1-Year Survival Rates for Neuroendocrine Tumour Patients in England

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INTRODUCTION

Accurate survival data for patients with neuroendocrine tumours (NETs) in England has been difficult to capture as national data has not historically been available. In 2013, the English cancer registry began to register NETs using the ICD-O-3 coding system, for the first time allowing a comprehensive isolation of NET data.

The NET Patient Foundation in partnership with the National Cancer Registration and Analysis Service (NCRAS) Public Health England (PHE) have used this data to determine survival statistics for people diagnosed with NETs in England.

METHODS

Survival was calculated for 6,345 males and 6,490 females diagnosed with a NET in England between 2013 and 2015.

Tumours were staged using TNM staging and graded using the ENETs grading system (WHO 2010) for gastrointestinal NETs or according to pathological grading of differentiation for other sites.

The Kaplan-Meier survival method was used to estimate overall survival and comparisons were performed with log-rank tests.

RESULTS

1-year survival was 75% [95% CI, 74.5-76.1] for NETs overall, 71% [70.3-72.6] in males and 78% [77.2-79.2] in females (*p<0.001, for comparison between sexes*).

Survival by age group was as follows: 0-55 years 90% [95% CI, 89.0-91.1]; 56-65 years 79% [77.9-81.0]; 66-75 years 72% [70.1-73.1]; >75 years 60% [57.9-61.4] (*with p<0.001 for comparisons between all age groups*).

Survival decreased with increasing stage (*p*<0.001, *for comparison between all stages*) (*figure 1*) and grade (*p*<0.001, *for comparison between all grades*) (*figure 2*), which was more pronounced when stage and grade were combined (*Table 1*).

The survival probability for people with advanced stage, high grade NETs of the small intestine (71%) was significantly higher than those for lung (26%), colorectal (27%), and pancreatic (42%) NETs.

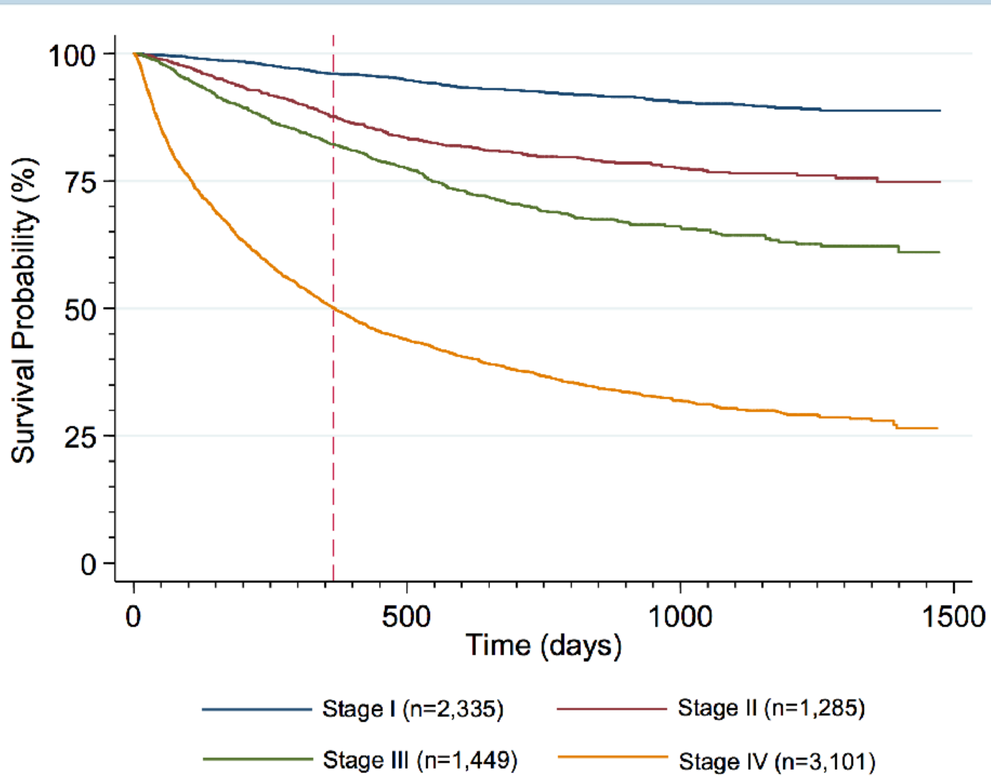

Figure 1. 1-year survival probability for neuroendocrine tumours diagnosed in England between 2013 and 2015, by stage.

	Survival Probability (%)	95% CI
Stage I	96	95.2 to 96.8
Stage II	89	85.8 to 89.4
Stage III	82	80.1 to 84.1
Stage IV	50	48.2 to 51.9

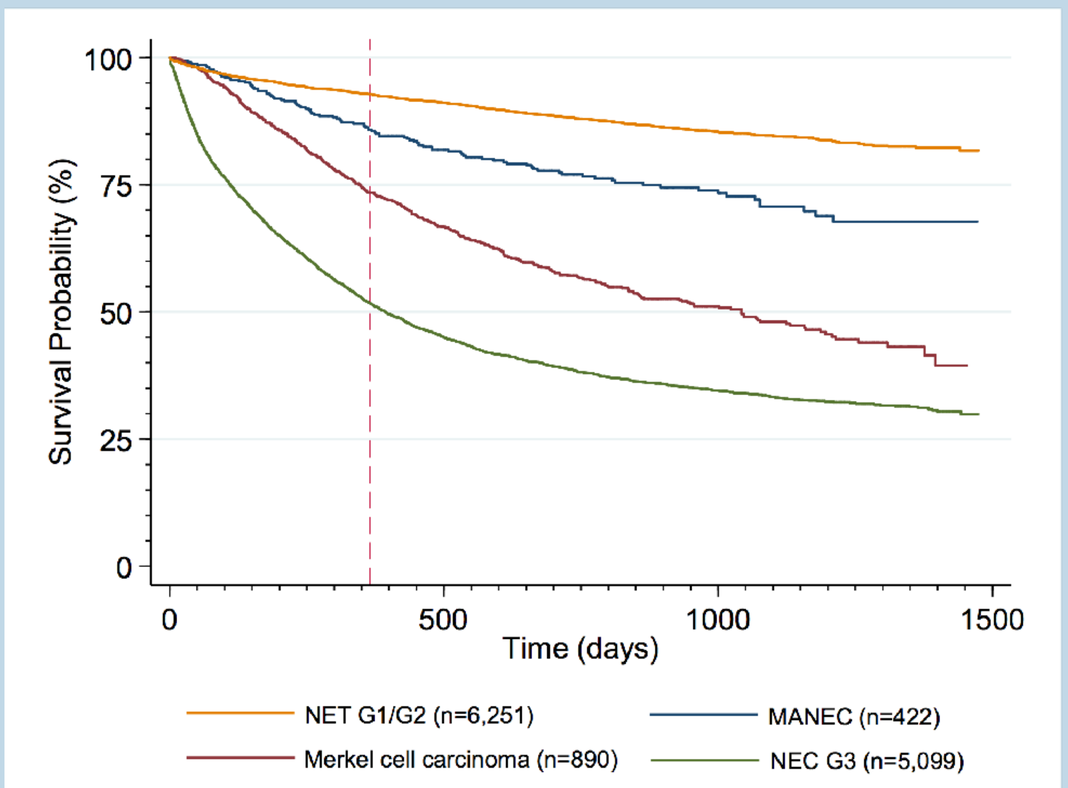

Figure 2. 1-year survival probability for neuroendocrine tumours diagnosed in England between 2013 and 2015, by grade.

	Survival Probability (%)	95% CI
NET G1/G2*	93	92.1 to 93.4
NEC G3**	52	50.2 to 53.1
MANEC***	86	82.1 to 88.9
Merkel call carcinoma (*not graded*)	73	70.4 to 76.2

Table 1. 1-year survival probability (%) for colorectal, lung, pancreas and lung neuroendocrine tumours diagnosed in England between 2013 and 2015 according to grade and stage.

	Colorectal (*n=2,718*)			Lung (*n=2,479*)		Pancreas (*n=1,218*)		Small Intestine (*n=1,699*)	
	Grade 1 or 2	Grade 3	MANEC	Grade 1 or 2	Grade 3	Grade 1 or 2	Grade 3	Grade 1 or 2	Grade 3
Stage I	99 (97.6-99.4)	-	98 (85.8-99.7)	98 (97.2-99.1)	93 (89.1-95.4)	97 (92.7-98.7)	87 (68.3-94.8)	98 (90.8-99.4)	-
Stage II	97 (94.6-98.5)	-	97 (92.3-99.2)	98 (93.8-99.6)	81 (71.1-87.7)	95 (88.8-97.6)	87 (58.6-96.7)	96 (89.7-98.5)	-
Stage III	98 (95.0-99.5)	70 (60.9-77.6)	85 (74.4-91.8)	92 (81.1-96.4)	63 (55.2-70.7)	100 (no deaths)	55 (30.5-74.7)	96 (93.6-97.3)	80 (58.4-91.1)
Stage IV	79 (73.3-85.5)	27 (21.9-33.7)	60 (45.2-72.6)	69 (59.1-76.8)	26 (22.4-29.9)	85 (79.7-89.6)	42 (35.7-48.6)	88 (84.3-90.7)	71 (60.1-79.9)
Overall	88 (86.4-88.9)			74 (72.3-75.9)		80 (77.6-82.2)		90 (88.2-91.1)	

DISCUSSION

This is the most current comprehensive population-based survival study of NETs. The results showed that the survival probabilities for NETs in England by sex, age, and tumour site had similar trends to previous international studies[1,2]. Although overall 1-year survival and lung NET 1-year survival were slightly lower.

This study further looked at survival by TNM stage and WHO 2010 tumour grade.

CONCLUSIONS

- Tumour grade and TNM stage have the potential to be good prognostic indicators for all NETs, and the combination of both stage and grade may be more definitive. This was particularly noticeable for lung, colorectal and pancreatic NETs.
- This is the first large scale series regarding mixed adenoneuroendocrine carcinoma demonstrating poor outcomes.

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REFERENCES

1. Yao JC *et al*. One hundred years after "carcinoid": epidemiology of and prognostic factors for neuroendocrine tumors in 35,825 cases in the United States. J Clin Oncol. 2008;26(18):3063-72.
2. Hallet J *et al*. Exploring the rising incidence of neuroendocrine tumors: a population-based analysis of epidemiology, metastatic presentation, and outcomes. Cancer. 2015;121(4):589-97.

*Neuroendocrine tumour grade 1/grade 2 – well differentiated **Neuroendocrine carcinoma grade 3 – poorly differentiated ***Mixed adenoneuroendocrine carcinoma