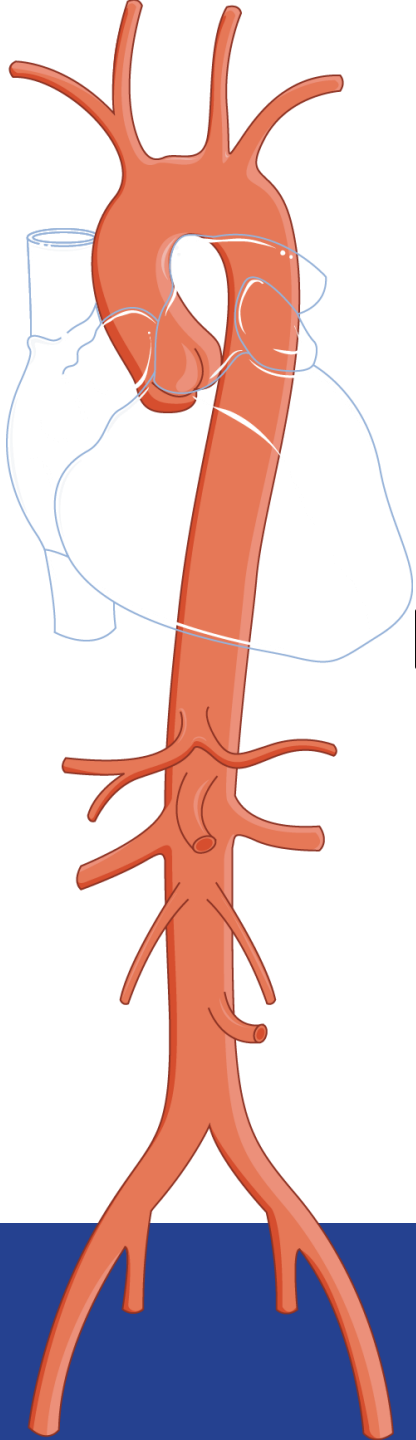TYPE A AORTIC DISSECTION 2010 - 2020
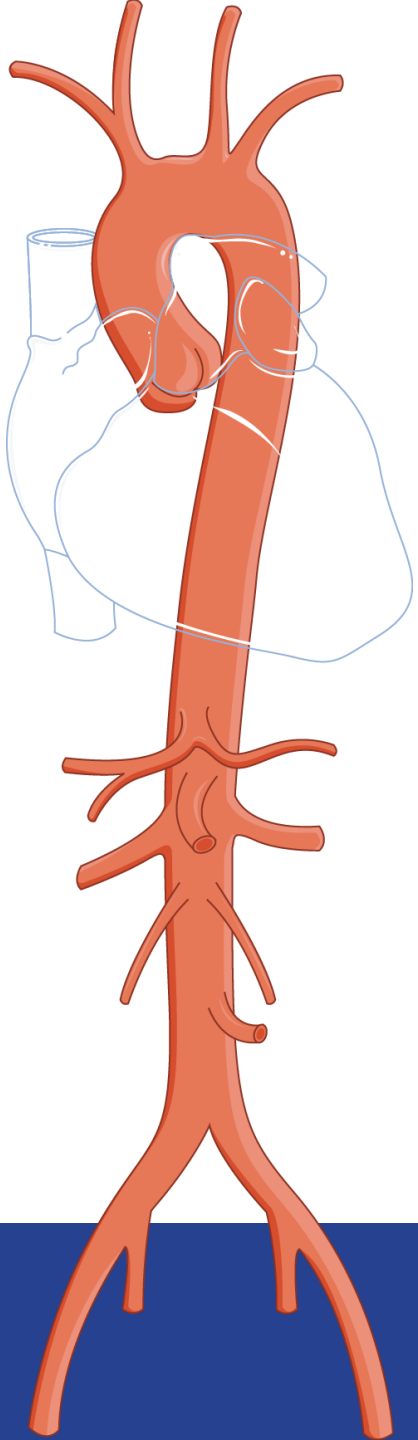
A Decade of Insight:
Exploring Acute Type A Aortic Dissection Incidence, Outcomes, and Socio-Economic Correlations in a Single-Center Population Study

Anchal Jain, Rushmi Purmessur, Ravi De Silva
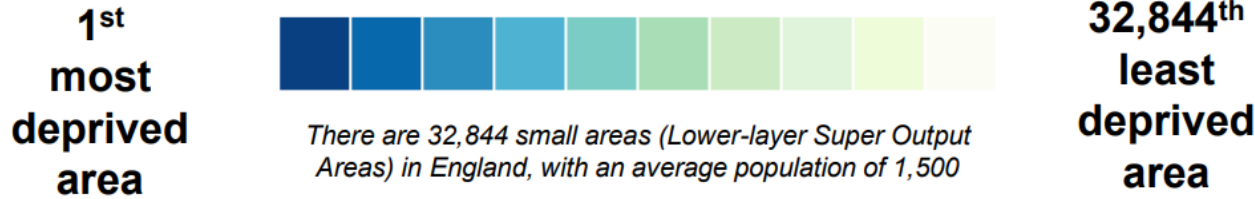Department of Cardiothoracic surgery, Royal Papworth Hospital

Background

- Acute Type A aortic dissection (ATAAD) is a highly severe cardiovascular disease with a substantial risk of mortality.

- Epidemiological data on this condition are limited or insufficient.

- Estimating the actual incidence of ATAAD is challenging due to diagnostic difficulties, pre hospital mortality, low autopsy rates.

- **Aim**: To delineate the correlation between ATAAD and indices of multiple deprivation (IMD)

Index of multiple deprivation (IMD)

- English Indices of Deprivation relatively rank each small area in England from most deprived to least deprived

1st most deprived area

32,844th least deprived area

There are 32,844 small areas (Lower-layer Super Output Areas) in England, with an average population of 1,500

- There are 7 domains of deprivation, which combine to create the Index of Multiple Deprivation (IMD)

- We have analyzed data based on 1 to 10 IMD

Income (22.5%)

Measures the proportion of the population experiencing deprivation relating to low income

Supplementary Indices

Income Deprivation Affecting Children Index (IDACI) measures the proportion of all children aged 0 to 15 living in income deprived families

Income Deprivation Affecting Older People Index (IDAOPI) measures the proportion of those aged 60+ who experience income deprivation

Employment (22.5%)

Measures the proportion of the working age population in an area involuntarily excluded from the labour market

Education (13.5%)

Measures the lack of attainment and skills in the local population

Health (13.5%)

Measures the risk of premature death and the impairment of quality of life through poor physical or mental health

Crime (9.3%)

Measures the risk of personal and material victimisation at local level

Barriers to Housing & Services (9.3%)

Measures the physical and financial accessibility of housing and local services

Living Environment (9.3%)

Measures the quality of both the 'indoor' and 'outdoor' local environment

Method

- No. of ATAAD cases in RPH aortic dissection database between 2010-2020

307

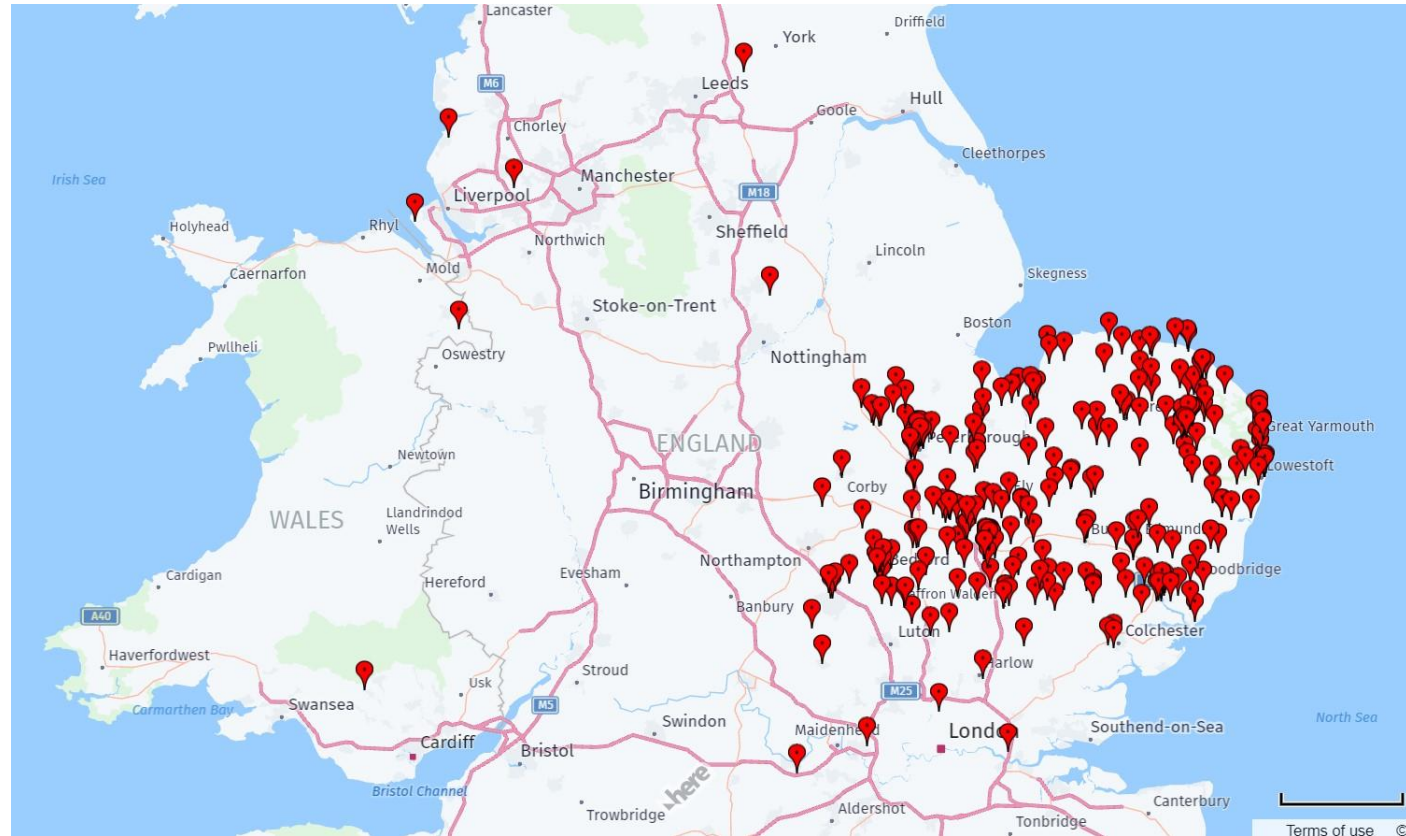- Met inclusion criteria: emergency/ urgent acute aortic dissection

283

- Postcodes generated. 2 postcodes not found

281

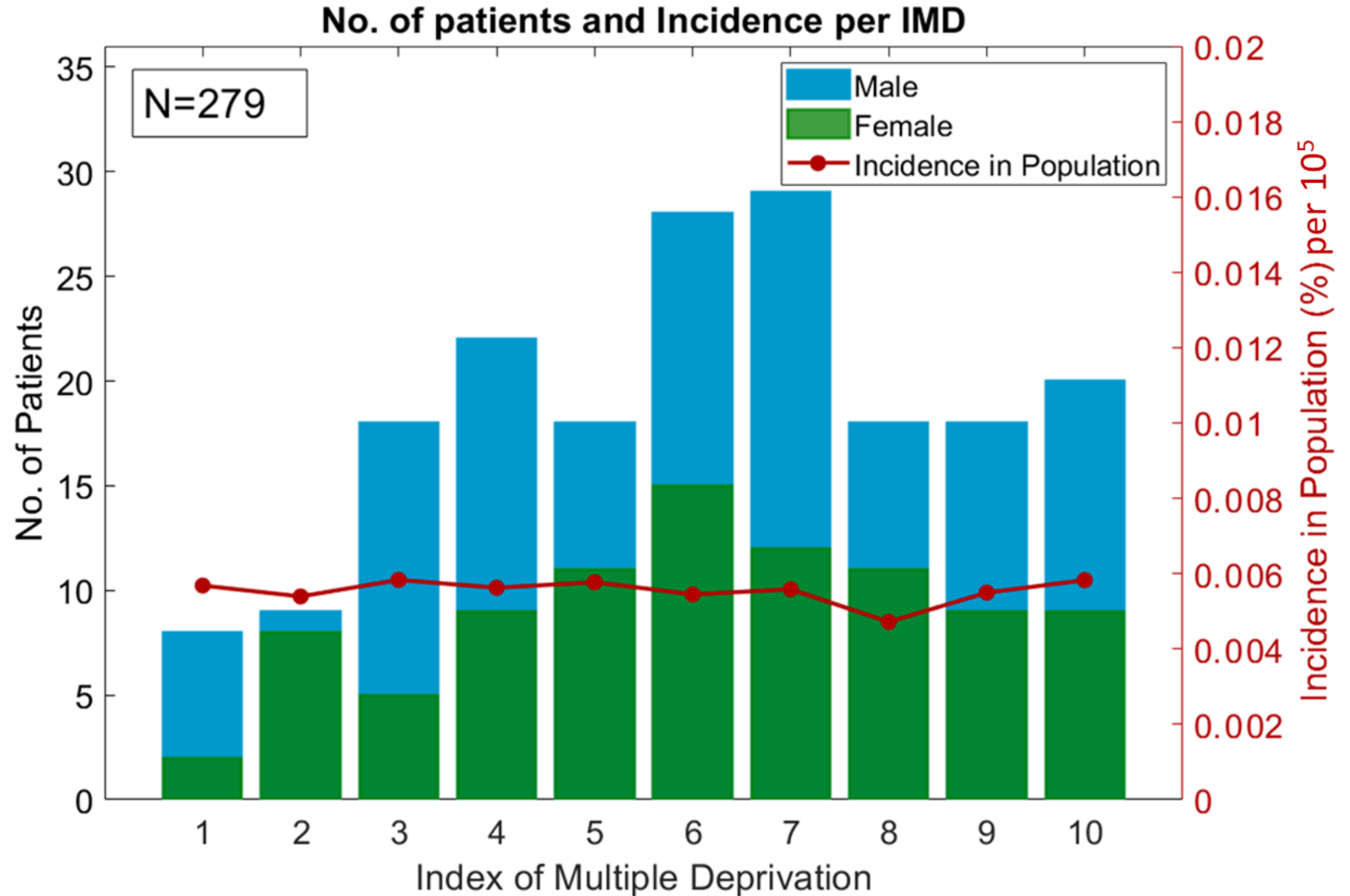- Index of Multiple Deprivation generated. 2 IMD data unavailable

279

n= 279

Epidemiology

Study	Melvinsdottir et al.	Howard et al.	Smedberg et al.	Yeh et al.	Lee et al.	Dinh et al.	Yamaguchi et al.	Jain et al. ☺
Study period	1992–2013	2002–12	2002–16	2005–12	2005–16	2017–18	2016–18	2010-2020
Population	Iceland	Oxfordshire, UK	Sweden	Taiwan	Korea	NSW, Australia	Miyazaki, Japan	Cambridgeshire, UK
Population	Nationwide	Regional	Nationwide	Nationwide	Nationwide	Regional	Regional	Regional
N with AAD	153	37	8057	9092	18 565	273	79	-
N with ATAAD	101	52	-	2340	4,319	-	51	279
Mean age, years	66.9	72	68	64.4	67	NA	76	63.3
Incidence, per 10^5 inhabitants	2.53 (AAD) 1.71 (ATAAD)	6 (AAD) -	7.2 (AAD) -	5.6 (AAD) 1.4 (ATAAD)	3.76 (AAD) 0.87 (ATAAD)	3.47 (AAD) -	17.6 (AAD) 11.3 (ATAAD)	- 5.5 (ATAAD)
Deaths included	Yes	Yes	Yes	No	No	No	Yes	No
Emergency surgery, %	43.7	36.5	32	38.3	NA	51	30	97.1
30-day mortality, %	45.2	55.8	23	17.7	10.8	35.5	74.5	19.7

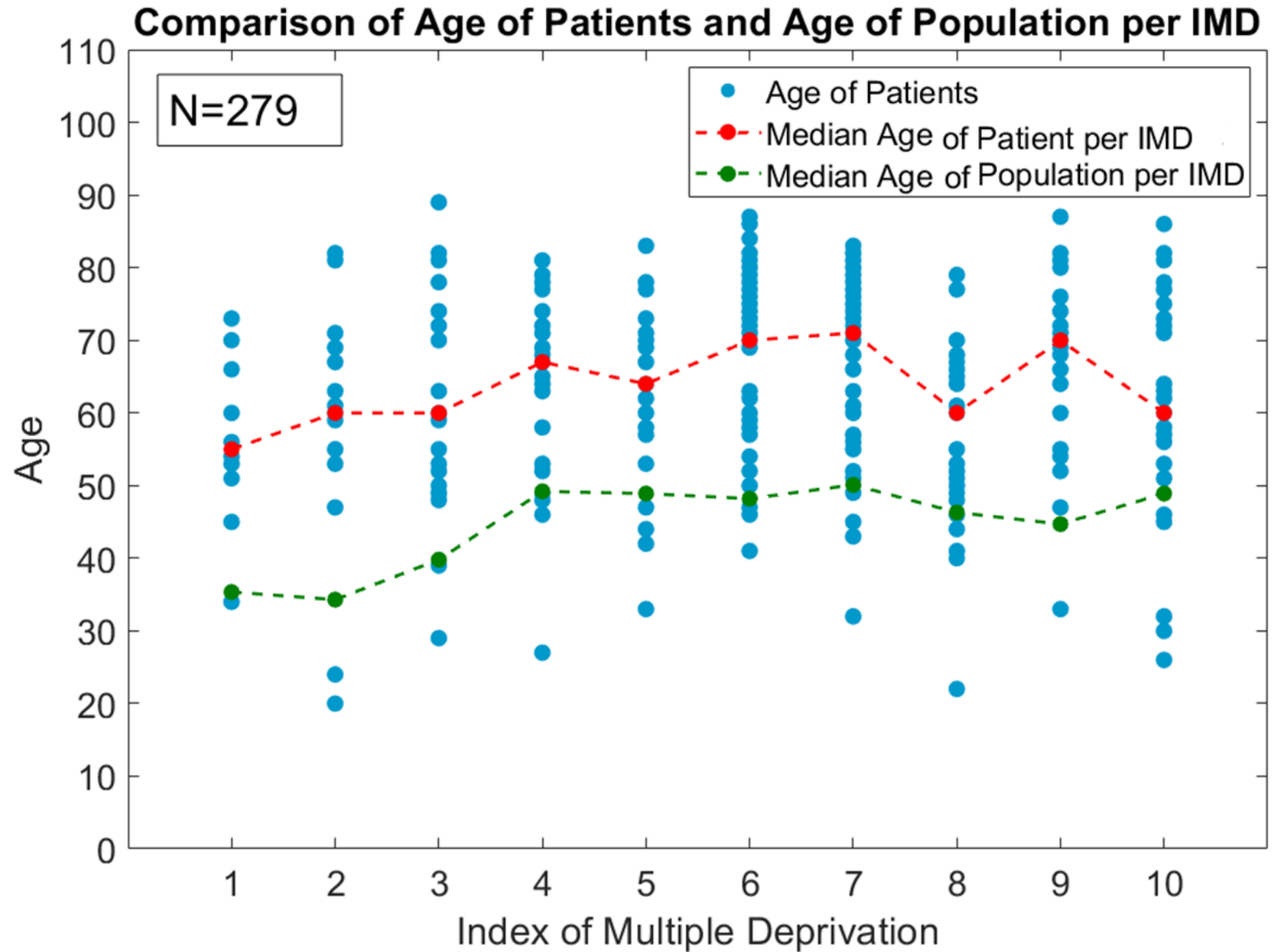AAD, acute aortic dissection; ATAAD, acute aortic dissection; NA, not assessed.

Incidence and Risk factors (gender)

- Incidence:

- Highest: IMD 3 (5.8)
- Lowest: IMD 8 (4.7)
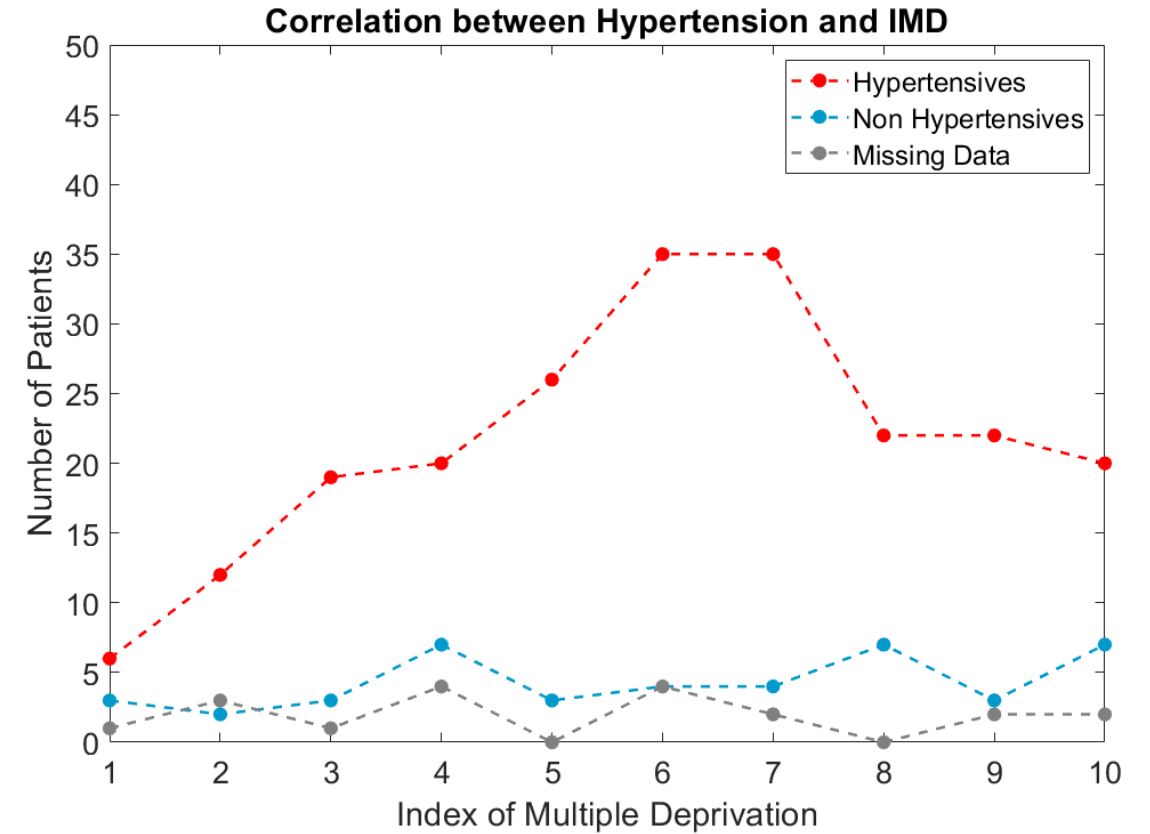
- Male > Female

M:F ratio = 2:1 (188:91)

No. of patients and Incidence per IMD

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Legend:
- Male
- Female
- Incidence in Population

Y-axis (left): No. of Patients

Y-axis (right): Incidence in Population (%) per 10^5
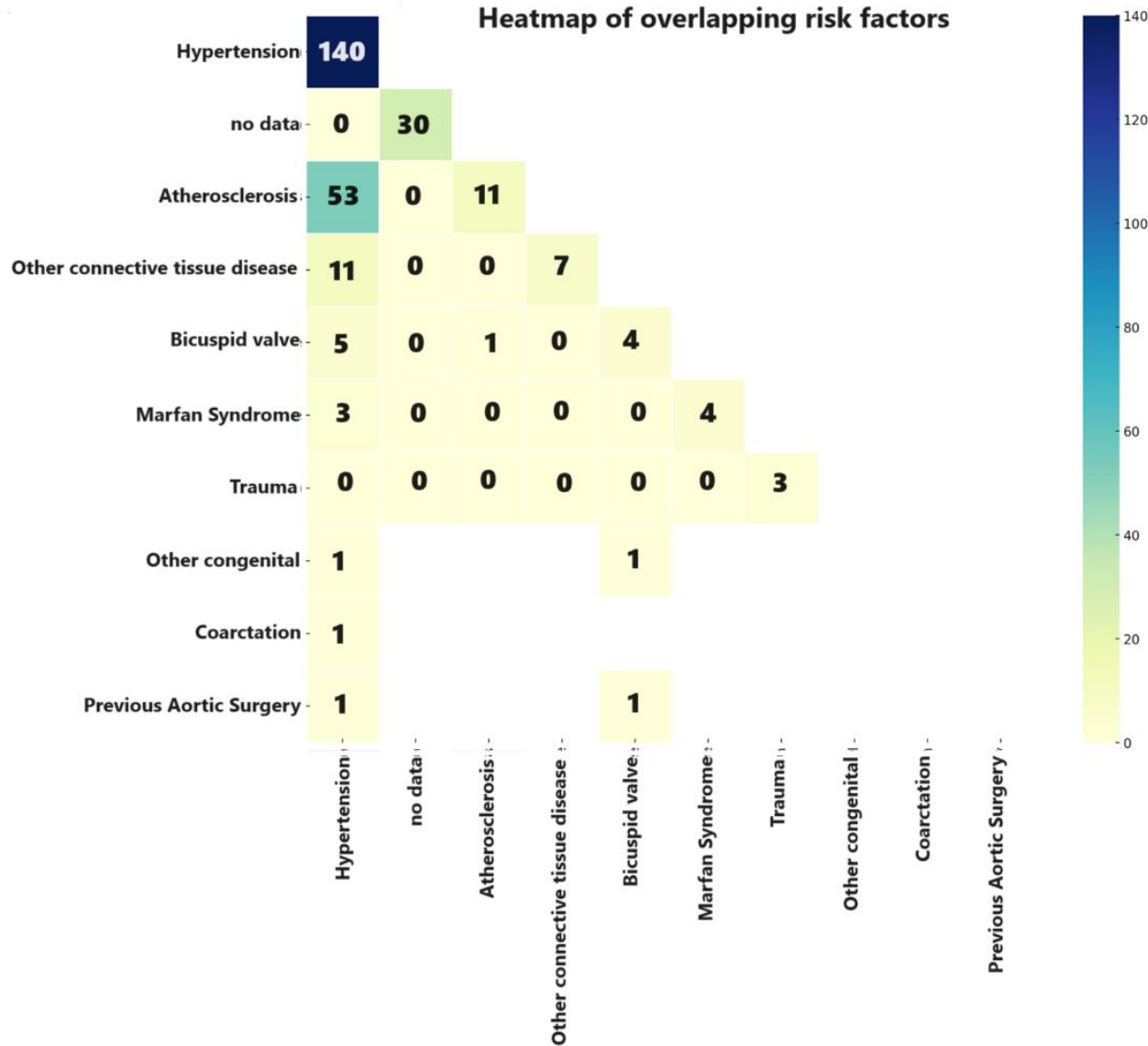
X-axis: Index of Multiple Deprivation

Risk factors (age)

- Mean age (σ) : 63.28 years (13.79)

- Range: 20 to 89 years

- Median age of population obtained from mid-2019 local authority population estimates.

  Office for National Statistics

- Median age of patients higher than that of population

Comparison of Age of Patients and Age of Population per IMD

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Legend:
- Age of Patients
- Median Age of Patient per IMD
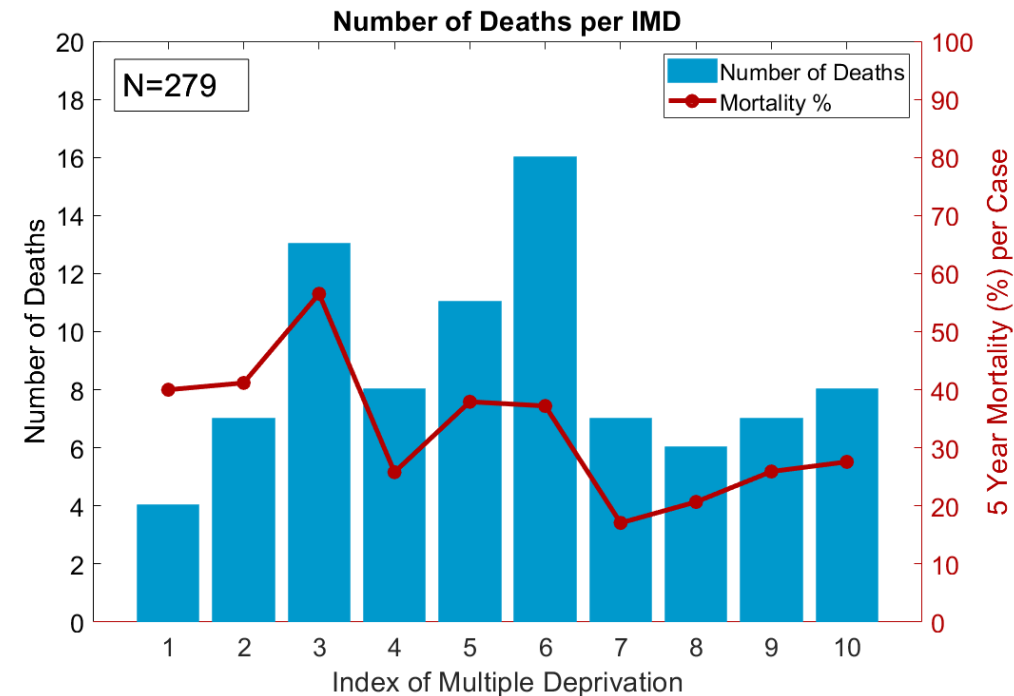- Median Age of Population per IMD

Y-axis: Age
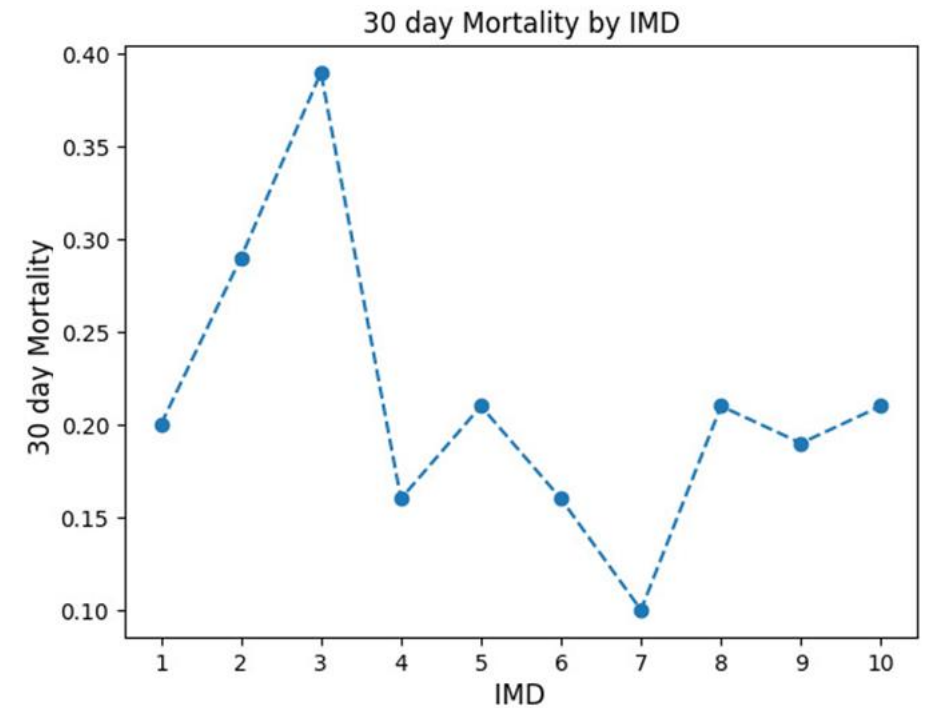
X-axis: Index of Multiple Deprivation
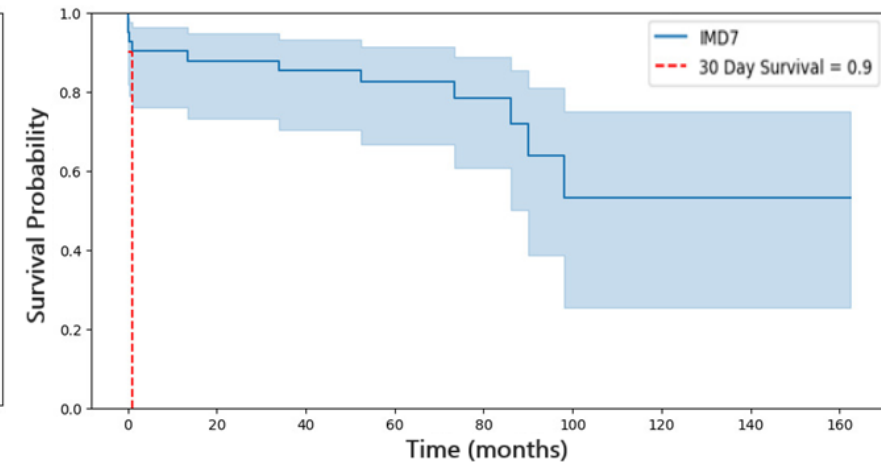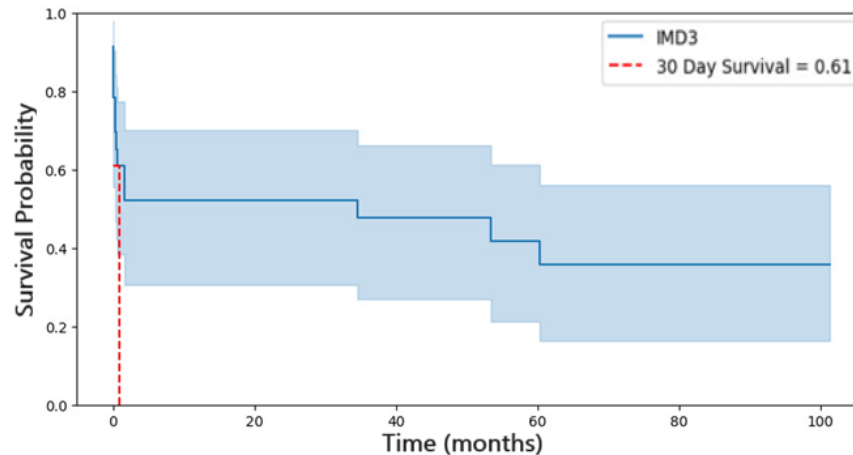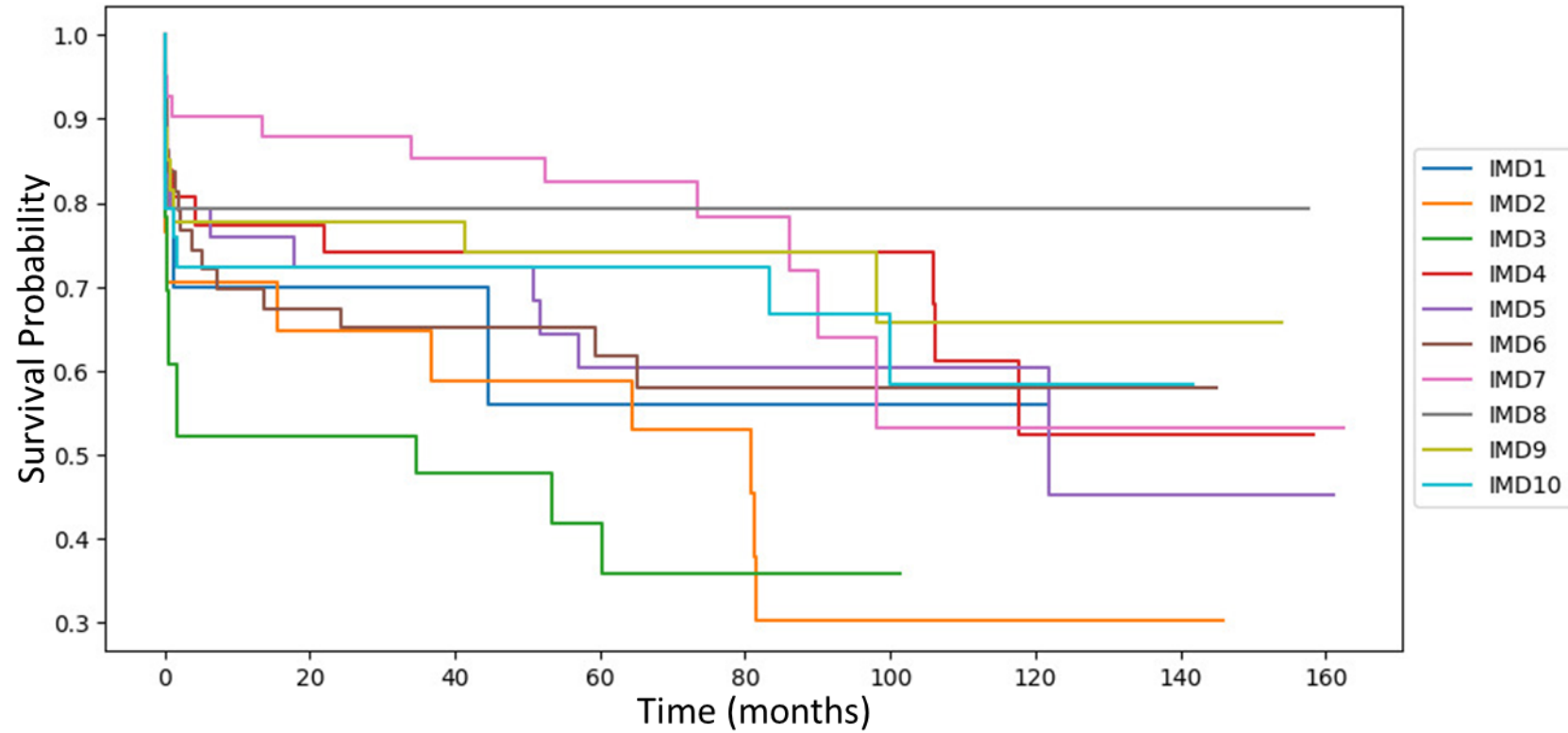
Risk factors (hypertension)

Mortality

- **30 day mortality :**

- 30d mortality highest in IMD 3

- **5 year mortality :**

- Overall mortality rate in 5 year = 17.2 per 10^5 population
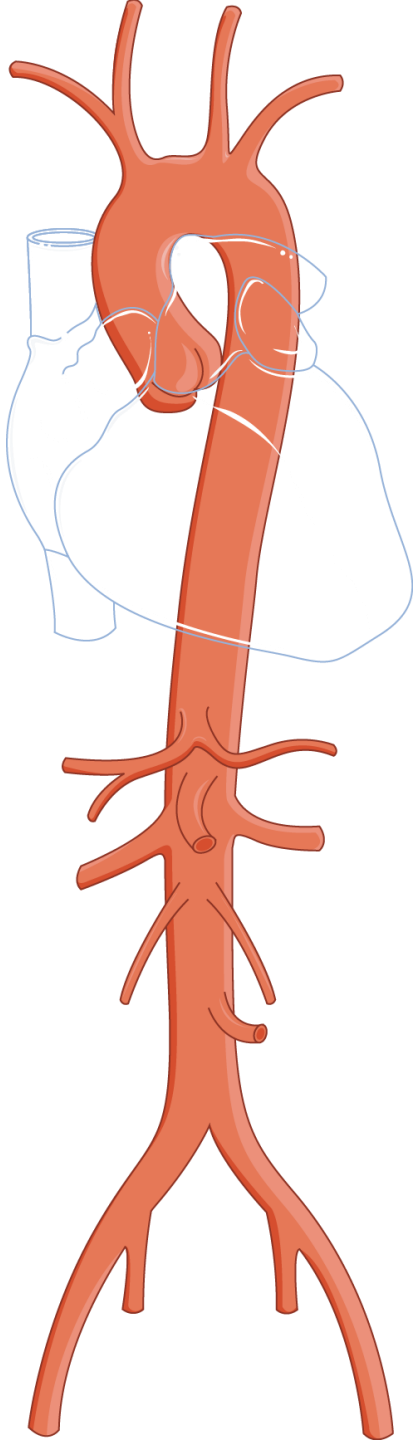- 5y mortality highest in IMD 3 (33 per 10^5 population)

Survival

- Lowest survival seen in most deprived population (IMD 2 and 3)

- Overall survival better in least deprived population if survive 30 day post-operatively
  (eg: IMD 8- all 6 deaths occurred within 30 days)

- Lowest 30 day survival in IMD 3 (0.61) and highest in IMD 7 (0.9) (*red dotted line*)

Summary and Discussion

- High burden of ATAAD at our center (Incidence = 5.5 per 10^5 inhabitants)

- Risk factors: men, age (mean: 63.28 years) and hypertension

	30-day mortality		5 year mortality	
	Odds Ratio	p-value	Hazard Ratio	p-value
Male	0.89	0.73	1.02	0.92
Age	1.02	0.046	1.03	<0.005
Hypertension	0.98	0.97	0.89	0.66

- High incidence, 30 day mortality and 5 year mortality associated with IMD 3 (1 = most deprived and 10 = least deprived)

THANK YOU