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# Exploring the healthcare cost implications of cancer stage

England level modelling

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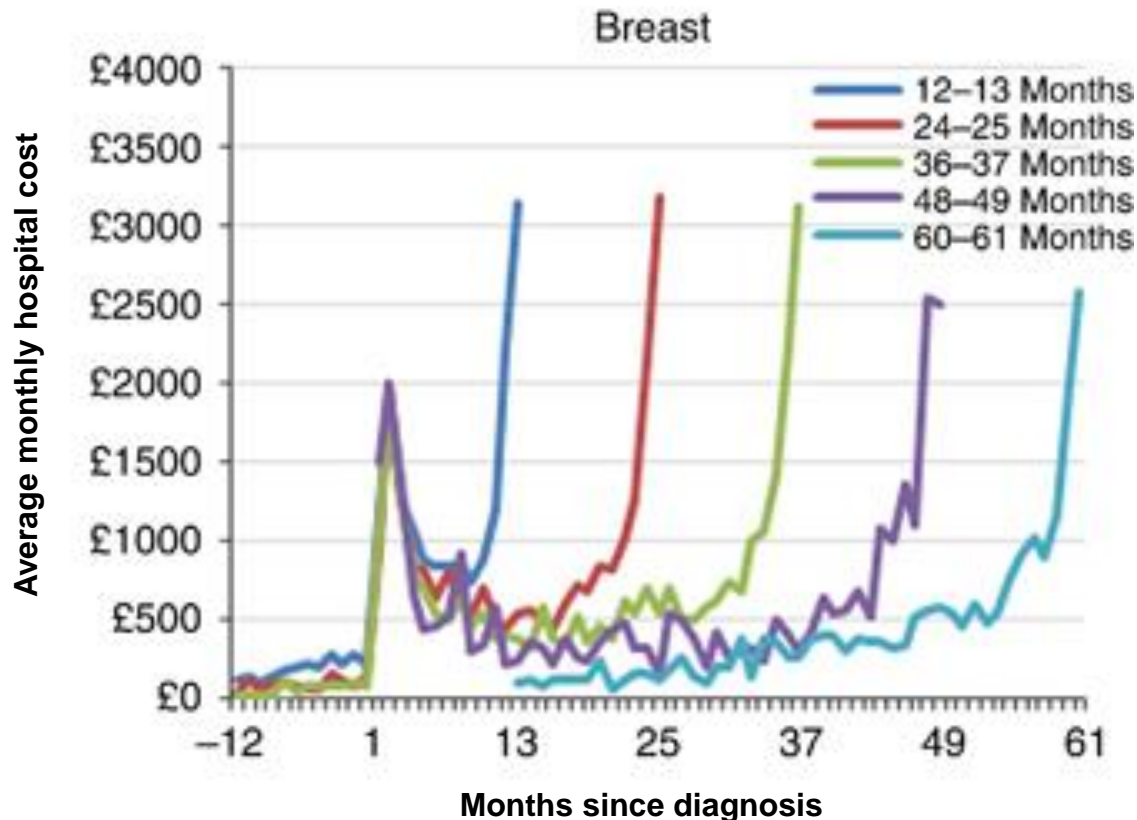
Thursday 22<sup>nd</sup> September 2016

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# What we're covering

- Modelling methods
- Results
  - variation by stage and cancer type
  - patterns in spend per person
  - the impact of cancer progression
- Conclusions

# Cost of care for cancer patients in England using HES



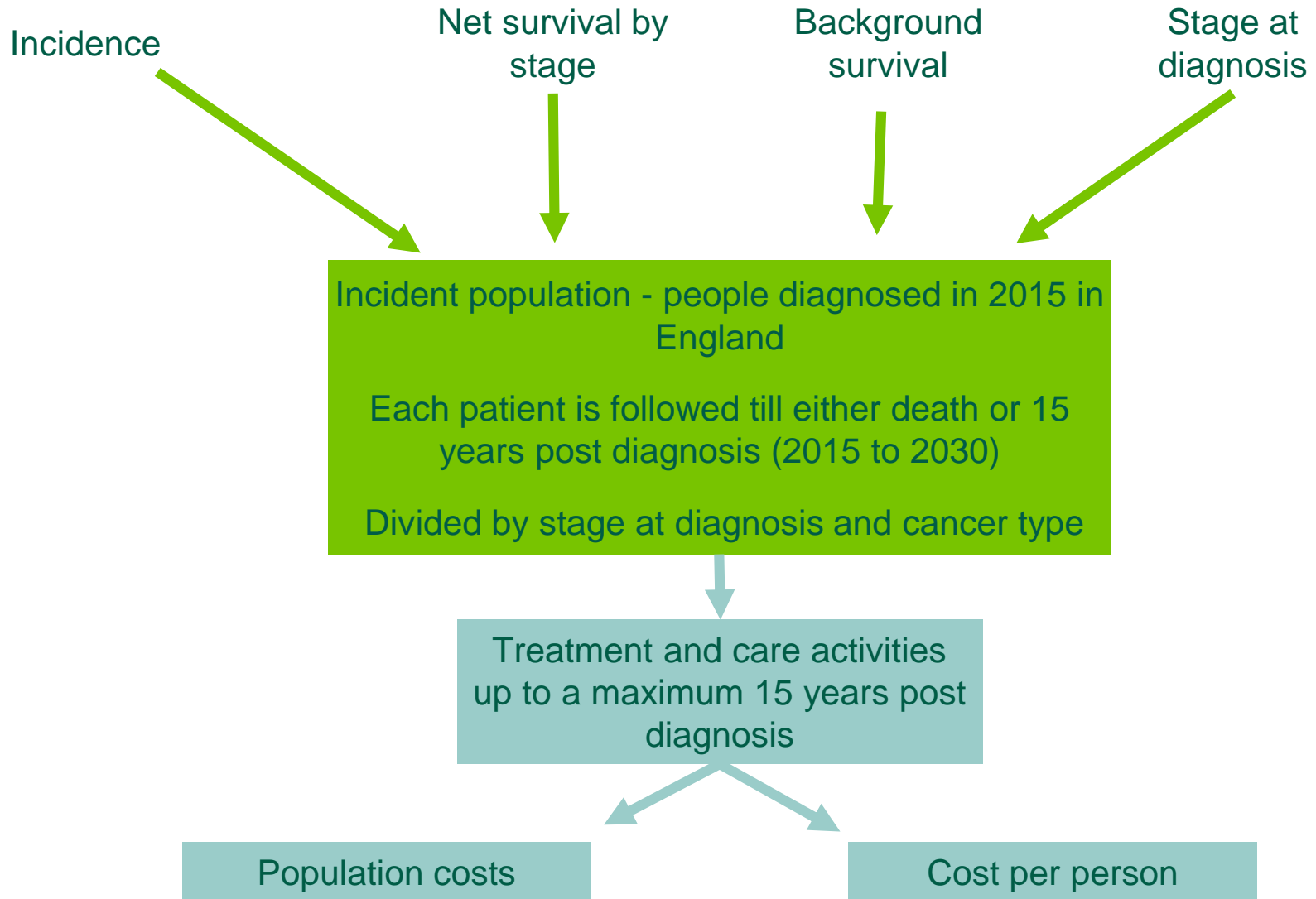
**Average monthly hospital costs in cohorts of patients surviving 12–13 months, 24–25 months, 36–37 months, 48–49 months and 60–61 months from diagnosis.**

Mauro Laudicella, Brendan Walsh, Elaine Burns, Peter C Smith. Cost of care for cancer patients in England: evidence from population-based patient-level data. *Br J Cancer* 2016 May 12;114(11):1286-92. Epub 2016 Apr 12.

A large, textured green brushstroke background, resembling a thick application of paint with visible brush marks and some white highlights at the top edge. The color is a vibrant, slightly dark green.

# Methods

# Modelling the population

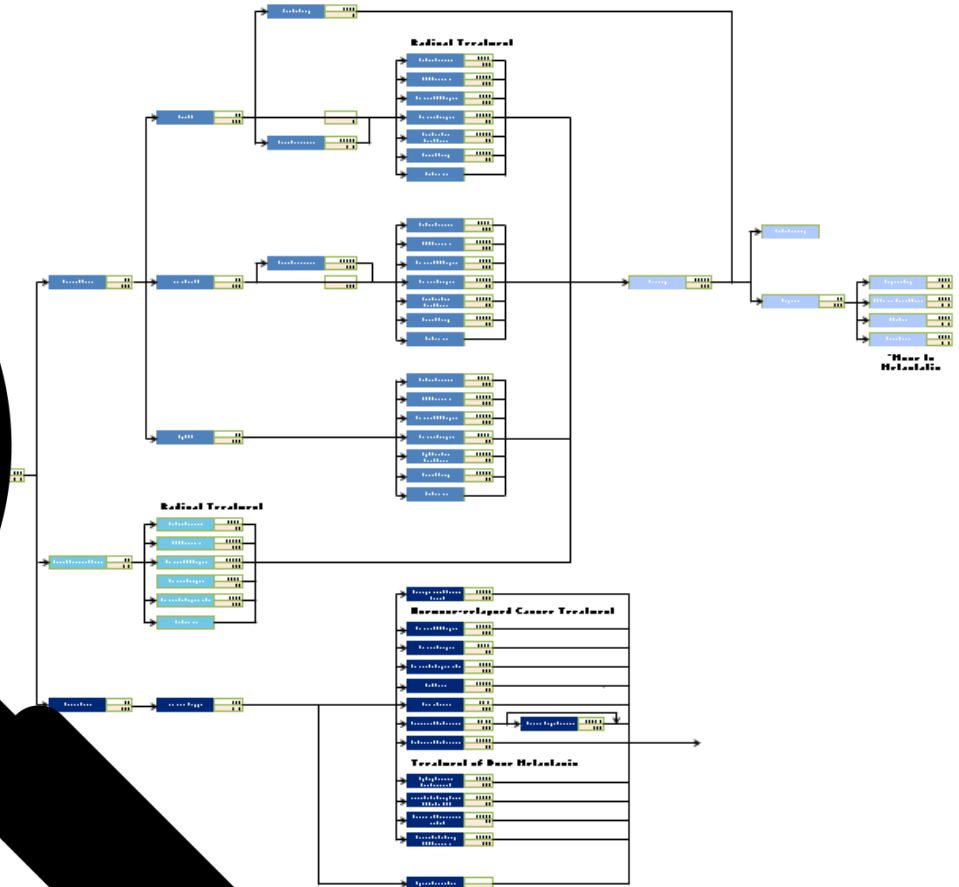
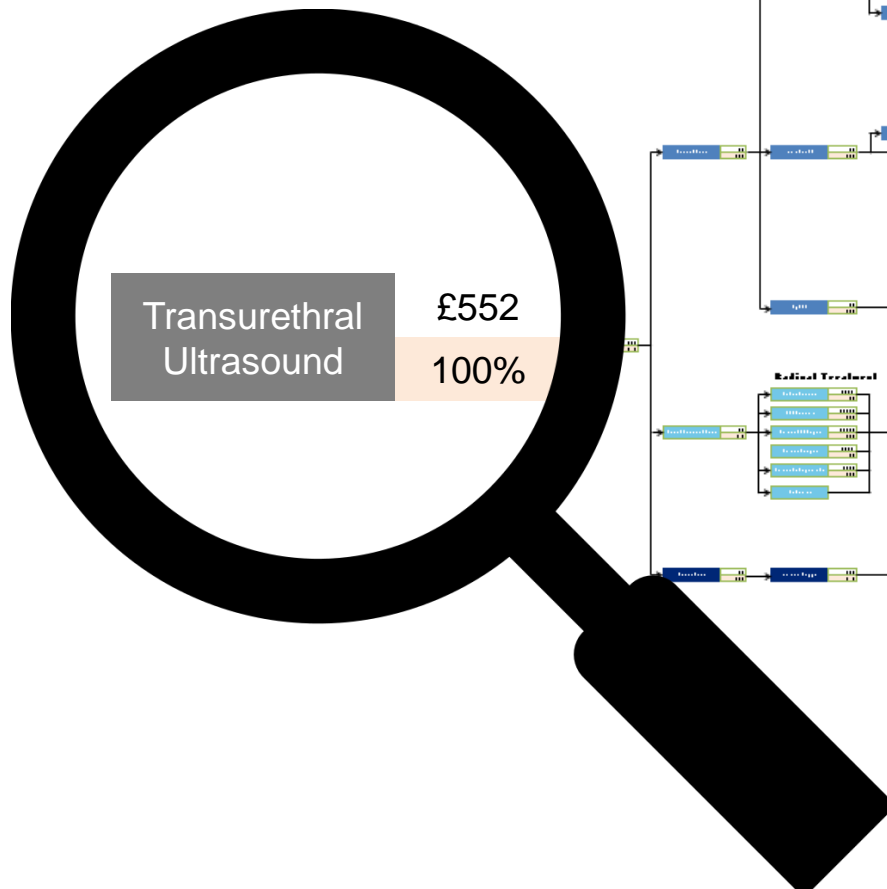


# Modelling the costs with a pathway decision tree

Diagnosis

Treatment

Follow up



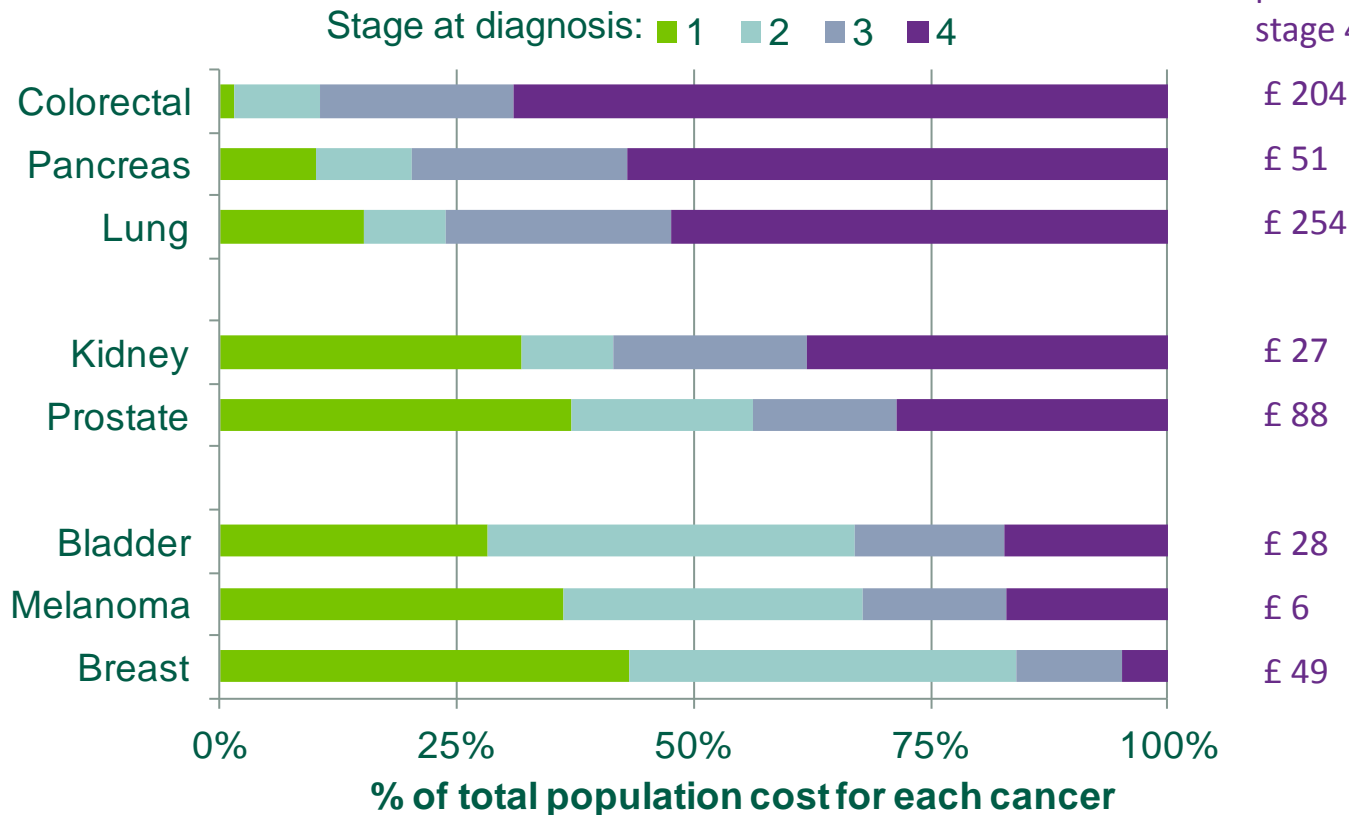
End of life care

# Results



# Spend on people with stage 4 disease varies by cancer

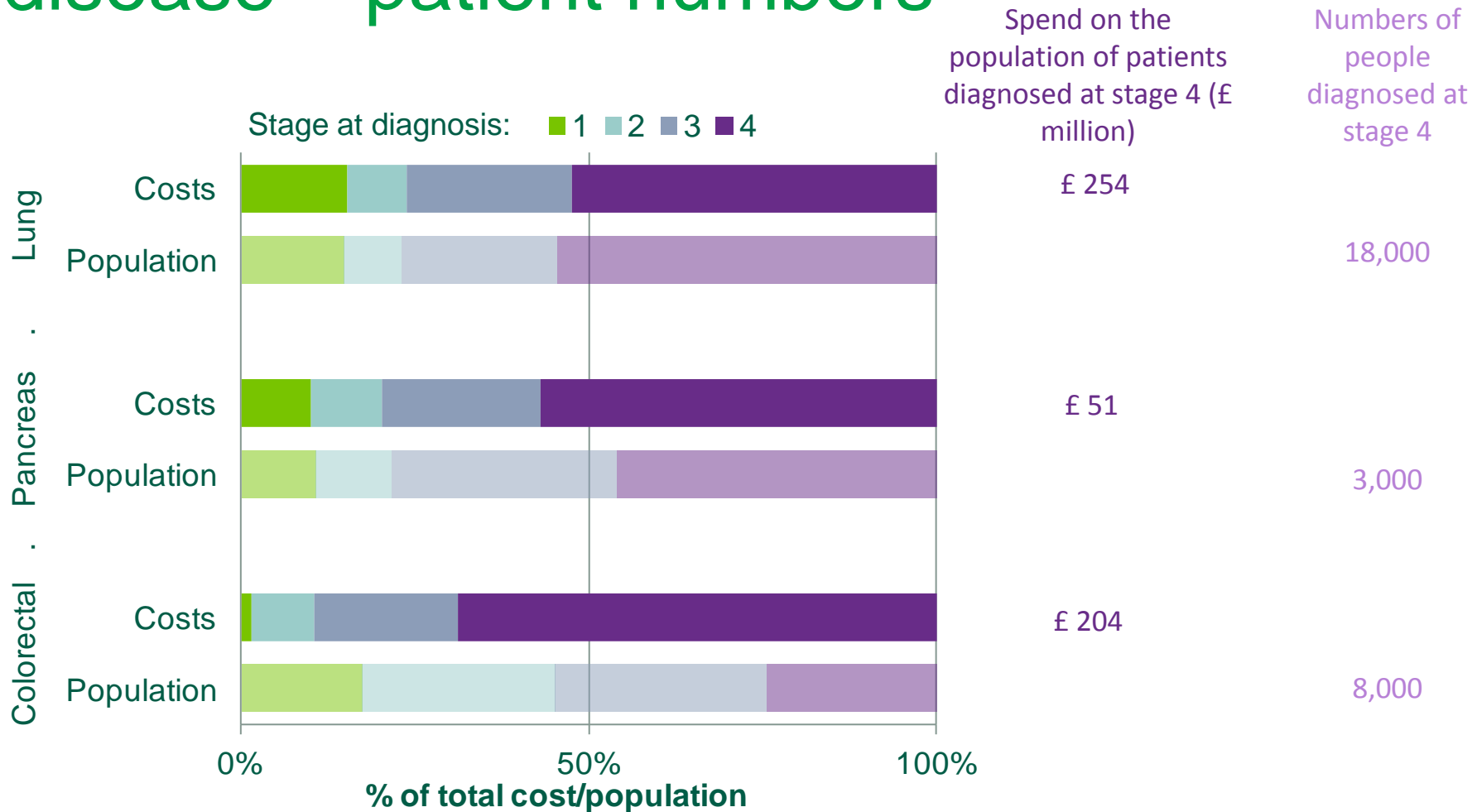
Spend on the population of patients diagnosed at stage 4 (£ million)



**Population costs over 15 years for those diagnosed in 2015 by cancer type and stage at diagnosis**

Split by stage at diagnosis mainly based on 2012 data and assumptions for those with unknown stage.

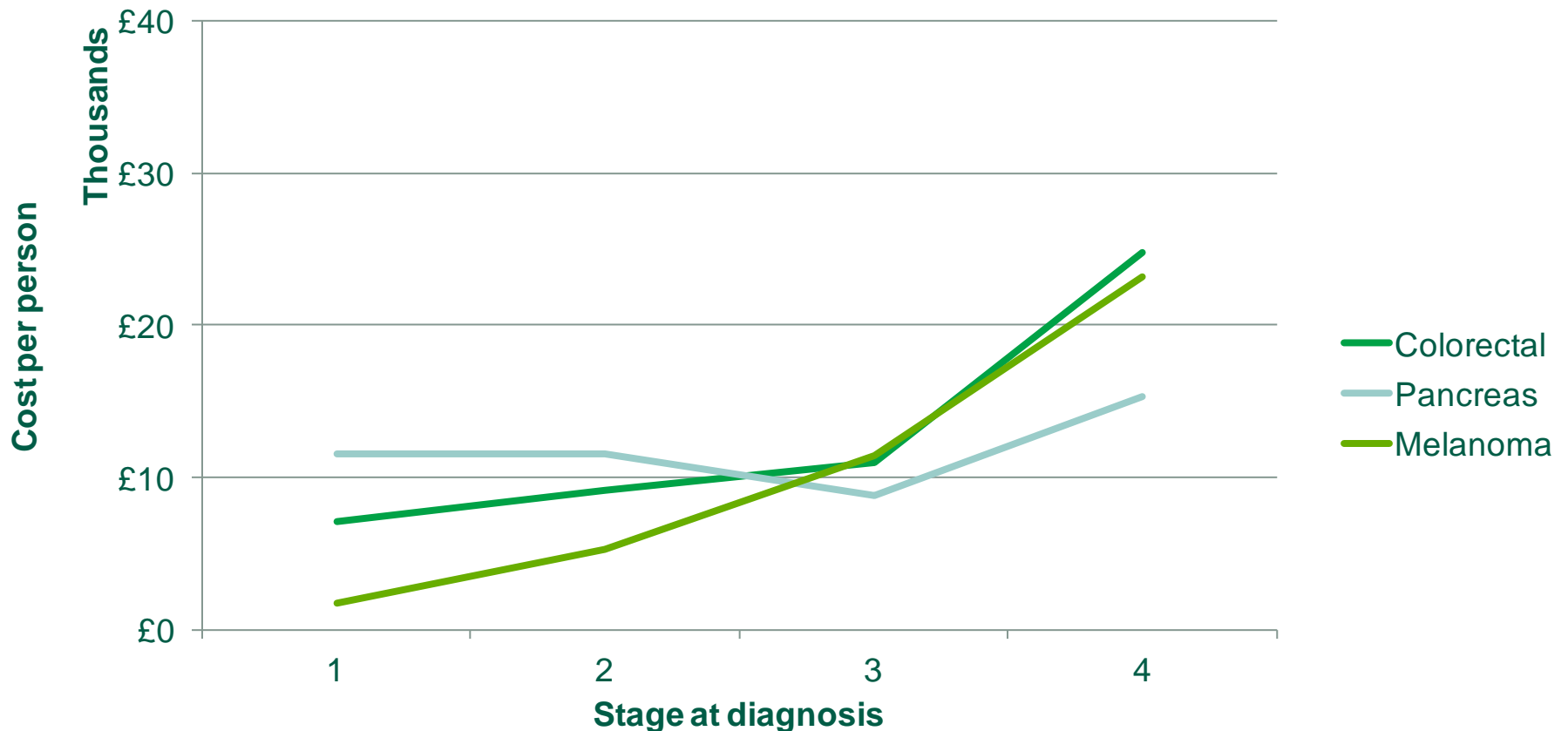
# Reasons for the high spend on stage 4 disease – patient numbers



**Population costs over 15 years for those diagnosed in 2015 and the 2015 population by stage at diagnosis**

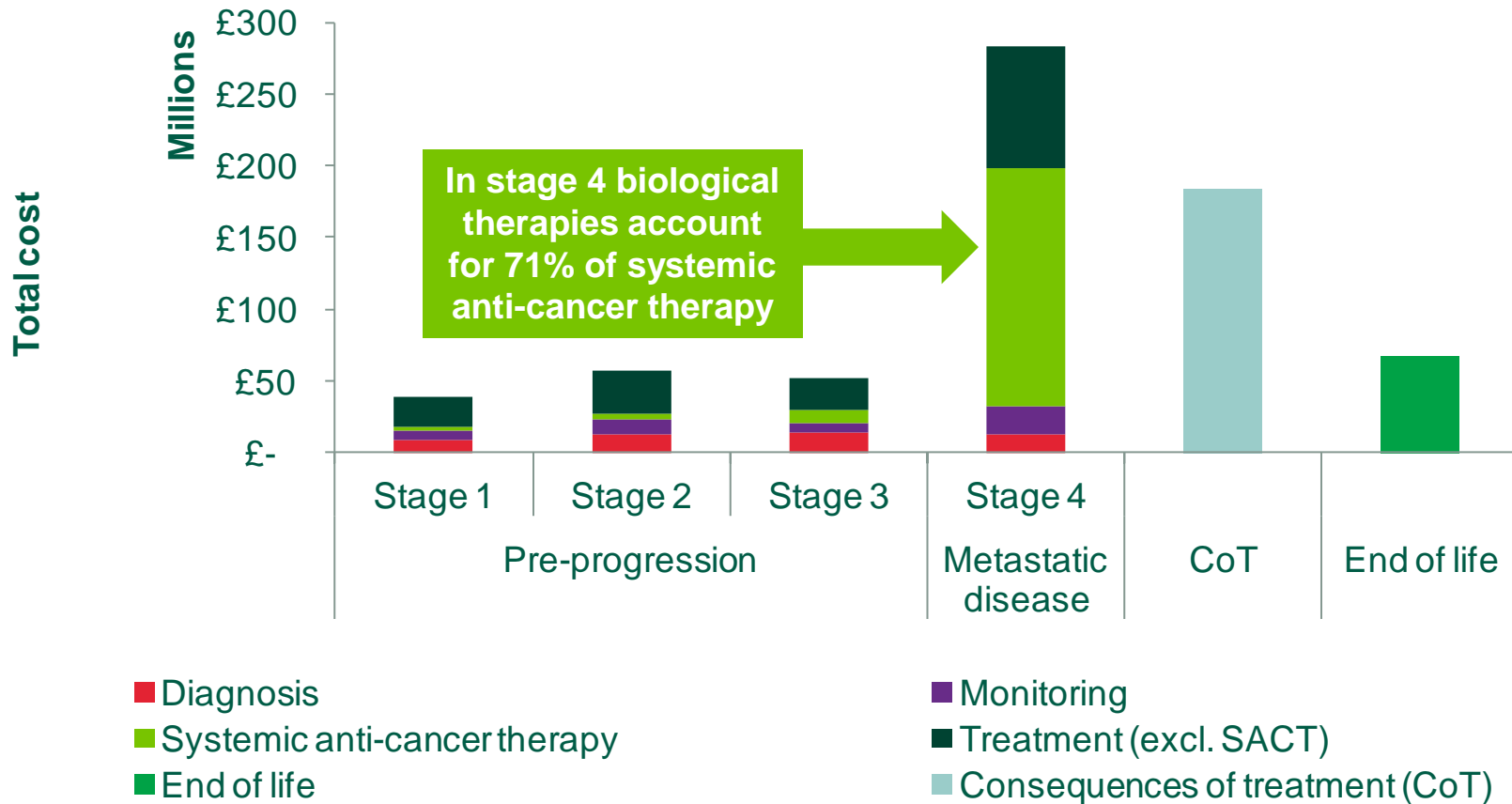
Split by stage at diagnosis mainly based on 2012 data and assumptions for those with unknown stage.

# Reasons for the high spend on stage 4 disease – high cost per patient



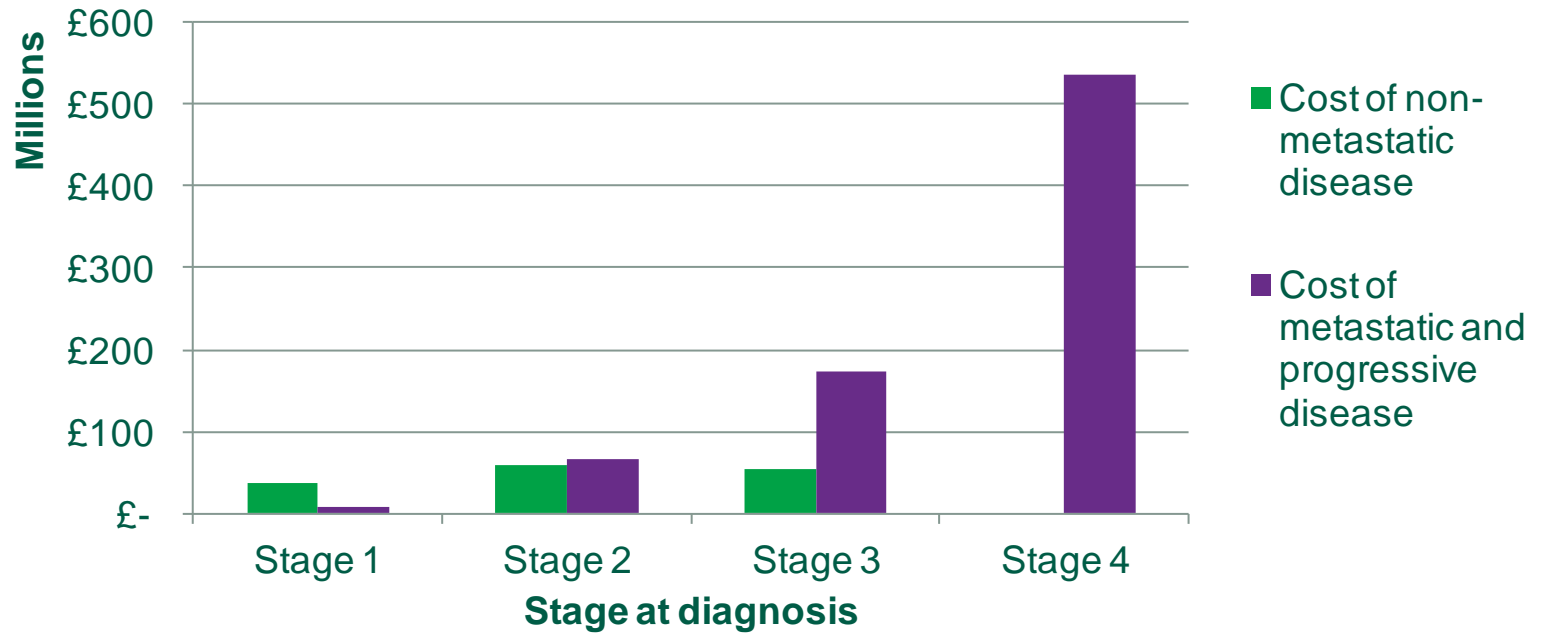
Costs per person over 15 years for those diagnosed in 2015

# Biological therapies have a big impact in colorectal cancer costs



**Total cost in 2015 of people living with cancer in 2015 by stage and cost type**

# Progressive disease also has an impact in colorectal cancer costs



Approximate number of 2015 cohort :

Diagnosed at each stage

Patients progressing over model period

5,900

9,400

10,300

8,200

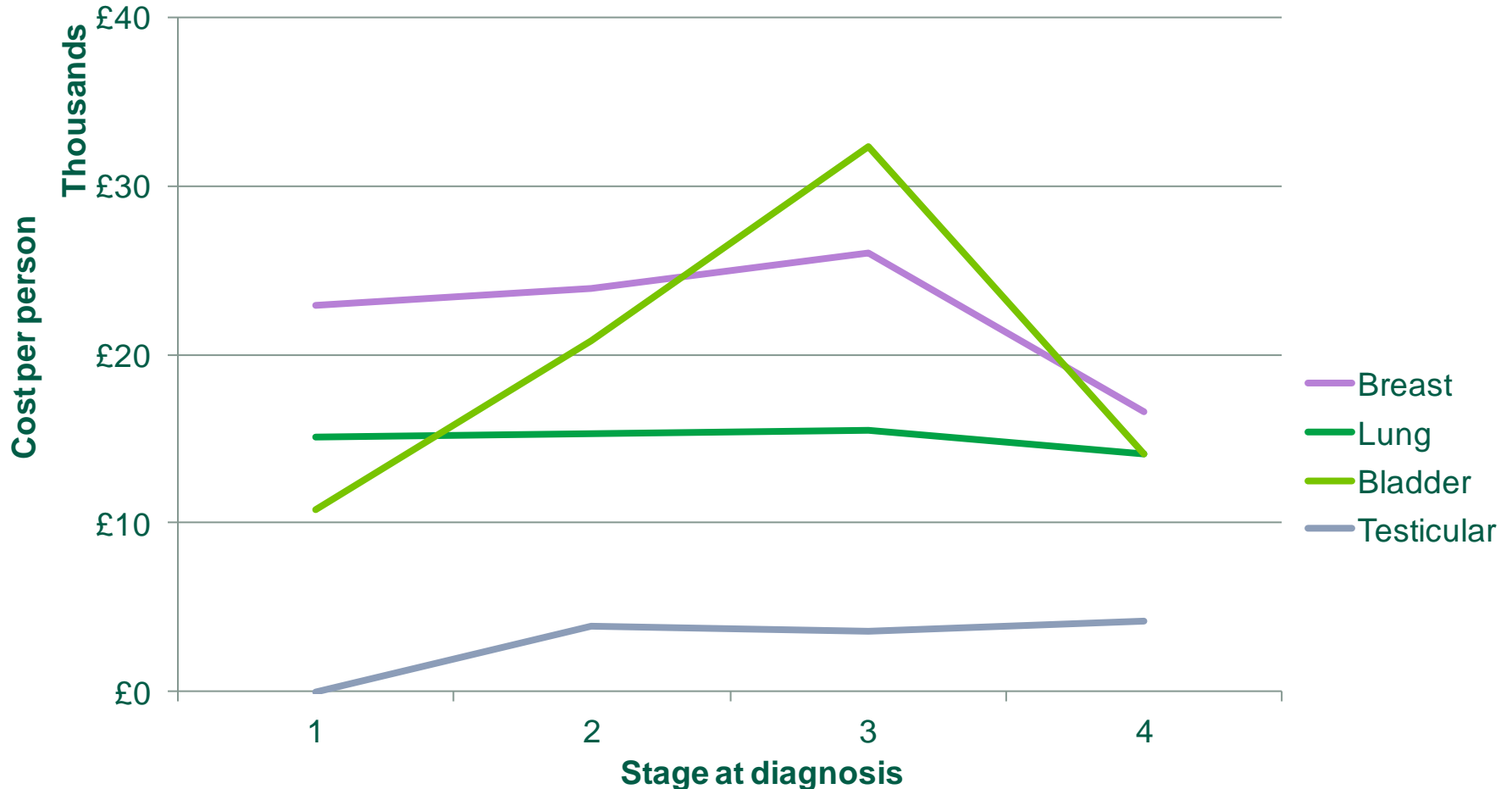
250

1,200

3,300

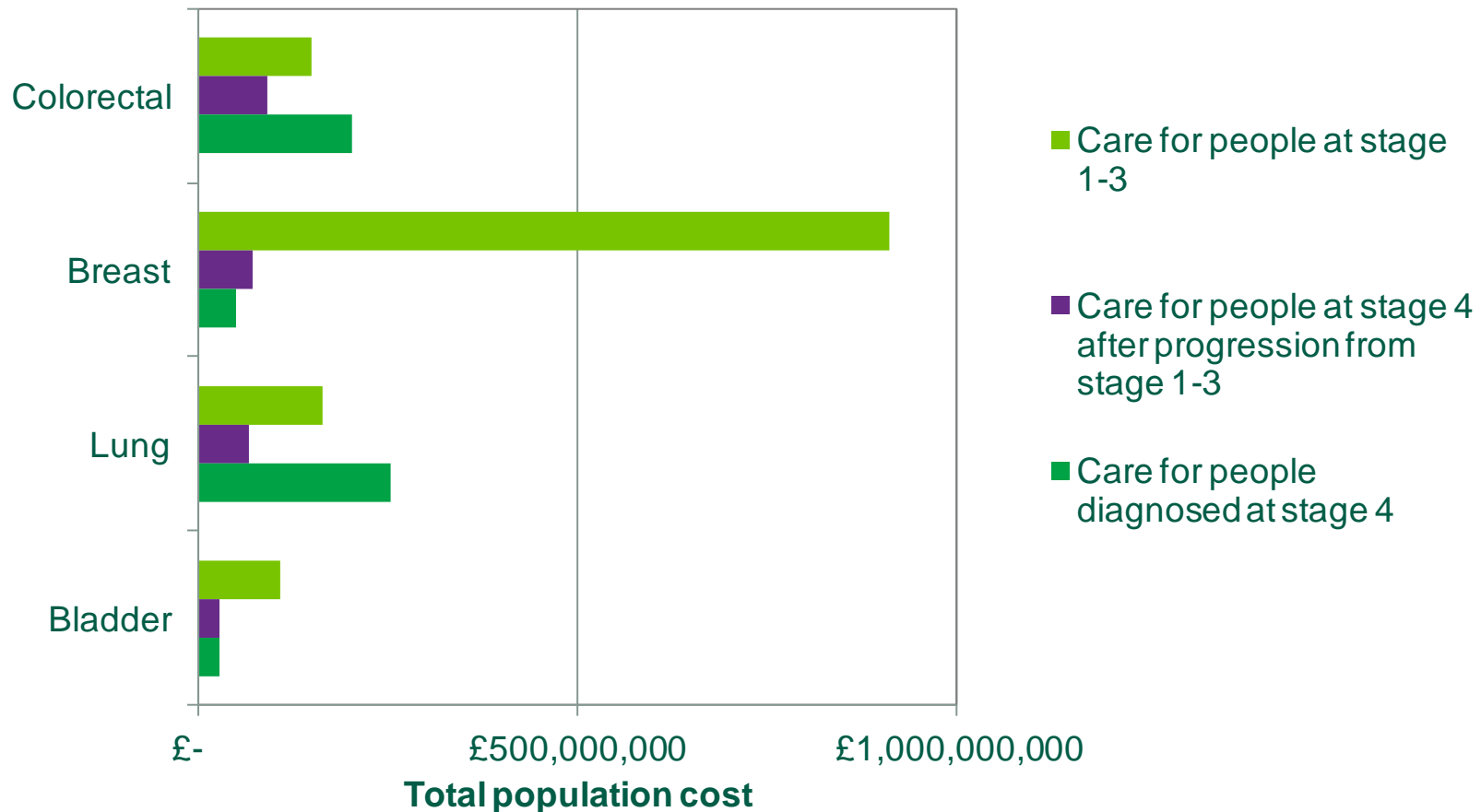
**Population costs over 15 years for those diagnosed in 2015 and the 2015 population by stage at diagnosis**

# Examples of cancers where a stage 4 diagnosis has less impact on cost



Costs per person over 15 years for those diagnosed in 2015

# Late stage disease after progression from stage 1-3 is also important



**Population costs over 15 years for those diagnosed in 2015 by stage at diagnosis and estimated progression**

# Example high cost consequences of treatment

Total cost in 2015 of people living with cancer in 2015 (£ millions)	Colorectal	Breast	Non-Hodgkin Lymphoma	Lung	Pancreas	Myeloma	Prostate	Hodgkin Lymphoma	Kidney	Bladder	Total
Post-surgical wound infection	4	127	0	55	62	0	1	0	10	6	269
Anaemia	0	0	89	0	0	25	0	2	0	0	116
Thrombocytopenia requiring platelet transfusion	0	0	44	0	0	17	0	1	0	0	62
Bowel obstruction	54	0	0	0	0	0	2	0	0	0	56
Mucositis	19	14	1	2	0	2	1	0	4	0	45
Fertility preservation	0	0	0	0	0	0	0	24	0	0	25
Biliary obstruction	7	1	4	2	3	1	1	0	1	1	23
Complication with CVL	6	4	5	2	0	2	1	0	1	0	21
Acute kidney injury	4	2	3	1	0	4	4	0	1	0	20
New onset diabetes mellitus	0	0	0	0	19	0	0	0	0	0	19
Severe sepsis/septic shock	5	3	5	1	0	2	1	0	1	0	19
Sexual dysfunction	14	0	0	0	0	0	4	0	0	0	18
Pneumonia	5	2	3	2	0	1	0	0	1	1	16
Bowel incontinence	11	0	0	0	0	0	0	0	0	0	12
Lymphoedema	0	9	0	2	0	0	0	0	0	0	11
Kidney damage	0	0	0	0	0	10	0	0	0	0	10
<b>All</b>	184	182	175	92	91	73	30	28	27	10	908

People living with cancer in 2015 - based on people with a cancer diagnosis in the 15 years before (2000-2015). Total includes testicular cancer and glioma. CVL - Central Venous Line



The image features a dark green, textured background that resembles a piece of torn paper or a watercolor wash. The edges are irregular and frayed, with some lighter green areas visible where the paper has been torn away. The word "Conclusions" is written in a clean, white, sans-serif font, positioned in the upper left quadrant of the image.

# Conclusions

# Conclusions

- Share of population spend on people diagnosed with stage 4 disease varies by cancer type – particularly high for colorectal, pancreas and lung
- For some cancers spend per person peaks at stage 4 but for many others there is no current peak at stage 4
- Population spend on people who develop a metastasis after a period of living with stage 1 to 3 can be significant

# Acknowledgments

Monitor  
**Deloitte.**



Clinicians who  
reviewed the  
assumptions

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