)
- Utilization of outpatient behavioral health services – therapies (page 44)
- Utilization of inpatient health services (page 49)
- Utilization of inpatient health services within 30 days of acute care hospital discharge (page 54)
- Other settings (page 58)
- Listing of major health providers (page 63)

Here are some additional tips for using this profile:

- Use the Executive Summary (pages 9-10) for a quick overview of this profile's key points, as well as the snapshot table that summarizes the prevalence of the selected behavioral health conditions and utilization of behavioral health services before and after Superstorm Sandy
- Use the Behavioral Health Conditions section (pages 13-34) for in-depth analyses and graphical comparison on the prevalence and incidence of eight behavioral health conditions before and after Superstorm Sandy
- Use the New Jersey and county maps to identify areas with higher rates of Medicare FFS beneficiaries at risk for depression and proxy disorders (pages 31-32); and areas with low utilization of the depression screening benefit (pages 38-39)

## METHODOLOGY

Each community profile compares one community's statistics to the aggregate of its county. Primary data sources include Medicare FFS Part A and Part B claims, the Medicare enrollment database, and U.S. Census data. The Medicare enrollment database includes basic demographic statistics such as age, gender, and race while the U.S. Census data provides a proxy indicator (average household income) for socioeconomic status. Based on the ICD-9-CM (International Classification of Disease, Ninth Revision, Clinical Modification), CPT (Current Procedural Terminology), or HCPCS (Healthcare Common Procedure Coding System) codes in Medicare Part A and Part B claims, beneficiaries were identified for chronic conditions including diseases/conditions related to behavioral health, such as depression. Appendices A through F contain documentation, technical notes, codes, algorithms, data sources, and references.

Medicare Part A and Part B claims provide information on the utilization of mental health outpatient services for assessment (e.g., depression screening, diagnostic psychological tests) and treatment (e.g., individual psychotherapy). Medicare Part A claims were also used to analyze utilization of health services in or by acute care hospitals, skilled nursing facilities, medical rehabilitation facilities, home health agencies, hospice, and inpatient psychiatric facilities.

Furthermore, Medicare Part A and Part B claims were used to aggregate data on behavioral health providers including: provider location, overall provider type, provider type by services, and major provider listing. Geographical mapping of health providers was also done using ArcGIS Online Explorer.

To identify beneficiaries with an elevated risk of depression or proxy disorders after the storm, HQSI conducted a literature review on risk factors for depression or proxy disorders (see Appendix B). Previous studies identified psychosocial and biological factors, increased age, history of cancer, Parkinson's disease, Alzheimer's disease, changes in mental function, and medication side effects as risk factors for developing depression. Based on findings from the literature review and factors available through Medicare claims, logistic regression analysis was conducted with Medicare claims and the top five risk factors – Alzheimer's disease and related disorders or senile dementia, hip/pelvic fractures, amputations, substance or alcohol abuse or tobacco use, and sleep disturbance – were used to identify beneficiaries with high risk for developing depression or proxy disorders.



## **MEASUREMENT TIME FRAMES**

This profile includes data from January 1, 2011 through September 30, 2013. Results are presented using different charts and measurement time frames as follows:

- Annual bar charts show the annual rates in the year before (October 1, 2011 to September 30, 2012) and during/after (October 1, 2012 to September 30, 2013) Superstorm Sandy. Statistics on demographics, prevalence of behavioral health conditions, and utilization of health services are presented for this 12-month period. These statistics allow for comparison between the community and its county
- Annual trend charts with rolling quarters for the behavioral health conditions and utilization statistics are included to adjust for seasonal variation and to examine possible changes in the year before and during/after Superstorm Sandy. The time period includes eight data points from January 1, 2011 to September 30, 2013
- Annual percent change (relative change) bar charts show relative increase or decrease in rates from the year before and during/after Superstorm Sandy. These statistics allow for comparison between the community and its county and to analyze the potential impact of Superstorm Sandy
- Quarterly new incidence charts for eight behavioral health conditions include seven quarters of data from January 1, 2012 to September 30, 2013. This allows for the identification of new cases in a given quarter when compared to the prior year
- Quarterly line charts show the trend in the utilization of depression screening for seven quarters from January 1, 2012 to September 30, 2013

### DATA CONSIDERATIONS

Currently, there are three quarters of post-storm data available. This is the first of two planned profile updates. Claims data processing lag (at least six months) coupled with the one-year project time frame, reduces the optimal time frame for more accurate estimation of post-Sandy effects.

Identification of beneficiaries with behavioral health conditions is based on diagnoses being reported in Medicare FFS claims and could result in underestimation. There is no accurate way to identify when certain health conditions began and ended when claims data is used.

According to the subject matter experts consulted for this project, unlike other conditions, behavioral health issues are often underdiagnosed in our society and the stigma associated with behavioral health conditions may prevent people from seeking care in mental health facilities. The subject matter experts also indicated that estimating the prevalence of depression using claims data can be particularly difficult as depression is often undiagnosed or not documented. Depression can be present with symptoms of anxiety and adjustment disorders. Based on this feedback, a combination measure named “depression or proxy disorders” was created to estimate prevalence and incidence of depression. If a patient has at least one of the three conditions reported in Medicare claims, he/she will be flagged as having depression or proxy disorders.

This community profile can be used to compare the prevalence and incidence rates of eight selected behavioral health conditions based on the ICD-9-CM codes through the analysis of Medicare claims. This profile may be used to prioritize and plan community and county preparation for the care, tracking, and monitoring of Medicare beneficiary behavioral health status and health care utilization patterns.

HQSI will produce a final update in summer 2014 that will include additional data for the post-Superstorm Sandy time period.

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### KEY OBSERVATIONS

The following observations show the South Amboy and Laurence Harbor community's percent change and rates after Superstorm Sandy among Medicare FFS beneficiaries.

1. South Amboy /Laurence Harbor community had a relative increase in depression or proxy disorders (7.23%), depression alone (8.12%), anxiety disorders (24.54%), alcohol or substance abuse (8.91%), substance abuse alone (30.14%), PTSD (114.25%) and suicide and self-inflicted injury (129.52%), after Superstorm Sandy.
2. The highest rates of depression or proxy disorders in South Amboy /Laurence Harbor were among Hispanics (289.47 per 1000 beneficiaries), females (205.79 per 1000 beneficiaries) and those below 65 years (284.55 per 1000 beneficiaries), after Sandy.
3. After Superstorm Sandy, South Amboy /Laurence Harbor community had a higher prevalence rate of the top five risk factors of depression or proxy disorders (132.39 per 1000 beneficiaries) than Middlesex County, despite a decrease in the rate.
4. Use of depression screening in South Amboy /Laurence Harbor community increased from 1.39 per 1000 Medicare FFS beneficiaries to 5.86 per 1,000 beneficiaries.
5. The South Amboy /Laurence Harbor community had a relative decrease in the utilization of psychiatric diagnostic procedures (21.06%), neuropsychological tests (31.68%) and individual psychotherapy (2.66%).
6. After Superstorm Sandy, South Amboy /Laurence Harbor had higher rates of acute care hospital admissions (335.52 per 1000 beneficiaries), emergency department visits (278.62 per 1000 beneficiaries) and 30-day hospital readmissions (64.83 per 1000 beneficiaries) than Middlesex County.
7. South Amboy /Laurence Harbor had a relative increase in the utilization of home health agency (6.60%), skilled nursing facility (10.28%), hospice (1.83%) and medical rehabilitation services (11.20%), after Superstorm Sandy.

# EXECUTIVE SUMMARY

The *Snapshot of the South Amboy and Laurence Harbor Community* (Figure 1) summarizes the prevalence of the behavioral health conditions as well as risk factors for depression or proxy disorders analyzed for this profile. This *Snapshot* also lists the most frequently performed behavioral health assessments and therapies in the South Amboy and Laurence Harbor community compared to the average of Middlesex County. The non-behavioral health utilization measures that were calculated for this profile are not included in the *Snapshot*.

<b>Figure 1. Snapshot of South Amboy and Laurence Harbor</b>				
<b>Behavioral Health Disorders</b>	<b>Prevalence per 1,000 Medicare FFS Beneficiaries</b>			
	<b>South Amboy and Laurence Harbor</b>			<b>Middlesex County</b>
	<b>10/1/11 – 9/30/12</b>	<b>10/1/12 – 9/30/13</b>	<b>% Change</b>	<b>% Change</b>
Depression or Proxy Disorders	159.16	170.66	7.23	0.87
• Depression alone	100.13	108.26	8.12	-0.43
• Anxiety Disorders alone	87.48	108.95	24.54	6.53
• Adjustment Disorders alone	21.43	16.89	-21.19	-1.53
Alcohol or Substance Abuse	31.97	34.82	8.91	7.15
• Substance Abuse alone	16.16	21.03	30.14	4.01
PTSD	3.86	8.27	114.25	9.96
Suicide and Intentional Self-Inflicted Injury	1.05	2.41	129.52	5.46
Any of the Top Five Risk Factors* for Depression or Proxy Disorders <sup>6</sup>	137.02	132.39	-3.38	-0.51
• Alzheimer’s Disease and related disorders or Senile Dementia	32.32	30.22	-6.50	-7.60
• Sleep Disturbance	21.78	19.79	-9.14	-2.41
• Substance or Alcohol Abuse or Tobacco Use	86.43	85.26	-1.35	3.88
• Hip/Pelvic Fractures	11.95	8.63	-27.78	-1.26
• Amputations	1.41	0.72	-48.94	-10.38
<b>Behavioral Health Services</b>	<b>Utilization per 1,000 Medicare FFS Beneficiaries</b>			
	<b>South Amboy and Laurence Harbor</b>			<b>Middlesex County</b>
	<b>10/1/11 – 9/30/12</b>	<b>10/1/12 – 9/30/13</b>	<b>% Change</b>	<b>% Change</b>
Assessments				
• Depression Screening**	1.39	5.86	321.58	25.47%
• Psychiatric Diagnostic Procedures	46.73	36.89	-21.06	-18.37%
• Neuropsychological Testing	8.08	5.52	-31.68	4.87%
Therapy				
• Individual Psychotherapy	43.57	42.41	-2.66	-4.14
• Family Psychotherapy	1.41	1.38	-2.13	-16.29
• Group Psychotherapy	3.86	3.79	-1.81	-10.47
Psychiatric Hospital Admissions	2.81	4.48	59.43	-6.96

\*The top five risk factors were identified based on findings from a literature review (Appendix B) and factors available through Medicare claims. Logistic regression analysis was conducted with Medicare claims.

\*\*Depression Screening comparison time frames are different (October 1, 2012 – September 30, 2013 vs. January 1, 2012 – December 31, 2012) due to availability of depression screening data starting in January 2012.

**Medicare FFS Demographics**

**At A Glance**

(October 1, 2012 – September 30, 2013)

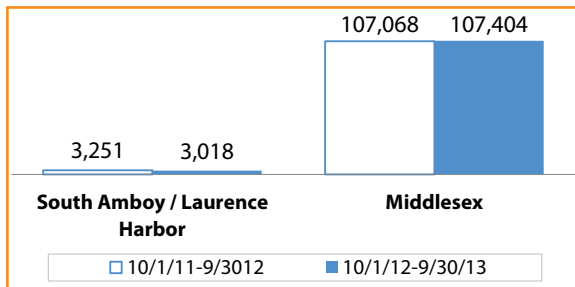
Total Medicare FFS Population	3,018
Females	1,683 (55.77%)
Males	1,335 (44.23%)
White	2,722 (90.19%)
Black	96 (3.18%)
Asian	69 (2.29%)
Hispanic	50 (1.66%)
Other	81 (2.68%)
Average Age	70.64
ZIP Codes	08879

Source: Medicare Claims Database

**South Amboy and Laurence Harbor**



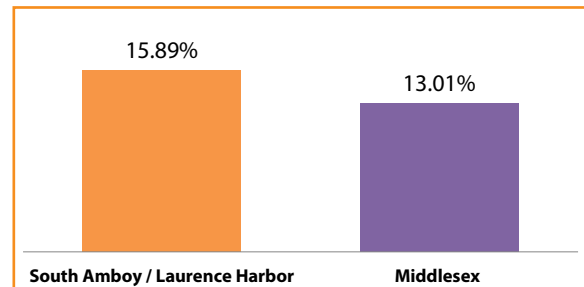
**FIGURE 2. TOTAL MEDICARE FFS BENEFICIARIES\***



\* Total beneficiaries who were under Medicare FFS coverage for at least one month during the time frame.

The total Medicare FFS population of the South Amboy and Laurence Harbor community prior to Superstorm Sandy was 3,251. After the storm, this number decreased to 3,018.

**FIGURE 3. PERCENT OF MEDICARE FFS BENEFICIARIES IN THE GENERAL POPULATION IN 2012\***



\* Source: Medicare Claims Database, U.S. Census Bureau, American Community Survey (ACS), 2012 <http://www.census.gov/>.

Medicare FFS beneficiaries made up 15.89% of the South Amboy and Laurence Harbor community in calendar year 2012.

**FIGURE 4. PERCENT OF MEDICARE FFS BENEFICIARY POPULATION BY FEMALE**

	10/1/11 – 9/30/12	10/1/12 – 9/30/13	Absolute Change*
South Amboy and Laurence Harbor	55.61	55.77	0.15
Middlesex County	56.31	56.10	-0.21

\* Due to rounding, the absolute change may not be the same as the difference subtracted from the two time frames shown.

Prior to the storm, females made up 55.61% of the entire Medicare FFS population residing in the South Amboy and Laurence Harbor community and males made up 44.39%. After the storm, the female beneficiary population increased to 55.77% and males decreased to 44.23%.

**FIGURE 5. PERCENT OF MEDICARE FFS BENEFICIARY POPULATION BY RACE**

Race	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	Absolute Change*	10/1/11 – 9/30/12	10/1/12 – 9/30/13	Absolute Change*
White	89.94	90.19	0.25	77.79	77.07	-0.72
Black	3.14	3.18	0.04	7.55	7.59	0.04
Hispanic	1.81	1.66	-0.16	3.48	3.16	-0.31
Asian	2.34	2.29	-0.05	6.28	5.90	-0.38
Other	2.77	2.68	-0.08	4.90	6.27	1.37

\* Due to rounding, the absolute change may not be the same as the difference subtracted from the two time frames shown.

Both before and after Superstorm Sandy, the majority of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community were White followed by Black, Asian, and Hispanic.

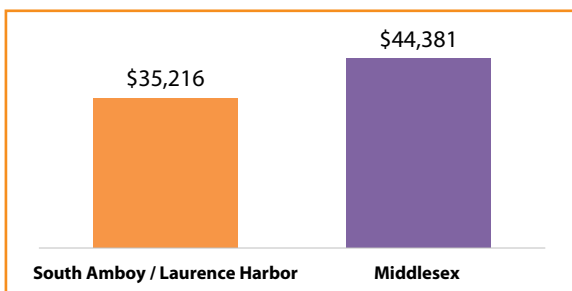
**FIGURE 6. PERCENT OF MEDICARE FFS BENEFICIARY POPULATION BY AGE**

Age	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	Absolute Change*	10/1/11 – 9/30/12	10/1/12 – 9/30/13	Absolute Change*
<65	26.02	19.22	-6.80	20.10	19.28	-0.82
65 – 74	39.71	44.23	4.52	40.98	42.61	1.63
75 – 84	23.44	24.22	0.78	25.92	25.00	-0.92
85 and Above	10.83	12.33	1.50	13.00	13.10	0.11
Average Age	69.80	70.64	0.84	71.40	71.38	-0.02

\* Due to rounding, the absolute change may not be the same as the difference subtracted from the two time frames shown.

Prior to Superstorm Sandy, the largest age group of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community was between ages 65 and 74 years old, followed by beneficiaries below the age of 65. After the storm, the largest age group was still between 65 and 74 years old, but the second largest group was between 75 and 84 years old. The average age of beneficiaries residing in this community increased from 69.80 years old prior to the storm to 70.64 years old after the storm.

**FIGURE 7. 2012 MEDIAN HOUSEHOLD INCOME (65 YEARS AND ABOVE)**



According to U.S. Census Data from 2012, residents aged 65 and older residing in the South Amboy and Laurence Harbor community had a median household income of \$35,216. This was lower than the average income among seniors residing in all of Middlesex County.

Source: U.S. Census Bureau, American Community Survey (ACS), 2012 <http://www.census.gov/>.



## PREVALENCE AND INCIDENCE

Using Medicare FFS claims data, eight behavioral health conditions were analyzed: depression or proxy disorders, depression, adjustment disorder, anxiety disorder, post-traumatic stress disorder (PTSD), alcohol or substance abuse, substance abuse alone, and suicide and intentional self-inflicted injury. These conditions were chosen based on literature review and feedback from subject matter experts.

Claims data can underestimate the real prevalence and incidence of depression in the population and individuals with depression could be diagnosed as having anxiety or adjustment disorders, as noted by the subject matter experts consulted for this project. Therefore, HQSI created a combination measure for depression (depression or proxy disorders) which includes beneficiaries who were reported for either depression, anxiety, or adjustment disorders.

The behavioral health data from January 1, 2011 to September 30, 2013 for these different measures were calculated to quantify disease occurrence:

1. The annual prevalence bar chart compares rates in two annual time frames
2. New incidence in a quarter for the specified disease that was not present in the prior 12 months (Q1 2012 – Q3 2013)
3. The yearly prevalence of the condition with quarterly rolling trends to account for seasonal variation

Refer to Appendix A for measurement calculation and Appendix E for quarterly time frames and formulae.

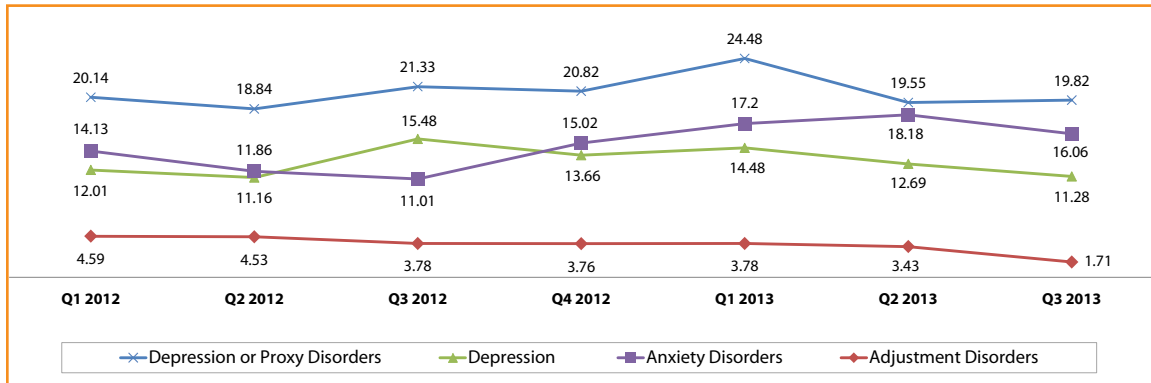
### Summary

Figure 8. Percent Change of Prevalence of Selected Behavioral Health Conditions per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
Depression or Proxy Disorders	159.16	170.66	7.23	180.56	182.13	0.87
• Depression	100.13	108.26	8.12	117.55	117.04	-0.43
• Anxiety	87.48	108.95	24.54	95.88	102.14	6.53
• Adjustment	21.43	16.89	-21.19	25.48	25.09	-1.53
Alcohol or Substance Abuse	31.97	34.82	8.91	25.46	27.28	7.15
• Substance abuse alone	16.16	21.03	30.14	14.47	15.05	4.01
PTSD	3.86	8.27	114.25	4.62	5.08	9.96
Suicide and intentional self-inflicted injuries	1.05	2.41	129.52	3.48	3.67	5.46

The South Amboy and Laurence Harbor community experienced a larger increase in depression or proxy disorders, anxiety disorders, alcohol or substance abuse, substance abuse alone, as well as in PTSD and suicide and intentional self-inflicted injuries, than Middlesex County. It also experienced a larger decrease in adjustment disorders than Middlesex County.

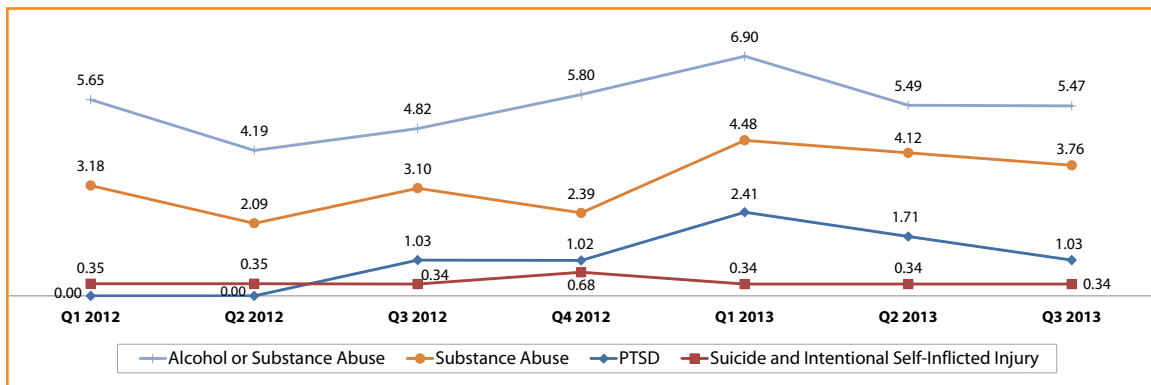
# BEHAVIORAL HEALTH CONDITIONS

**FIGURE 9. QUARTERLY NEW INCIDENCE TREND OF SELECTED BEHAVIORAL HEALTH CONDITIONS: DEPRESSION OR PROXY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES**



\* Quarterly new incidence of conditions that were not diagnosed in the prior year.

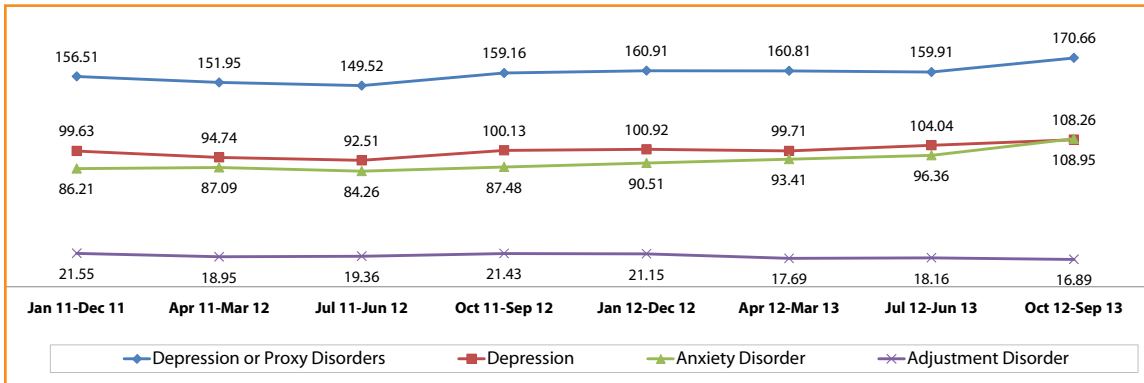
**FIGURE 10. QUARTERLY NEW INCIDENCE TREND OF OTHER SELECTED BEHAVIORAL HEALTH CONDITIONS\* PER 1,000 MEDICARE FFS BENEFICIARIES**



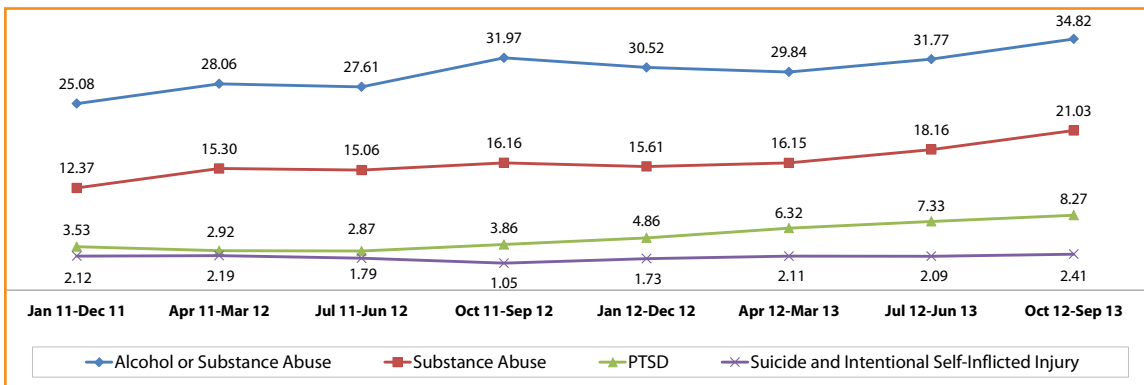
\* Quarterly new incidence of conditions that were not diagnosed in the prior year.

The charts above reflect quarterly trending in new incidence of the eight selected behavioral health conditions among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

**FIGURE 11. ANNUAL PREVALENCE TREND OF SELECTED BEHAVIORAL HEALTH CONDITIONS: DEPRESSION OR PROXY DISORDERS PER 1,000 MEDICARE FFS BENEFICIARIES**



**FIGURE 12. ANNUAL PREVALENCE TREND OF OTHER SELECTED BEHAVIORAL HEALTH CONDITIONS PER 1,000 MEDICARE FFS BENEFICIARIES**



The charts above reflect annual trending in the prevalence of the eight selected behavioral health conditions among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

## Depression or Proxy Disorders

Figure 13. Demographics of Depression or Proxy Disorders among Medicare FFS Beneficiaries				
	10/1/11 – 9/30/12		10/1/12 – 9/30/13	
	Number of Beneficiaries	Percent (%)	Number of Beneficiaries	Percent (%)
<b>Race</b>				
• White	417	92.05	451	91.11
• Black	12	2.65	13	2.63
• Hispanic	10	2.21	15	3.03
• Asian	7	1.55	9	1.82
• Other	7	1.55	7	1.41
<b>Gender</b>				
• Males	158	34.88	163	32.93
• Females	295	65.12	332	67.07
<b>Age</b>				
• Below 65	145	32.01	147	29.70
• 65-74	137	30.24	153	30.91
• 75-84	106	23.40	101	20.40
• 85 and Above	65	14.35	94	18.99
<b>Total</b>	<b>453</b>	<b>100.00</b>	<b>495</b>	<b>100.00</b>

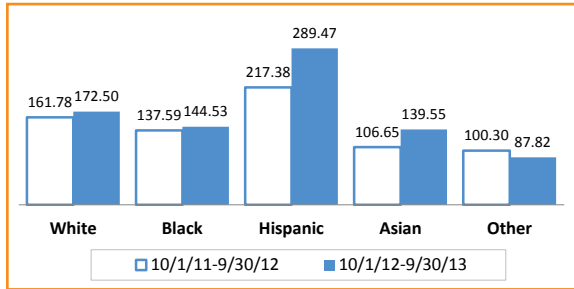
This table displays the number and percentage of Medicare FFS beneficiaries of each race, gender, and age diagnosed with depression or proxy disorders before and after Superstorm Sandy. There were 453 beneficiaries residing in the South Amboy and Laurence Harbor community diagnosed with depression or proxy disorders before the storm. This increased to 495 beneficiaries after the storm.

Figure 14. Depression or Proxy Disorders Rate per 1,000 Medicare FFS Beneficiaries by Demographic Group						
	10/1/11 – 9/30/12			10/1/12 – 9/30/13		
	Numerator	Denominator*	Rate per 1,000 Beneficiaries	Numerator	Denominator*	Rate per 1,000 Beneficiaries
<b>Race</b>						
• White	417	2,578	161.78	451	2,614	172.50
• Black	12	87	137.59	13	90	144.53
• Hispanic	10	46	217.38	15	52	289.47
• Asian	7	66	106.65	9	64	139.55
• Other	7	70	100.30	7	80	87.82
<b>Gender</b>						
• Males	158	1,254	125.99	163	1,287	126.63
• Females	295	1,592	185.27	332	1,613	205.79
<b>Age</b>						
• Below 65	145	496	292.57	147	517	284.55
• 65-74	137	1,241	110.37	153	1,286	119.01
• 75-84	106	730	145.30	101	715	141.22
• 85 and Above	65	380	171.15	94	383	245.43
Total	453	2,846	159.16	495	2,900	170.66

\* Total eligible beneficiaries (denominator) computed after adjusting for total enrolled FFS days divided by the total measurement days in the time frame

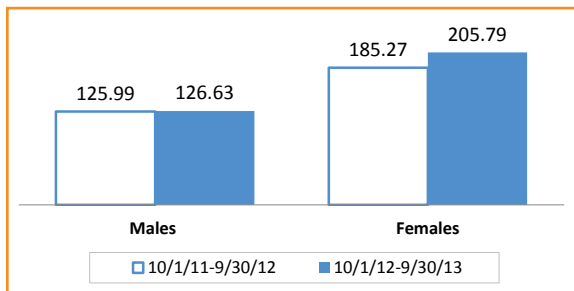
This table displays the rate of Medicare FFS beneficiaries per 1,000 diagnosed with depression or proxy disorders by race, gender, and age both before and after Superstorm Sandy by different demographic groups. The numerator is the number of beneficiaries with a claim for depression or proxy disorders; the denominator is the total number of beneficiaries residing in the community for each group.

**FIGURE 15. DEPRESSION OR PROXY DISORDERS RATE BY RACE PER 1,000 MEDICARE FFS BENEFICIARIES**



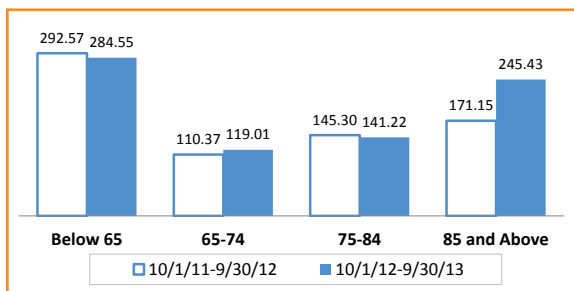
Hispanic Medicare FFS beneficiaries have the highest rate of depression or proxy disorders followed by White, Black, and Asian beneficiaries. In the 12 months prior to Superstorm Sandy, 217.38 per 1,000 Hispanic beneficiaries were diagnosed with depression or proxy disorders. After the storm, this rate increased to 289.47 per 1,000 beneficiaries.

**FIGURE 16. DEPRESSION OR PROXY DISORDERS RATE BY GENDER PER 1,000 MEDICARE FFS BENEFICIARIES**



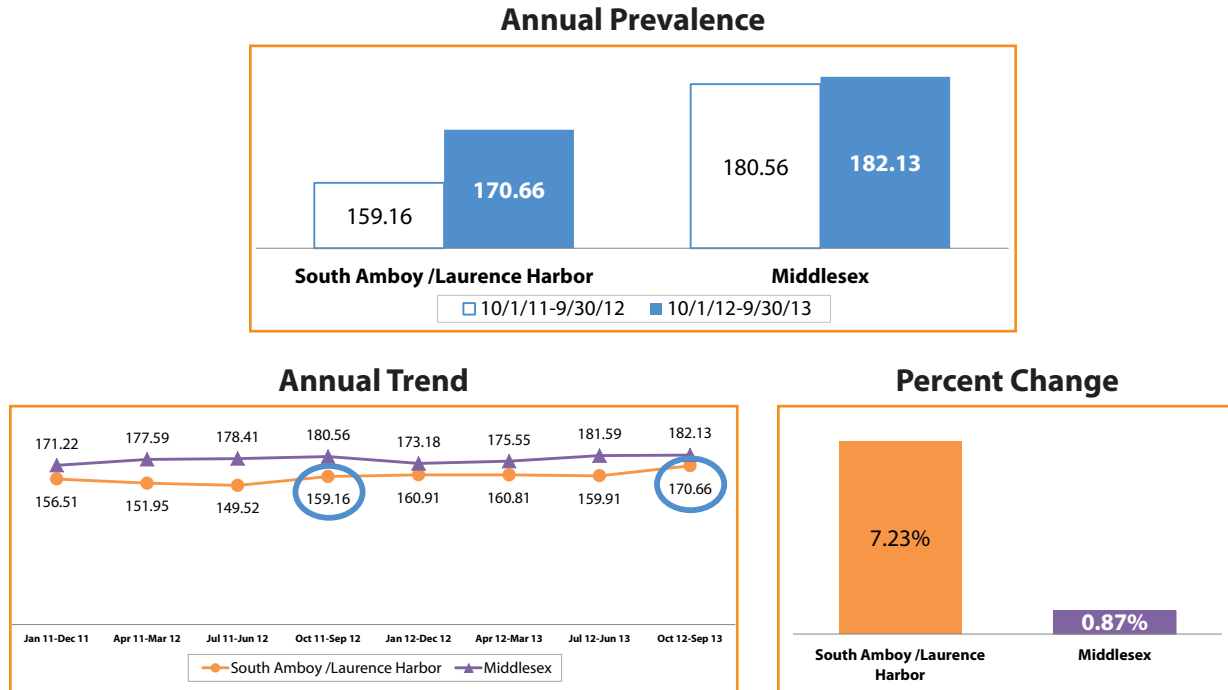
Female Medicare FFS beneficiaries have a higher rate of depression or proxy disorders than male beneficiaries. In the 12 months prior to Superstorm Sandy, 185.27 per 1,000 female beneficiaries were diagnosed with depression or proxy disorders. After the storm, this rate increased to 205.79 per 1,000 beneficiaries.

**FIGURE 17. DEPRESSION OR PROXY DISORDERS RATE BY AGE GROUP PER 1,000 MEDICARE FFS BENEFICIARIES**



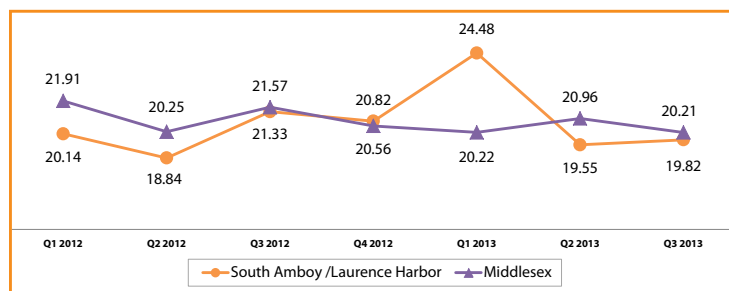
Medicare FFS beneficiaries below the age of 65 have the highest rate of depression or proxy disorders, followed by beneficiaries ages 85 and above. In the 12 months prior to Superstorm Sandy, 292.57 per 1,000 beneficiaries below the age of 65 were diagnosed with depression or proxy disorders. After the storm, this rate decreased to 284.55 per 1,000 beneficiaries.

**FIGURE 18. DEPRESSION OR PROXY DISORDERS PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of depression or proxy disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 159.16 per 1,000 beneficiaries. After the storm, this rate increased to 170.66 per 1,000 beneficiaries, reflecting a 7.23% relative increase.

**FIGURE 19. QUARTERLY NEW INCIDENCE OF DEPRESSION OR PROXY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of quarterly new incidence of depression or proxy disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

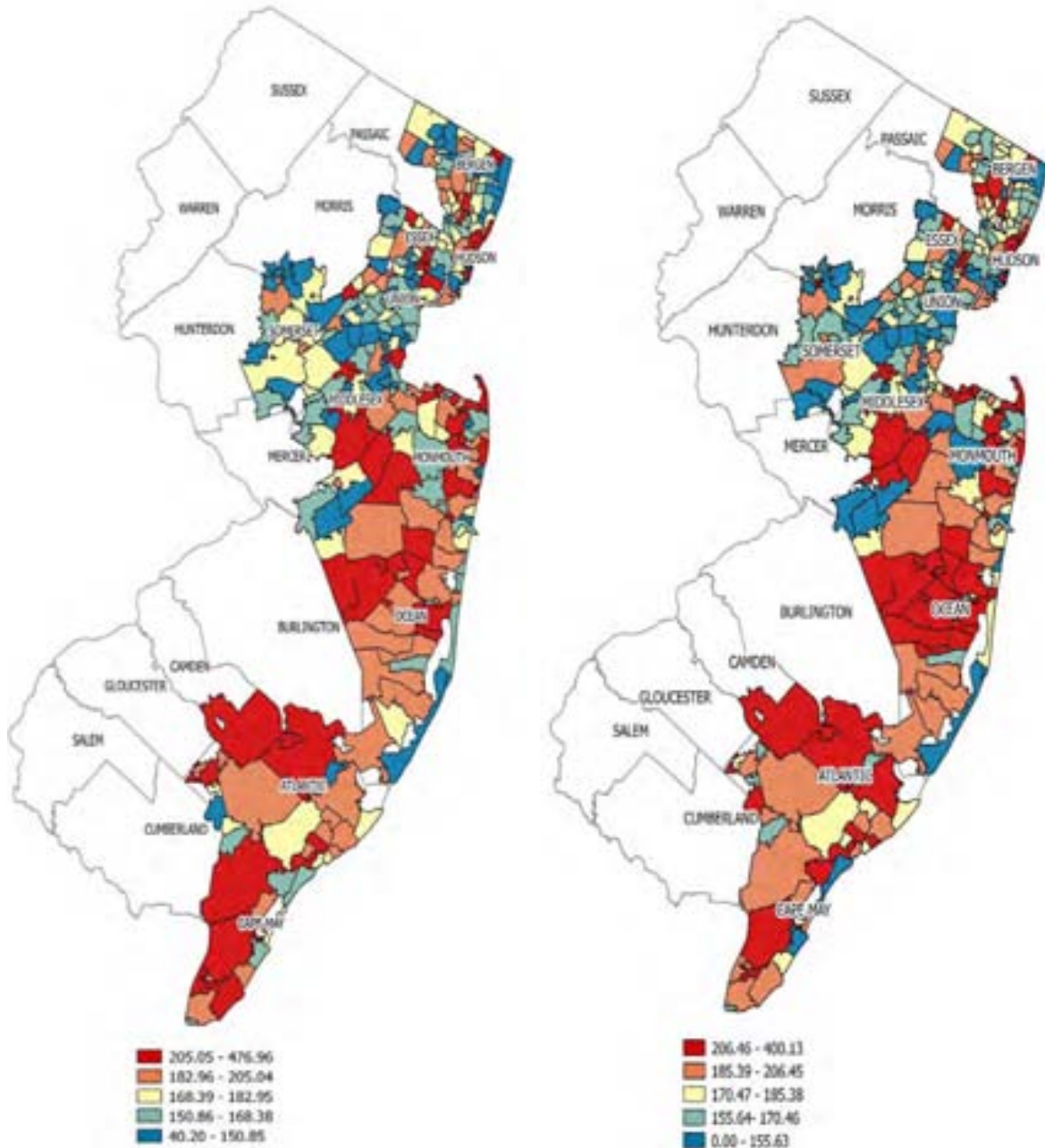
\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

# BEHAVIORAL HEALTH CONDITIONS

**FIGURE 20. PREVALENCE OF DEPRESSION OR PROXY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES IN 10 COUNTIES**

October 1, 2011 – September 30, 2012

October 1, 2012 – September 30, 2013



The color-coded map of New Jersey depicts prevalence of depression or proxy disorders from high (red) to low (blue) in the 10 FEMA-declared disaster counties before and after Superstorm Sandy.

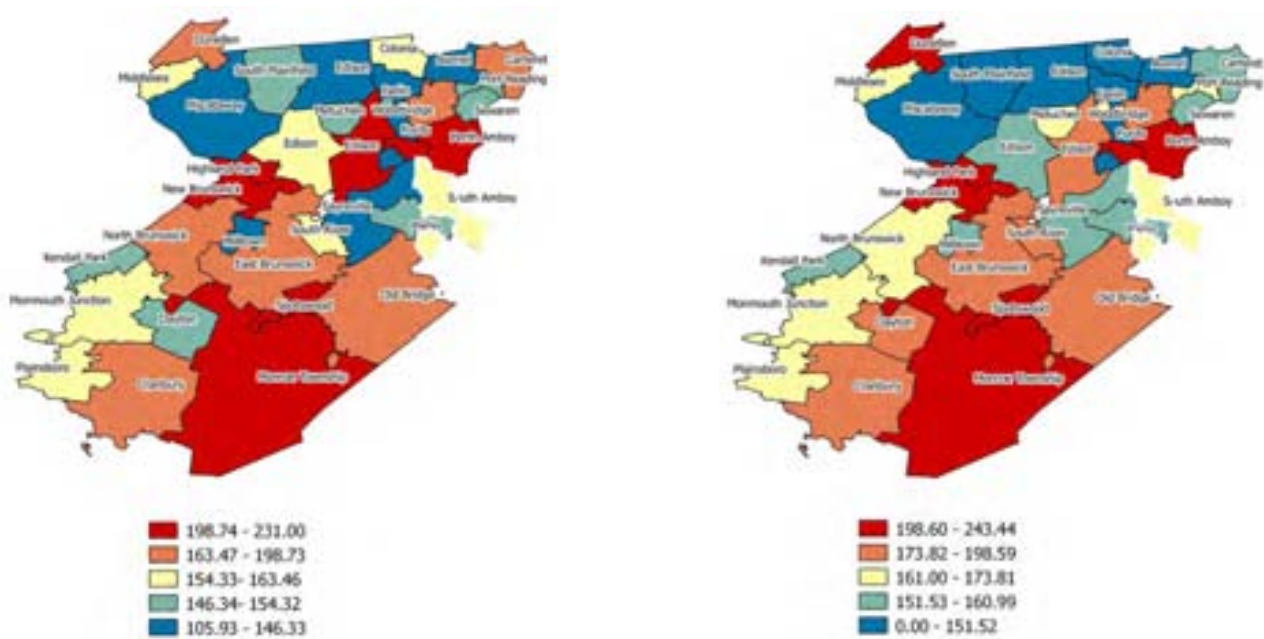
\* Mapped using ZIP codes of the 10 counties.



**FIGURE 21. MIDDLESEX COUNTY PREVALENCE OF DEPRESSION OR PROXY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES**

October 1, 2011 – September 30, 2012

October 1, 2012 – September 30, 2013

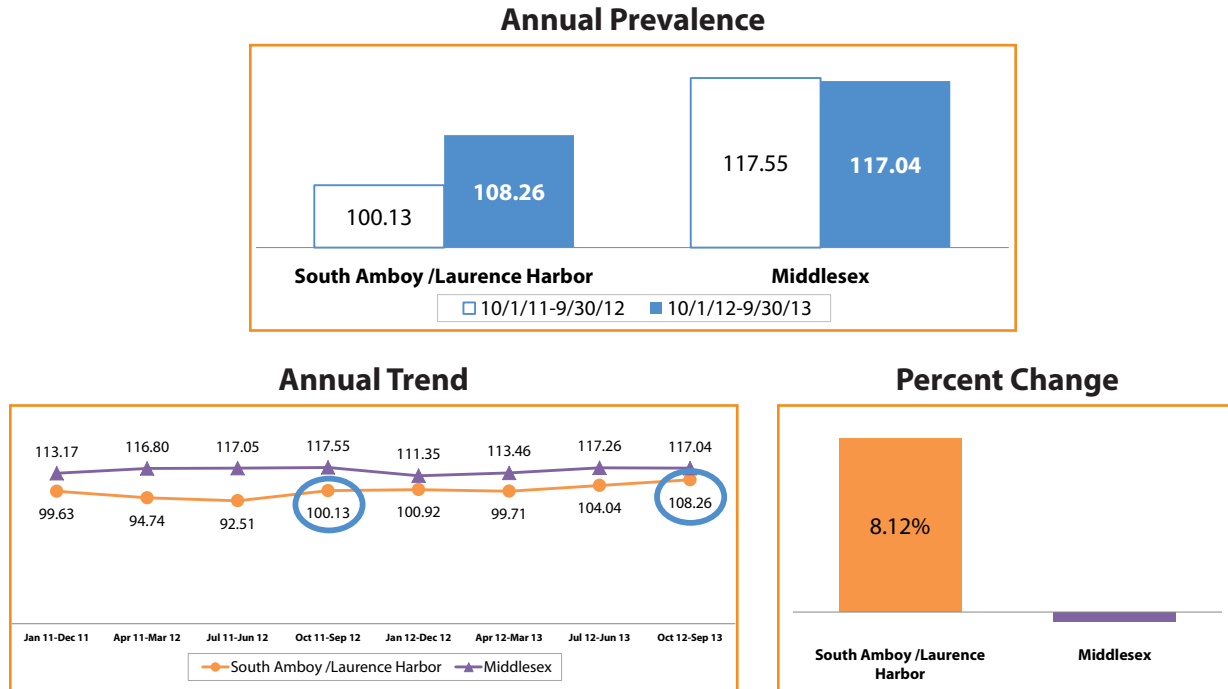


The color-coded map of Middlesex County depicts regional variation of prevalence of depression or proxy disorders from high (red) to low (blue) before and after Superstorm Sandy.

\* Mapped using ZIP codes; may not display all the city names located within the ZIP code.

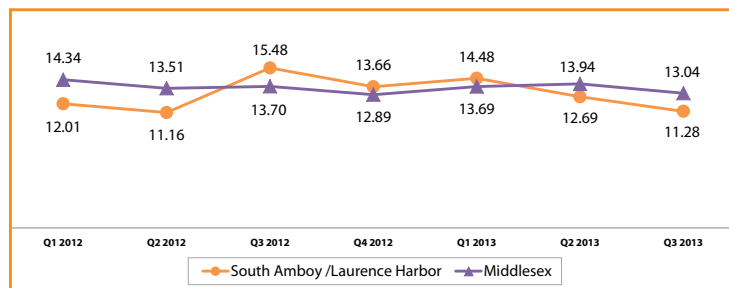
## Depression

**FIGURE 22. DEPRESSION PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of depression among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 100.13 per 1,000 beneficiaries. After the storm, this rate increased to 108.26 per 1,000 beneficiaries, reflecting a 8.12% relative increase.

**FIGURE 23. QUARTERLY NEW INCIDENCE OF DEPRESSION\* PER 1,000 MEDICARE FFS BENEFICIARIES**

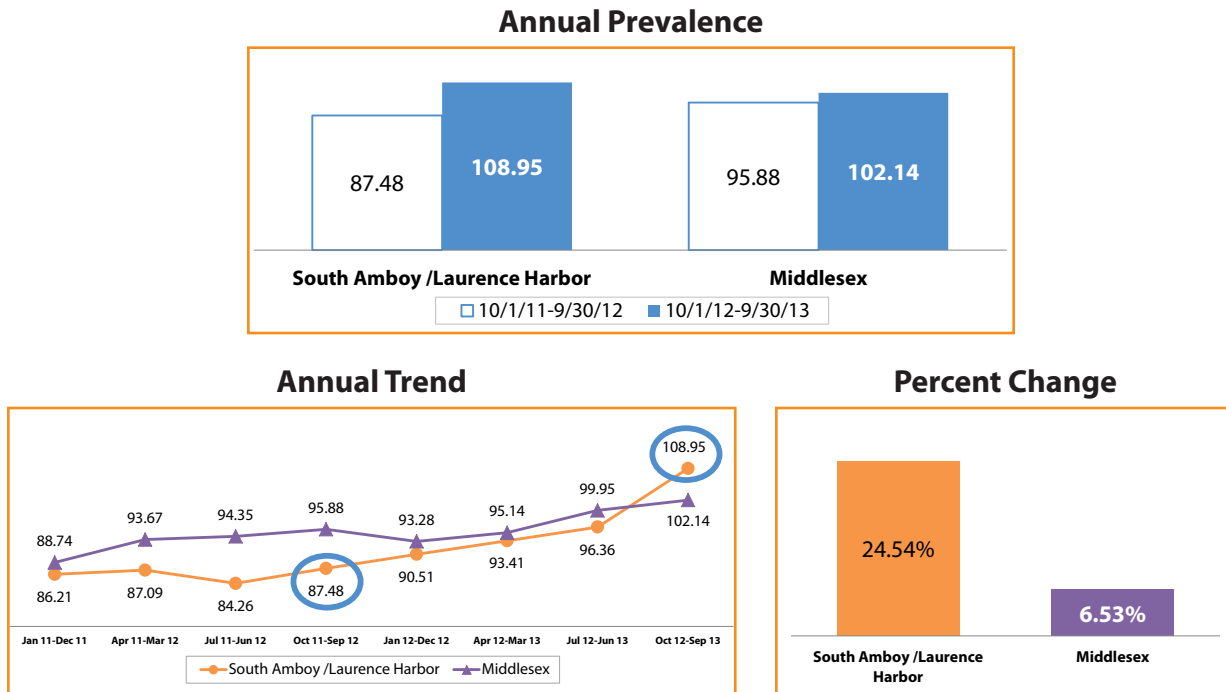


This chart reflects trending of quarterly new incidence of depression among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

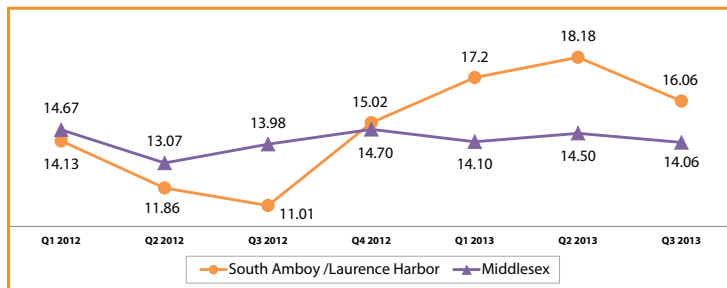
## Anxiety Disorders

**FIGURE 24. ANXIETY DISORDERS PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of anxiety disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 87.48 per 1,000 beneficiaries. After the storm, this rate increased to 108.95 per 1,000 beneficiaries, reflecting a 24.54% relative increase.

**FIGURE 25. QUARTERLY NEW INCIDENCE OF ANXIETY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES**

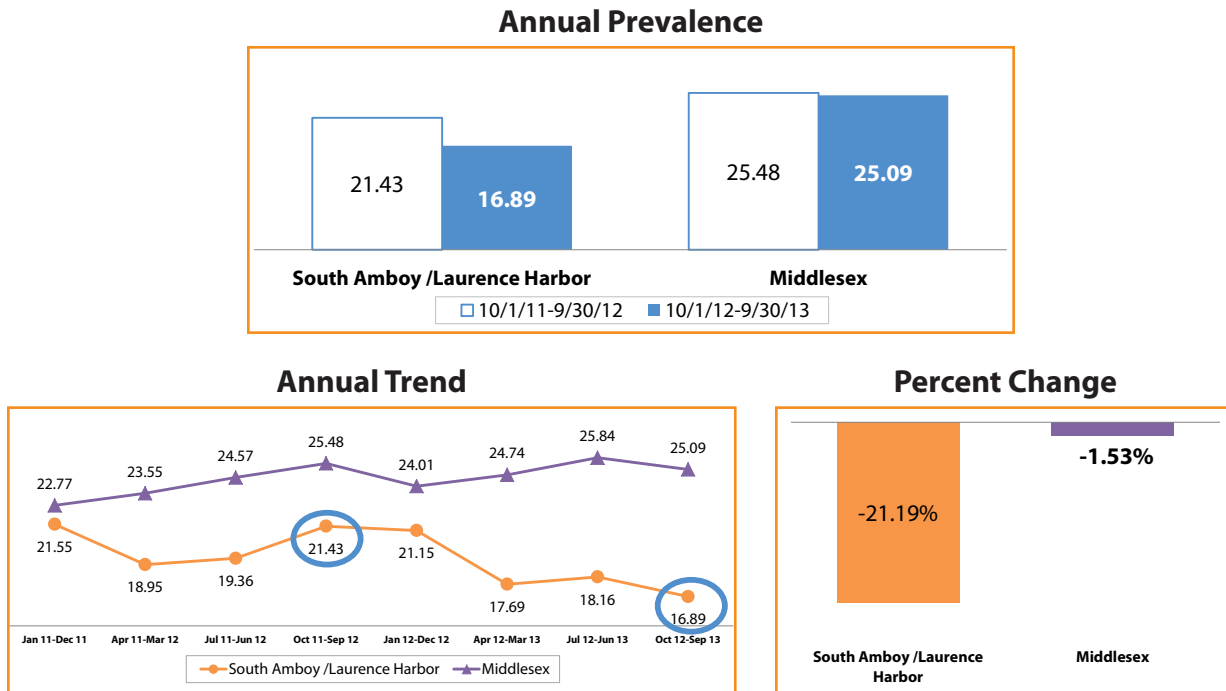


This chart reflects trending of quarterly new incidence of anxiety disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

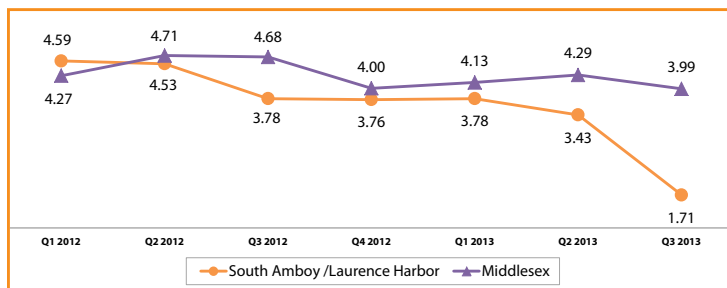
## Adjustment Disorders

**FIGURE 26. ADJUSTMENT DISORDERS PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of adjustment disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 21.43 per 1,000 beneficiaries. After the storm, this rate decreased to 16.89 per 1,000 beneficiaries, reflecting a 21.19% relative decrease.

**FIGURE 27. QUARTERLY NEW INCIDENCE OF ADJUSTMENT DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES**

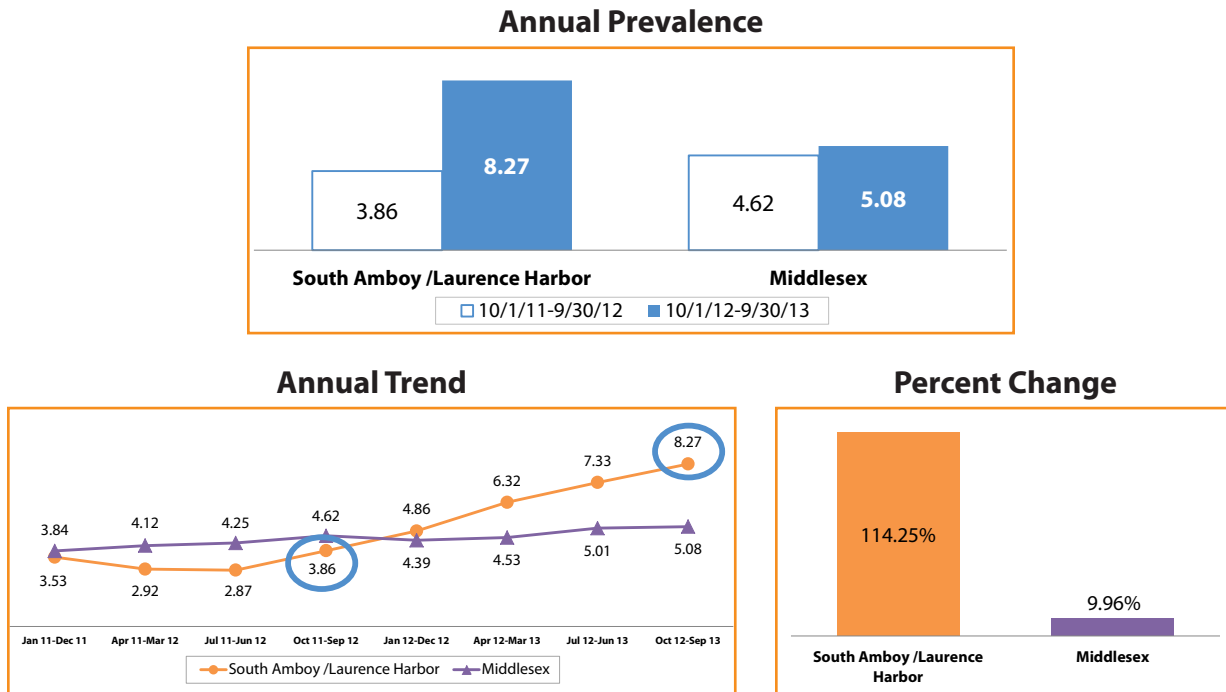


This chart reflects trending of quarterly new incidence of adjustment disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

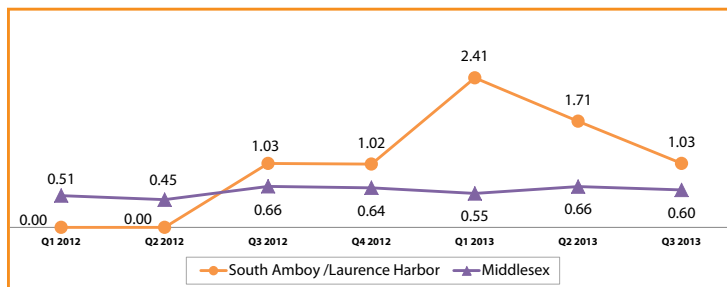
## Post-Traumatic Stress Disorder (PTSD)

**FIGURE 28. PTSD PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of PTSD among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 3.86 per 1,000 beneficiaries. After the storm, this rate increased to 8.27 per 1,000 beneficiaries, reflecting a 114.25% relative increase.

**FIGURE 29. QUARTERLY NEW INCIDENCE OF PTSD\* PER 1,000 MEDICARE FFS BENEFICIARIES**

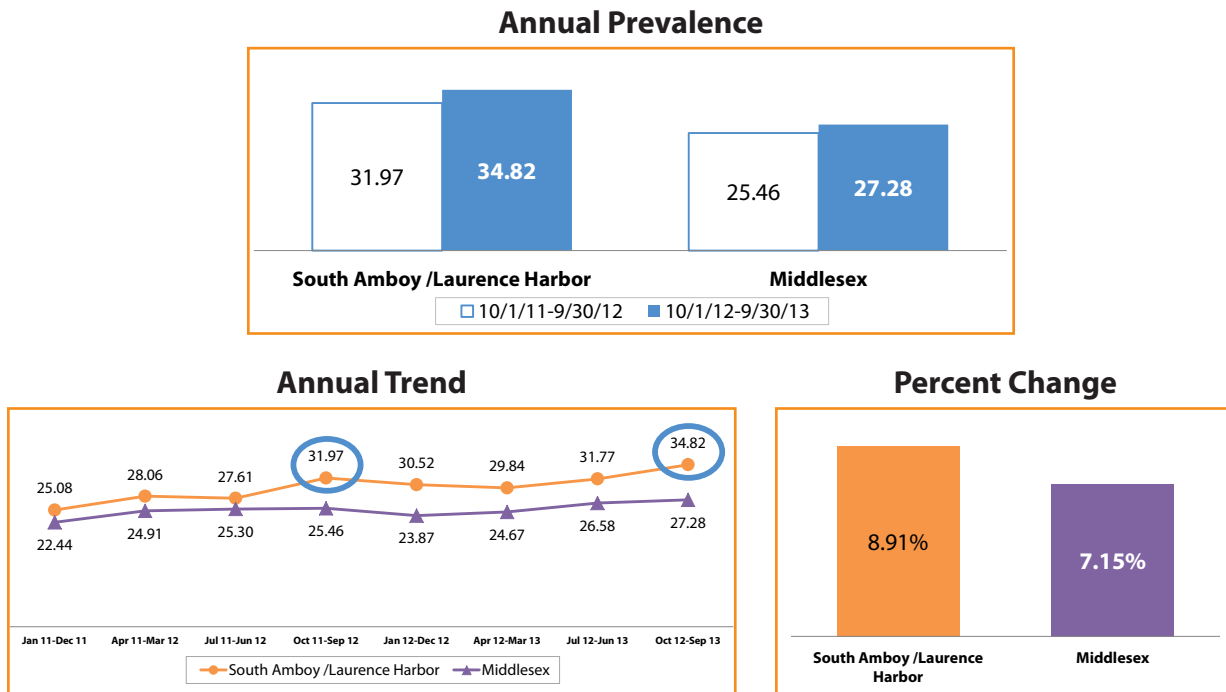


This chart reflects trending of quarterly new incidence of PTSD among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

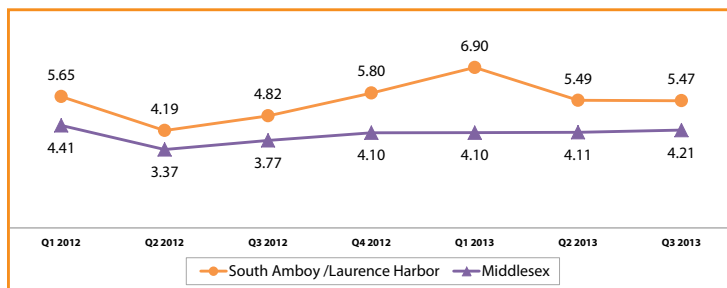
## Alcohol or Substance Abuse

**FIGURE 30. ALCOHOL OR SUBSTANCE ABUSE PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of alcohol or substance abuse among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 31.97 per 1,000 beneficiaries. After the storm, this rate increased to 34.82 per 1,000 beneficiaries, reflecting a 8.91% relative increase.

**FIGURE 31. QUARTERLY NEW INCIDENCE OF ALCOHOL OR SUBSTANCE ABUSE\* PER 1,000 MEDICARE FFS BENEFICIARIES**

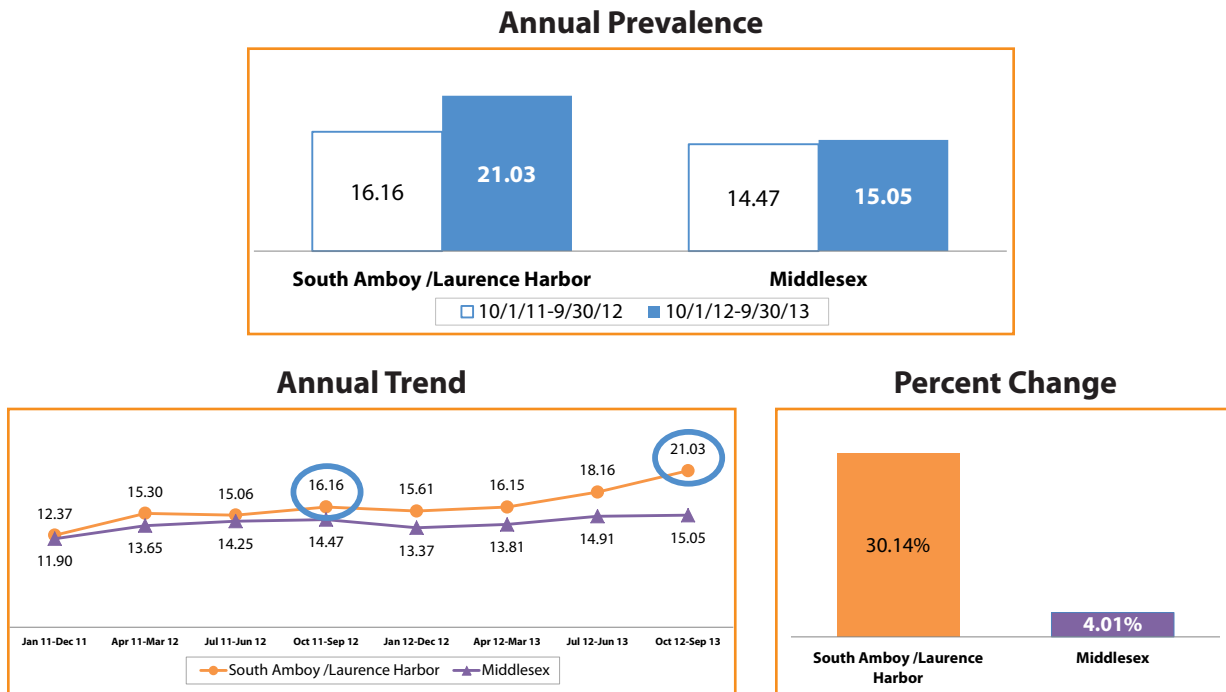


This chart reflects trending of quarterly new incidence of alcohol or substance abuse among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

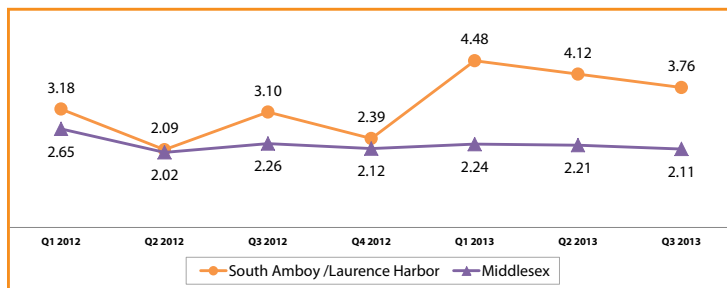
## Substance Abuse Alone

**FIGURE 32. SUBSTANCE ABUSE ALONE PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of substance abuse alone among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 16.16 per 1,000 beneficiaries. After the storm, this rate increased to 21.03 per 1,000 beneficiaries, reflecting a 30.14% relative increase.

**FIGURE 33. QUARTERLY NEW INCIDENCE OF SUBSTANCE ABUSE ALONE\* PER 1,000 MEDICARE FFS BENEFICIARIES**

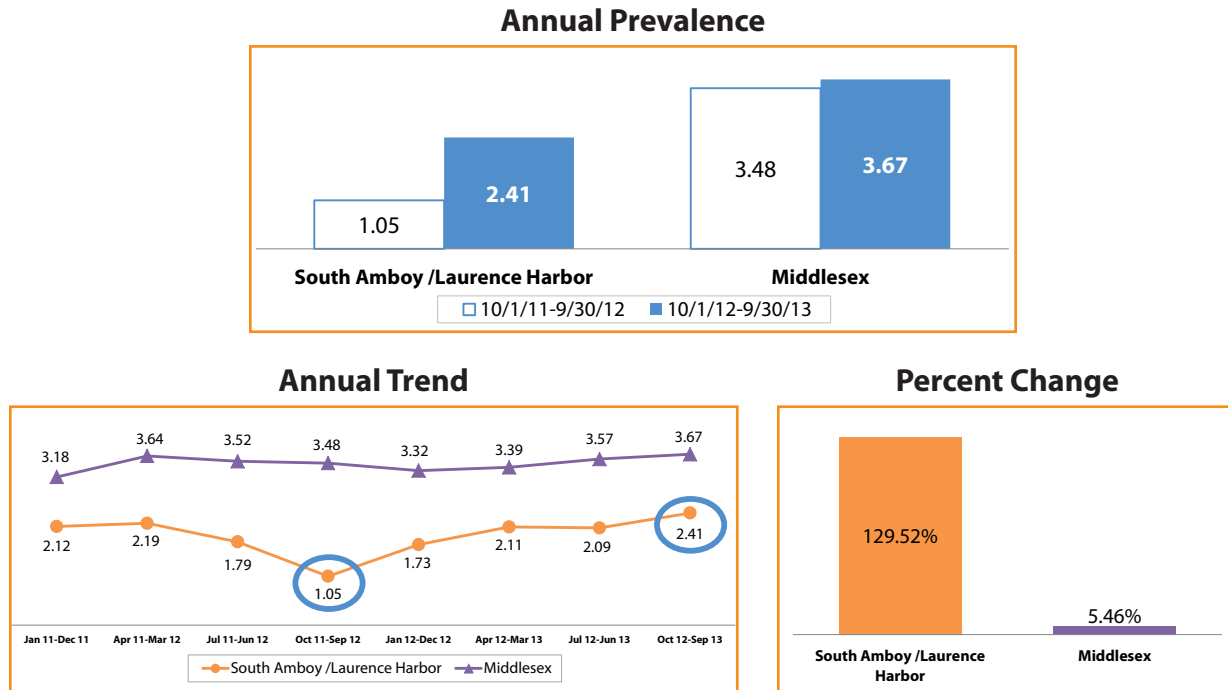


This chart reflects trending of quarterly new incidence of substance abuse alone among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

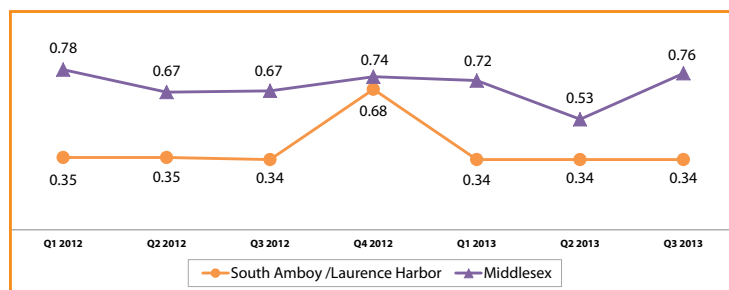
## Suicide and Intentional Self-Inflicted Injury

**FIGURE 34. SUICIDE AND INTENTIONAL SELF-INFLICTED INJURY PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of suicide and intentional self-inflicted injuries among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 1.05 per 1,000 beneficiaries. After the storm, this rate increased to 2.41 per 1,000 beneficiaries, reflecting a 129.52% relative increase.

**FIGURE 35. QUARTERLY NEW INCIDENCE OF SUICIDE AND INTENTIONAL SELF-INFLICTED INJURY\* PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of quarterly new incidence of suicide and intentional self-inflicted injuries among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.



## RISK FACTORS FOR DEPRESSION OR PROXY DISORDERS

To identify beneficiaries at risk of developing depression or proxy disorders, HQSI conducted a literature review on the potential risk factors for depression or proxy disorders. Previous studies suggested that psychosocial factors, biological factors, deteriorating physical functioning, and medication side effects could increase the risk of depression or proxy disorders.

Based on the literature review and data analysis using factors available through Medicare claims data, the top five risk factors for depression or proxy disorders were identified as: Alzheimer’s disease and related disorders or senile dementia, sleep disturbance, alcohol or substance abuse or tobacco use, hip/pelvic fractures, and amputations (see Appendix B).

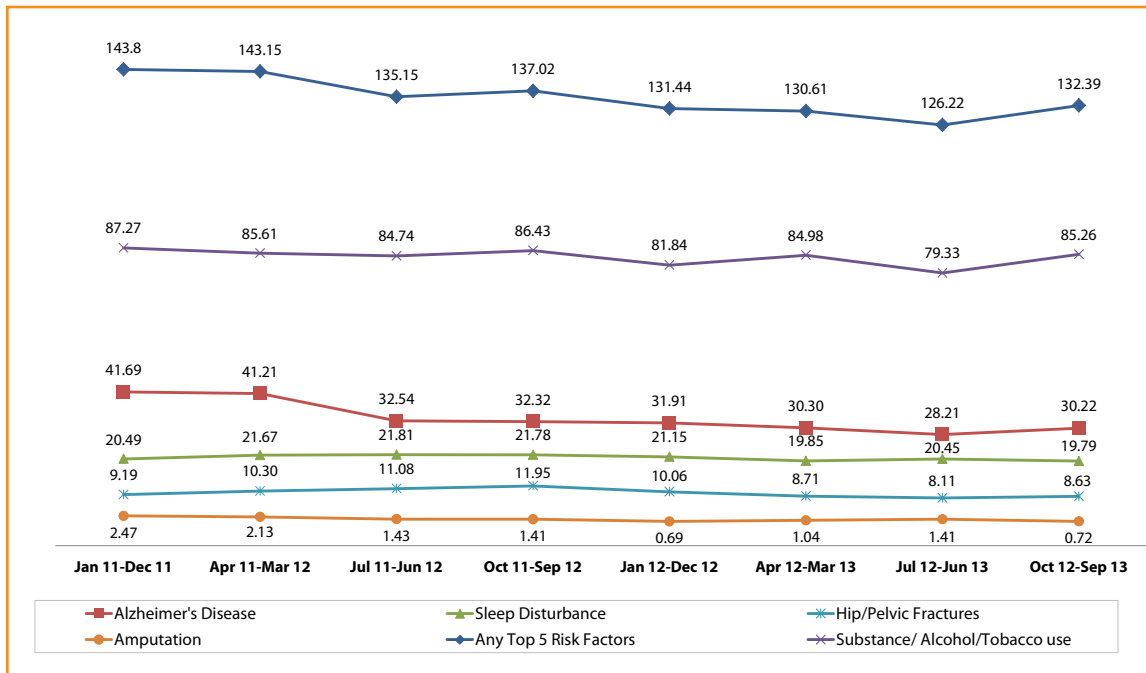
For Medicare FFS beneficiaries residing in the community who were diagnosed with these risk factor conditions prior to being diagnosed with depression or proxy disorders, these conditions may have contributed to the risk of developing depression or proxy disorders. The following figures show the prevalence rates for these five conditions in the 12 months before and after Superstorm Sandy.

### Summary

Figure 36. Percent Change of Prevalence of the Top Five Risk Factors of Depression or Proxy Disorders per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
Any of the Top Five Risk Factors for Depression or Proxy Disorders	137.02	132.39	-3.38	125.62	124.98	-0.51
• Alzheimer’s Disease and related disorders or Senile Dementia	32.32	30.22	-6.50	38.04	35.15	-7.60
• Sleep Disturbance	21.78	19.79	-9.14	25.35	24.74	-2.41
• Substance or Alcohol Abuse or Tobacco Use	86.43	85.26	-1.35	65.93	68.49	3.88
• Hip/Pelvic Fractures	11.95	8.63	-27.78	8.76	8.65	-1.26
• Amputations	1.41	0.72	-48.94	1.06	0.95	-10.38

The South Amboy and Laurence Harbor community experienced a larger decrease in any of the top five risk factors for depression or proxy disorders, hip/pelvic fractures, sleep disturbance, and amputations than Middlesex County.

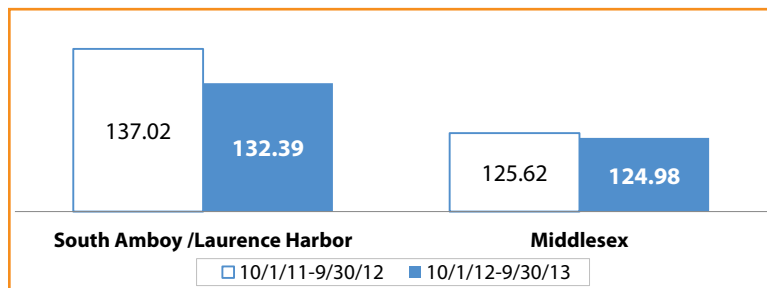
**FIGURE 37. ANNUAL PREVALENCE TREND FOR RISK FACTORS OF DEPRESSION OR PROXY DISORDERS PER 1,000 MEDICARE FFS BENEFICIARIES**



The chart above reflects annual trending in the prevalence of any of the top five risk factors for depression or proxy disorders among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

## Any of the Top Five Risk Factors for Depression or Proxy Disorders

**FIGURE 38. ANNUAL PREVALENCE OF ANY OF THE TOP FIVE RISK FACTORS FOR DEPRESSION OR PROXY DISORDERS PER 1,000 MEDICARE FFS BENEFICIARIES**

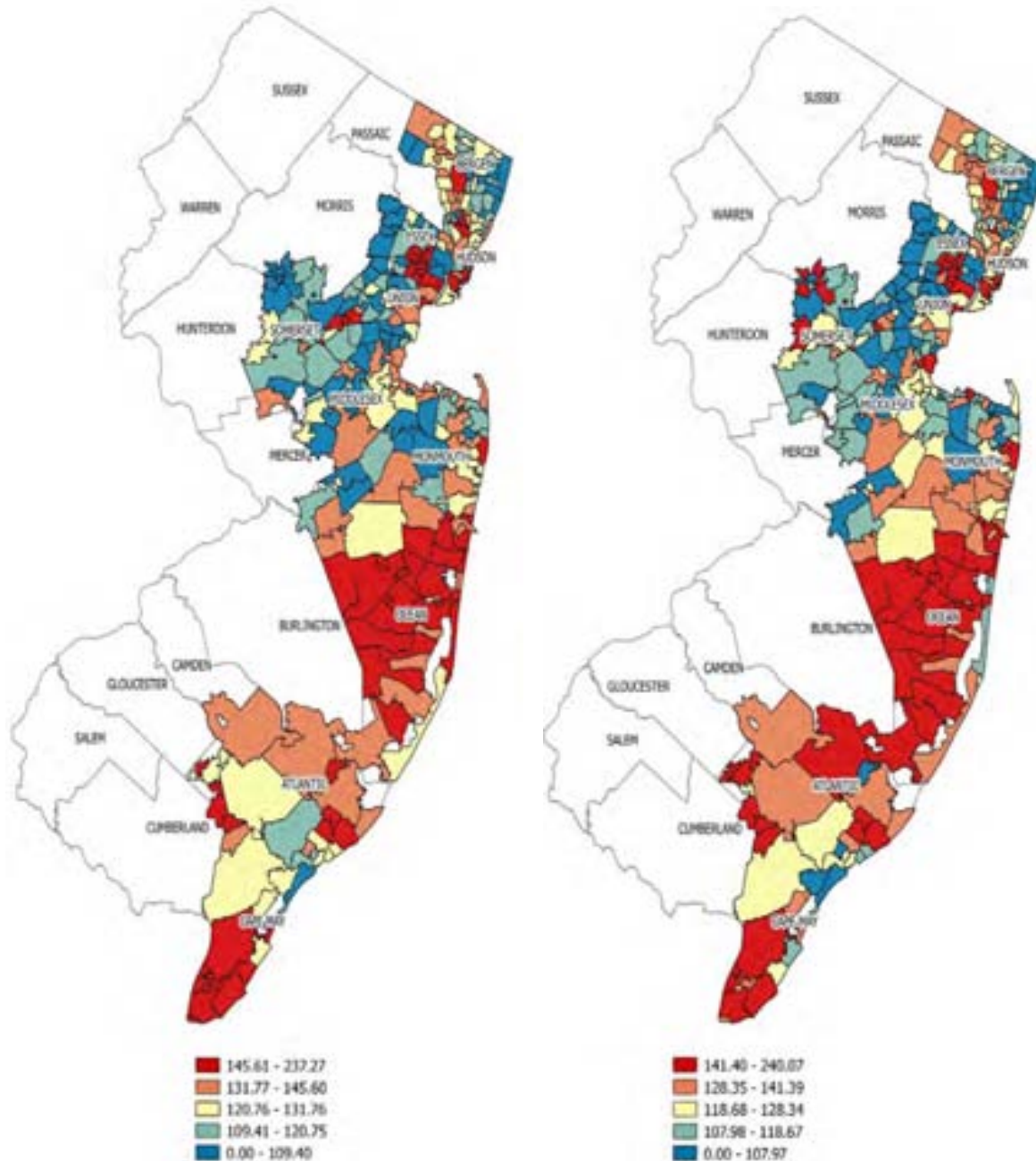


The prevalence rate of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community with any of the top five risk factors for depression or proxy disorders in the 12 months prior to Superstorm Sandy was 137.02 per 1,000 beneficiaries. After the storm, the rate decreased to 132.39 per 1,000 beneficiaries.

**FIGURE 39. PREVALENCE OF ANY OF THE TOP FIVE RISK FACTORS FOR DEPRESSION OR PROXY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES IN 10 COUNTIES**

October 1, 2011 – September 30, 2012

October 1, 2012 – September 30, 2013



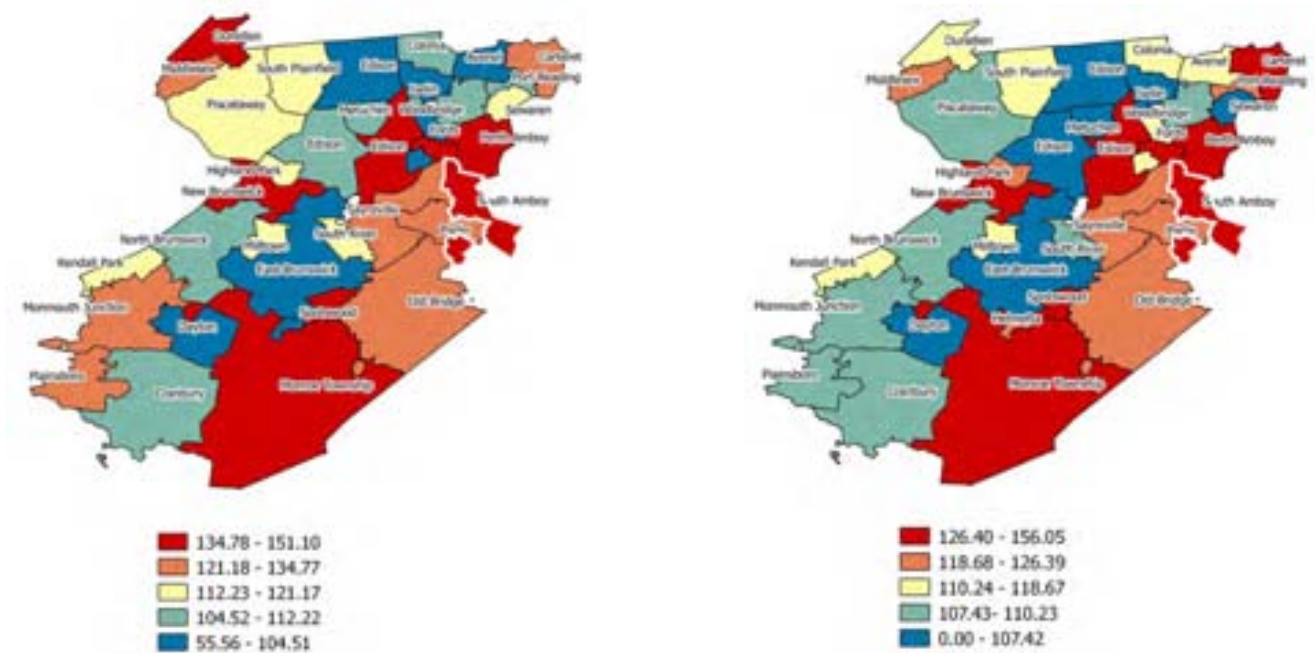
The color-coded map of New Jersey depicts prevalence of any of the top five risk factors from high (red) to low (blue) in the 10 FEMA-declared disaster counties before and after Superstorm Sandy.

\* Mapped using ZIP codes of the 10 counties.

**FIGURE 40. MIDDLESEX COUNTY PREVALENCE OF ANY OF THE TOP FIVE RISK FACTORS FOR DEPRESSION OR PROXY DISORDERS\* PER 1,000 MEDICARE FFS BENEFICIARIES**

October 1, 2011 – September 30, 2012

October 1, 2012 – September 30, 2013

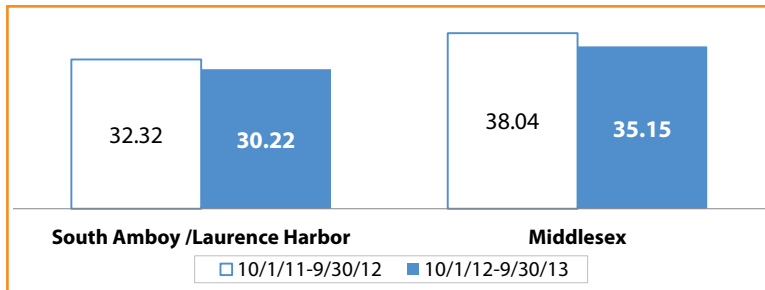


The color-coded map of Middlesex County depicts regional variation of prevalence of any of the top five risk factors from high (red) to low (blue) before and after Superstorm Sandy.

\* Mapped using ZIP codes; may not display all the city names located within the ZIP code.

## Alzheimer’s Disease and Related Disorders or Senile Dementia

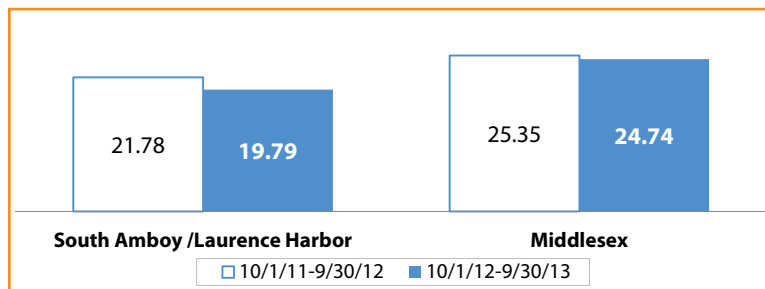
**FIGURE 41. ANNUAL PREVALENCE OF ALZHEIMER’S DISEASE AND RELATED DISORDERS OR SENILE DEMENTIA PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community with Alzheimer’s disease and related disorders or senile dementia in the 12 months prior to Superstorm Sandy was 32.32 per 1,000 beneficiaries. After the storm, the rate decreased to 30.22 per 1,000 beneficiaries.

## Sleep Disturbance

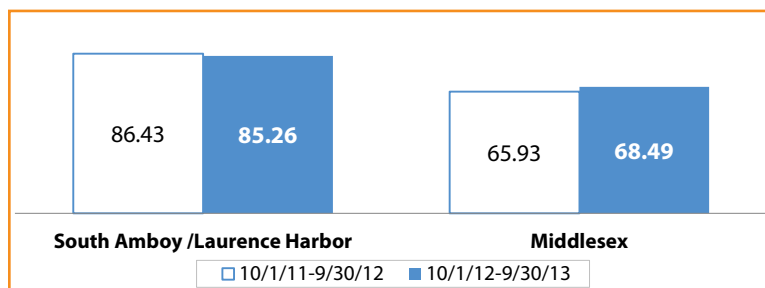
**FIGURE 42. ANNUAL PREVALENCE OF SLEEP DISTURBANCE PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community with sleep disturbance in the 12 months prior to Superstorm Sandy was 21.78 per 1,000 beneficiaries. After the storm, the rate decreased to 19.79 per 1,000 beneficiaries.

## Substance or Alcohol Abuse or Tobacco Use

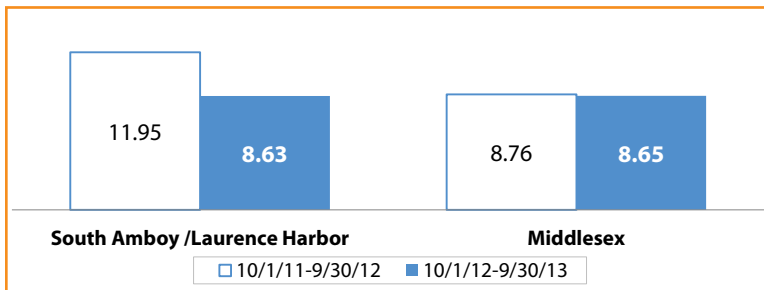
**FIGURE 43. ANNUAL PREVALENCE OF SUBSTANCE OR ALCOHOL ABUSE OR TOBACCO USE PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community with substance or alcohol abuse or tobacco use in the 12 months prior to Superstorm Sandy was 86.43 per 1,000 beneficiaries. After the storm, the rate decreased to 85.26 per 1,000 beneficiaries.

## Hip/Pelvic Fractures

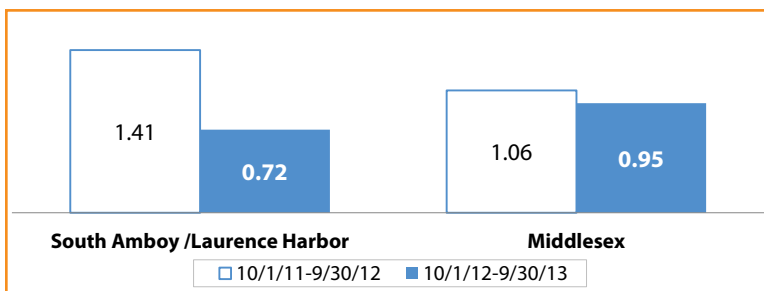
**FIGURE 44. ANNUAL PREVALENCE OF HIP/PELVIC FRACTURES PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community with hip/pelvic fractures in the 12 months prior to Superstorm Sandy was 11.95 per 1,000 beneficiaries. After the storm, the rate decreased to 8.63 per 1,000 beneficiaries.

## Amputations

**FIGURE 45. ANNUAL PREVALENCE OF AMPUTATIONS PER 1,000 MEDICARE FFS BENEFICIARIES**



The prevalence rate of Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community with amputations in the 12 months prior to Superstorm Sandy was 1.41 per 1,000 beneficiaries. After the storm, the rate decreased to 0.72 per 1,000 beneficiaries.

# UTILIZATION OF OUTPATIENT BEHAVIORAL HEALTH SERVICES

## Assessments\*

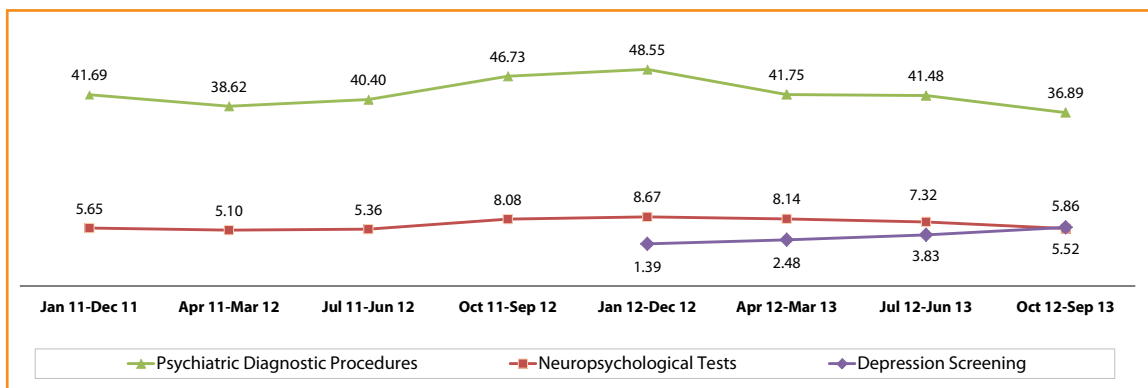
### Summary

Figure 46. Percent Change of Behavioral Health Service Utilization – Assessments per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
Annual Depression Screening**	1.39	5.86	321.58	7.50	9.41	25.47
Psychiatric Diagnostic Procedures	46.73	36.89	-21.06	47.91	39.11	-18.37
Neuropsychological Tests	8.08	5.52	-31.68	7.81	8.19	4.87

\*\* Depression screening comparison time frames are different (January 1, 2012 – December 31, 2012 vs. October 1, 2012 – September 30, 2013)

Annual depression screening in the South Amboy and Laurence Harbor community has increased from 1.39 per 1,000 Medicare FFS beneficiaries to 5.86 per 1,000 beneficiaries. Psychiatric diagnostic procedures and neuropsychological tests decreased.

**FIGURE 47. ANNUAL UTILIZATION TREND OF BEHAVIORAL HEALTH ASSESSMENT SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



The chart above reflects annual trending in the utilization of behavioral health assessment services among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

### Depression Screening

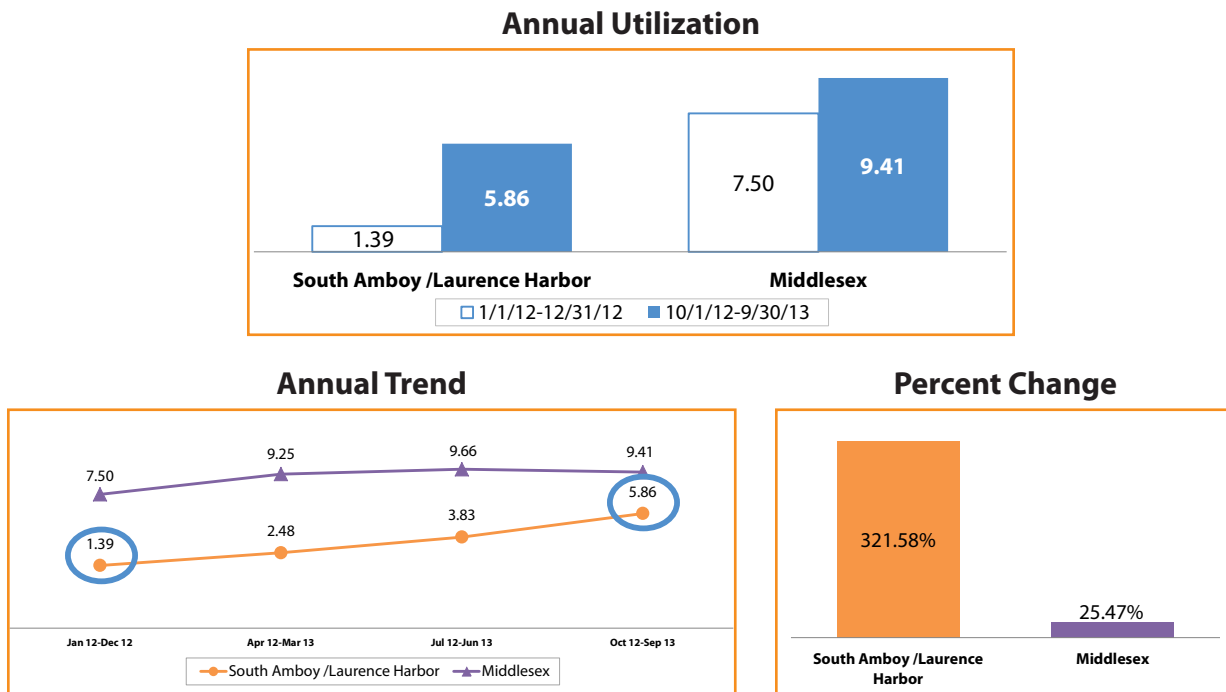
One of the long-term goals of this project is to increase the awareness and use of Medicare-covered depression screening among at-risk Medicare FFS beneficiaries residing in the 10 counties during Superstorm Sandy.

\*The utilization rates for Diagnostic Psychological Tests and Health and Behavior Assessment/Intervention are not provided in this profile due to low rates.

Beginning October 2011, depression screening became a Medicare-covered service. According to the CMS Screening for Depression Booklet,<sup>7</sup> Medicare Part B covers an annual screening for depression of 15 minutes in length for beneficiaries in primary care settings when staff-assisted depression care supports are in place to assure accurate diagnosis, effective treatment, and follow-up. The first quarter of data in this profile for depression screening starts on January 2012 since there were only 14 claims filed for depression screening in the last quarter of 2011 in all 10 counties.

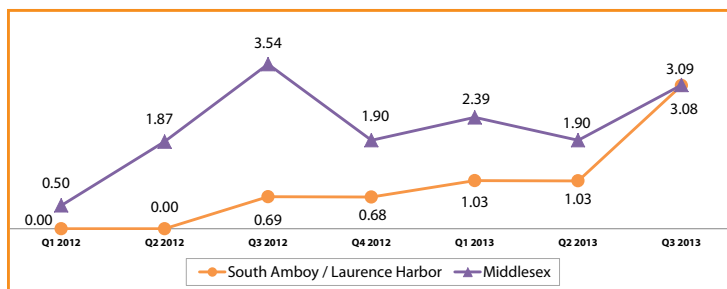
The depression screening utilization rates have been low in all 10 communities.

**FIGURE 48. DEPRESSION SCREENING PER 1,000 MEDICARE FFS BENEFICIARIES**



The rate of depression screening in the South Amboy and Laurence Harbor community for calendar year 2012 was 1.39 per 1,000 Medicare FFS beneficiaries. After the storm, this rate increased to 5.86 per 1,000 beneficiaries, reflecting a 321.58% relative increase.

**FIGURE 49. QUARTERLY DEPRESSION SCREENING\* PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of quarterly utilization of depression screening among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

\* Quarterly new incidences of conditions that were non-existent (not reported) in the last 12 months.

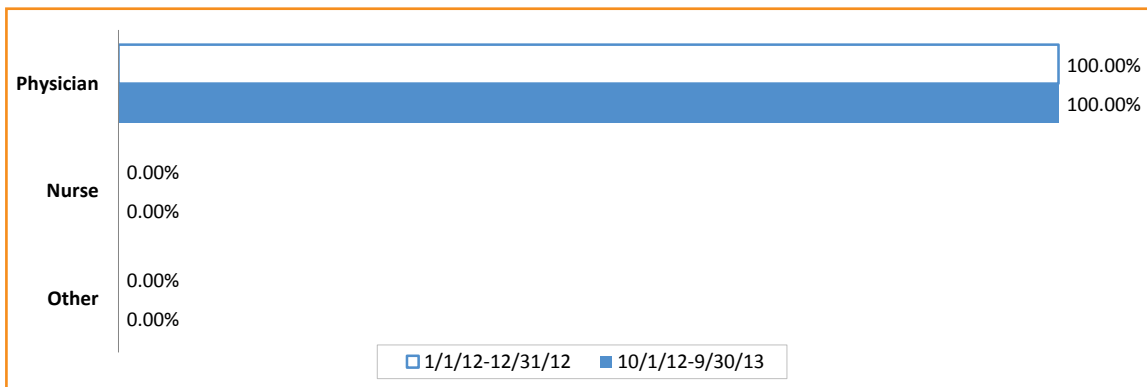


Figure 50. Provider Location for Depression Screening* Claims for Medicare FFS Beneficiaries Residing in South Amboy and Laurence Harbor Community				
Providers	1/1/12-12/31/12		10/1/12-9/30/13	
	Number of Claims N=4	Percent	Number of Claims N=17	Percent
Outside of New Jersey	0	0.0	0	0.0
New Jersey	4	100.0	17	100.0
• Middlesex County	2	50.0	11	64.7
– South Amboy and Laurence Harbor Community	0	0.0	0	0.0
• Other Counties	2	50.0	6	35.3

\* Depression screening is a one time benefit per year. Depression screening comparison time frames are different (January 1, 2012 – December 31, 2012 vs. October 1, 2012 – September 30, 2013)

After Superstorm Sandy, of the 17 claims filed for a depression screening for beneficiaries residing in the South Amboy and Laurence Harbor community, 0.00% were filed outside of New Jersey and 100.00% were filed within New Jersey. Of those filed within New Jersey, 64.7% were filed within Middlesex County, and 35.3% were filed in other counties.

**FIGURE 51. DEPRESSION SCREENING\* CLAIMS FOR MEDICARE FFS BENEFICIARIES**



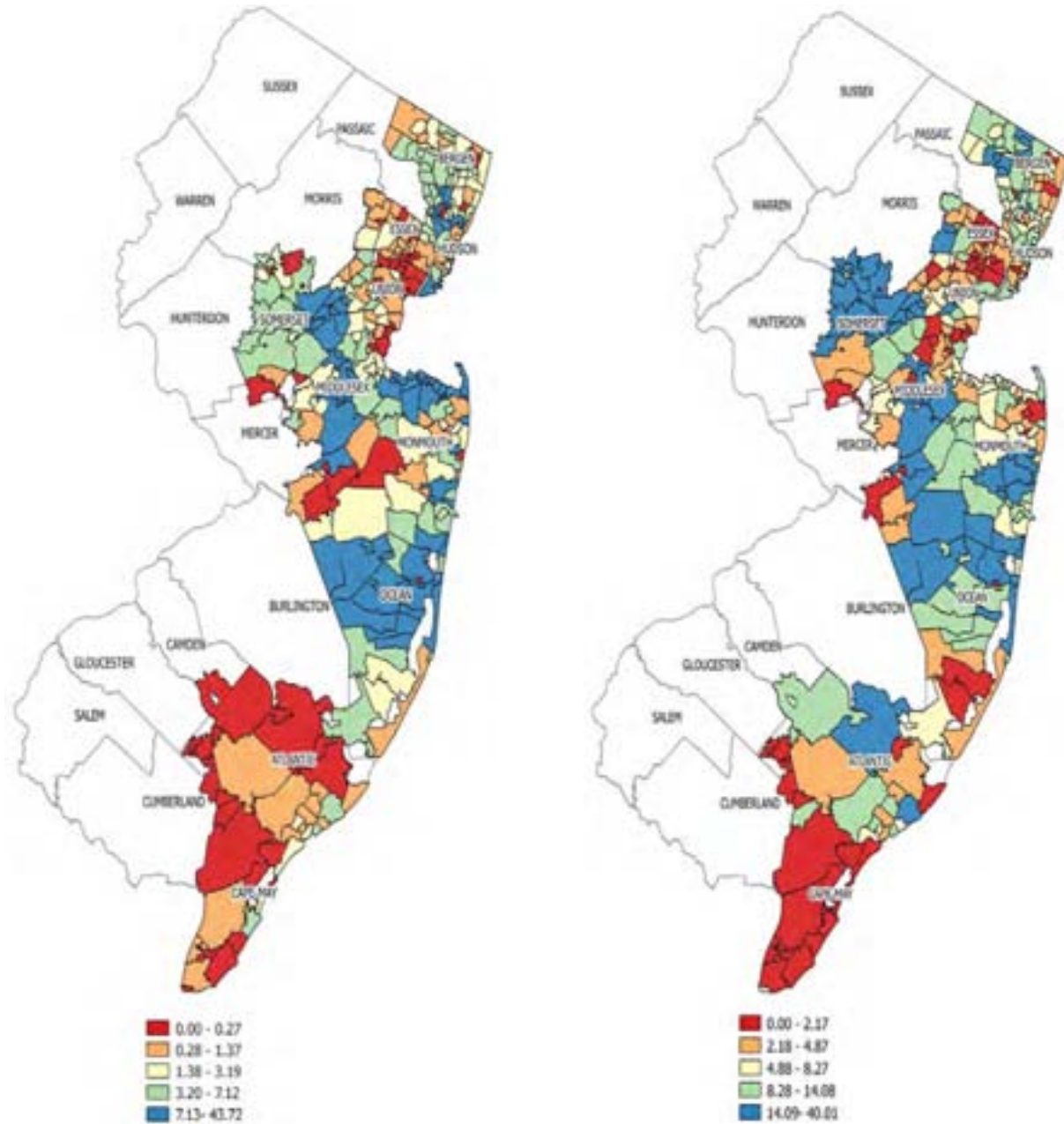
\* Depression screening is a one time benefit per year

In the 12 months prior to Superstorm Sandy, 100.00% of depression screening claims were filed by physicians. After the storm, all depression screening claims were also filed by physicians.

**FIGURE 52. DEPRESSION SCREENING\*  
PER 1,000 MEDICARE FFS BENEFICIARIES IN 10 COUNTIES**

January 1, 2012 – December 31, 2012

October 1, 2012 – September 30, 2013



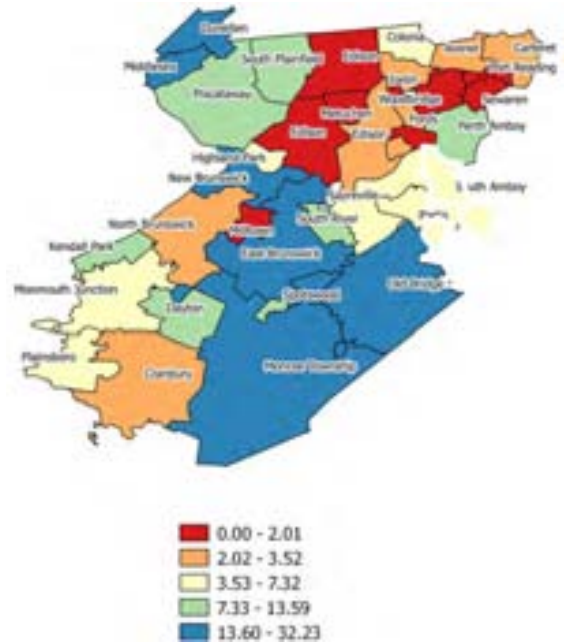
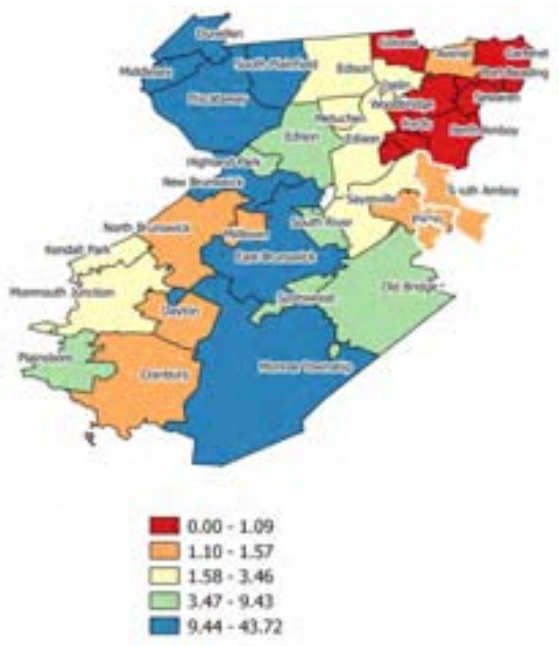
The color-coded map of New Jersey depicts the use of depression screening from low (red) to high (blue) in the 10 FEMA-declared disaster counties before and after Superstorm Sandy.

\* Mapped using ZIP codes of the 10 counties.

**FIGURE 53. MIDDLESEX COUNTY DEPRESSION SCREENING\*  
PER 1,000 MEDICARE FFS BENEFICIARIES**

January 1, 2012 – December 31, 2012

October 1, 2012 – September 30, 2013



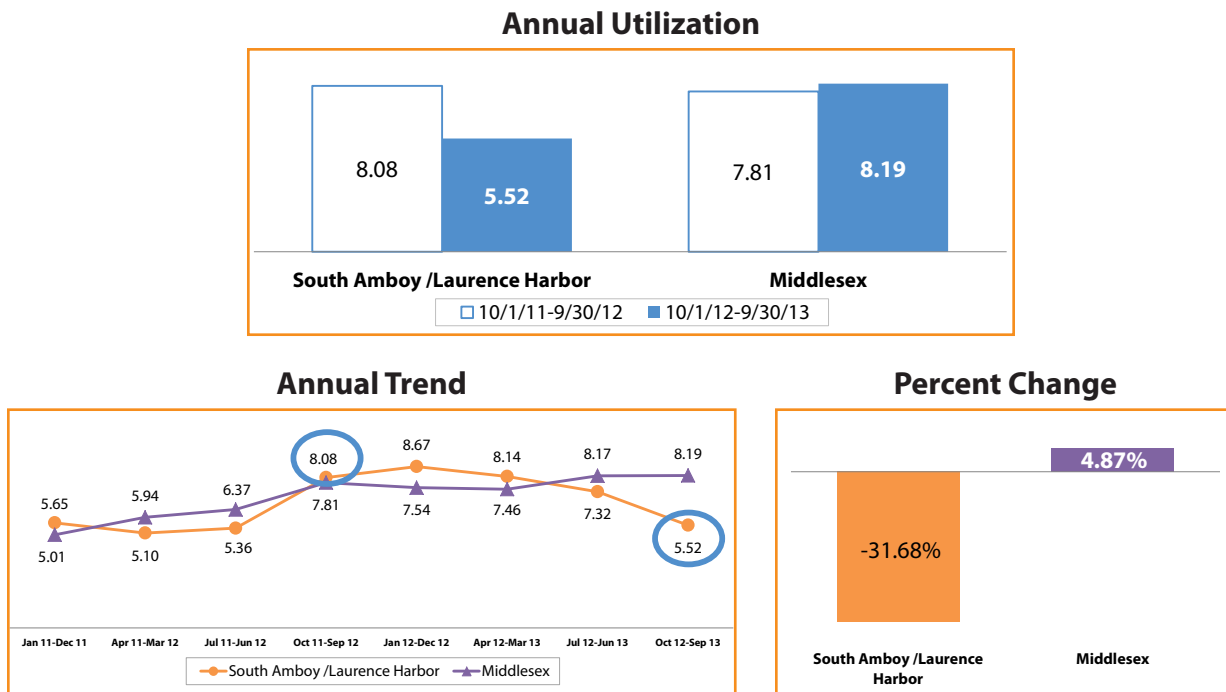
The color-coded map of Middlesex County depicts regional variation in the rates of the use of the depression screening benefit from low (red) to high (blue) before and after Superstorm Sandy.

\* Mapped using ZIP codes; may not display all the city names located within the ZIP code.

### Neuropsychological Tests

According to the CMS Mental Health Services Billing Guide, neuropsychological tests are evaluations designed to determine the functional consequences of known or suspected brain injury through testing of the neurocognitive domains responsible for language, perception, memory, learning, problem solving, and adaptation.<sup>8</sup>

**FIGURE 54. NEUROPSYCHOLOGICAL TESTS PER 1,000 MEDICARE FFS BENEFICIARIES**



The rate of neuropsychological tests among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 8.08 per 1,000 beneficiaries. After the storm, this rate decreased to 5.52 per 1,000 beneficiaries, reflecting a 31.68% relative decrease.

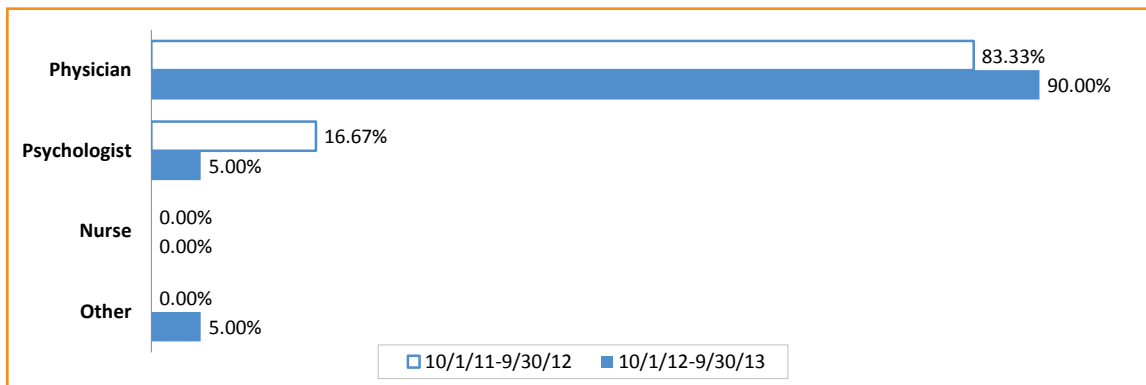
**Figure 55. Provider Location for Neuropsychological Tests Claims for Medicare FFS Beneficiaries Residing in South Amboy and Laurence Harbor Community\***

Providers	10/1/11-9/30/12		10/1/12-9/30/13	
	Number of Claims N=30	Percent	Number of Claims N=20	Percent
Outside of New Jersey	0	0.0	1	5.0
New Jersey	30	100.0	19	95.0
• Middlesex County	15	50.0	12	60.0
– South Amboy and Laurence Harbor Community	0	0.0	0	0.0
• Other Counties	15	50.0	7	35.0

\* Number of claims, instead of unique beneficiaries were used in this analysis because a beneficiary can have multiple encounters for these procedures at different locations.

After Superstorm Sandy, of the 20 claims filed for neuropsychological tests for Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community, 5.0% were filed outside of New Jersey and 95.0% were filed within New Jersey. Of those filed within New Jersey, 60.0% were filed within Middlesex County, 0.0% were filed within the South Amboy and Laurence Harbor community and 35.0% were filed in other counties.

**FIGURE 56. NEUROPSYCHOLOGICAL TESTS CLAIMS FOR MEDICARE FFS BENEFICIARIES**

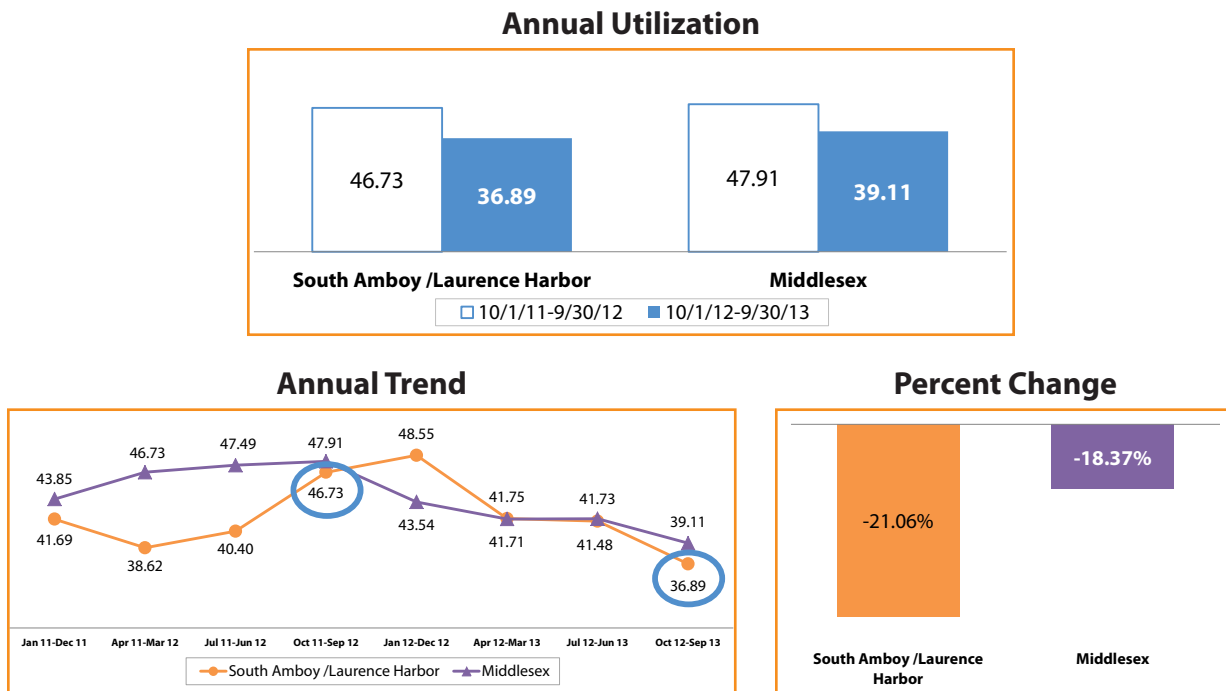


In the 12 months prior to Superstorm Sandy, 83.33% of neuropsychological tests claims were filed by physicians, and 16.67% were filed by psychologists. After the storm, 90.00% of neuropsychological tests claims were filed by physicians, 5.00% were filed by psychologists, and 5.00% were filed by others.

## Psychiatric Diagnostic Procedures

According to the CMS Mental Health Services Billing Guide, psychiatric diagnostic evaluation is an integrated biopsychosocial assessment, including history, mental status, and recommendations. The evaluation may include communication with family or other sources and review of diagnostic studies.<sup>8</sup>

**FIGURE 57. PSYCHIATRIC DIAGNOSTIC PROCEDURES PER 1,000 MEDICARE FFS BENEFICIARIES**



The rate of psychiatric diagnostic procedures among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 46.73 per 1,000 beneficiaries. After the storm, this rate decreased to 36.89 per 1,000 beneficiaries, reflecting a 21.06% relative decrease.

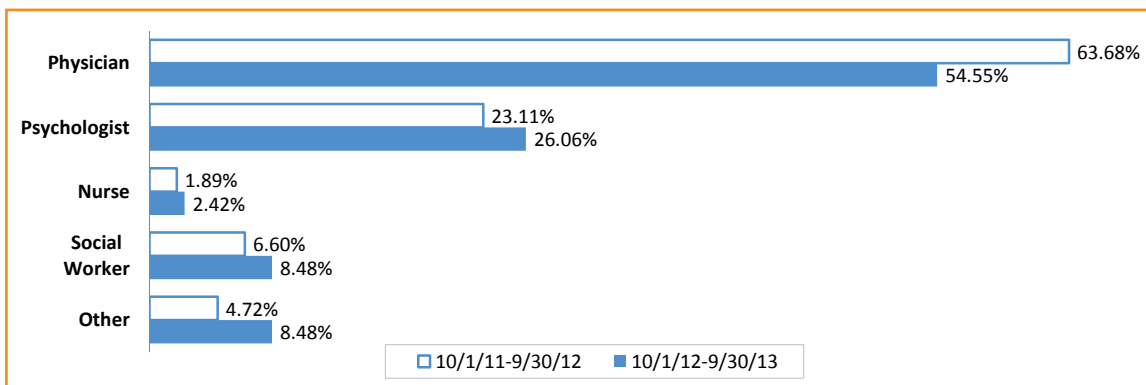
**Figure 58. Provider Location for Psychiatric Diagnostic Procedures Claims for Medicare FFS Beneficiaries Residing in South Amboy and Laurence Harbor Community\***

Providers	10/1/11-9/30/12		10/1/12-9/30/13	
	Number of Claims N=212	Percent	Number of Claims N=165	Percent
Outside of New Jersey	3	1.4	7	4.2
New Jersey	209	98.6	158	95.8
• Middlesex County	81	38.2	53	32.1
– South Amboy and Laurence Harbor Community	0	0.0	0	0.0
• Other Counties	128	60.4	105	63.6

\* Number of claims, instead of unique beneficiaries were used in this analysis because a beneficiary can have multiple encounters for these procedures at different locations.

After Superstorm Sandy, of the 165 claims filed for psychiatric diagnostic procedures for Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community, 4.2% were filed outside of New Jersey and 95.8% were filed within New Jersey. Of those filed within New Jersey, 32.1% were filed within Middlesex County, 0.0% were filed in the South Amboy and Laurence Harbor community, and 63.6% were filed in other counties.

**FIGURE 59. PSYCHIATRIC DIAGNOSTIC PROCEDURES CLAIMS FOR MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, 63.68% of psychiatric diagnostic procedures claims were filed by physicians, 23.11% were filed by psychologists, 6.60% were filed by social workers, 4.72% were filed by others, and 1.89% were filed by nurses.

After the storm, 54.55% of psychiatric diagnostic procedures claims were filed by physicians, 26.06% were filed by psychologists, 8.48% were filed by others, 8.48% were filed by social workers, and 2.42% were filed by nurses.

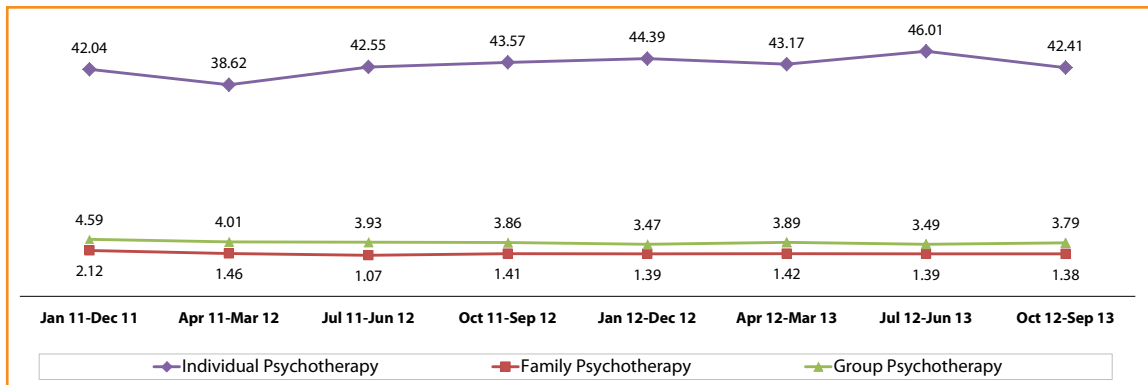
## Therapies\*

### Summary

Figure 60. Percent Change of Behavioral Health Service Utilization – Therapies per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
Individual Psychotherapy	43.57	42.41	-2.66	53.33	51.12	-4.14
Family Psychotherapy	1.41	1.38	-2.13	3.07	2.57	-16.29
Group Psychotherapy	3.86	3.79	-1.81	5.35	4.79	-10.47

The South Amboy and Laurence Harbor community experienced a smaller decrease in the utilization of individual psychotherapy, family psychotherapy, and group psychotherapy than Middlesex County.

**FIGURE 61. ANNUAL UTILIZATION TREND OF BEHAVIORAL HEALTH THERAPY SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of annual utilization of behavioral health therapy services among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

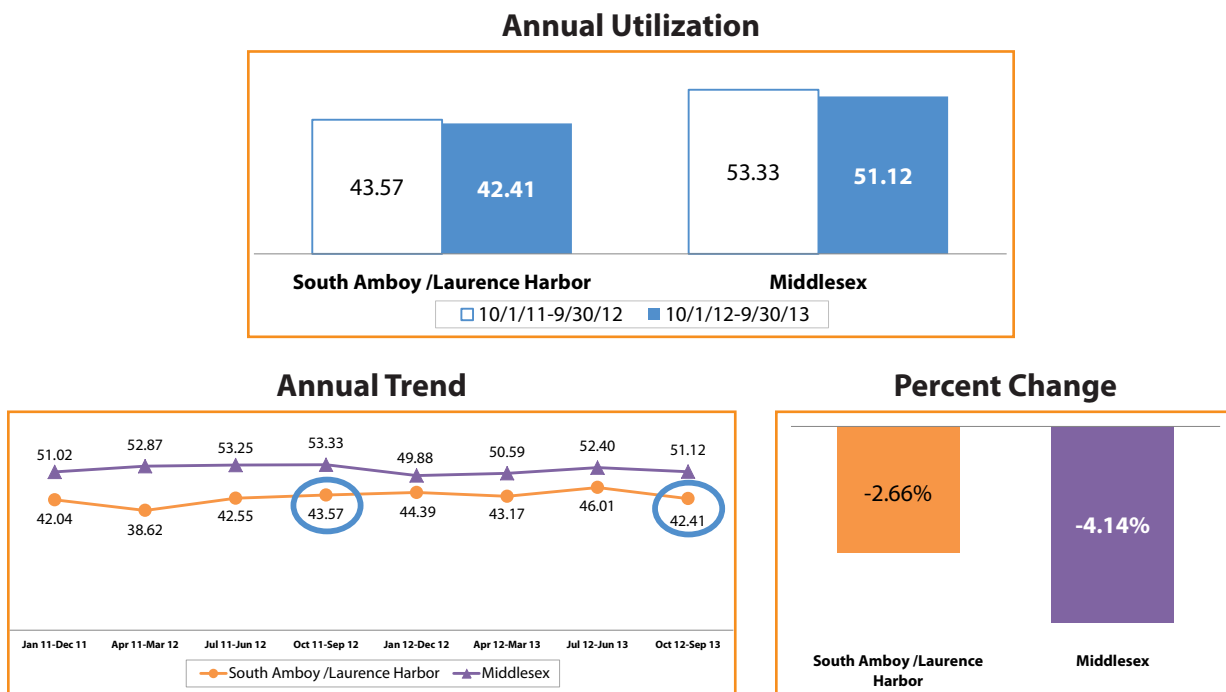
\*The utilization rates for Electroconvulsive Therapy and Biofeedback Therapy are not provided in this profile due to low rates.



## Individual Psychotherapy

According to the CMS Mental Health Services Billing Guide, individual psychotherapy is the treatment of mental illness and behavioral disturbances where the physician or other qualified health professional attempts to alleviate the emotional disturbances, reverse or change maladaptive patterns of behavior, and encourage personality growth and development. This is done through the use of definitive therapeutic communication.<sup>8</sup>

**FIGURE 62. INDIVIDUAL PSYCHOTHERAPY PER 1,000 MEDICARE FFS BENEFICIARIES**



The rate of individual psychotherapy among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 43.57 per 1,000 beneficiaries. After the storm, this rate decreased to 42.41 per 1,000 beneficiaries, reflecting a 2.66% relative decrease.

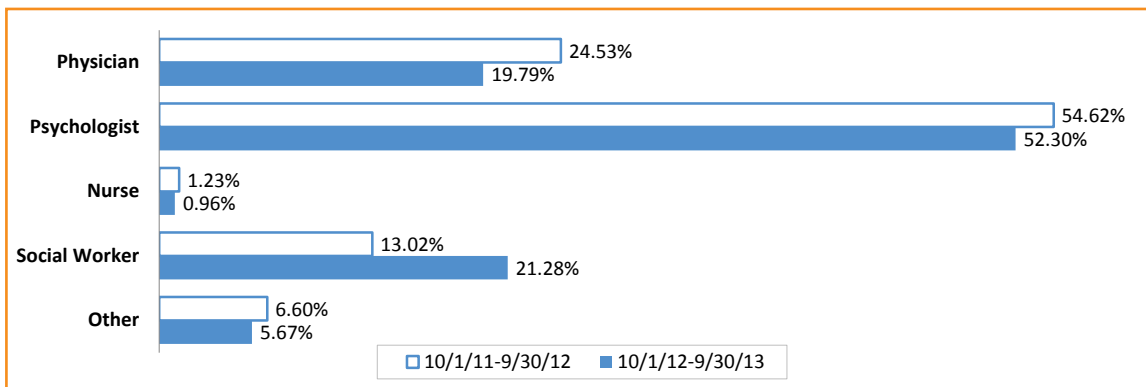
**Figure 63. Provider Location for Individual Psychotherapy Claims for Medicare FFS Beneficiaries Residing in South Amboy and Laurence Harbor Community\***

Providers	10/1/11-9/30/12		10/1/12-9/30/13	
	Number of Claims N=1,060	Percent	Number of Claims N=935	Percent
Outside of New Jersey	25	2.4	37	4.0
New Jersey	1,035	97.6	898	96.0
• Middlesex County	473	44.6	395	42.2
– South Amboy and Laurence Harbor Community	0	0.0	0	0.0
• Other Counties	562	53.0	503	53.8

\* Number of claims, instead of unique beneficiaries were used in this analysis because a beneficiary can have multiple encounters for these procedures at different locations.

After Superstorm Sandy, of the 935 claims filed for individual psychotherapy for beneficiaries residing in the South Amboy and Laurence Harbor community, 4.0% were filed outside of New Jersey and 96.0% were filed within New Jersey. Of those filed within New Jersey, 42.2% were filed within Middlesex County, 0.0% were filed in the South Amboy and Laurence Harbor community, and 53.8% were filed in other counties.

**FIGURE 64. INDIVIDUAL PSYCHOTHERAPY CLAIMS FOR MEDICARE FFS BENEFICIARIES**



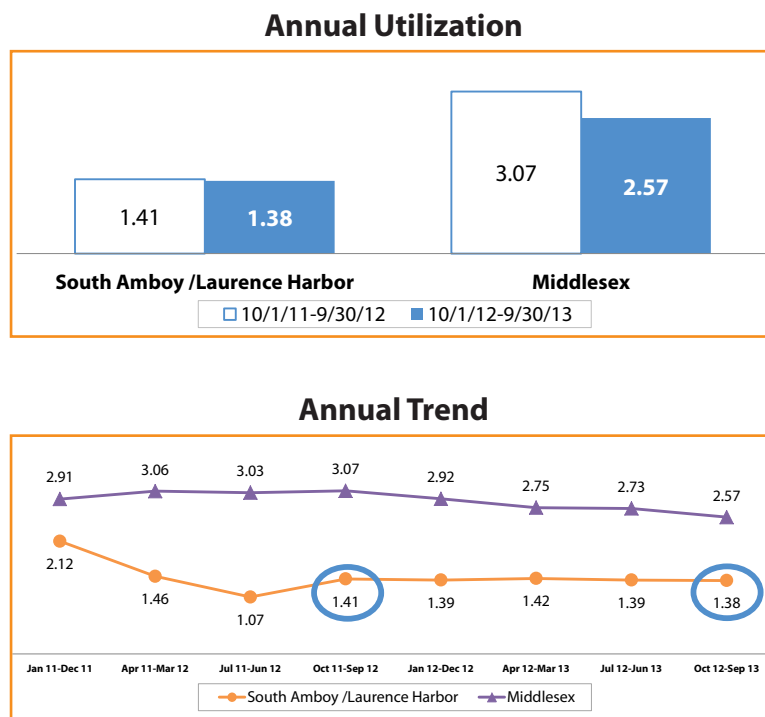
In the 12 months prior to Superstorm Sandy, 54.62% of individual psychotherapy claims were filed by psychologists 24.53% were filed by physicians, 13.02% were filed by social workers, 6.60% were filed by others, and 1.23% were filed by nurses.

After the storm, 52.30% of individual psychotherapy claims were filed by psychologists, 21.28% were filed by social workers, 19.79% were filed by physicians, 5.67% were filed by others, and 0.96% were filed by nurses.

## Family Psychotherapy

According to the CMS Mental Health Services Billing Guide, family psychotherapy describes the treatment of the family unit when maladaptive behaviors of family members are exacerbating the beneficiary’s mental illness or interfering with treatment. It can also be used to assist the family in addressing the maladaptive behaviors of the patient and improve treatment compliance.<sup>8</sup>

**FIGURE 65. FAMILY PSYCHOTHERAPY PER 1,000 MEDICARE FFS BENEFICIARIES**



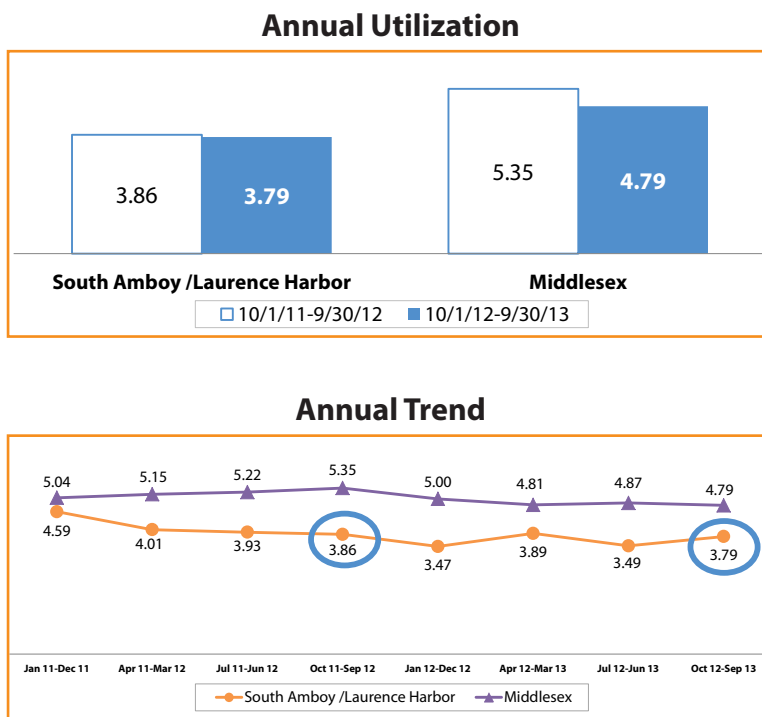
The rate of family psychotherapy among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 1.41 per 1,000 beneficiaries. After the storm, this rate decreased to 1.38 per 1,000 beneficiaries.

Due to these low numbers, no percent change data has been provided for this therapy.

## Group Psychotherapy

According to the CMS Mental Health Services Billing Guide, group psychotherapy is a form of treatment where a selected group of patients are guided by a licensed psychotherapist for the purpose of helping to change maladaptive patterns which interfere with social functioning and are associated with a diagnosable psychiatric illness.<sup>8</sup>

**FIGURE 66. GROUP PSYCHOTHERAPY PER 1,000 MEDICARE FFS BENEFICIARIES**



The rate of group psychotherapy among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community in the 12 months prior to Superstorm Sandy was 3.86 per 1,000 beneficiaries. After the storm, this rate decreased to 3.79 per 1,000 beneficiaries.

Due to these low numbers, no percent change data has been provided for this therapy.

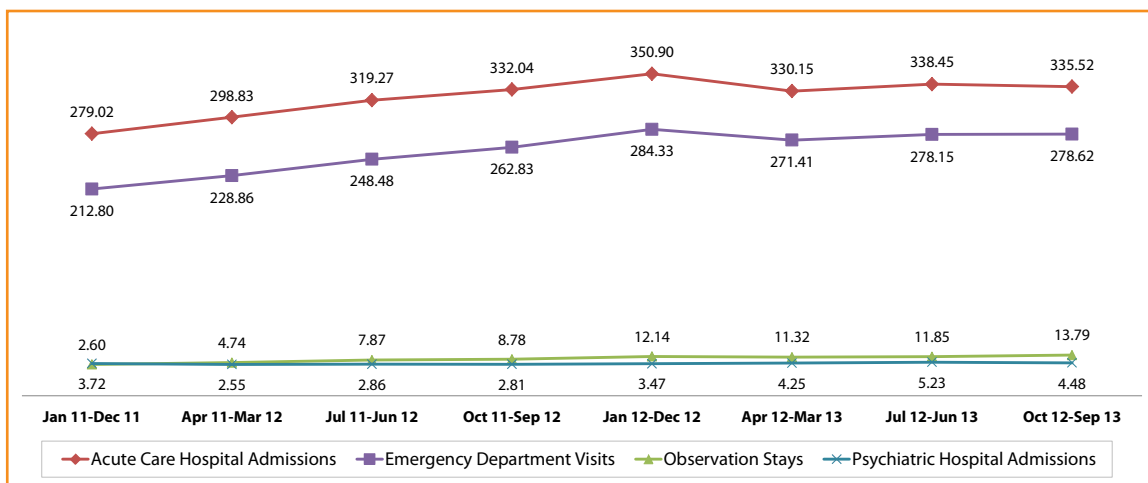
# INPATIENT HEALTH SERVICES

## Summary

Figure 67. Percent Change of Inpatient Health Service Utilization per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
Psychiatric Admissions	2.81	4.48	59.43	7.04	6.55	-6.96
Acute Care Hospital Admissions	332.04	335.52	1.05	298.85	293.11	-1.92
Emergency Department Visits	262.83	278.62	6.01	239.50	239.56	0.03
Observation Stays	8.78	13.79	57.06	15.98	19.06	19.27

The South Amboy and Laurence Harbor community experienced a larger increase in observation stays, as well as in emergency department visits, than Middlesex County.

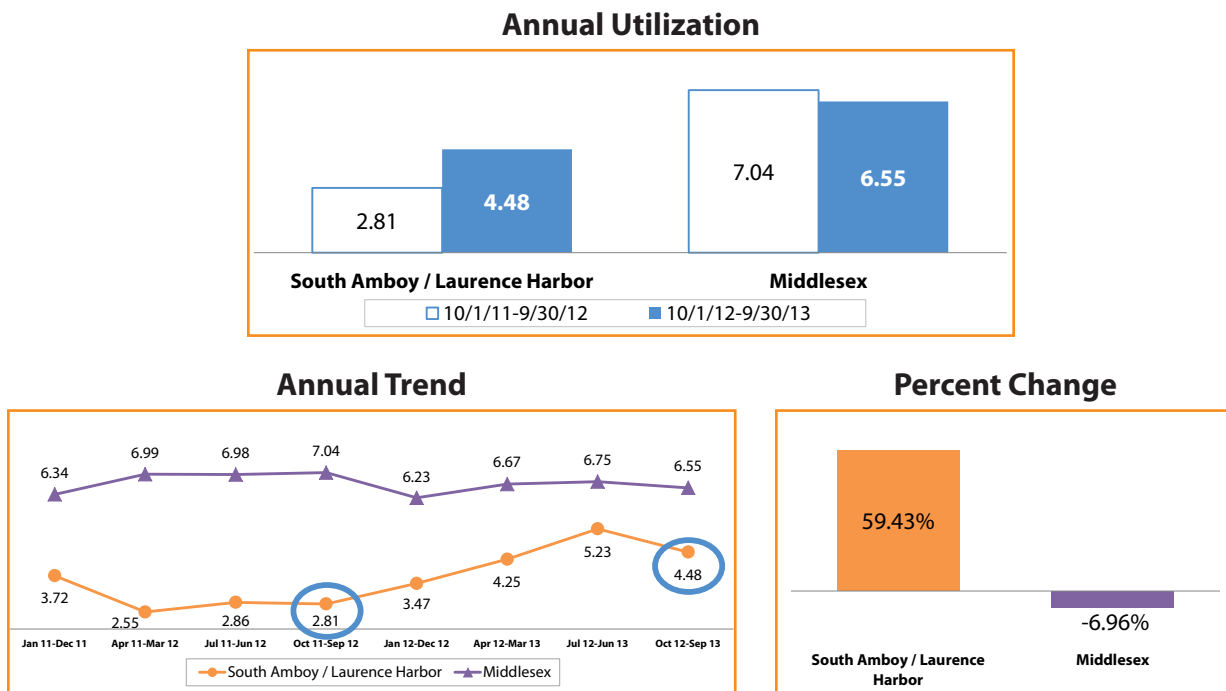
**FIGURE 68. ANNUAL UTILIZATION TREND OF INPATIENT HEALTH SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of annual utilization of inpatient health services among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

## Psychiatric Hospital Admissions

**FIGURE 69. PSYCHIATRIC HOSPITAL ADMISSIONS PER 1,000 MEDICARE FFS BENEFICIARIES**



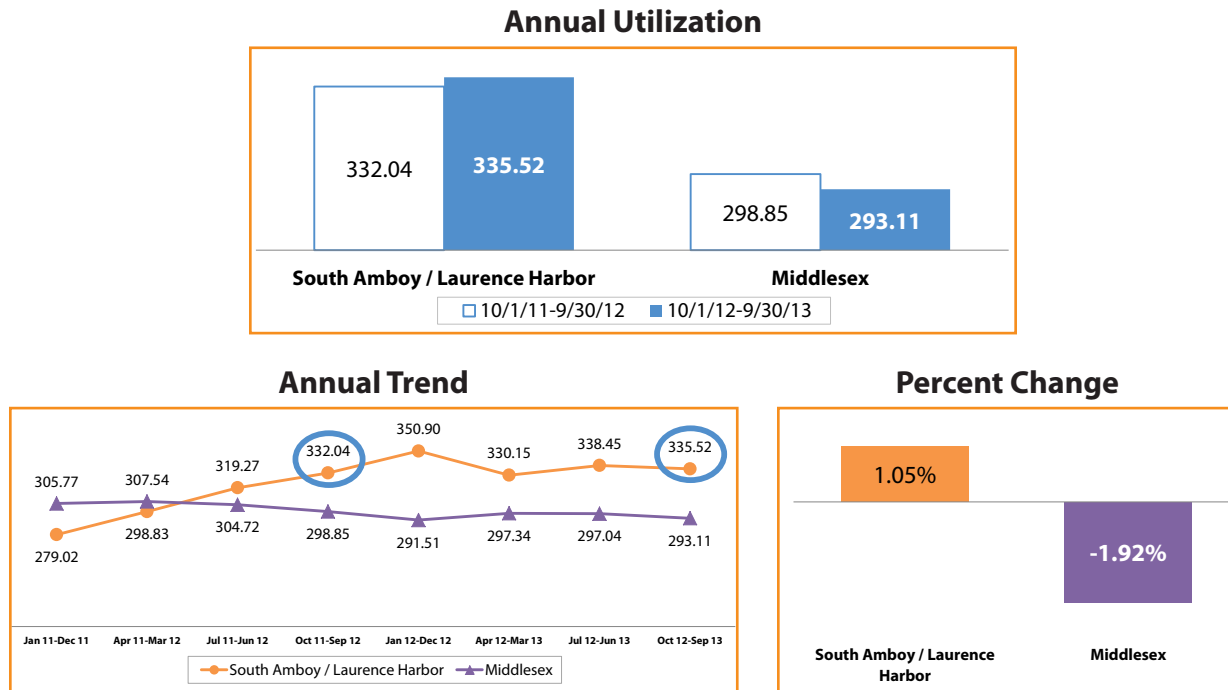
In the 12 months prior to Superstorm Sandy, standalone psychiatric hospitals or distinct part psychiatric units in acute care hospitals in the South Amboy and Laurence Harbor community had an admissions rate of 2.81 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 4.48 per 1,000 beneficiaries, reflecting a 59.43% relative increase.

## Acute Care Hospitals

### Admissions

The following data shows all-cause utilization measures and includes all Medicare FFS beneficiaries, not just beneficiaries with behavioral health conditions.

**FIGURE 70. ACUTE CARE HOSPITAL ADMISSIONS PER 1,000 MEDICARE FFS BENEFICIARIES**

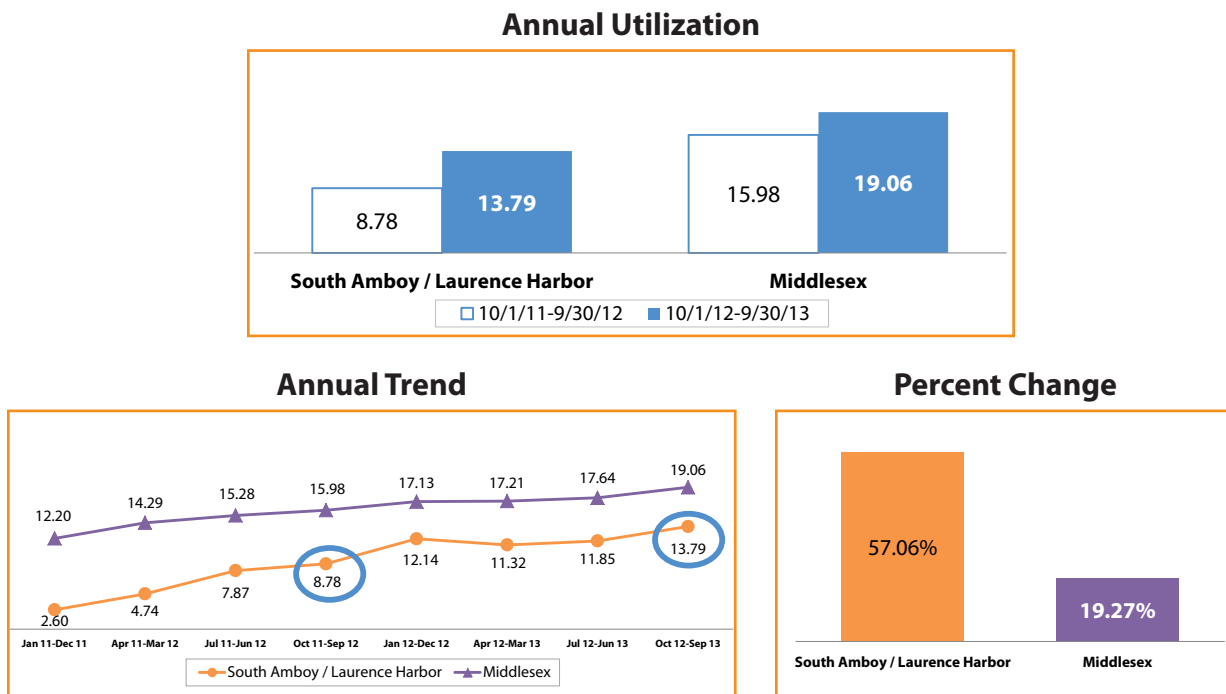


In the 12 months prior to Superstorm Sandy, acute care hospitals in the South Amboy and Laurence Harbor community had an acute care admissions rate of 332.04 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 335.52 per 1,000 beneficiaries, reflecting a 1.05% relative increase.

## Observation Stays

According to the U.S. Department of Health and Human Services, observation stays are short-term treatments and assessments provided to Medicare FFS beneficiaries as outpatients to determine whether they require further treatment as inpatients or can be discharged.

**FIGURE 71. OBSERVATION STAYS PER 1,000 MEDICARE FFS BENEFICIARIES**

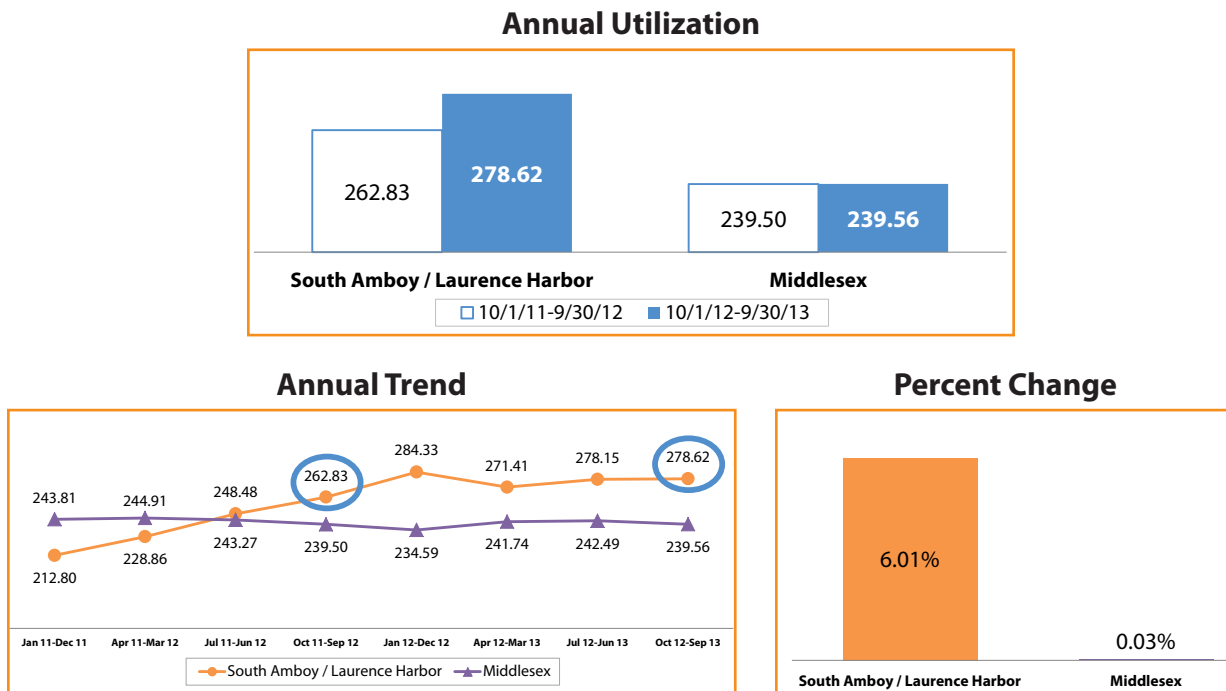


In the 12 months prior to Superstorm Sandy, observation stays in acute care hospitals in the South Amboy and Laurence Harbor community had a rate of 8.78 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 13.79 per 1,000 beneficiaries, reflecting a 57.06% relative increase.



## Emergency Department Visits

**FIGURE 72. EMERGENCY DEPARTMENT VISITS PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, emergency department visits in the South Amby and Laurence Harbor community had a rate of 262.83 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 278.62 per 1,000 beneficiaries, reflecting a 6.01% relative decrease.

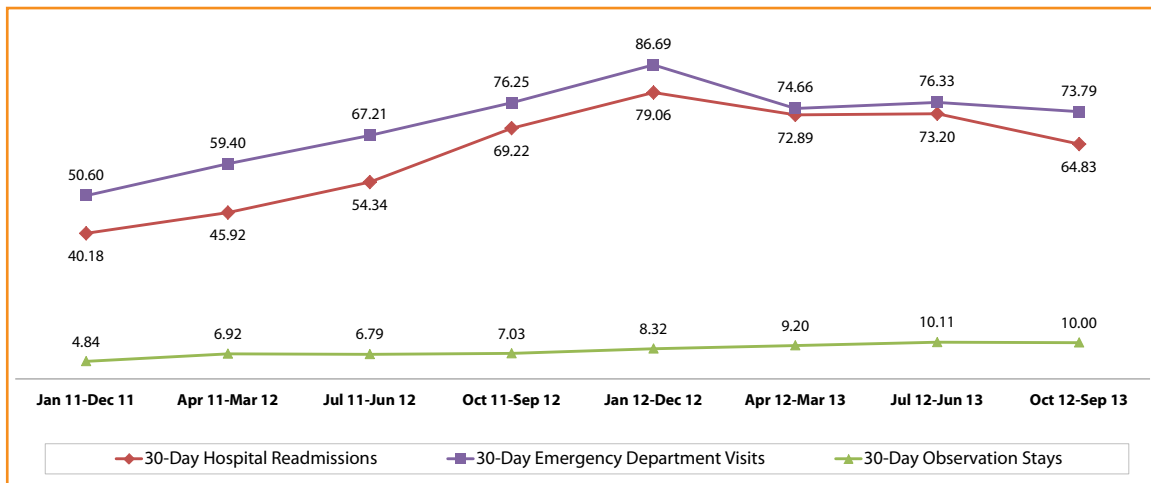
## Within 30 Days of Acute Care Hospital Discharge

### Summary

Figure 73. Percent Change of Inpatient Health Service Utilization Within 30 Days of Discharge per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
30-Day Hospital Readmissions	69.22	64.83	-6.34	57.82	56.68	-1.97
Emergency Department Visits	76.25	73.79	-3.23	69.29	69.46	0.25
Observation Stays	7.03	10.00	42.25	7.63	8.36	9.57

The South Amboy and Laurence Harbor community experienced a larger increase in observation stays than Middlesex County. It also experienced a larger decrease in 30-day hospital readmissions, as well as in emergency department visits, than Middlesex County.

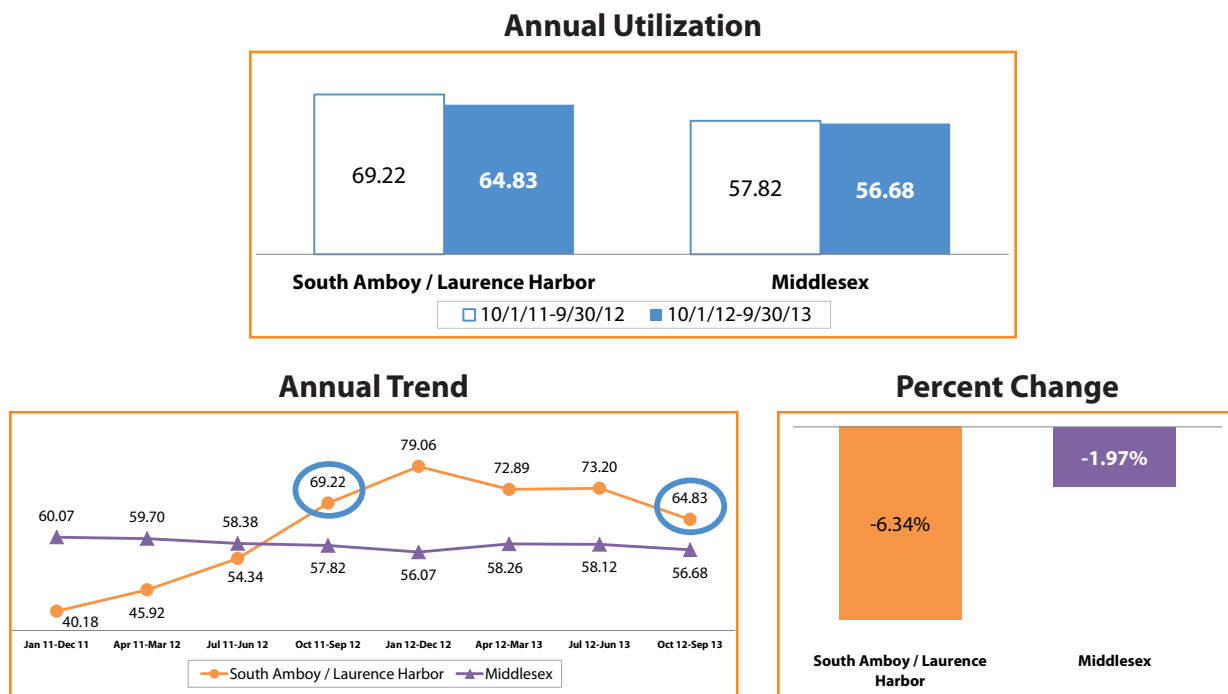
**FIGURE 74. ANNUAL UTILIZATION TREND OF INPATIENT HEALTH SERVICES WITHIN 30 DAYS OF DISCHARGE PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of annual utilization of inpatient health services within 30 days of discharge among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

### 30-Day Hospital Readmissions

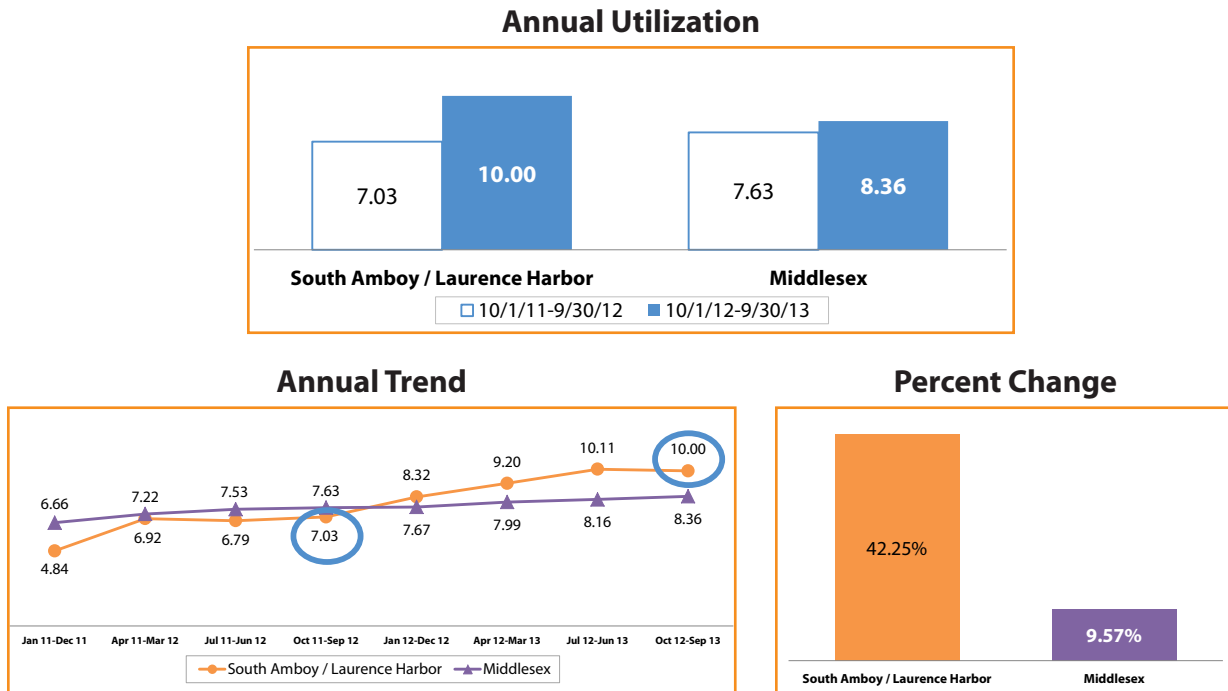
**FIGURE 75. 30-DAY HOSPITAL READMISSIONS PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, acute care hospitals in the South Amboy and Laurence Harbor community had a 30-day readmissions rate of 69.22 per 1,000 Medicare FFS beneficiaries. After the storm, the rate decreased to 64.83 per 1,000 beneficiaries, reflecting a 6.34% relative decrease.

## Observation Stays Within 30 Days of Discharge

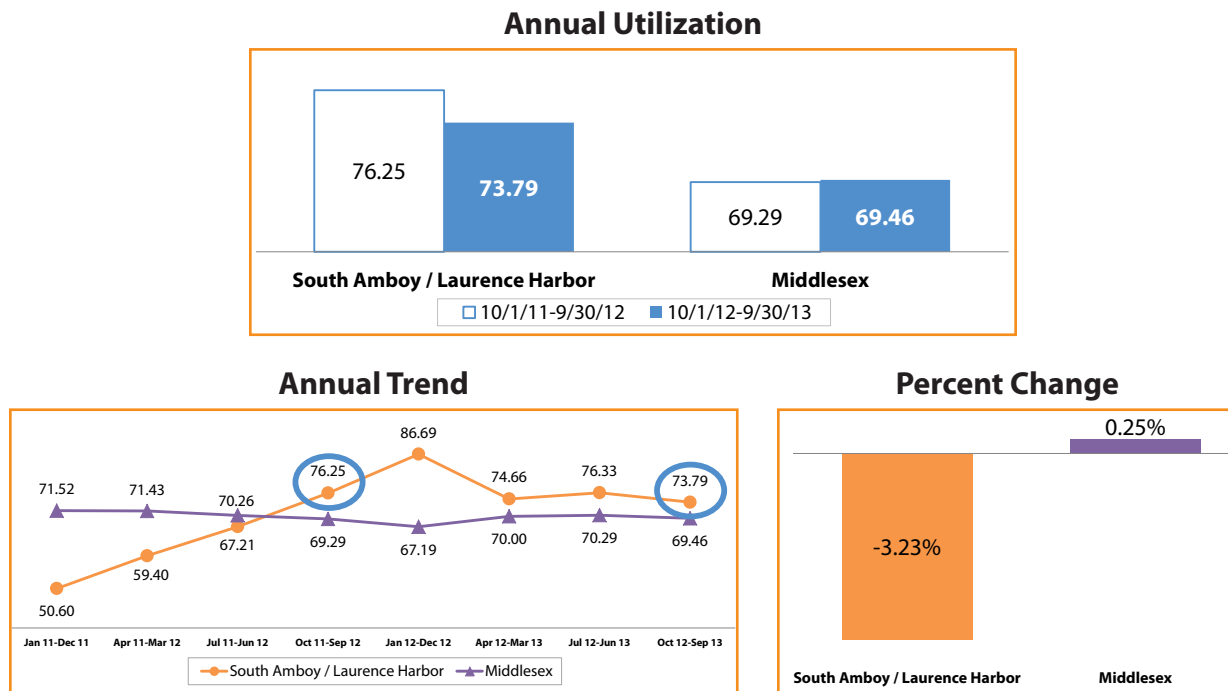
**FIGURE 76. OBSERVATION STAYS WITHIN 30 DAYS OF DISCHARGE PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, the rate of observation stays within 30 days of discharge in the South Amboy and Laurence Harbor community was 7.03 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 10.00 per 1,000 beneficiaries, reflecting a 42.25% relative increase.

## Emergency Department Visits Within 30 Days of Discharge

**FIGURE 77. EMERGENCY DEPARTMENT VISITS WITHIN 30 DAYS OF DISCHARGE PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, the rate of emergency department visits within 30 days of discharge in the South Amboy and Laurence Harbor community was 76.25 per 1,000 Medicare FFS beneficiaries. After the storm, the rate decreased to 73.79 per 1,000 beneficiaries, reflecting a 3.23% relative decrease.

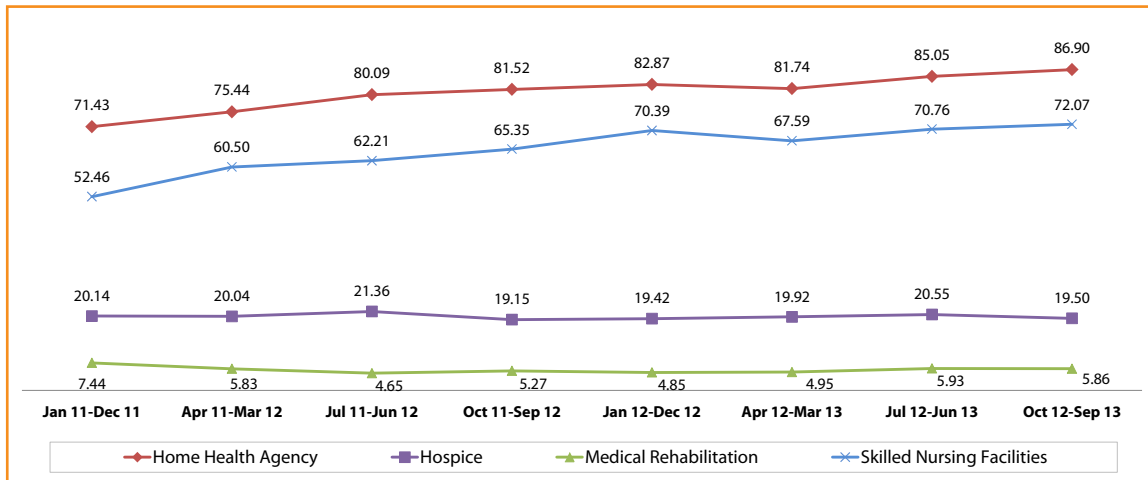
## Other Settings

### Summary

Figure 78. Percent Change of Other Health Services Utilization per 1,000 Medicare FFS Beneficiaries						
	South Amboy and Laurence Harbor			Middlesex		
	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change	10/1/11 – 9/30/12	10/1/12 – 9/30/13	% Change
Home Health Agency	81.52	86.90	6.60	81.77	79.76	-2.46
Skilled Nursing Facility	65.35	72.07	10.28	68.80	68.56	-0.35
Hospice	19.15	19.50	1.83	21.03	21.33	1.43
Medical Rehabilitation	5.27	5.86	11.20	8.93	9.40	5.26

The South Amboy and Laurence Harbor community experienced a larger increase in medical rehabilitation, as well as in hospice services, than Middlesex County.

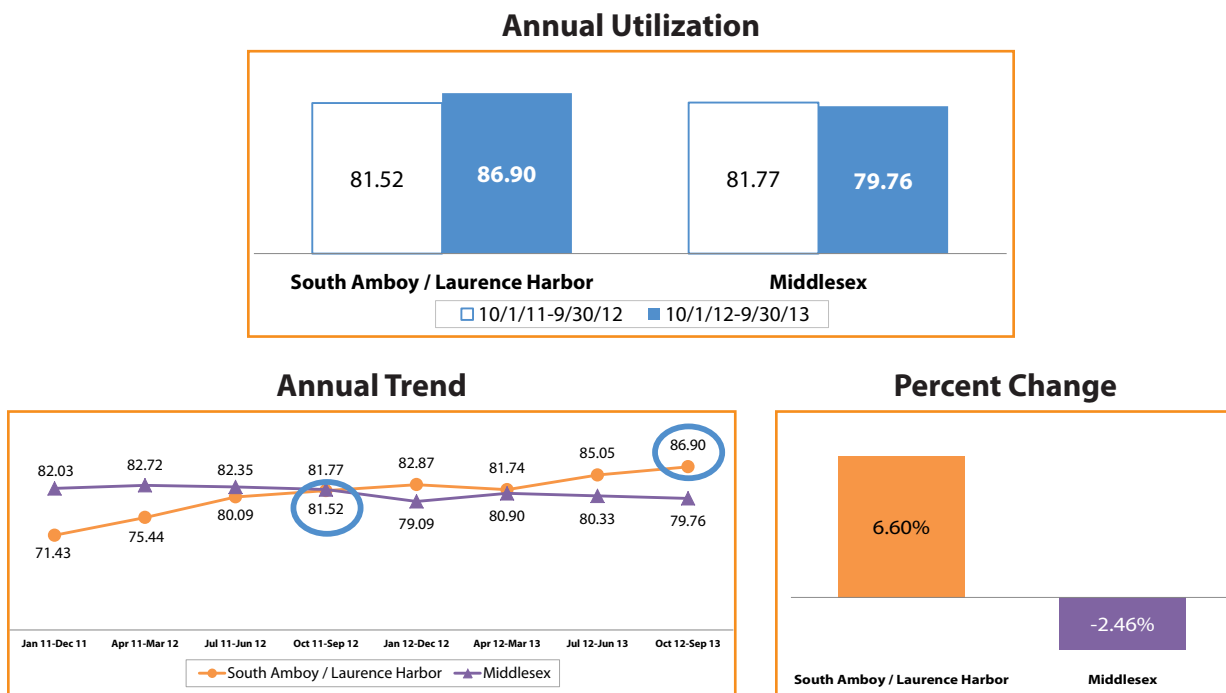
**FIGURE 79. ANNUAL UTILIZATION TREND IN OTHER HEALTH SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



This chart reflects trending of annual utilization of other health services among Medicare FFS beneficiaries residing in the South Amboy and Laurence Harbor community.

## Home Health Agency Services

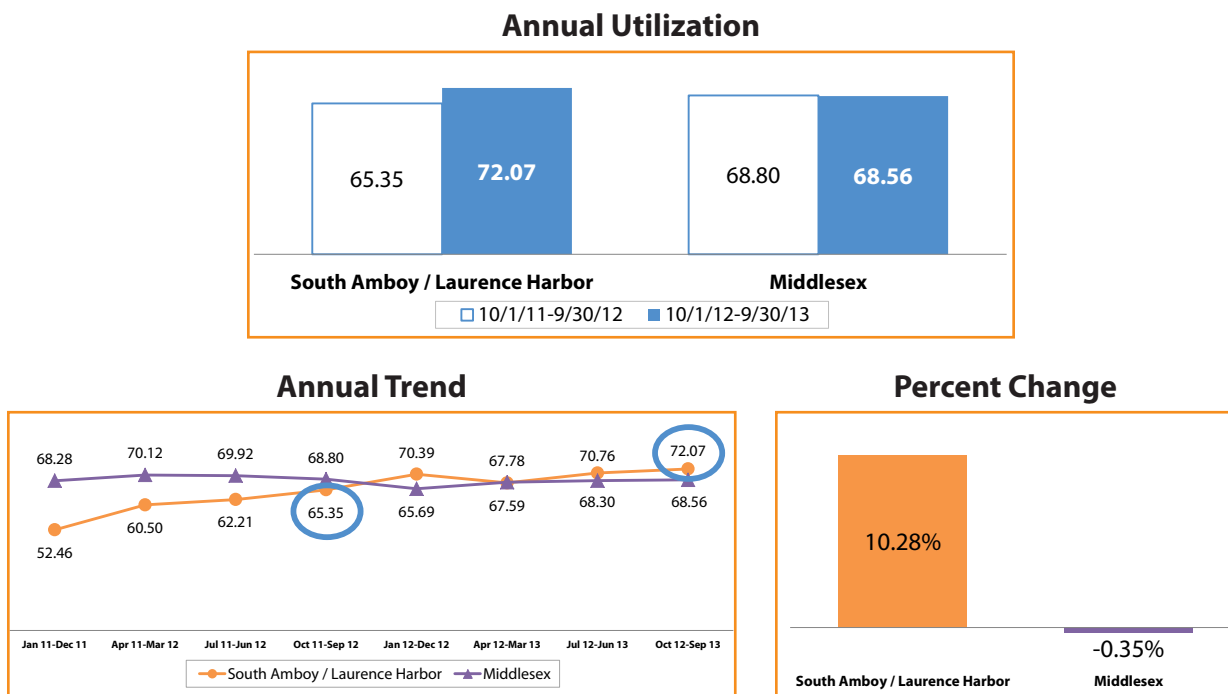
**FIGURE 80. HOME HEALTH AGENCY SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, the utilization rate of home health agency services in the South Amboy and Laurence Harbor community was 81.52 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 86.90 per 1,000 beneficiaries, reflecting a 6.60% relative increase.

## Skilled Nursing Facility Services

**FIGURE 81. SKILLED NURSING FACILITY SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**

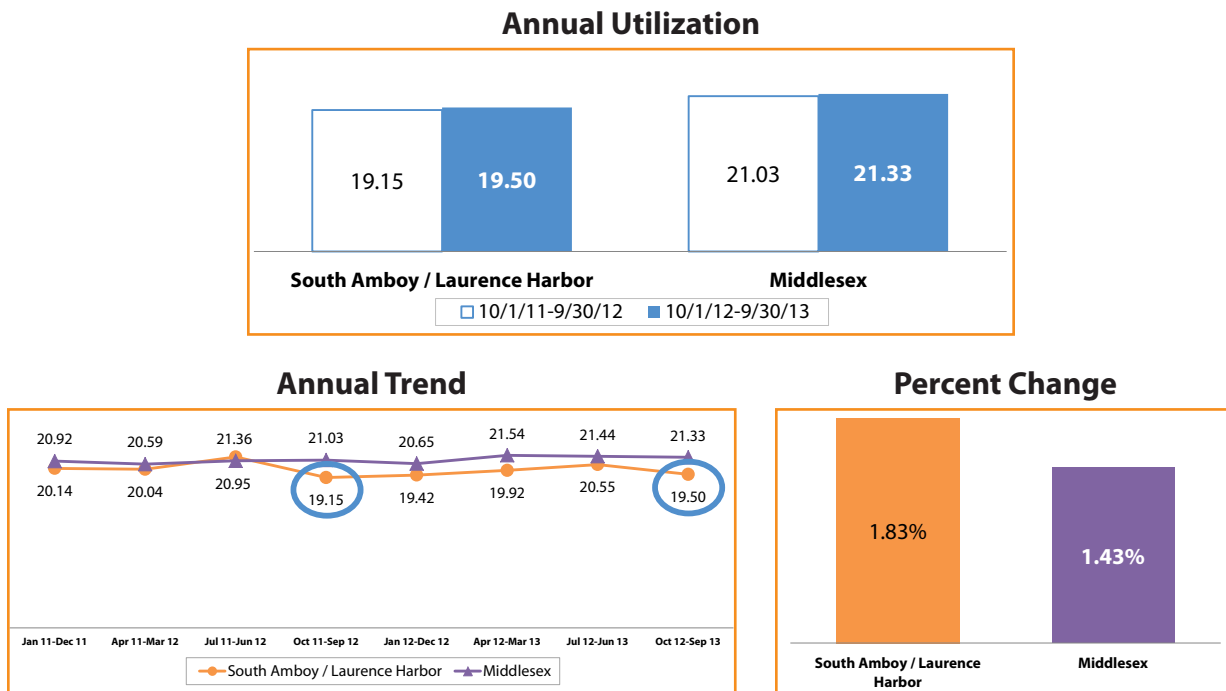


In the 12 months prior to Superstorm Sandy, the utilization rate of skilled nursing facility services in the South Amby and Laurence Harbor community was 65.35 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 72.07 per 1,000 beneficiaries, reflecting a 10.28% relative increase.



## Hospice Services

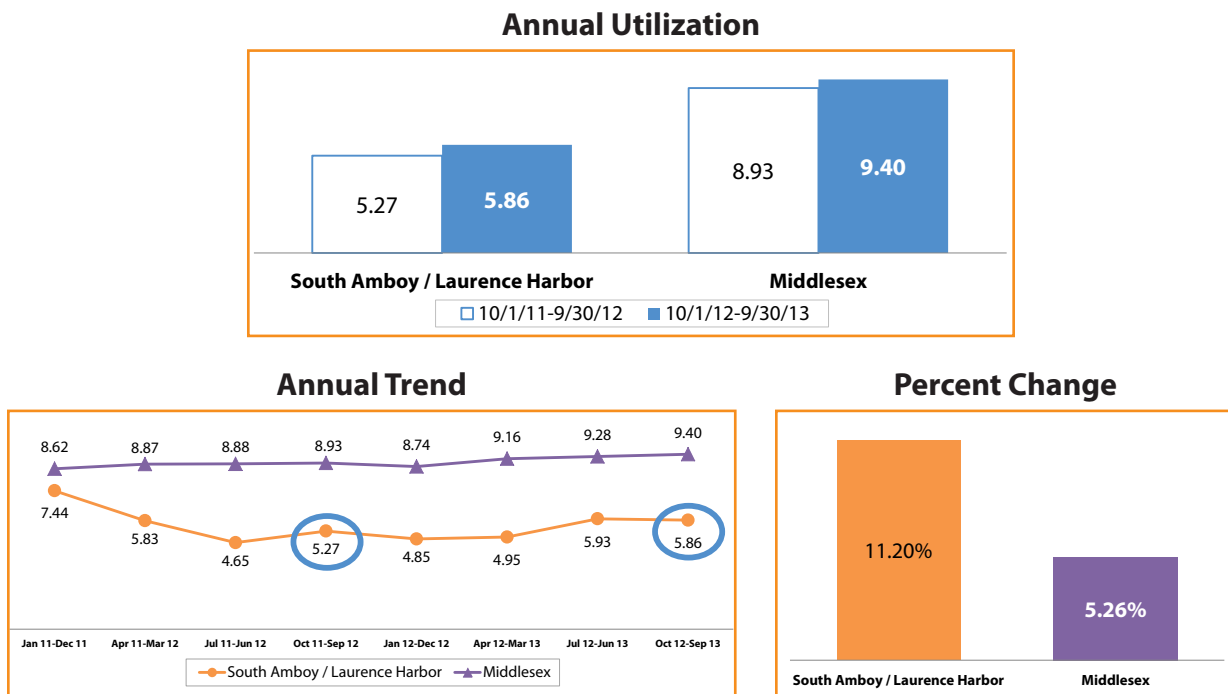
**FIGURE 82. HOSPICE SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, the utilization rate of hospice services in the South Amboy and Laurence Harbor community was 19.15 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 19.50 per 1,000 beneficiaries, reflecting a 1.83% relative increase.

## Medical Rehabilitation Services

**FIGURE 83. MEDICAL REHABILITATION SERVICES PER 1,000 MEDICARE FFS BENEFICIARIES**



In the 12 months prior to Superstorm Sandy, the utilization rate of medical rehabilitation services in the South Amboy and Laurence Harbor community was 5.27 per 1,000 Medicare FFS beneficiaries. After the storm, the rate increased to 5.86 per 1,000 beneficiaries, reflecting a 11.20% relative increase.

## LISTING OF MAJOR HEALTH PROVIDERS

The list below shows the major healthcare facilities that provided 90% of all health services to beneficiaries residing in the South Amboy and Laurence Harbor community. These are providers in different care settings and are not restricted to behavioral health providers or services. The map on the following page depicts the location of these providers in relation to the community.

### Acute Care Hospitals

Raritan Bay Medical Center  
 Bayshore Community Hospital  
 Robert Wood Johnson University Hospital  
 JFK Medical Center  
 Saint Peter's University Hospital  
 Riverview Medical Center  
 CentraState Medical Center  
 Jersey Shore University Medical Center  
 Deborah Heart and Lung Center  
 Saint Barnabas Medical Center

### Medical Rehabilitation Centers

JFK Johnson Rehabilitation Institute

### Skilled Nursing Facilities

Briarwood Care & Rehabilitation Center  
 Madison Center  
 Victoria Health Care Center  
 Bayshore Health Care and Rehabilitation Center  
 Bayshore Community Hospital SubAcute Unit  
 Roosevelt Care Center  
 Reformed Church Home  
 CareOne at Holmdel  
 Regency Park Nursing Center

### Hospice Facilities

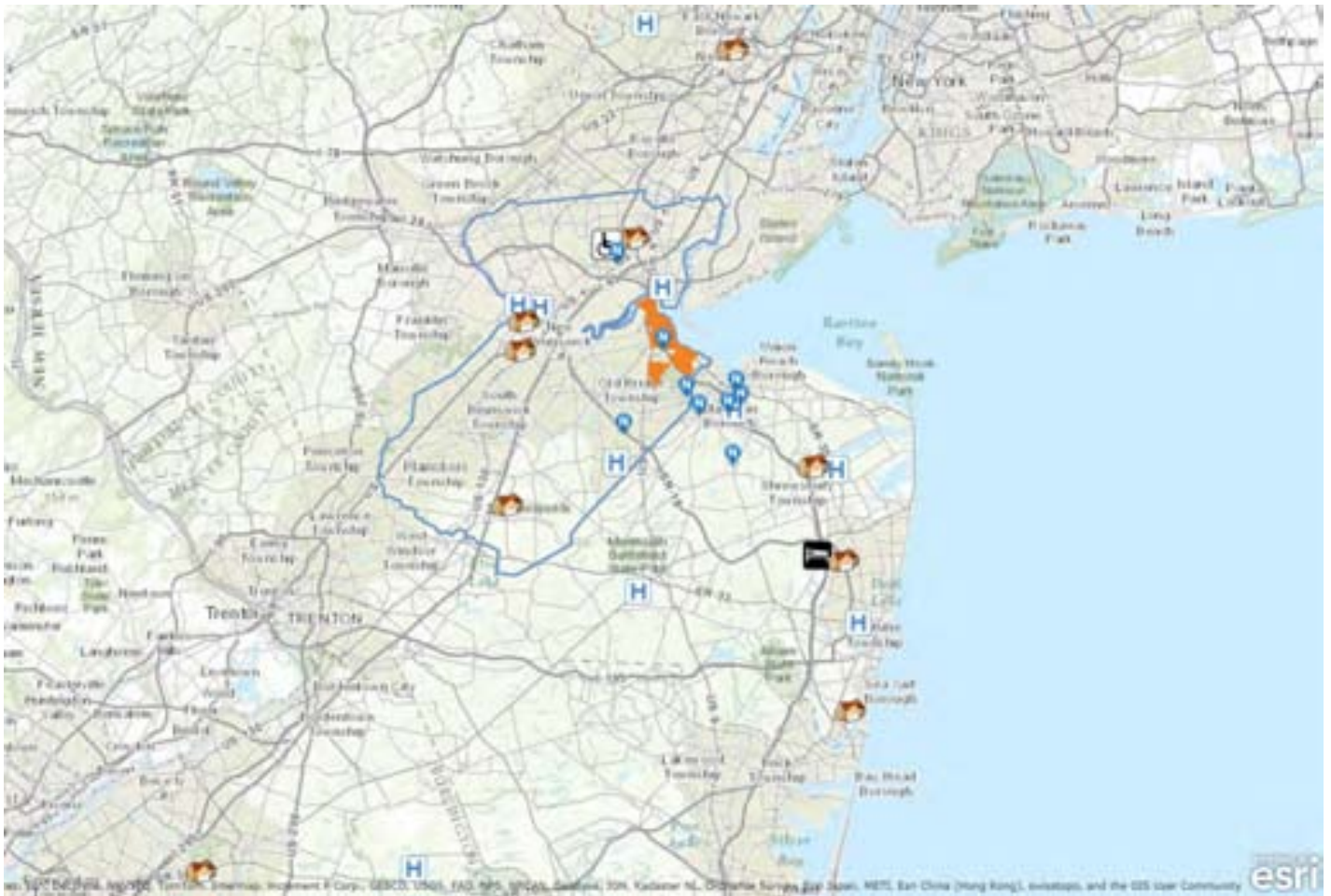
Visiting Nurse Association of Central Jersey Hospice

### Home Health Agencies

Visiting Nurse Association of Central Jersey  
 JFK at Home  
 Robert Wood Johnson Visiting Nurses, Inc.

# SOUTH AMBOY AND LAURENCE HARBOR COMMUNITY PROVIDERS

The map below shows the major healthcare facilities that served the beneficiaries of the South Amboy and Laurence Harbor community based on the Medicare Part A claims database. These are providers in all different care settings and are not restricted to behavioral health providers or services. There is one hospital and one skilled nursing facility located within this community.



**Map Legend**

<p>▼ Medical Rehabilitation Centers</p>	<p>▼ Psychiatric Facilities</p>	<p>▼ Hospice Facilities</p>	<p>▼ Home Health Agencies</p>
<p>▼ Acute Care Hospitals</p>	<p>▼ Skilled Nursing Facility</p>		

## APPENDIX A: BEHAVIORAL HEALTH CONDITIONS

### Documentation and Technical Notes

The following defines the study population, the time frames, and the exclusion and inclusion criteria:

#### *Data Source*

- New Jersey Medicare FFS Part A and Part B claims data and denominator file

#### *Reference Time Period*

- Annual prevalence of risk factors for depression or proxy disorders comparing October 1, 2011 – September 30, 2012 to October 1, 2012 – September 30, 2013
- Annual prevalence trend for risk factors for depression or proxy disorders consists of eight points of data with rolling quarters (starting January 2011 and ending September 2013)
- Quarterly new incidence trend charts of the selected behavioral health conditions contain data from January 1, 2012 to September 30, 2013 and allows for the identification of new cases in a given quarter when compared to the prior year

#### *Mapping Tool*

- QGIS Development Team, 2014, QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
- Source: ZIP code boundaries based on the 2013 U.S. Census Tiger Files

#### *Denominator*

- Denominator was the sum of all eligible Medicare FFS beneficiaries who were in the CMS denominator file during the measurement time frame
- Eligible beneficiaries were computed after adjusting for total enrolled FFS days divided by the total measurement days in the time frame
- Where Medicare FFS enrolled days > 0

#### *Numerator*

- Unique Medicare FFS beneficiaries with disease-specific inpatient or outpatient claims during the time frame
- CCW and AHRQ disease diagnosis code match (ICD-9-CM codes) Part A dgns\_cd\_1-25 and dgns\_e\_cd\_1-3; Match Part B dgns\_cd\_1\_12

#### *Exclusions*

- HMO coverage period
- Age <18 or >= 110
- Eligible Medicare FFS days/total measurement days = 0

## Resources

More information on the classification codes, requirements, and processing of the behavioral health conditions highlighted in this profile can be located at the following links:

- Buccaneer, A General Dynamics Company. Chronic Condition Data Warehouse: Additions and Access – Task Order 10 New Clinical Conditions: Requirements and Processing [Internet]. [unknown]: Buccaneer, A General Dynamics Company. 2013 May 22 [cited 17 Sep 2013]. Available from: [https://www.ccwdata.org/cs/groups/public/documents/document/clin\\_cond\\_algo\\_req\\_proc.pdf](https://www.ccwdata.org/cs/groups/public/documents/document/clin_cond_algo_req_proc.pdf)
- Healthcare Cost and Utilization Project (H-CUP). Clinical Classifications Software (CCS) for ICD-9-CM [Internet]. Rockville (MD): Agency for Healthcare Research and Quality; Nov 2013 [15 Sep 2013]. Available from: <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>

The following table shows the ICD-9-CM codes for the eight behavioral health conditions:

Behavioral Health Conditions	Numerator: Valid ICD-9-CM Codes
Depression or Proxy Disorders (Depression, Anxiety Disorders or Adjustment Disorders)	29384, 29620, 29621, 29622, 29623, 29624, 29625, 29626, 29630, 29631, 29632, 29633, 29634, 29635, 29636, 30000, 30001, 30002, 30009, 30010, 30020, 30021, 30022, 30023, 30029, 3003, 3004, 3005, 30089, 3009, 3080, 3081, 3082, 3083, 3084, 3089, 3090, 3091, 30922, 30923, 30924, 30928, 30929, 3093, 3094, 30981, 30982, 30983, 30989, 3099, 311, 3130, 3131, 31321, 31322, 3133, 31382, 31383, V790
Depression	29620, 29621, 29622, 29623, 29624, 29625, 29626, 29630, 29631, 29632, 29633, 29634, 29635, 29636, 3004, 311, V790
Anxiety Disorders	29384, 30000, 30001, 30002, 30009, 30010, 30020, 30021, 30022, 30023, 30029, 3003, , 3005, 30089, 3009, 3080, 3081, 3082, 3083, 3084, 3089, 3130, 3131, 31321, 31322, 3133, 31382, 31383
Adjustment Disorders	3090, 3091, 30922, 30923, 30924, 30928, 30929, 3093, 3094, 30981, 30982, 30983, 30989, 3099
Post-Traumatic Stress Disorder (PTSD)	30981
Alcohol or Substance Abuse	2920, 29211, 29212, 2922, 29281, 29282, 29283, 29284, 29285, 29289, 2929, 30400, 30401, 30402, 30403, 30410, 30411, 30412, 30413, 30420, 30421, 30422, 30423, 30430, 30431, 30432, 30433, 30440, 30441, 30442, 30443, 30450, 30451, 30452, 30453, 30460, 30461, 30462, 30463, 30470, 30471, 30472, 30473, 30480, 30481, 30482, 30483, 30490, 30491, 30492, 30493, 30520, 30521, 30522, 30523, 30530, 30531, 30532, 30533, 30540, 30541, 30542, 30543, 30550, 30551, 30552, 30553, 30560, 30561, 30562, 30563, 30570, 30571, 30572, 30573, 30580, 30581, 30582, 30583, 30590, 30591, 30592, 30593, 64830, 64831, 64832, 64833, 64834, 65550, 65551, 65553, 76072, 76073, 76075, 7795, 96500, 96501, 96502, 96509, V6542 Alcohol Abuse: 2910, 2911, 2912, 2913, 2914, 2915, 2918, 29181, 29182, 29189, 2919, 30300, 30301, 30302, 30303, 30390, 30391, 30392, 30393, 30500, 30501, 30502, 30503, 76071, 9800

Behavioral Health Conditions	Numerator: Valid ICD-9-CM Codes
Substance Abuse Alone	2920, 29211, 29212, 2922, 29281, 29282, 29283, 29284, 29285, 29289, 2929, 30400, 30401, 30402, 30403, 30410, 30411, 30412, 30413, 30420, 30421, 30422, 30423, 30430, 30431, 30432, 30433, 30440, 30441, 30442, 30443, 30450, 30451, 30452, 30453, 30460, 30461, 30462, 30463, 30470, 30471, 30472, 30473, 30480, 30481, 30482, 30483, 30490, 30491, 30492, 30493, 30520, 30521, 30522, 30523, 30530, 30531, 30532, 30533, 30540, 30541, 30542, 30543, 30550, 30551, 30552, 30553, 30560, 30561, 30562, 30563, 30570, 30571, 30572, 30573, 30580, 30581, 30582, 30583, 30590, 30591, 30592, 30593, 64830, 64831, 64832, 64833, 64834, 65550, 65551, 65553, 76072, 76073, 76075, 7795, 96500, 96501, 96502, 96509, V6542
Suicide and Intentional Self-Inflicted Injury	E9500, E9501, E9502, E9503, E9504, E9505, E9506, E9507, E9508, E9509, E9510, E9511, E9518, E9520, E9521, E9528, E9529, E9530, E9531, E9538, E9539, E954, E9550, E9551, E9552, E9553, E9554, E9555, E9556, E9557, E9559, E956, E9570, E9571, E9572, E9579, E9580, E9581, E9582, E9583, E9584, E9585, E9586, E9587, E9588, E9589, E959, V6284

# APPENDIX B: RISK FACTORS FOR DEPRESSION OR PROXY DISORDERS

## Documentation and Technical Notes

The following defines the study population, the time frame, the exclusion and inclusion criteria, and the literature review references:

### *Data Source*

- New Jersey Medicare FFS Part A and Part B claims data and denominator file

### *Reference Time Period*

- Annual prevalence of risk factors for depression or proxy disorders comparing October 1, 2011 – September 30, 2012 to October 1, 2012 – September 30, 2013
- Annual prevalence trend for risk factors for depression or proxy disorders consists of eight points of data with rolling quarters (starting January 2011 and ending September 2013)

### *Mapping Tool*

- QGIS Development Team, 2014, QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
- Source: ZIP code boundaries based on the 2013 U.S. Census Tiger Files

### *Denominator*

- Denominator was the sum of all eligible Medicare FFS beneficiaries who were in the CMS denominator file during the measurement time frame
- Eligible beneficiaries were computed after adjusting for total enrolled FFS days divided by the total measurement days in the time frame
- Where Medicare FFS enrolled days > 0

### *Numerator*

- Unique Medicare FFS beneficiaries with disease-specific inpatient or outpatient claims during the time frame
- CCW and AHRQ disease diagnosis code match (ICD-9-CM codes) Part A dgns\_cd\_1-25 and dgns\_e\_cd\_1-3; Match Part B dgns\_cd\_1\_12

### *Exclusions*

- HMO coverage period
- Age <18 or >= 110
- Eligible Medicare FFS days/total measurement days = 0

### *Model*

- Logistic Regression Models were used to determine the top five risk factors with the highest Odds Ratios (OR) ( $p < 0.001$ )



## Resources

More information on the classification codes, requirements, and processing of the combination measure of depression or proxy disorders which includes beneficiaries reported for either depression, anxiety, or adjustment disorders can be located at the following links:

- Buccaneer, A General Dynamics Company. Chronic Condition Data Warehouse: Additions and Access – Task Order 10 New Clinical Conditions: Requirements and Processing [Internet]. [unknown]: Buccaneer, A General Dynamics Company. 2013 May 22 [cited 17 Sep 2013]. Available from: [https://www.ccwdata.org/cs/groups/public/documents/document/clin\\_cond\\_algo\\_req\\_proc.pdf](https://www.ccwdata.org/cs/groups/public/documents/document/clin_cond_algo_req_proc.pdf)
- Healthcare Cost and Utilization Project (H-CUP). Clinical Classifications Software (CCS) for ICD-9-CM [Internet]. Rockville (MD): Agency for Healthcare Research and Quality; Nov 2013 [15 Sep 2013]. Available from: <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>

## Literature Review References for Risk Factors for Depression or Proxy Disorders

National Alliance on Mental Illness. Information Helpline: Depression in Older Persons Fact Sheet [Internet]. Arlington (VA): National Alliance on Mental Illness; 2009 Oct [cited 2013 Sep 17]. Available from: <http://www.nami.org/Template.cfm?Section=Helpline1&Template=/ContentManagement/ContentDisplay.cfm&ContentID=144039>

National Institute of Mental Health. Depression: Causes and Risk Factors [Internet]. Bethesda (MD): National Institute of Mental Health; 2013 Jul [cited 2013 Sep 17]. Available from: <http://nihseniorhealth.gov/depression/causesandriskfactors/01.html>

Centers for Disease Control and Prevention and National Association of Chronic Disease Directors. The State of Mental Health and Aging in America [Internet]. Atlanta (GA): National Association of Chronic Disease Directors, 2008 [cited 2013 Sep 19]. 11 p. Available from: [http://www.cdc.gov/aging/pdf/mental\\_health.pdf](http://www.cdc.gov/aging/pdf/mental_health.pdf)

Jacques L, Jensen T, Schafer J, Caplan S, Schott L. Final Coverage Decision Memorandum for Screening for Depression in Adults [Internet]. Baltimore (MD): Centers for Medicare & Medicaid Services; 2011 Oct 14 [cited 2013 Sep 18]. 42 p. Available from: <http://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=251>

Thakur M, Blazer DG. Depression in long-term care. *Journal of the American Medical Directors Association* [Internet]. 2008 Feb [cited 2013 Sep 19];9(2):82-87. Available from: <http://www.amda.com/tools/clinical/depression/DepressioninLongTermCare.pdf>

Sozeri-Varma G. Depression in the elderly: clinical features and risk factors. *Aging and Disease* [Internet]. 2012 Dec [cited 2013 Sep 18];3(6):465-471. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3522513/>

Qian J, Simoni-Wastila L, Rattinger GB, Lehmann S, Langenberg P, et al. Associations of depression diagnosis and antidepressant treatment with mortality among young and disabled Medicare beneficiaries with COPD. *General Hospital Psychiatry*. 2013 Jul 18 [cited 2013 Sep 22]; 35(6):612-618.

## APPENDIX B

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Substance Abuse and Mental Health Services Administration. *The Treatment of Depression in Older Adults: Depression and Older Adults: Key Issues* [Internet]. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services, 2011 [cited 2013 Sep 24]. HHS Pub. No. SMA-11-4631. 24 p. Available from: <http://store.samhsa.gov/shin/content/SMA11-4631CD-DVD/SMA11-4631CD-DVD-KeyIssues.pdf>

Himelhoch S, Weller WE, Wu AW, Anderson GF, Cooper LA. Chronic medical illness, depression, and use of acute medical services among Medicare beneficiaries. *Medical Care*. 2004 Jun [cited 2013 Sep 25];42(6):512-521.

Mohile SG, Fan L, Reeve E, Jean-Pierre P, Mustian K, et al. Association of cancer with geriatric syndromes in older Medicare beneficiaries. *Journal of Clinical Oncology: Official Journal of the American Society of Clinical Oncology* [Internet]. 2011 Apr 10 [cited 2013 Sep 25];29(11): 1458-1464. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3082984/>

Jayadevappa R, Malkowicz SB, Chhatre S, Johnson JC, Gallo JJ. The burden of depression in prostate cancer. *Psycho-oncology*. 2012 Dec [cited 2013 Sep 26];21(12):1338-1345.

Missouri Department of Mental Health. *CPS Facts: Depression and Older Adults* [Internet]. Jefferson City(MO): Missouri Department of Mental Health, [date unknown, cited 2013 Sep 26], 2 p. Available from: <http://dmh.mo.gov/docs/mentalillness/elderlydepress.pdf>

Oregon State University, Washington State University, University of Idaho. *Depression in Later Life: Recognition and Treatment* [Internet]. Corvallis(OR): Pacific Northwest Extension Publication; 2004 Jul [Published April 1990; revised July 2000; cited 2013 Sep 29]; 32 p. Available from: <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20713/pnw347.pdf>

Cole MG, Dendukuri N. Risk factors for depression among elderly community subjects: a systematic review and meta-analysis. *American Journal of Psychiatry* [Internet]. 2003 Jun [cited 2013 Sep 29]; 160(6):1147-1156. Available from: <http://ajp.psychiatryonline.org/article.aspx?articleid=176272>

Kohn R, Levav I, Garcia ID, Machuca ME, Tamashiro R. Prevalence, risk factors and aging vulnerability for psychopathology following a natural disaster in a developing country. *International Journal of Geriatric Psychiatry*. 2005 Sep [cited 2013 Sep 29];20(9):835-841.

Pietrzak RH, Southwick SM, Tracy M, Galea S, Norris FH. Posttraumatic stress disorder, depression, and perceived needs for psychological care in older persons affected by Hurricane Ike. *Journal of Affective Disorders* [Internet]. 2012 Apr [cited 2013 Sep 30];138(1-2):96-103. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3306486/>

Oriol W. *Psychosocial Issues for Older Adults in Disasters* [Internet]. Washington (DC): Emergency Services and Disaster Relief Branch, Center for Mental Health Services (CMHS), Substance Abuse and Mental Health Services Administration; 1999 [cited 2013 Sep 30]; DHHS Publication No. ESDRB SMA 99-3323. 79 p. Available from: <http://store.samhsa.gov/shin/content/SMA99-3323/SMA99-3323.pdf>

O'Connor EA, Whitlock EP, Gaynes B, Beil TL. Screening for Depression in Adults and Older Adults in Primary Care: An Updated Systematic Review. [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2009 Dec [cited 2013 Sept 30]. 167 p. (Evidence Synthesis No. 75. AHRQ Publication No. 10-05143-EF-1). Available from: <http://www.ncbi.nlm.nih.gov/books/NBK36403/pdf/TOC.pdf>

Noyes K, Liu H, Lyness JM, Friedman B. Medicare beneficiaries with depression: comparing diagnoses in claims data with the results of screening. *Psychiatric Services* [Internet]. 2011 Oct [cited 2013 Sep 30];62(10):1159-1166. Available from: [http://ps.psychiatryonline.org/data/Journals/PSS/4336/pss6210\\_1159.pdf](http://ps.psychiatryonline.org/data/Journals/PSS/4336/pss6210_1159.pdf)

The following table shows the ICD-9-CM codes for the top five risk factors for depression or proxy disorders:

Top Five Risk Factors for Depression or Proxy Disorders*	Numerator: Valid ICD-9-CM Codes
Alzheimer's Disease and Related Disorders or Senile Dementia	3311, 33111, 33119, 3312, 3317, 2900, 29010, 29011, 29012, 29013, 29020, 29021, 2903, 29040, 29041, 29042, 29043, 2940, 2941, 29410, 29411, 2948, 797
Sleep Disturbance	04672, 29182, 29285, 30740, 30741, 30742, 30748, 30749, 32700, 32701, 32702, 32709, 78050, 78051, 78052, 78059
Substance or Alcohol Abuse or Tobacco Use	2910, 2911, 2912, 2913, 2914, 2915, 2918, 29181, 29182, 29189, 2919, 2920, 29211, 29212, 2922, 29281, 29282, 29283, 29284, 29285, 29289, 2929, 30300, 30301, 30302, 30303, 30390, 30391, 30392, 30393, 30400, 30401, 30402, 30403, 30410, 30411, 30412, 30413, 30420, 30421, 30422, 30423, 30430, 30431, 30432, 30433, 30440, 30441, 30442, 30443, 30450, 30451, 30452, 30453, 30460, 30461, 30462, 30463, 30470, 30471, 30472, 30473, 30480, 30481, 30482, 30483, 30490, 30491, 30492, 30493, 30500, 30501, 30502, 30503, 3051, 30510, 30511, 30512, 30513, 30520, 30521, 30522, 30523, 30530, 30531, 30532, 30533, 30540, 30541, 30542, 30543, 30550, 30551, 30552, 30553, 30560, 30561, 30562, 30563, 30570, 30571, 30572, 30573, 30580, 30581, 30582, 30583, 30590, 30591, 30592, 30593, 33392, 3575, 4255, 5353, 53530, 53531, 5710, 5711, 5712, 5713, 64830, 64831, 64832, 64833, 64834, 65550, 65551, 65553, 76071, 76072, 76073, 76075, 7795, 7903, 96500, 96501, 96502, 96509, 9800, V110, V111, V112, V113, V114, V118, V119, V154, V1541, V1542, V1549, V1582, V6285, V6542, V663, V701, V702, V7101, V7102, V7109, V790, V791, V792, V793, V798, V799
Hip/Pelvic Fractures	73314, 73315, 73396, 73397, 73398, 8080, 8081, 8082, 8083, 80841, 80842, 80843, 80849, 80851, 80852, 80853, 80859, 8088, 8089, 82000, 82001, 82002, 82003, 82009, 82010, 82011, 82012, 82013, 82019, 82020, 82021, 82022, 82030, 82031, 82032, 8208, 8209
Amputations	8870, 8871, 8872, 8873, 8874, 8875, 8876, 8877, 8960, 8961, 8962, 8963, 8970, 8971, 8972, 8973, 8974, 8975, 8976, 8977, 9059, 99760, 99761, 99762, 99769

\* Other risk factors for depression or proxy disorders analyzed include Acute Myocardial Infarction (AMI), Stroke/Transient Ischemic Attack, Coronary Artery Bypass Graft Surgery (CABG), Parkinson's Disease, Chronic Obstructive Pulmonary Disease and Bronchiectasis (COPD), Diabetes, Chronic Kidney Disease, Rheumatoid Arthritis/Osteoarthritis (RA/OA), Macular Degeneration, Disability, History of Cancer, Heart Failure, and Acquired Hypothyroidism.

# APPENDIX C: UTILIZATION OF OUTPATIENT MENTAL HEALTH SERVICES

## Documentation and Technical Notes

The following defines the study population, the time frame, and the exclusion and inclusion criteria:

### *Data Source*

- New Jersey Medicare FFS Part A and Part B claims data and denominator file

### *Reference Time Period*

- Annual utilization comparing October 1, 2011 – September 30, 2012 to October 1, 2012 – September 30, 2013
- Annual utilization trend consists of eight points of data with rolling quarters (starting January 2011 and ending September 2013)
- Quarterly utilization trend charts for depression screening contains data from January 1, 2012 to September 30, 2013 and allows for the identification of new cases in a given quarter when compared to the prior year

### *Mapping Tool*

- QGIS Development Team, 2014, QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
- Source: ZIP code boundaries based on the 2013 U.S. Census Tiger Files

### *Denominator*

- Denominator was the sum of all eligible Medicare FFS beneficiaries who were in the CMS denominator file during the measurement time frame
- Eligible beneficiaries were computed after adjusting for total enrolled FFS days divided by the total measurement days in the time frame
- Where Medicare FFS enrolled days > 0

### *Numerator*

Unique Medicare FFS beneficiaries with specific outpatient mental health service claims

### *Exclusions*

- HMO coverage period
- Age <18 or >= 110
- Eligible Medicare FFS days/total measurement days =0

### *Resources*

More information on the definitions and uses of the outpatient mental health services highlighted in this profile can be located at <http://www.medicarenhic.com/providers/pubs/REF-EDO-0012MentalHealthBillingGuide2013.pdf>.

The following table shows the CPT/HCPCS codes for the outpatient mental health services:

Mental Health Services	Numerator: CPT/HCPCS Codes
<b>Assessments</b>	
Depression Screening	G0444
Diagnostic Psychological Tests	96101, 96102, 96103, 96105, 96110, 96111
Health and Behavior Assessment/Intervention	96150, 96151, 96152, 96153, 96154, 96155
Neuropsychological Tests	96116, 96118, 96119, 96120
Psychiatric Diagnostic Procedures	90801, 90802, 90791, 90792
<b>Therapies</b>	
Individual Psychotherapy	90804, 90805, 90832, 90833, 90806, 90807, 90834, 90836, 90808, 90809, 90810, 90811, 90812, 90813, 90814, 90815, 90816, 90817, 90818, 90819, 90821, 90822, 90823, 90824, 90826, 90827, 90828, 90829, 90837, 90838, 90839, 90840
Family Psychotherapy	90846, 90847
Group Psychotherapy	90849, 90853, 90857
Electroconvulsive Therapy	90870
Biofeedback Therapy	90901, 90911

# APPENDIX D: UTILIZATION OF SERVICES – INPATIENT AND OTHER SETTINGS

## Documentation and Technical Notes

The following defines the study population, the time frame, and the exclusion and inclusion criteria:

### *Data Source*

New Jersey Medicare FFS Part A claims data and denominator file

### *Reference Time Period*

- Annual utilization comparing October 1, 2011 – September 30, 2012 to October 1, 2012 – September 30, 2013
- Annual utilization trend consists of eight points of data with rolling quarters (starting January 2011 and ending September 2013)

### *Denominator*

- Denominator was the sum of all eligible Medicare FFS beneficiaries who were in the CMS denominator file during the measurement time frame
- Eligible beneficiaries were computed after adjusting for total enrolled FFS days divided by the total measurement days in the time frame
- Where Medicare FFS enrolled days > 0

### *Exclusions*

- HMO coverage period
- Age <18 or >= 110
- Eligible Medicare FFS days/total measurement days =0

### *Utilization Measure*

Refer to Appendix E.

### Numerator

Utilization Measure Description	Numerator
Psychiatric Hospital Admissions	Number of eligible beneficiaries with at least one psychiatric hospital admission claim
Acute Care Hospital Admissions	Number of acute care hospital admissions
Observation Stays	Number of observation stays
Emergency Department Visits	Number of emergency department visits
30-Day Hospital Readmissions	Number of 30-day hospital readmissions
Observation Stays Within 30 Days of Hospital Discharge	Number of observation stays within 30 days of hospital discharge
Emergency Department Visits Within 30 Days of Hospital Discharge	Number of emergency department visits within 30 days of hospital discharge
Home Health Agency Services	Number of eligible beneficiaries with at least one home health agency claim
Skilled Nursing Facility Services	Number of eligible beneficiaries with at least one skilled nursing facility claim
Hospice Services	Number of eligible beneficiaries with at least one hospice claim
Medical Rehabilitation Services	Number of eligible beneficiaries with at least one medical rehabilitation claim

## APPENDIX E: TIME FRAMES AND FORMULAE

Time Frames	
Quarters	Dates
Q1	January 1 to March 31
Q2	April 1 to June 30
Q3	July 1 to September 30
Q4	October 1 to December 31

### Formulae

$$\text{Incidence} = \frac{\text{(Number of new cases in a time frame, not present in prior year)}}{\text{(Total eligible beneficiaries in the population during the time frame)}}$$

$$\text{Prevalence} = \frac{\text{(Number of cases in a time frame)}}{\text{(Total eligible beneficiaries in the population during the time frame)}}$$

$$\text{Utilization} = \frac{\text{(Number of beneficiaries or measures with specific service utilization)}}{\text{(Total eligible beneficiaries in the population during the time frame)}}$$

$$\text{Relative change} = \frac{\text{(Current rate - Former rate)}}{\text{(Former rate)}}$$



## APPENDIX F: REFERENCES

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# APPENDIX G: PROVIDER SUMMARY TABLES AND PROVIDER LISTINGS

The following defines the data source and time period for the provider summary tables and listings:

### *Data Source*

New Jersey Medicare Part A and Part B FFS claims data

### *Reference Time Period*

Provider summary tables were based on Pre-Sandy time frame (Q1 2011-Q3 2012)

### *Mapping Tool*

ArcGIS Explorer Online. ArcGIS® software by Esri. [www.esri.com](http://www.esri.com)

## **Professional Type by Behavioral Health Services**

The following defines the data source and time period for the provider summary tables and listings:

### *Data Source*

New Jersey Medicare FFS Part B claims data

### *Reference Time Period*

- Professional type of behavioral health service claims during October 1, 2011 – September 30, 2012 and October 1, 2012 – September 30, 2013

### *Professional Type Credentials – Including, but not limited to:*

- Physicians: DO, MD
- Psychologists: PhD, PsyD, EdD
- Social Workers: MSW, LCSW
- Nurses: APN, RN, NP
- Others: Other

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