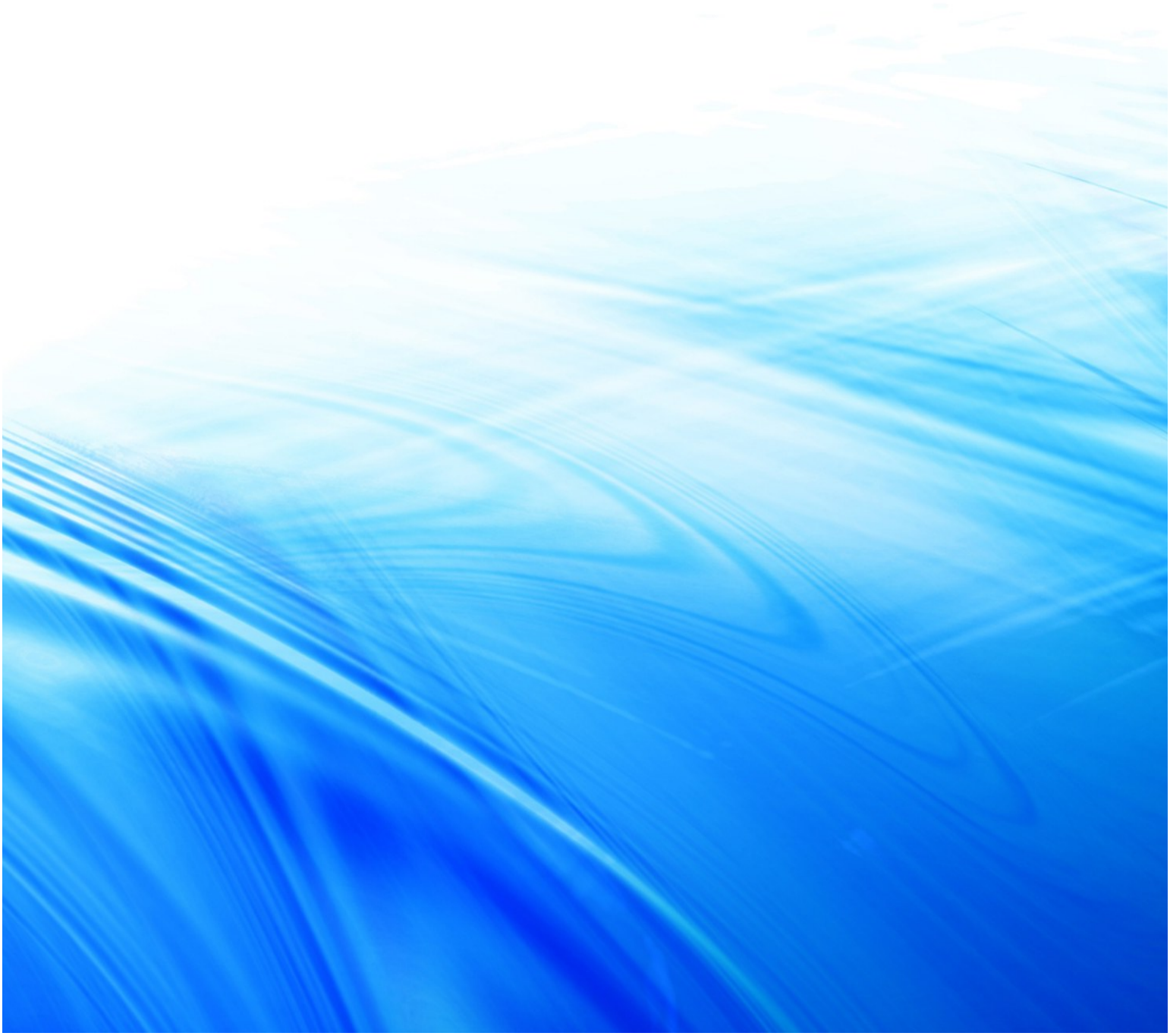

Report

American Lung Association of the Northeast:
COPD Re-Admissions Report: Maine and the US

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INTRODUCTION:

In fall of 2015, the American Lung Association of the Northeast (ALA-NE) commissioned the Public Health Research Institute (PHRI) to profile hospital admissions and re-admissions for COPD, comparing Maine (overall and by county) to the other northeast states for which data is readily available.

Chronic Obstructive Pulmonary Disease (COPD) is the third leading cause of death in the United States accounting for a yearly mortality of more than 140,000 people. There are more than 13 Million adults diagnosed with COPD in the US, with as many more living with the disease without diagnosis (Mannino et al, 2002). Symptoms most commonly associated with COPD include chronic cough, dyspnea, and sputum production. Treatment of COPD with medication including bronchodilators, and corticosteroids, and supplemental therapy including, stop smoking, oxygen, nutrition, surgery and pulmonary rehabilitation can control symptoms and can sometimes slow the progression of the disease, unfortunately, the symptoms of chronic obstructive pulmonary disease cannot be completely eliminated with treatment and the condition usually worsens over time. As COPD progresses, patients often experience low levels of energy, difficulties in performing activities of daily living, anxiety, and a reduced quality of life.

COPD exacerbations lead to impairments of lung function, peripheral muscle dysfunction, decreases in exercise capacity and activity levels, and worsening the quality of life. COPD severity can be classified using the Global Initiative for Chronic Obstructive Lung Disease (GOLD) staging system. This includes four stages from mild to very severe. Staging is based on a forced expiratory volume in one-second (FEV1) test. The current standard of care for patients diagnosed with COPD at stage 2 or greater (FEV1 < 0.70) to be referred to a pulmonary rehabilitation (PR) program. PR typically consists of 32 inpatient visits occurring over a span of 8 – 12 weeks. Treatments that emphasize physical activity have been successful in slowing its progress, maintaining lung function, boosting energy levels, and improving overall quality of life.iii Pulmonary rehabilitation has demonstrated to improve the management of COPD patients, in regards to physical activity, quality of life, exacerbations and use of healthcare facilities. However, after months of completing the pulmonary rehabilitation program, the benefits gained in patients with COPD do not last, and patients reduce their exercise capacity and health status (Reis et al 1995; Wedzicha et al 1998, Foglio et al 1999). Griffiths et al (2000) attributed poor self-management and lack of adherence to treatment to the loss of effects after pulmonary rehabilitation.

Maine has traditionally had a high rate of COPD prevalence and inpatient and ED admissions. For example, the age 65+ ED admissions rate for Maine is 25% higher than the US (998 compared to 796 per 100,000 population). In this study we profiled hospital admissions and re-admissions for COPD, (overall and by county). We also planned to compare Maine to the other northeast states. Using this analyses ALANE planned to review the availability of COPD Rehab services in Maine along with other resources and supports that have been shown to assist COPD patients in maintaining their health status and lung function levels both at the clinical level and in the community. The information could then be used by ALANE to target educational efforts for both patients and health care providers. The information is also intended to raise awareness among community groups and Healthy Maine Partnerships so as to 2 target resources for assisting patients with COPD and related chronic health conditions in maintaining their health.

DEFINITIONS:

COPD DRG Definitions	190 - CHRONIC OBSTRUCTIVE PULMONARY DISEASE With Major Complications or Major Comorbidity (MCC)
	191 - CHRONIC OBSTRUCTIVE PULMONARY DISEASE With Complications or Comorbidity (CC)
	192 - CHRONIC OBSTRUCTIVE PULMONARY DISEASE Without Complications or Comorbidity or Major Complications or Comorbidity (W/O CC/MCC)

Please also note:

- "Percent readmitted" is defined as the percentage of index stays with at least one readmission within 30 days of discharge.
- Index stays do not require a prior "clean period" with no hospitalizations; that is, a hospital stay may be both a readmission for a prior stay and an index stay for a subsequent readmission.
- Re-admissions may be defined with inclusion criteria (e.g., same diagnosis upon readmission); however, the definition of re-admissions does not use risk adjustment or diagnostic exclusions (e.g., cancer, trauma, maternal, neonatal, planned re-admissions).
- Re-admissions can occur at any hospital within a given state in the database; re-admissions that cross state boundaries will not be counted.
- See "Methods - Calculating Re-admissions for HCUPnet" PDF (82KB) / HTML.

METHODS:

For this study we combed the Internet, in particular northeast states and US government and non-government health websites for information on COPD admissions and re-admissions. Except for the Agency for Health Research and Quality (USDHHS/AHRQ) where we found national tables on COPD re-admission rates, we found no regional or statewide data on COPD re-admissions. For several states we found COPD admissions rates but no re-admission rates. However using the criteria that AHRQ used to compute national rates, we computed Maine State and county rates for the period 2008-2010 using the Maine Claims data -base. In keeping with the criteria we computed rates of re-admissions only for the Medicare population.

FINDINGS:

- Overall there were on average 2760 admissions annually in Maine for COPD for the age group 65+ between 2008 and 2010. This includes admissions for DRG codes 190-192. The split between the three DRG codes is similar for these years at 36% for DRG 190, 34% for DRG 191 and 30% for DRG 192—see Table 1.
- Hospital length of stay for COPD admissions averaged 4 days in 2008 and 3 days in both 2009 and 2010.

- On average women with COPD were at greater risk for a COPD hospital admission than males; COPD admissions for males was 45% compared to 55% for females. This is important especially given that there is a higher prevalence of COPD among males than females.
- COPD admission rates varied widely by county compared to the state rate. Aroostook and Franklin counties, for example, were 83% and 73% respectively higher than the state rate while Cumberland and Kennebec counties were 33% and 22% lower than the state rate. (See Table 2).
- In Maine re-admissions for COPD were level during this period with only a slight fluctuation from year to year. Re-admissions rates by gender were similar (Table 4).
- Re-admissions for COPD in Maine were generally higher than the US during this period (~28% COPD re-admits for Maine compared to ~20% for the US). On average re-admissions for COPD occurred in Maine 7.5 days after discharge.
- The pattern of hospital admissions for COPD varied widely by county compared to the state (see bullet above). The pattern of re-admissions also varied by county but the variation was different from the pattern of initial admissions—see Table 3. For example the proportion of COPD re-admissions in Cumberland and Kennebec counties was 63% and 75% respectively with Somerset, Waldo and Washington counties experiencing much lower proportions—54%, 50% and 54% respectively.

DISCUSSION:

In this study we present US, Maine State and county level hospital inpatient admissions and re-admissions for COPD. Maine State and county rates were for the period 2008-2010 using the Maine All Payer Claims data base.

Women with COPD were at greater risk for a COPD hospital admission than males but re-admissions were similar by gender; the former needs to be explained but is beyond the scope of this report.

Admissions for COPD in Maine vary by county but not in relation to county prevalence rates. As a high variation admission this follows the pattern for other admissions such as diabetes, hypertension and health disease (CHF). Variations are likely due to factors such as the quality of primary care available to treat COPD and patients factors such as poverty, education and rurality. For example there is a higher proportion of people with COPD in many rural counties compared to more urban ones who continue to smoke, known to cause and exacerbate COPD.

Re-admissions rates were higher for Maine than the US. However variation in county re-admission rates did not correspond to the variation in admissions rates. Some counties with lower admissions rates compared to the state had high re-admissions rates. This is an issue worth exploring by ALANE and the health care community as it may be explained by access, quality and patient involvement in care—something the health system can work on.

TABLES:

Table 1

Cohort COPD DRG Admissions per Incurred Year

	Incurred Year					
	2008		2009		2010	
DRG	Count	%	Count	%	Count	%
190	841	32.0%	1,170	41.4%	944	35.0%
191	924	35.2%	914	32.3%	899	33.4%
192	863	32.8%	742	26.3%	852	31.6%
Total	**2,628**	**100.0%**	**2,826**	**100.0%**	**2,695**	**100.0%**

Note: includes multiple member [COPD] admissions in the incurred year

Table 2

COPD Admissions rates by County and compared to the state rate

County	Average Count of Members w/ COPD Admissions (2008-2010)	2009 Population Est.	Rate (per 100,000)	% Difference from State Rate
ANDROSCOGGIN	166	106,539	155.8	0.0%
AROOSTOOK	204	71,488	285.4	83.2%
CUMBERLAND	289	278,559	103.7	-33.4%
FRANKLIN	80	29,735	269.0	72.7%
HANCOCK	94	53,447	175.9	12.9%
KENNEBEC	147	121,090	121.4	-22.1%
KNOX	55	40,801	134.8	-13.5%
LINCOLN	54	34,576	156.2	0.2%
OXFORD	110	56,244	195.6	25.5%
PENOBSCOT	280	149,419	187.4	20.3%
PISCATAQUIS	37	16,795	220.3	41.4%
SAGADAHOC	50	36,391	137.4	-11.8%
SOMERSET	93	50,947	182.5	17.2%
WALDO	51	38,287	133.2	-14.5%
WASHINGTON	71	32,107	221.1	41.9%
YORK	273	201,876	135.2	-13.2%
MAINE STATE	**2,054**	**1,318,301**	**155.8**	

Color shading (heat map) corresponds to county rate, with green representing lower rates than State and red representing higher rates than the State.

Table 3

Re-admissions by Type per County

% of Index	Re-admission Type				
County	COPD is Principle Diagnosis	COPD is Secondary Diagnosis	COPD is Any Other Diagnosis	All-cause Re-admission	Total Re-admission
ANDROSCOGGIN	35.1%	10.3%	9.3%	30.9%	85.6%
AROOSTOOK	27.8%	7.3%	9.9%	30.5%	75.5%
CUMBERLAND	22.6%	6.7%	8.7%	25.6%	63.6%
FRANKLIN	28.1%	6.3%	10.9%	32.8%	78.1%
HANCOCK	32.1%	6.4%	3.8%	23.1%	65.4%
KENNEBEC	23.4%	11.7%	6.4%	40.4%	81.9%
KNOX	38.2%	8.8%	8.8%	20.6%	76.5%
LINCOLN	23.1%	5.1%	5.1%	38.5%	71.8%
OXFORD	26.8%	8.5%	7.0%	23.9%	66.2%
PENOBSCOT	24.4%	6.7%	6.1%	22.2%	59.4%
PISCATAQUIS	22.2%	0.0%	3.7%	14.8%	40.7%
SAGADAHOC	30.0%	12.5%	7.5%	30.0%	80.0%
SOMERSET	13.6%	8.5%	6.8%	27.1%	55.9%
WALDO	16.2%	2.7%	10.8%	21.6%	51.4%
WASHINGTON	17.0%	8.5%	12.8%	19.1%	57.4%
YORK	27.3%	10.7%	9.1%	29.4%	76.5%

Note: 'All-cause' is readmission with COPD Dx in 1st or 2nd listed position and COPD Dx listed positions 3-10. Color shading (heat map) corresponds to % re-admissions; low (white) to high (darkest red).

Table 4

COPD Re-admissions by Gender and Dx listing position

	Re-admissions Dx COPD listing position			
Gender	COPD is Principle Diagnosis	COPD is Secondary Diagnosis	COPD is Any Other Diagnosis	All-cause Re-admission
Female	33.8%	11.2%	11.0%	37.1%
Male	34.7%	10.2%	11.0%	36.0%

Note: 'All-cause' is readmission with COPD Dx in 1st or 2nd listed position and COPD Dx listed positions 3-10.

APPENDIX: DATA SOURCES

DATA MEASURES	DATA YEAR(S)	DATA SOURCE
COPD Admissions	2008-10	Maine Health Data Organization (MHDO) All Payer Claims Data
Maine Population	2009	US Census Population Estimates