

Epidemiology of Gastrointestinal Neuroendocrine Tumors (GI NET) in the US: Analysis of 2 Large Insurance Claims Databases

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BACKGROUND

- U.S. incidence of all neuroendocrine tumors (NET) increased from 10.9 cases per million person-years (PMPY) in 1973 to 52.5 PMPY in 2004 as reported in SEER.¹
- Prevalence was reported as 216 per million per year for GI NET, representing nearly two-thirds of NET prevalence.
- Incidence and prevalence may have continued to increase since 2004, but no published studies exist.

METHODS

- Retrospective, cross-sectional study using 2010-2014 data from 2 U.S. commercial claims databases: Truven Health Analytics MarketScan and IMS PharMetrics.

Inclusion Criteria:

- Age ≥ 18, AND
- ≥ 1 inpatient or ≥ 2 outpatient claims for GI NET (benign or malignant) in a given calendar year

Study Measures:

- Prevalence was number of GI NET patients divided by number of enrollees/year.
 - One year of continuous enrollment in the year of diagnosis was required
- Incidence was number of patients with a first observed GI NET diagnosis who were disease-free for 2 years prior, divided by number of enrollees.
 - Three years of continuous enrollment (year of diagnosis and two years prior) was required

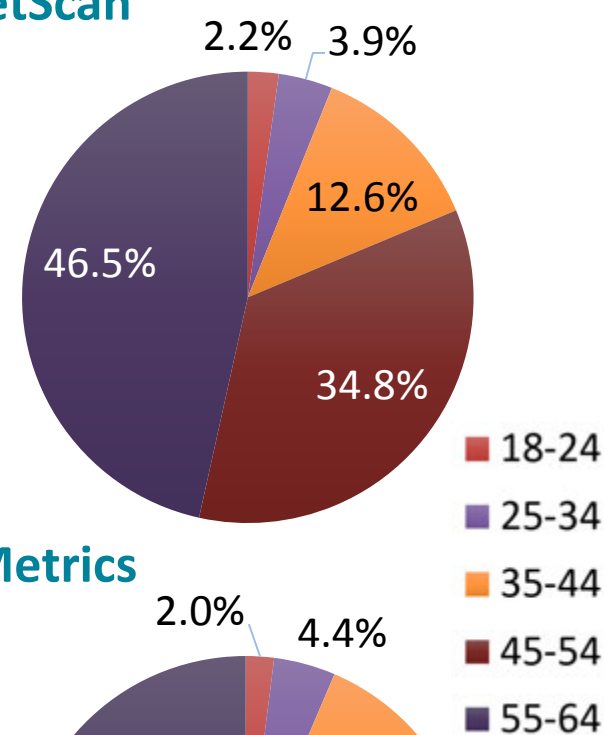
RESULTS

From 2010 to 2014,

- Prevalence (**Table 1; Figures 1-3**)
 - Increased from 90.8 to 131.2 per million per year in MarketScan;
 - Increased from 71.1 to 108.9 per million per year in PharMetrics;
 - Was highest in 55-64 year olds (from 146.5 to 281.5 depending on year and data source)
 - Nearly half of prevalent cases were in patients between 55 and 64 years of age.
 - Was slightly higher in females (from 74.3 to 141.6) than in males (from 67.7 to 119.7) (depending on year and data source)
 - Women represented approximately 55% of prevalent cases.
- Incidence (**Table 2; Figure 4**)
 - Increased from 67.0 to 79.1 PMPY in MarketScan
 - Increased from 47.4 to 58.2 PMPY in PharMetrics
 - Slightly more than half of incident cases were female.
 - Nearly half of all incident cases were among those between 55 and 64 years.

Figure 1: 2014 Prevalent Cases by Age

1A: MarketScan



1B: PharMetrics

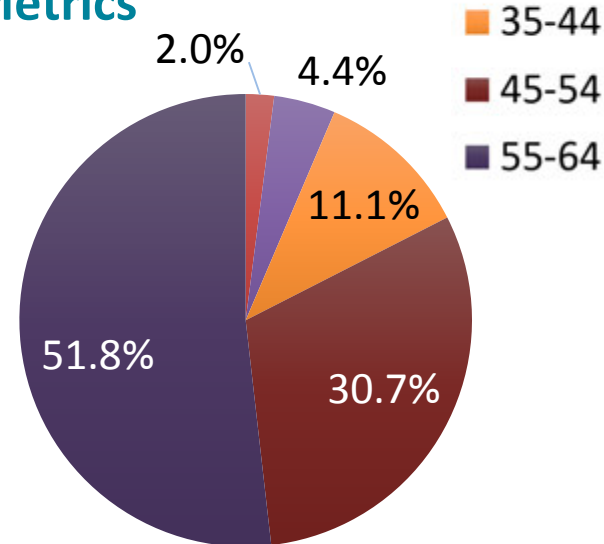
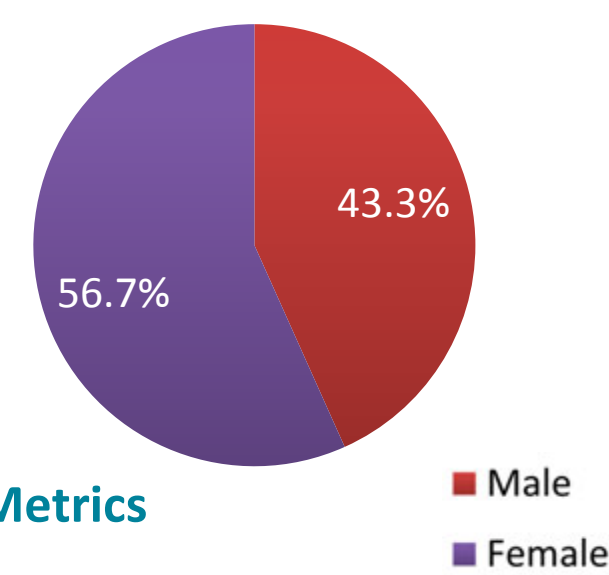


Figure 2: 2014 Prevalent Cases by Gender

2A: MarketScan



2B: PharMetrics

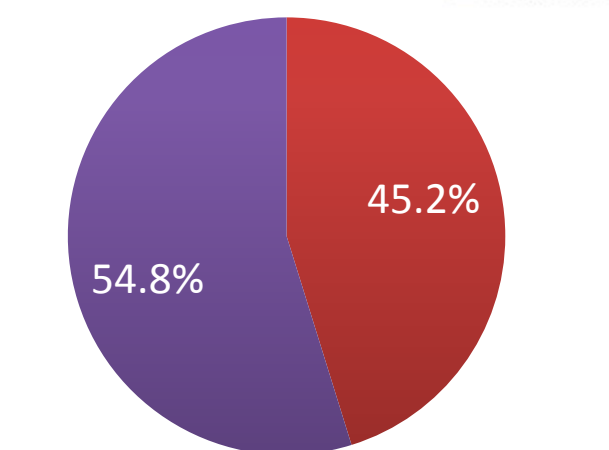


Table 1: GI NET Prevalence by Demographic Groups

A: MarketScan						B: PharMetrics							
		Prevalence: No. Of Cases Per Million Per Year ^a							Prevalence: No. Of Cases Per Million Per Year ^a				
Gender	Age, years	2010	2011	2012	2013	2014	Gender	Age, years	2010	2011	2012	2013	2014
Female		93.0	111.7	125.5	135.8	141.6	Female		74.3	87.8	95.4	109.6	117.7
Male		88.2	99.6	113.3	114.9	119.7	Male		67.7	72.7	84.8	89.7	99.9
Both	18-24	16.5	18.8	20.2	19.0	18.8	Both	18-24	13.3	14.9	16.3	13.2	15.4
	25-34	28.9	31.5	35.5	40.0	30.5		25-34	23.6	27.1	26.2	32.8	27.0
	35-44	53.5	60.5	65.4	73.8	77.4		35-44	35.5	43.3	51.0	56.9	59.2
	45-54	120.0	146.0	164.6	167.5	183.2		45-54	90.6	110.2	123.2	126.7	137.1
	55-64	181.2	216.4	253.3	267.3	281.5		55-64	146.5	157.9	180.8	212.2	243.4
All Patients		90.8	106.0	119.7	125.9	131.2	All Patients		71.1	80.5	90.3	99.9	108.9

^a Values represent the number of prevalent cases in each demographic group divided by all members of the same demographic group with a full year enrollment in that year.

Table 2: GI NET Incidence by Demographic Groups

A: MarketScan						B: PharMetrics							
		Incidence: No. Of Cases Per Million Person-Years ^a							Incidence: No. Of Cases Per Million Person-Years ^a				
Gender	Age, years	2011	2012	2013	2014	Gender	Age, years	2011	2012	2013	2014		
Female		68.2	76.8	79.0	84.8	Female		51.6	49.6	60.0	60.7		
Male		65.7	75.4	72.6	72.7	Male		43.0	56.9	51.8	55.6		
Both	18-24	13.5	14.4	16.5	13.7	Both	18-24	6.7	9.2	7.0	13.2		
	25-34	15.0	29.1	33.6	25.4		25-34	17.7	13.4	17.4	20.4		
	35-44	32.9	40.3	46.5	47.1		35-44	25.2	32.4	30.6	35.6		
	45-54	89.2	95.3	96.0	110.2		45-54	62.8	72.9	71.8	71.2		
	55-64	123.7	141.2	133.8	137.6		55-64	83.0	90.5	105.0	106.9		
All Patients		67.0	76.2	76.0	79.1	All Patients		47.4	53.1	56.0	58.2		

^a Values represent the number of incident cases in each demographic group divided by all members of the same demographic group with a full year enrollment in that year and two years prior.

Figure 3: Prevalence

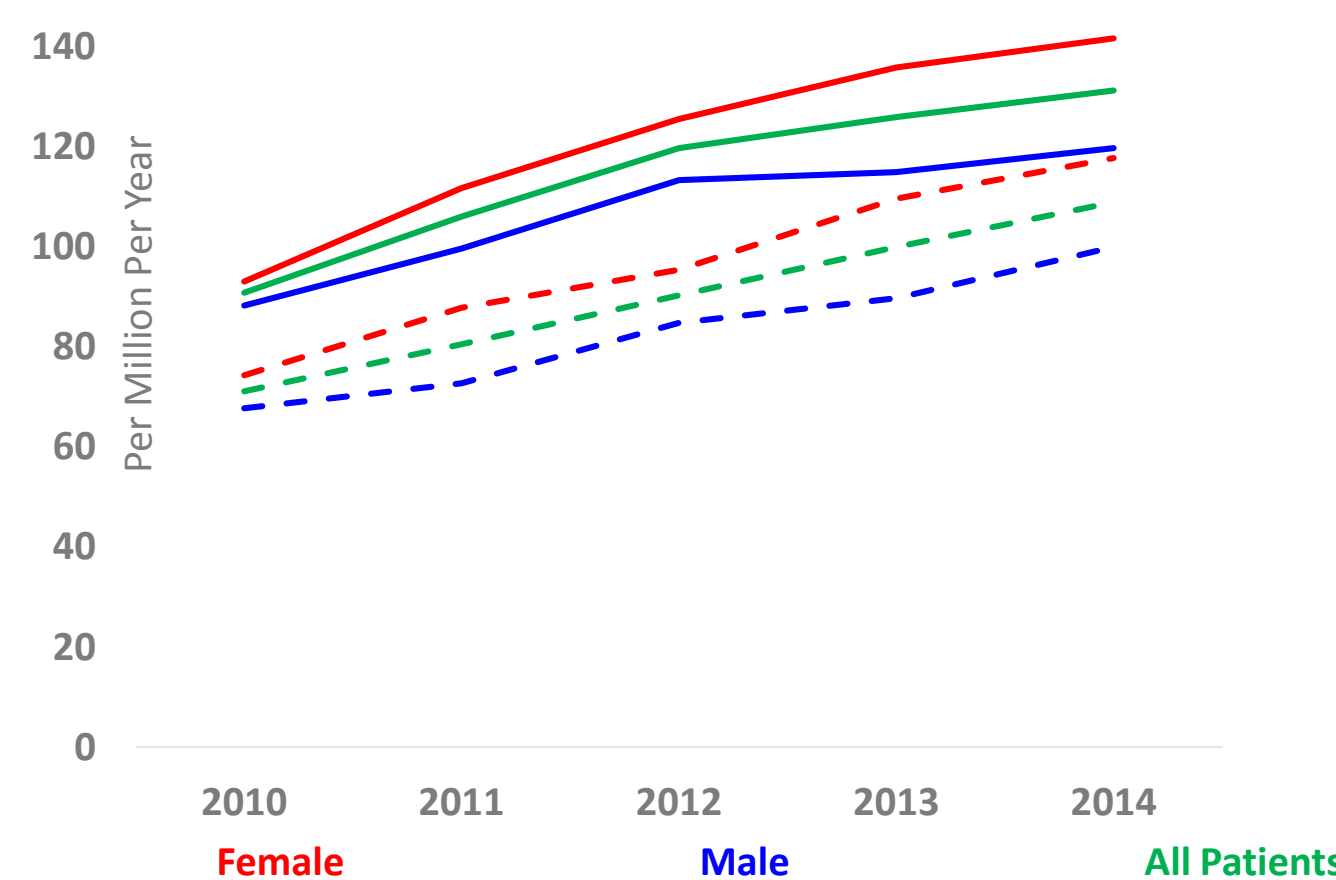
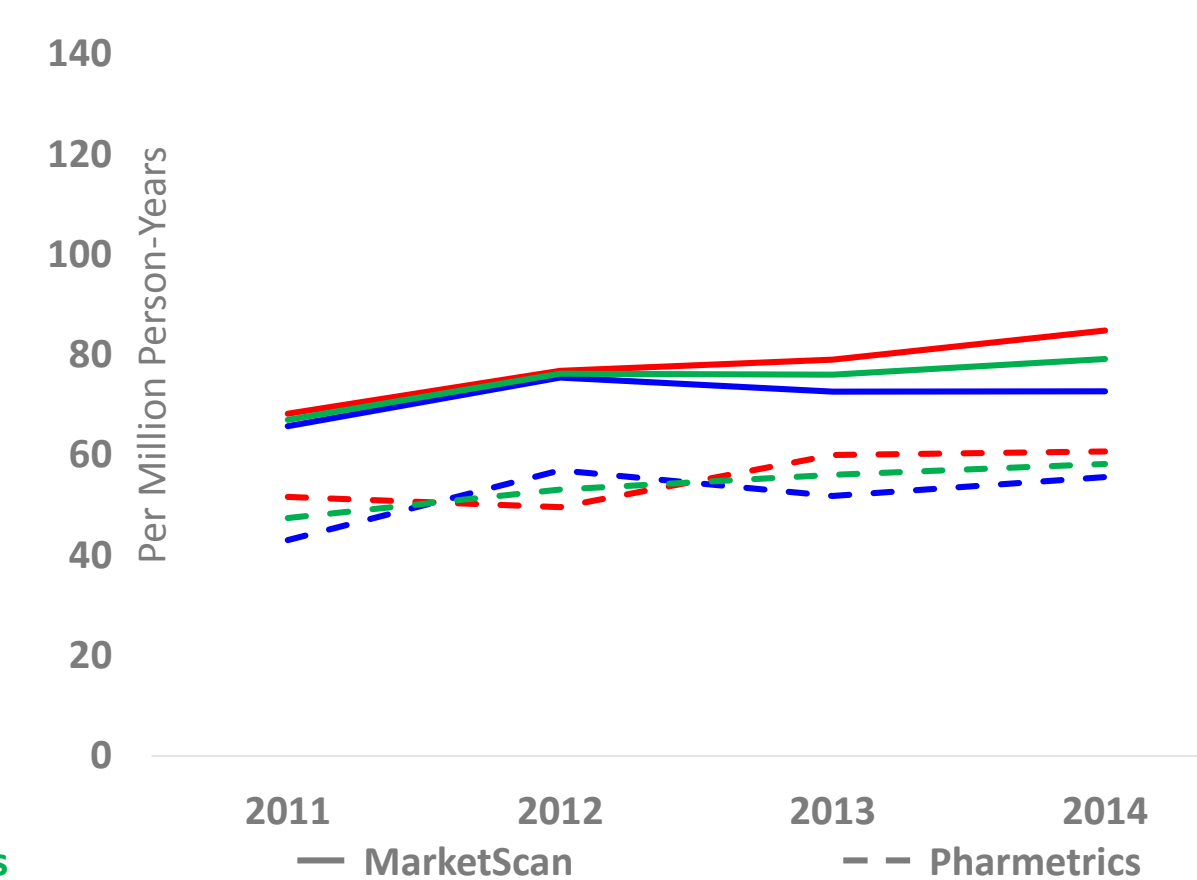


Figure 4: Incidence



CONCLUSIONS

- In both databases, incidence and prevalence of GI NET increased considerably from 2010 to 2014. In 2014, the highest prevalence was seen in MarketScan at 131.2 cases per million per year, a 44.5% increase from 2010; and the highest incidence was seen in MarketScan at 79.1 PMPY, an 18.1% increase from 2011.
- This increase may be due to better diagnostic methods, increased awareness of NET among clinicians and pathologists, and/or an actual increase in disease occurrence in the U.S. population.
- Increased prevalence likely results from longer survival and increasing incidence.²
- In order for physicians and health plans to appropriately manage this larger population, it may be necessary to improve awareness of safe and effective treatment options.
- Further, with only one FDA approved oral treatment for GI NET (everolimus, approved Feb 2016), the development of additional treatment options for these patients is needed.

LIMITATIONS

- These results only reflect patients with commercial insurance and do not include those with Medicaid, Medicare or uninsured individuals. Results may not be nationally representative.
- Study patients were identified using ICD-9-CM codes; pathologic diagnosis could not be confirmed in this administrative database.

References

- Yao et al. One hundred years after "carcinoid": epidemiology of and prognostic factors for neuroendocrine tumors in 35,825 cases in the United States. *Journal of Clinical Oncology*. 2008 Jun 20;26(18):3063-72.
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