

# Costing Cancer Pathways

**Cost accumulation over time and variation as a function of survivorship and associated morbidities within a tumour-specific outcomes framework**

*15<sup>th</sup> June 2012*

**WE ARE  
MACMILLAN.  
CANCER SUPPORT**

MONITOR GROUP

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<sup>1</sup> Monitor Group, Europe, <sup>2</sup> Macmillan Cancer Support, <sup>3</sup> National Cancer Intelligence Network

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This document provides an outline of a presentation and is incomplete without the accompanying oral commentary and discussion.

## Introduction to Routes from Diagnosis

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Total Cost of Inpatient Care including Survivorship

- Variation across Survivorship Outcome Groups
  - Cost Accumulation over Time
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Next Steps

## Introduction to 'Routes from Diagnosis'

- Routes from Diagnosis: a framework for describing **survivorship outcome pathways**
- We can organise each patient's experience of care (pre-diagnosis, treatment, survivorship) into a groups with similar characteristics, e.g.:
  - Use of services pre-diagnosis, survival, morbidities requiring inpatient stays, recurrence or progression
- And identify the characteristics highly associated with certain survivorship outcomes
- **Original study:** all patients diagnosed in 2001 (from NCDR) with either colorectal cancer, multiple myeloma or Hodgkin's Disease (*Wells et al 2011 paper in preparation, NCIN presentation 2011 available on request*)
- The stability of the colorectal cancer framework has been assessed using updated, local data from the North Trent Cancer Network (NTCN) for patients diagnosed in 2006, 2007, and 2008
- This presentation will outline selected **high-level financial outputs from both 2001 and 2006** cohorts, establishing the cost of inpatient care and the **variation across survivorship outcome pathways**

# The Team

## Macmillan Cancer Support

- Julie Flynn
- Jane Maher
- Catherine Boyle
- Tom Noel
- Jane Rudge
- Siobhan McClelland
- Sandra Clarkson
- Alba Bowe

## Monitor Group

- Ashley Woolmore
- Reid Adrian
- Edmund Drage
- Chris Edson

## NYCRIS & NCIN

- James Thomas
- Michael Chapman

- We worked in close collaboration with the **North Trent Cancer Network and NHS Sheffield**, as part of their **Network Survivorship Project** that has the objective to: *Develop self management models of care to reduce emergency admissions whilst enhancing holistic care for patients living with and beyond cancer*

## Steering Group

### Clinical Panel

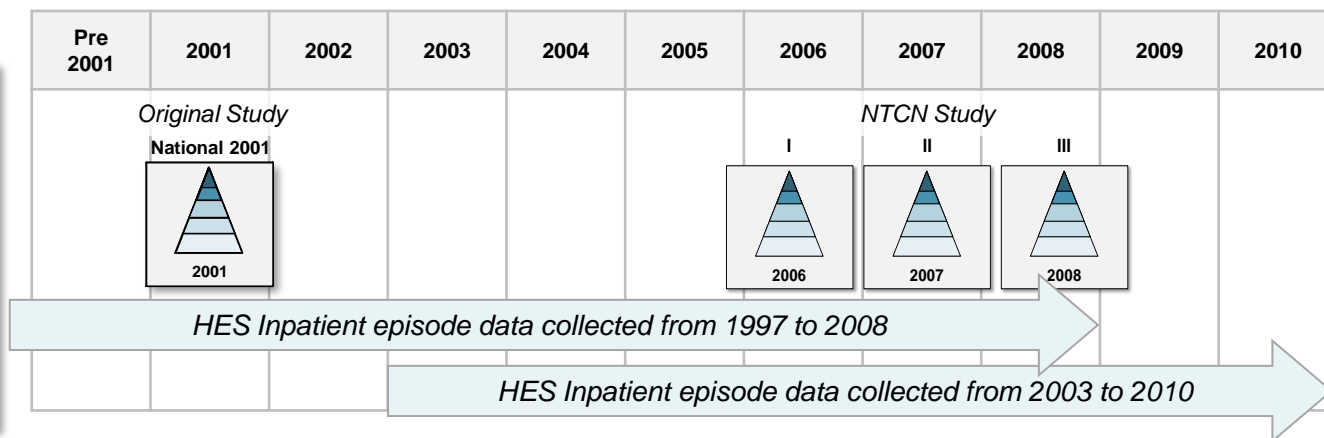
Joy Robinson	NSSG Chair
Shwan Amin	Consultant General Surgeon
Debra Furniss	Consultant Oncologist
Pauline Love	GP, Bakewell Medical Centre

### NTCN Project Team

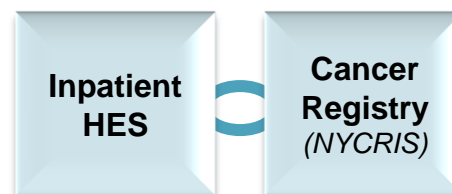
Kim Fell	Network Director, NTCN
Julia Jessop	Service Improvement Lead, NTCN
Judith Bird	Network Lead Nurse, NTCN
Denise Friend	Service Improvement Facilitator, NTCN
Zoe Ardern	Information Analyst, NTCN

# Schematic of Research Design

**Definition of the cohort**



**Data extraction and linkage**



Linked Registry and Inpatient HES data

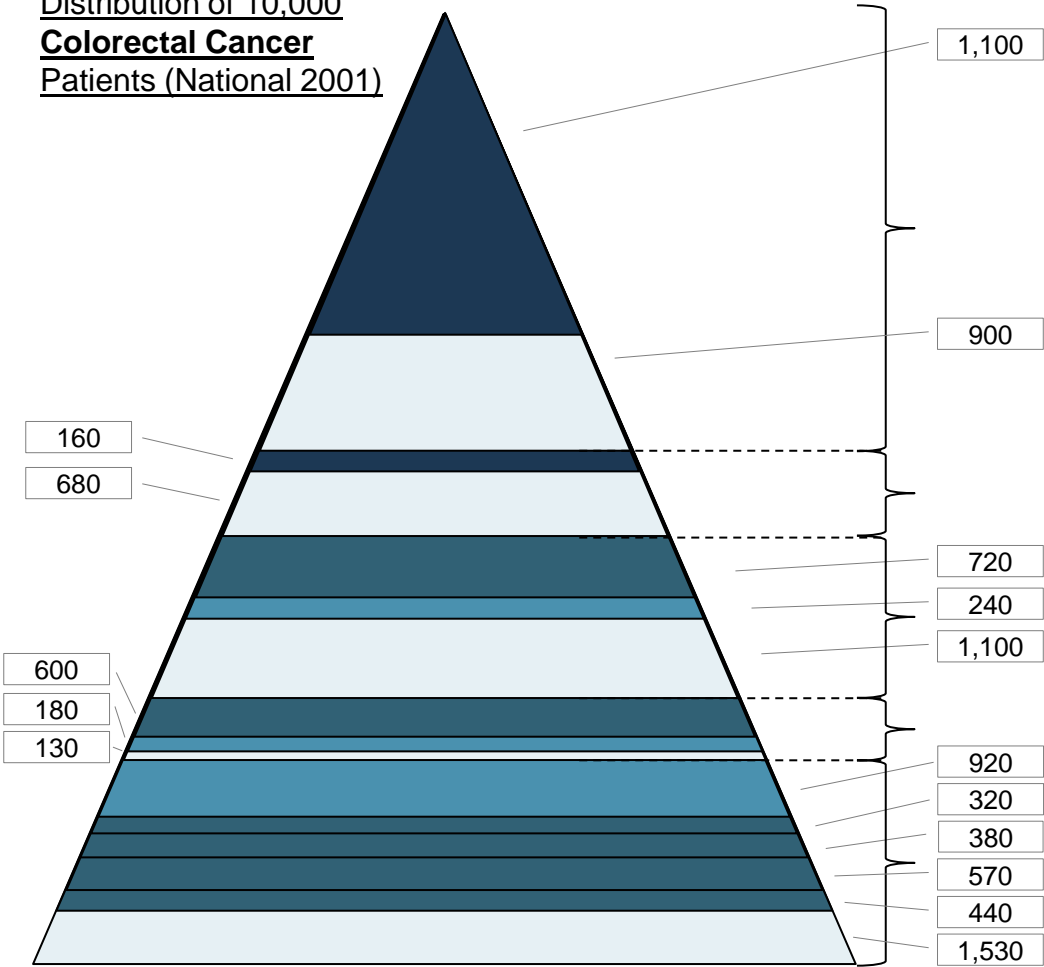
Created an integrated data set: patient level; activity level

**Analytical Phase**

- 1 Populated Routes from Diagnosis Framework
- 2 Simplified Pathways Framework
- 3 Economic Evaluation of Interventions

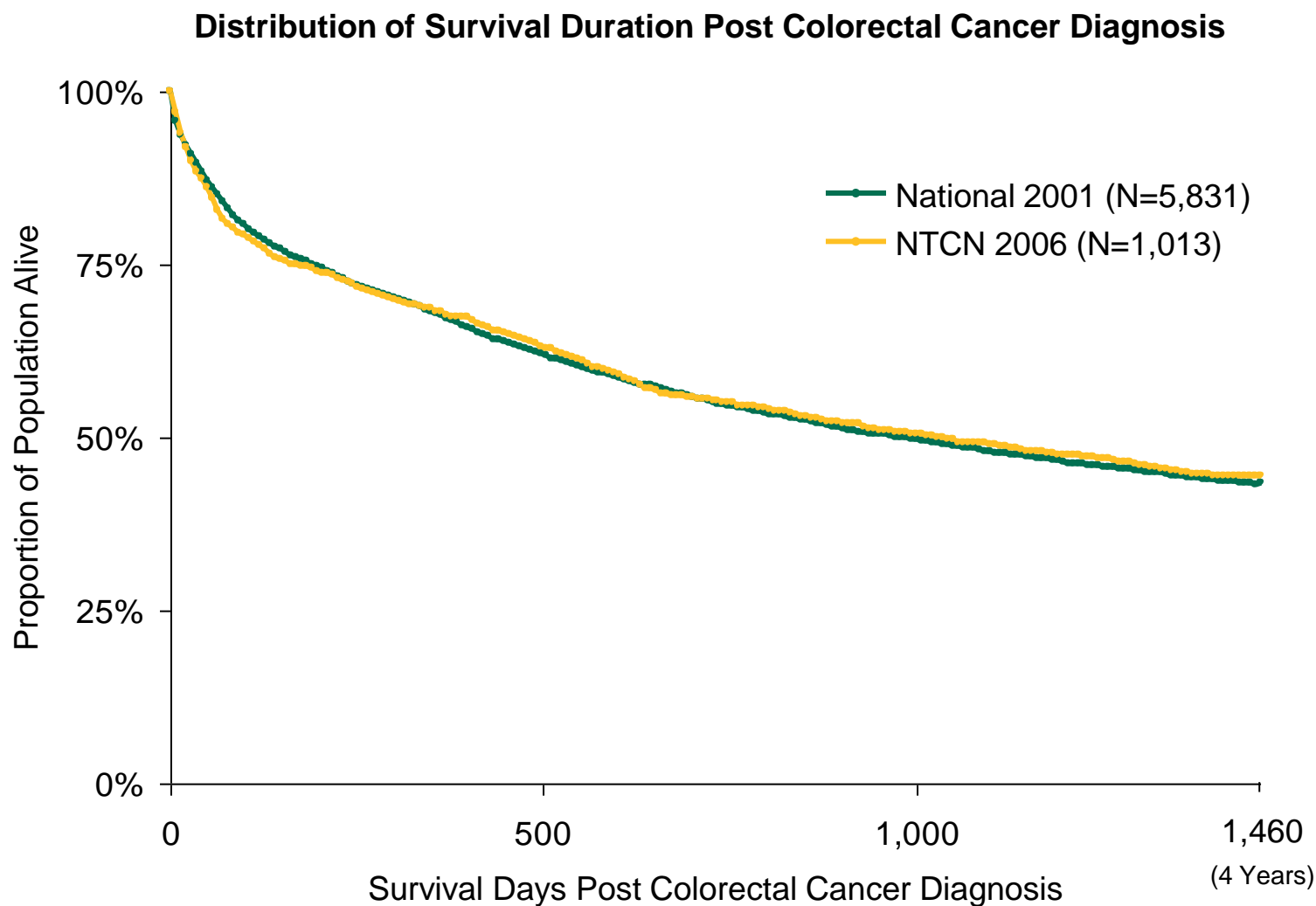
# Routes from Diagnosis framework for colorectal cancer was based on mutually exclusive outcomes

Distribution of 10,000  
Colorectal Cancer  
Patients (National 2001)



Survival	Survival +1
0 – 6 Month Survival	<div></div> <b>Patient management issues:</b> Patient has remained in inpatient care for 25% or more of their survival post diagnosis
6 - 12 Month Survival	<div></div> <b>Cancer related issues:</b> including secondary cancer, metastatic cancer and secondary primary tumors
1 - 3 Year Survival	<div></div> <b>Non cancer related issues:</b> Including Cardio Vascular Morbidities, Renal morbidities Immunological disorders, and intestinal morbidities
3 - 5 Year Survival	
5+ Year Survival	<div></div> <b>No additional issues</b>

## Distribution of survival outcomes for patients living less than 4 years are very similar for patients diagnosed in 2001 and those in 2006



Note: Survival curves include all patients within cohort; Kolmogorov-Smirnov two-sample test fails to reject the hypothesis that the two samples are from different populations based on survival distribution, p-value=0.20

Source: NTCN 2006 data based on HES Inpatient & NCDR data from 2003-2010, 2001 analysis based on previous RfD outputs, Monitor Analysis

**The framework of 15 outcomes was simplified to 8, in line with the focus on the survivorship phase**

			<div>N (NTCN 2006)</div>		<div>Rationale</div>			
0 – 6 Month Survival	1	No Patient Management Issues	1	0-1 Year Survival	325			
	2	Patient Management Issues						
6 - 12 Month Survival	3	No Patient Management Issues	2	1-5 Year Survival No complications	90			
	4	Patient Management Issues						
1 - 3 Year Survival	5	No Complications	3	1-3 Year Survival Cancer Complications	88			
	6	Cancer Complications						
	7	Non Cancer Complications						
3 - 5 Year Survival	8	No Complications	4	1-5 Year Survival Non Cancer Complications	26			
	9	Cancer Complications						
	10	Non Cancer Complications						
Continued Survival	11	No Complications	6	Continued Survival Cancer Complications	50			
	12	Cancer Complications						
	13	Non Cancer Complications				7	Continued Survival Non-Cancer Complications	169
	14							
	15							
			8	Continued Survival No-Complications	222			

Combine groups with very complex needs

- Patients with very short survival post diagnosis
- Potential role for palliative support

Combine groups with similar support needs

- Groups merged based on the types of complications (1-3 and 3-5 year survival groups)
- Further discussion as to whether cancer complications groups could be merged across the 1-3 and 3-5 year survival

Prioritise groups for intervention based on local strategy

- Groups with non-cancer complications kept separate from those with cancer complications – with each group being prioritised for intervention
- Overall, continued survival cases and no-complications kept separate



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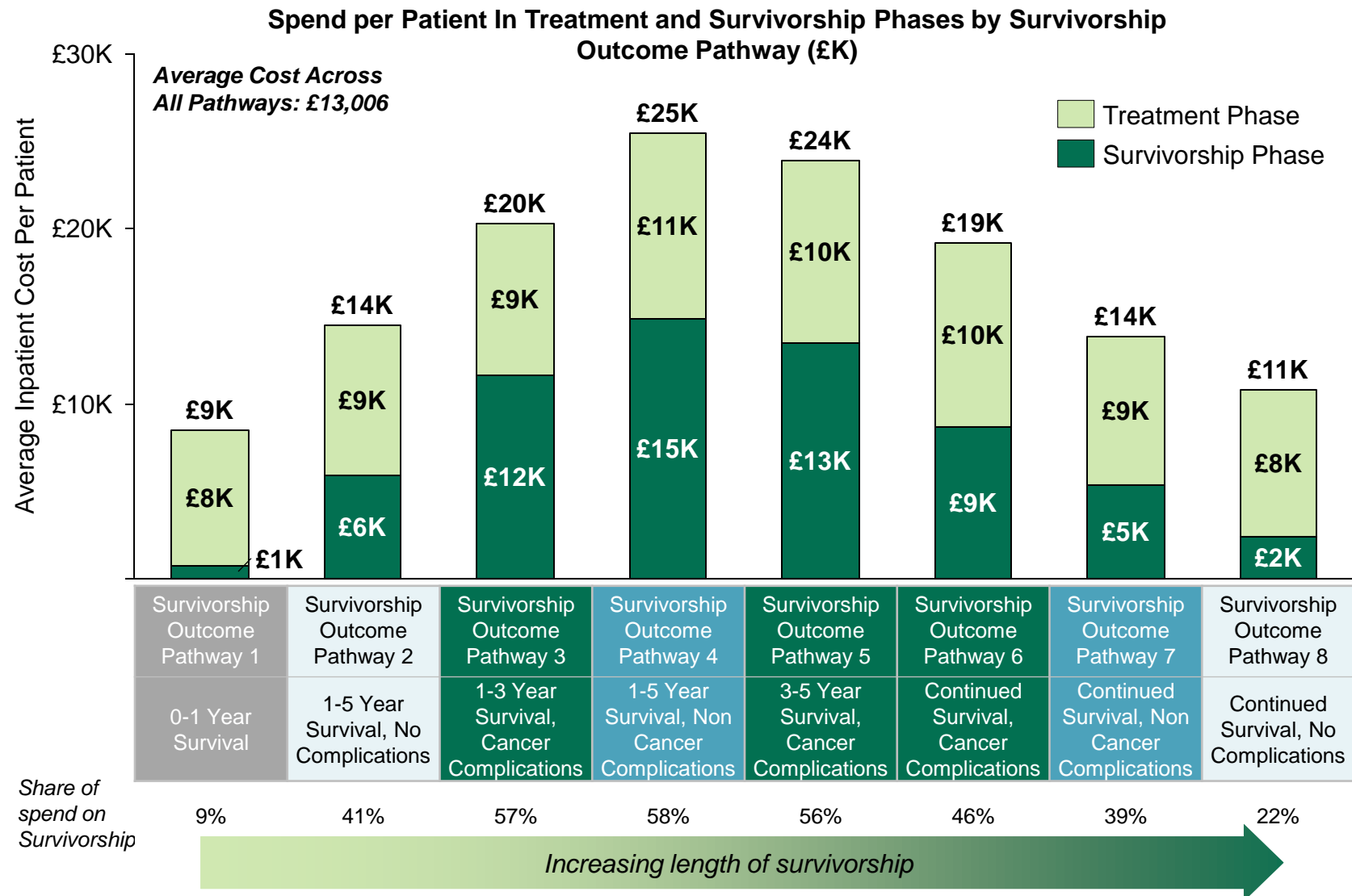
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## **Total Cost of Inpatient Care including Survivorship**

- Variation across Survivorship Outcome Groups**
  - Cost Accumulation over Time
- 

Next Steps

# We observe substantial variation in total pathway cost, with the major drivers being the complexity and length of the survivorship period



Note: To obtain spend per patient, HRG 4.0 codes were costed using the 2010/11 National Tariff; costs are inpatient only, excluding locally agreed costs (such as chemotherapy), and priced at the spell, rather than episode, level (in line with how hospitals receive funding from their PCT)

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## **Total Cost of Inpatient Care including Survivorship**

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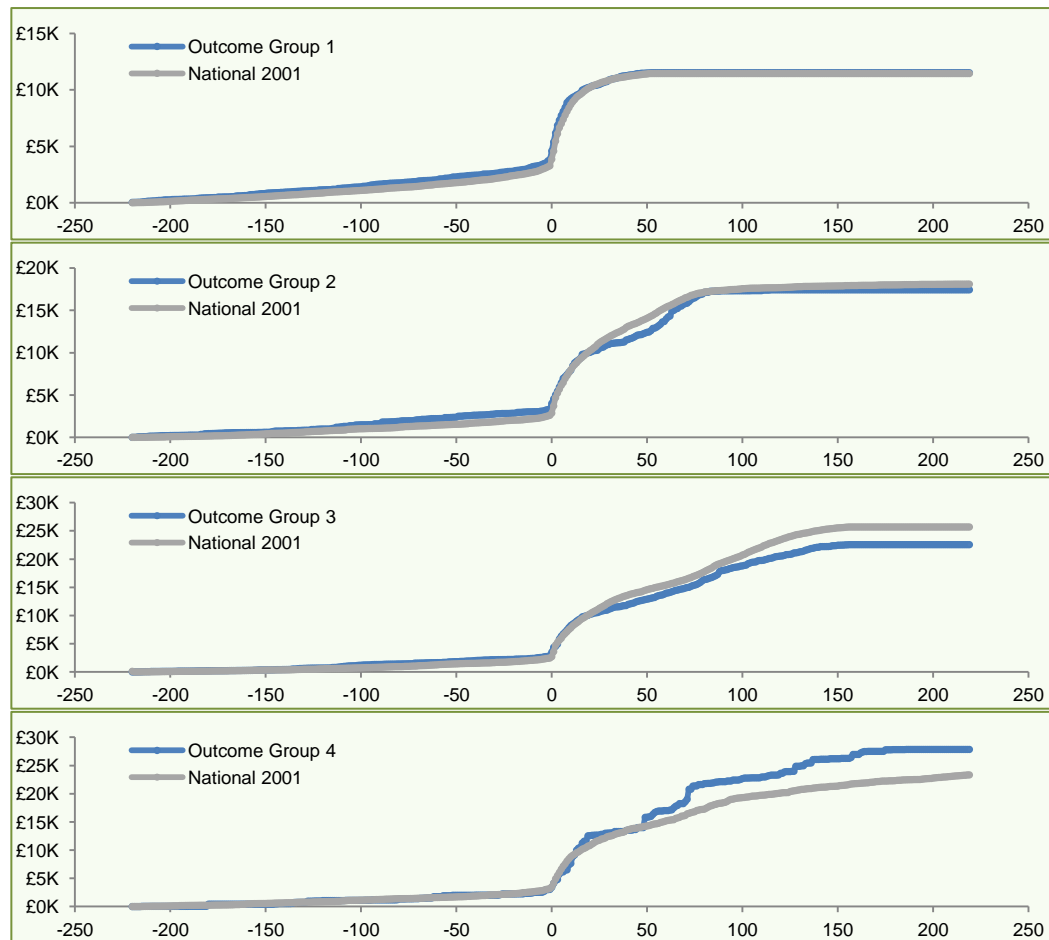
- **Cost Accumulation over Time**

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Next Steps

# Comparing the pattern of cost accumulation of the National 2001 CRC cohort to North Trent 2006 shows remarkable similarity (1/2)

Survivorship Outcome Pathways			
Description		% <sup>1</sup>	Avg Cost
1	0-1 Year Survival	32%	£9k
2	1-5 Year Survival, No Complications	9%	£14k
3	1-3 Year Survival, Cancer Complications	9%	£20k
4	1-5 Year Survival, Non Cancer Complications	3%	£25k



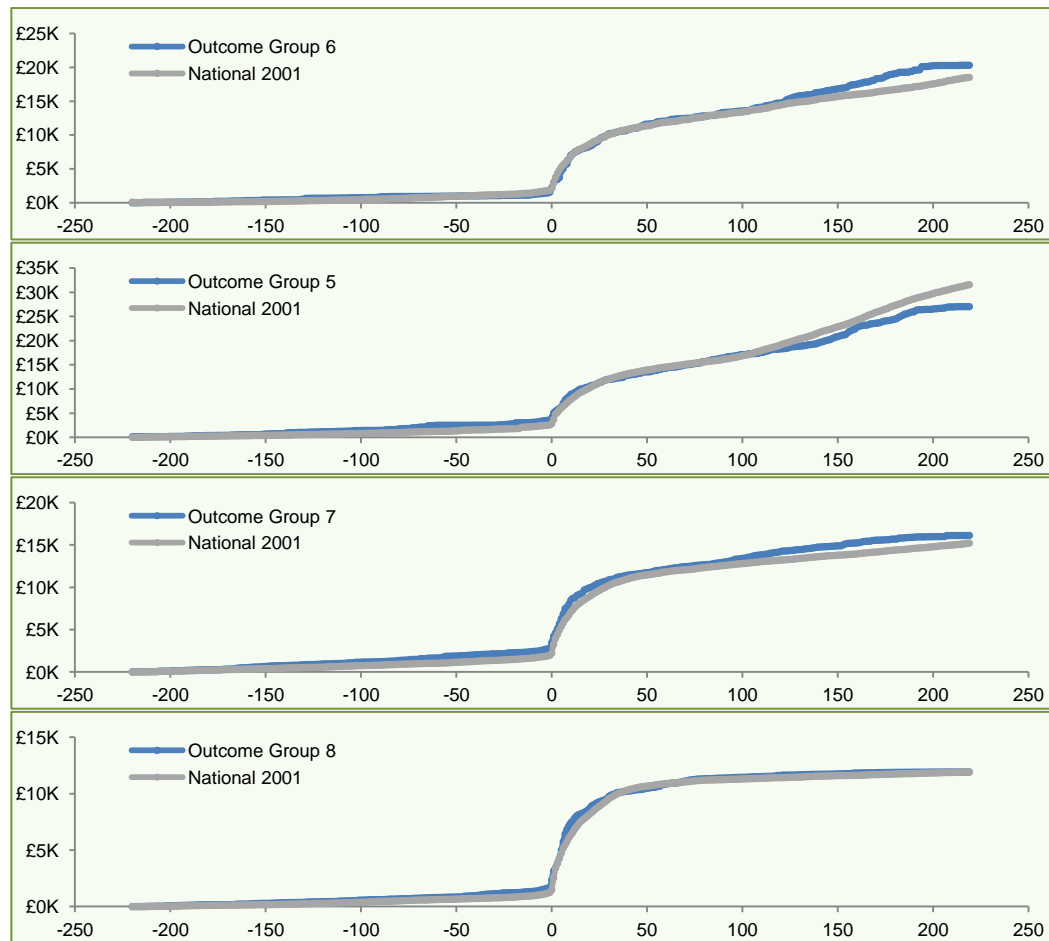
Note: x axis indicates number of weeks from primary index tumor; y axis indicates average inpatient cost, applied through the 2010/11 National Tariff the spell level; 1)

Survivorship Outcome Pathway share of total 2006 cohort patients

Source: NTCN Registry Data 2006; HES Inpatient Data 2003 – 2010

# Comparing the pattern of cost accumulation of the National 2001 CRC cohort to North Trent 2006 shows remarkable similarity (2/2)

Survivorship Outcome Pathways			
Description		% <sup>1</sup>	Avg Cost
5	3-5 Year Survival, Cancer Complications	4%	£24k
6	Continued Survival, Cancer Complications	5%	£19k
7	Continued Survival, Non Cancer Complications	17%	£14k
8	Continued Survival, No Complications	22%	£11k



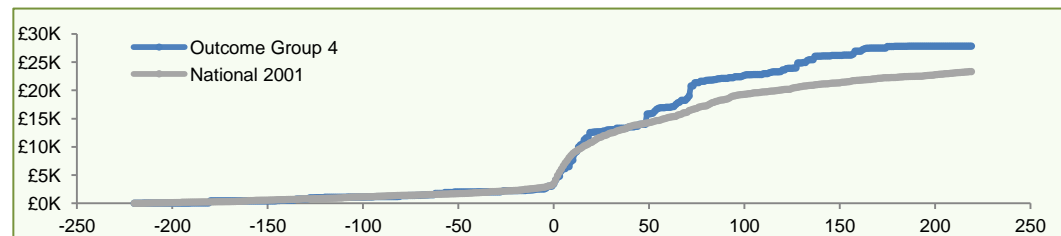
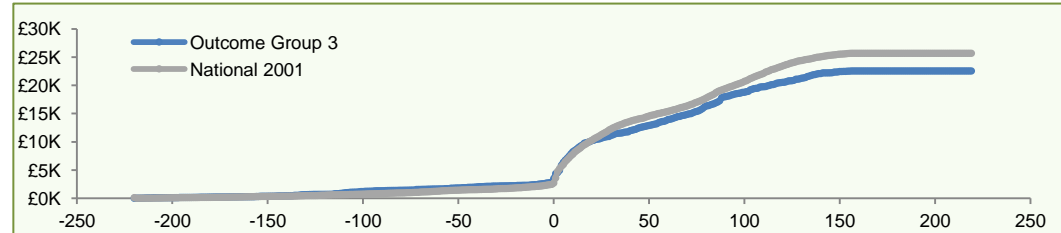
Note: x axis indicates number of weeks from primary index tumor; y axis indicates average inpatient cost, applied through the 2010/11 National Tariff the spell level; 1)

Survivorship Outcome Pathway share of total 2006 cohort patients

Source: NTCN Registry Data 2006; HES Inpatient Data 2003 – 2010

# Cost accumulation was closely mirrored for all but two Survivorship Outcome Pathways; the next phase will be to determine the source of these differences

Survivorship Outcome Pathways			
Description		% <sup>1</sup>	Avg Cost
3	1-3 Year Survival, Cancer Complications	9%	£20k
4	1-5 Year Survival, Non Cancer Complications	3%	£25k



Note: x axis indicates number of weeks from primary index tumor; y axis indicates average inpatient cost, applied through the 2010/11 National Tariff the spell level: 1)

Survivorship Outcome Pathway share of total 2006 cohort patients

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**Next Steps**

## Next Steps

- Attempt to include expanded sources of activity and cost to provide a more comprehensive view of the survivorship phase
- Apply the framework to assess the financial impact of:
  - Increasing size of the survivorship population
  - Focussed efforts to target potential inefficiencies
  - Putting in place targeted interventions to anticipate and react to the different needs of patients in the survivorship phase
  - Explore implications for pathway-based commissioning
- Continue to work closely with the North Trent team on the implementation of this type of customised approach