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The West of Scotland  
Cancer Surveillance Unit

## Exploring the deprivation gap in colorectal cancer survival: the influence of disease stage at diagnosis


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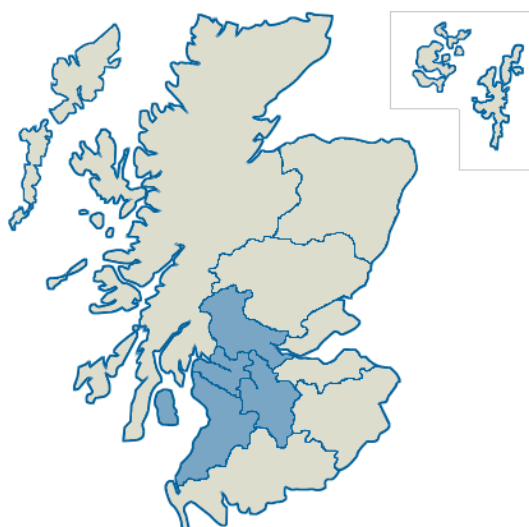
### Colorectal Cancer Survival



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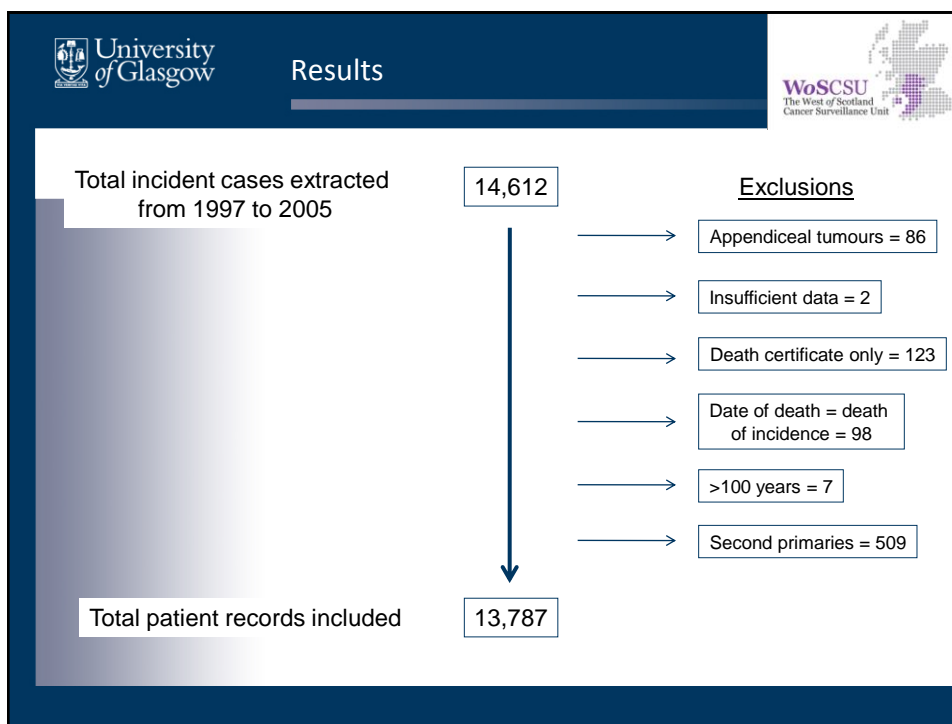
- Survival from colorectal cancer continues to improve
- Deprivation gap exists favouring the most affluent
- Widening socioeconomic gradients reported
- Influence of disease stage on deprivation gap unclear from population-based studies

Examine the influence of socioeconomic  
circumstances and stage of disease at diagnosis  
on survival from colorectal cancer in the west  
of Scotland



- Incident cases of colorectal cancer extracted from Scottish Cancer Registry 1997 to 2005
- Linked to General Registry Office death records
- Scottish Index of Multiple Deprivation (SIMD)
- Dukes' staging for disease stage
- Site of tumour
  - Colon (ICD10 C18) & rectal (ICD10 C19 – C20)

- Relative survival
  - Stage-specific and conditional relative survival analyses
  - Modelled using full likelihood approach
- Complete annual life tables by age, sex and SIMD
- Deprivation gap in survival
  - Estimated from absolute fitted difference between most and least deprived from linear regression model
- Chi-squared used for univariate comparisons



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Results

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Clinicopathological characteristics		Patients (%) N=13,787
Age at diagnosis	<75 years	60.3
	≥75 years	39.7
Sex	Male	53.3
	Female	46.7
Socioeconomic group*	Affluent	14.8
	Intermediate	54.7
	Deprived	30.5
Dukes' stage	A	10.8
	B	25.9
	C	23.6
	D	19.4
	Unknown	20.4
Site of tumour	Colon	65.4
	Rectal	34.6

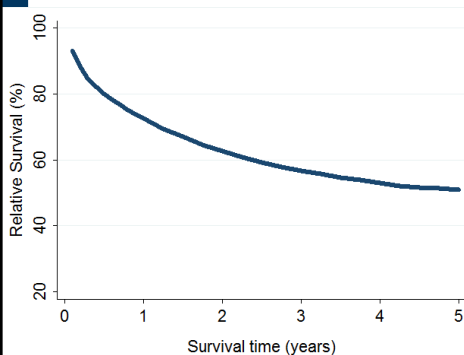
\*Affluent = SIMD 1, Intermediate = SIMD 2 – 4, Deprived = SIMD 5

Clinicopathological characteristics		Socioeconomic group* (%)			
		Affluent	Intermediate	Deprived	P-Value†
Age at diagnosis	<75 years	62.8	59.7	60.3	0.011
	≥75 years	37.2	40.3	39.7	
Sex	Male	55.5	52.4	53.9	0.023
	Female	44.5	47.6	46.1	
Dukes' stage	A	12.9	11.1	9.1	<0.001
	B	26.8	26.2	24.9	
	C	25.3	23.6	22.7	
	D	17	19.1	20.9	
	Unknown	18	19.9	22.4	
Site of tumour	Colon	66.9	65.6	64.3	0.011
	Rectum	33.2	34.4	35.7	

\*Affluent = SIMD 1, Intermediate = SIMD 2 – 4, Deprived = SIMD 5;

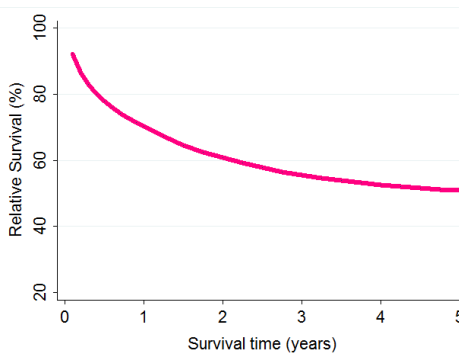
†Chi-squared test across all 5 SIMD groups

## Male

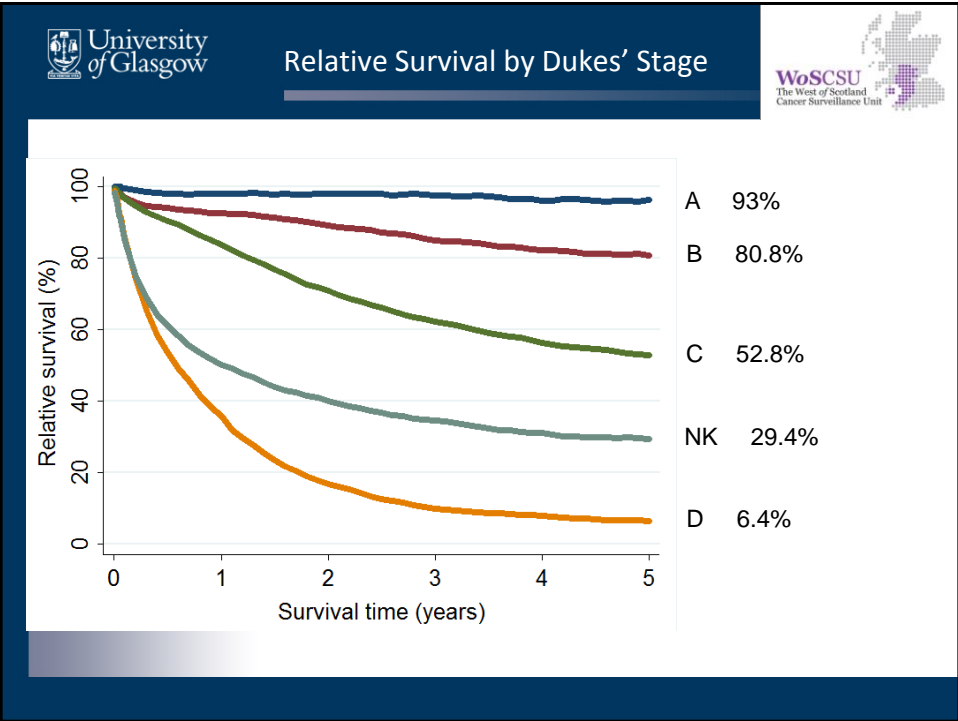
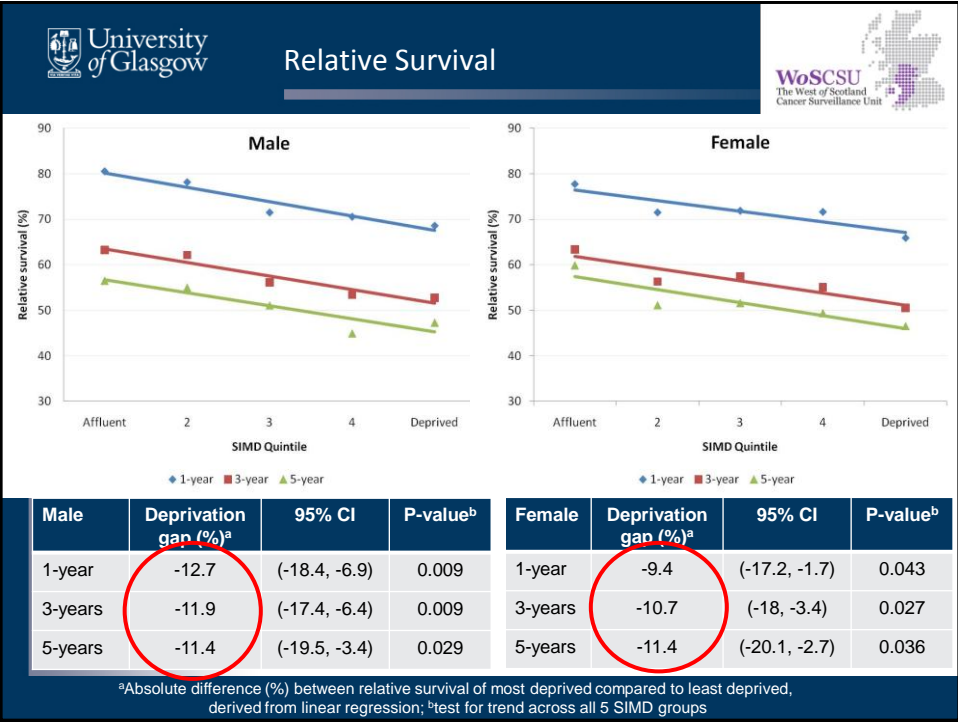


5-year RS = 51%

## Female



5-year RS = 51%



5-year Relative Survival (%)						
Dukes' stage	Socioeconomic group*			Deprivation gap (%) <sup>a</sup>	95% CI	P-value <sup>b</sup>
	Affluent	Intermediate	Deprived			
A	92	92.8	93.8	0.7	(-5.6, 7)	0.776
B	82.7	79	77.5	-5.2	(-6.8, -3.6)	0.003
C	62	51.9	50.8	-11.6	(-20.4, -2.8)	0.036
D	8.1	6.4	5.7	-3.3	(-6.5, 0.1)	0.067
Unknown	42.6	28.9	27.4	-14.9	(-29, -0.9)	0.041

\*Affluent = SIMD1, Intermediate SIMD 2 – 4, Deprived SIMD 5; <sup>a</sup>Absolute difference (%) between relative survival of most deprived compared to least deprived, derived from linear regression; <sup>b</sup>test for trend across all 5 SIMD groups

5-year Relative Survival (%) Conditional on Surviving 1-year						
Dukes' stage	Socioeconomic group*			Deprivation gap (%) <sup>a</sup>	95% CI	P-value <sup>b</sup>
	Affluent	Intermediate	Deprived			
A	94.2	94.9	96.4	1.5	(-3.1, 6.1)	0.444
B	85.2	85.5	85.2	-0.5	(-5.9, 4.9)	0.814
C	69.9	61.4	62.4	-7.9	(-17.8, 2)	0.114
D	17.7	17.2	19	-2	(-12.7, 8.6)	0.637
Unknown	66.6	61.2	61.4	-7	(-17.6, 3.5)	0.163

\*Affluent = SIMD1, Intermediate SIMD 2 – 4, Deprived SIMD 5; <sup>a</sup>Absolute difference (%) between relative survival of most deprived compared to least deprived, derived from linear regression; <sup>b</sup>test for trend across all 5 SIMD groups

## Multivariate model

		Relative excess risk	95% CI	P-value
Socioeconomic group	Most affluent	1		
	2	1.13	(1.04, 1.24)	0.006
	3	1.26	(1.16, 1.37)	<0.001
	4	1.39	(1.29, 1.5)	<0.001
	Most deprived	1.41	(1.31, 1.52)	<0.001

Adjusted for age at diagnosis, year of incidence,  
sex, Dukes' stage and site of tumour

## Multivariate model conditional on surviving 1-year

		Relative excess risk	95% CI	P-value
Socioeconomic group	Most affluent	1		
	2	1.14	(0.97, 1.35)	0.106
	3	1.15	(0.98, 1.35)	0.083
	4	1.19	(1.04, 1.34)	0.009
	Most deprived	1.22	(1.06, 1.41)	0.007

Adjusted for age at diagnosis, year of incidence,  
sex, Dukes' stage and site of tumour



- Deprivation associated with poorer survival from colorectal cancer in the west of Scotland
- Deprivation gap widened as stage of disease became more advanced
- Modest excess of advanced disease among most deprived groups

- Early survival experience largely determines size of deprivation gap at 5-years
- Deprivation gap only partially explained by differences in age, sex, stage or site
- Additional risk among deprived likely due to variations in treatment, tumour or patient-related factors

- Clinical audit data linked to Scottish Cancer Registry data to explore influence of the following on the observed deprivation gap
  - Mode of presentation
  - Surgery
  - Postoperative mortality
  - Pathological factors
  - Oncological therapies
  - Medical comorbidity

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