



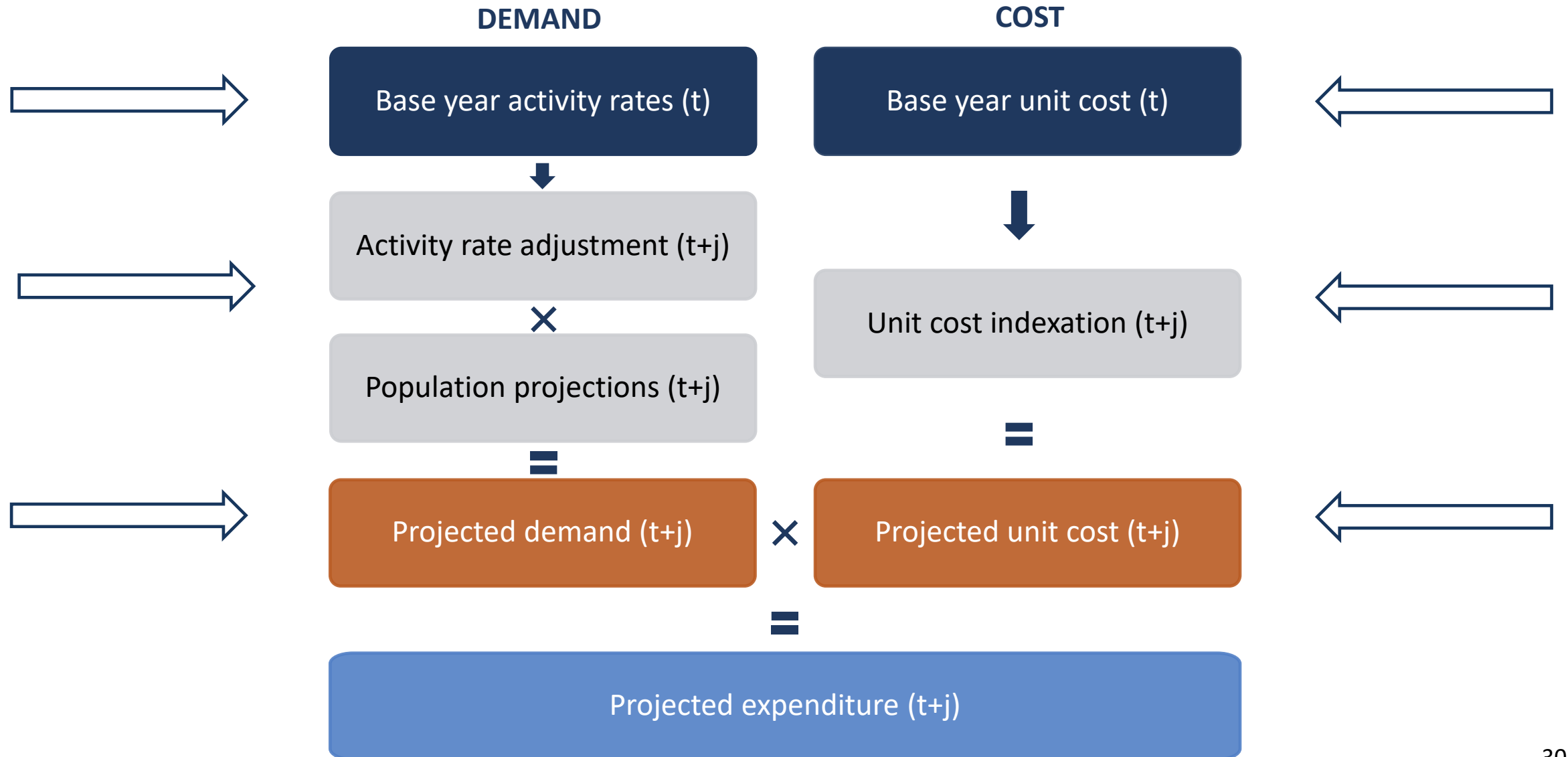
PROJECTIONS OF EXPENDITURE FOR PUBLIC HOSPITALS IN IRELAND, 2018–2035, BASED ON THE HIPPOCRATES MODEL

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PRESENTATION TO THE SOCIETY OF ACTUARIES IN IRELAND

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HIPPOCRATES MODEL – DIAGRAMMATIC REPRESENTATION





WHAT DRIVES HEALTHCARE EXPENDITURE?



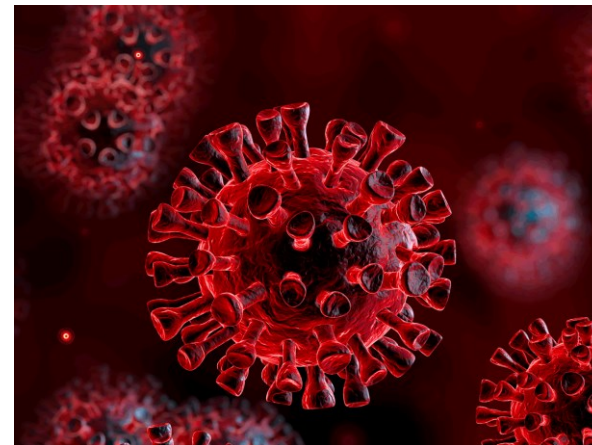
DRIVERS OF HEALTHCARE EXPENDITURE

■ Demographic

- Population size
- Population age structure
- Relationship of health to ageing

■ Non-Demographic

- Income
- Relative prices
- Technology
- Policy

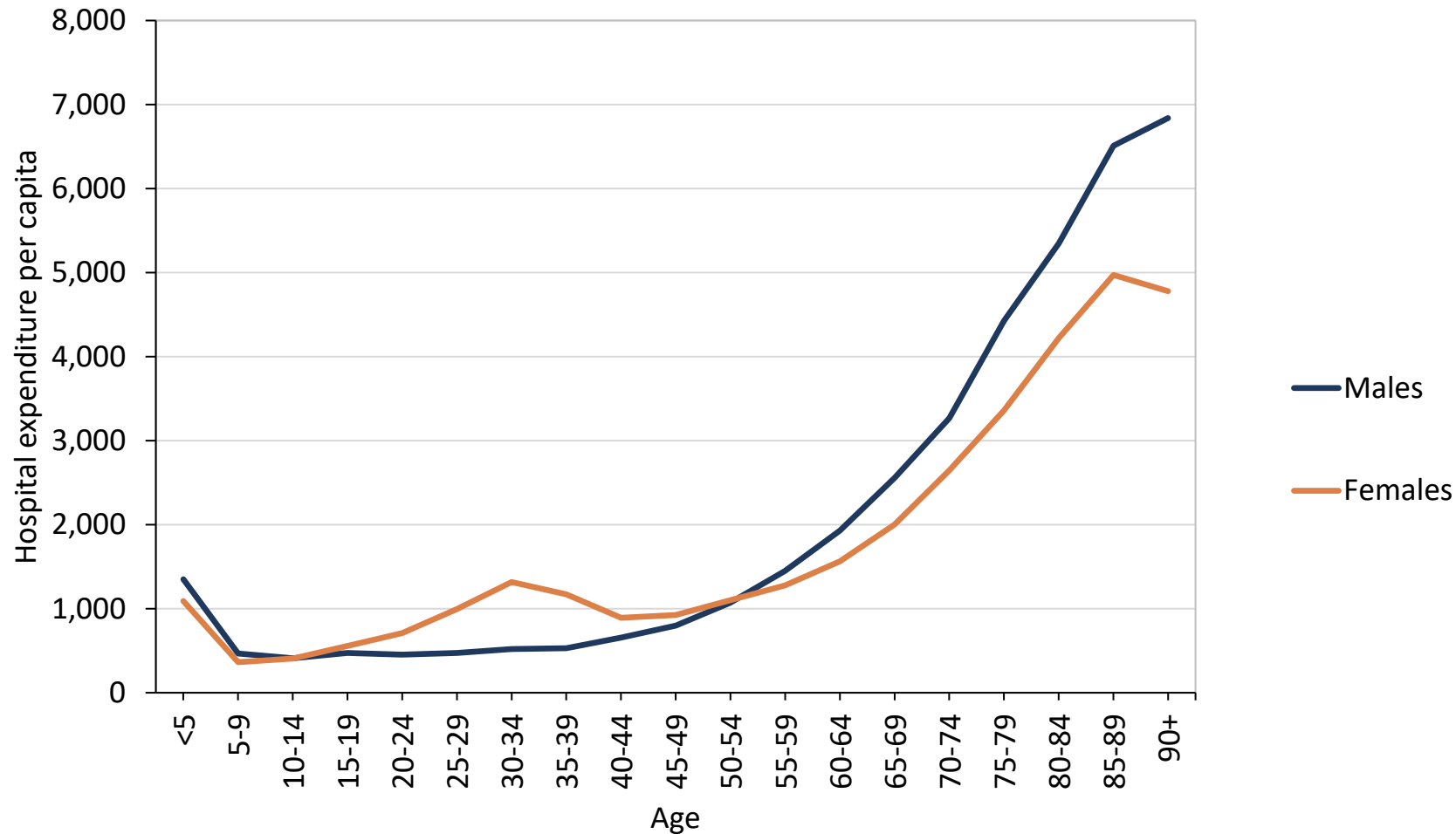


POPULATION GROWTH AND AGEING

- Demand for healthcare depends on number of people in need of care:
 - Size of population
 - Health status of the population
 - Linked to age and sex structure
 - Older individuals, particularly, often require more care
 - Age and sex-related expenditure curves

POPULATION GROWTH AND AGEING

■ Gross public acute hospital expenditure in Ireland, 2018



BACKGROUND

- Ireland's demographic context is unusual in the EU
 - Experienced more rapid population growth (31% vs. 6% in EU between 1996 & 2016)
 - Younger demographic structure (e.g. 13% aged 65+ vs. 19% in EU in 2016)
- However the population is ageing
 - Between 1996-2016: 64% increase in pop. aged 80+
 - And continued ageing expected over the projection horizon

DEMOGRAPHIC MODELLING - APPROACH

- Cohort-component model (in-house model)
 - Combine assumptions around fertility, mortality, and migration to generate population projections by sex and single year of age for each year
- Migration is the key driver of total population change in Ireland
 - Migration flows are very sensitive to economic conditions
 - Covid-adjusted

KEY ASSUMPTIONS UNDERPINNING DEMOGRAPHIC SCENARIOS

	Central Scenario	High Population Scenario	Low Population Scenario
Mortality			
Life expectancy at birth to increase from 79.5 (83.4) years for males (females) to:	83.5 (86.5) years for males (females) in 2035	83.8 (86.7) years for males (females) in 2035	83.2 (86.2) years for males (females) in 2035
Migration			
Net immigration:	≈ +5,000 p.a. until 2022; +10,000 p.a. over long term	≈ +17,000 p.a. until 2022; +25,000 p.a. over long term	≈ -3,000 p.a. until 2022; +5,000 p.a. over long term
Fertility			
Total fertility rate:	Unchanged at 1.72	Rises to 1.96 by 2026 and remains constant thereafter	Declines to 1.6 by 2035

SUMMARY OF DEMOGRAPHIC SCENARIOS

- Pop. to increase from 4.9m in 2018 to between 5.2m and 5.8m in 2035
 - Increase of between 0.4% to 1% on average p.a.
 - Migration is key driver of differences in scenarios
- The number of older persons is set to increase
 - Population aged 65+: **1 in 7 now**. By 2035: **1 in 5**

HEALTHY AGEING



Additional years



Expansion of Morbidity –
Additional years spent in bad health



Dynamic Equilibrium –
Number of years in bad health remains fixed



Compression of Morbidity –
Number of years in bad health reduces



Pessimistic

Optimistic

Moderate Healthy Ageing – between Expansion of Morbidity and Dynamic Equilibrium

NON-DEMOGRAPHIC - BAUMOL'S COST DISEASE

- HCE prices tend to outstrip other prices – why?
- Productivity differentials between sectors matter (Baumol)



- Ireland's apparent high HCE driven by prices (Wren & Fitzpatrick, 2020)
- Pay costs linked to government sector earnings – tied to wages in the wider economy as we recover from COVID

PAY AND NON-PAY GROWTH

- Use COSMO to develop a *Recovery* and *Delayed Recovery* Scenarios
- **Pay costs** in line with projected government sector earnings
 - *Recovery* - 2.5% p.a.
 - *Delayed Recovery* - 2.2% p.a.
- **Non-pay** (non-drug) costs in line with projected inflation rates
 - *Recovery* - 1.6% p.a.
 - *Delayed Recovery* - 1.4% p.a.

COST - TECHNOLOGY

- We explicitly model a technological effect through channelling its impact on projected hospital drug costs (Charlesworth et al, 2018)
- Delivery of new innovative, technologically-advanced, drugs will impact hospital costs disproportionately (e.g. cancer care)

	Acute Expenditure ('000)						Unit Cost
	2015	2016	2017	2018	2015-2018		2015-2018
					Percentage change	Average annual percentage change	Average annual percentage change
Drugs and medicines	297,883	324,463	335,545	357,070	19.9	6.2	5.2
Other non-pay	980,132	1,001,187	1,063,598	1,109,119	13.2	4.2	3.2

Source: HPO Specialty costing

PROJECTION SCENARIOS

	Low pressure	Central	High pressure
Demand assumptions			
Population growth and ageing	Low	Central	Central
Healthy ageing	Dynamic equilibrium	Moderate healthy ageing	None
Cost assumptions			
Pay	<i>COMSO Delayed Recovery</i> 2.2% p.a.	<i>COSMO Recovery</i> – 2.5% p.a.	<i>COSMO Recovery (+ 1 pct point)</i> – 3.5% p.a.
Non-pay			
Drug cost	4.2% increase p.a.	5.2% increase p.a.	6.2% increase p.a.
Other	<i>COSMO Delayed Recovery</i> – inflation + 0.5 pct point p.a.	<i>COSMO Recovery</i> – inflation + 1 pct point p.a.	<i>COSMO Recovery</i> – inflation + 1 pct point p.a.



WHAT ABOUT POLICY CONSIDERATIONS?



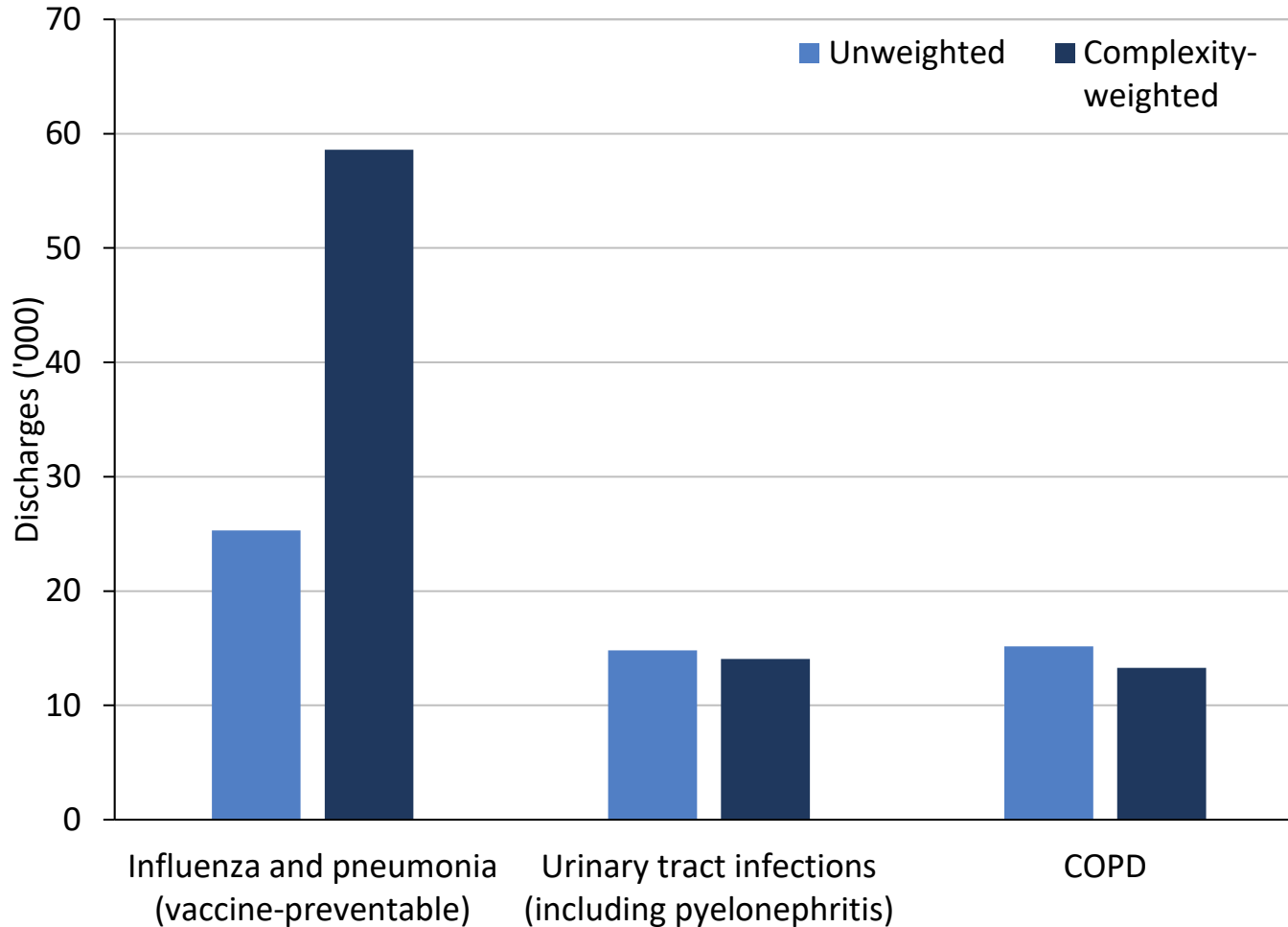
MODELS OF CARE

- Key recommendation of Sláintecare is to shift care out of hospitals through better primary care delivery
- If primary care improves what impact on hospital demand?
- Not exactly clear! (Kaestner & Lasso, 2015; Nolan, 2011; Ma & Nolan, 2016; Walsh et al, 2019)
- However, internationally, better primary care is associated with fewer **avoidable hospitalisations** (Gibson et al. 2013; Rosano et al. 2013; van Leonen, 2014)

AVOIDABLE HOSPITALISATIONS

- Conditions for which good primary/community care can prevent the need for hospitalisations
 - Vaccine-preventable influenza and pneumonia
 - Urinary tract infections
 - COPD
- We can reduce rates of avoidable hospitalisation under assumed improvements in primary care

POLICY- AVOIDABLE HOSPITALISATIONS



- In 2018 accounted for
 - 70% of all complexity-weighted avoidable discharges
 - 612,176 bed days
 - €292m – excluding emergency department cost

PROGRESS SCENARIO

Assumption	Outpatient	Emergency Dept.	Day patient and in-patient
Waiting list management	Backlog clearance from 2021–2025. Additional recurring activity to sustain lower waiting times.	N.A.	Backlog clearance from 2021–2025. Additional recurring activity to sustain lower waiting times.
Avoidable hospitalisations	N.A.	Linearly reduce ED attendances in line with in-patient avoidable hospitalisations each year.	Linearly reduce rate of avoidable hospitalisations each year, converging to 33% reduction by 2035.



FINDINGS

BASELINE EXPENDITURE, 2018

BASELINE EXPENDITURE BY SERVICE 2018

Public Acute Hospitals

€5,907m

Attendances
€1,095m

Discharges
€4,140m

ED
€419m

OPD
€676m

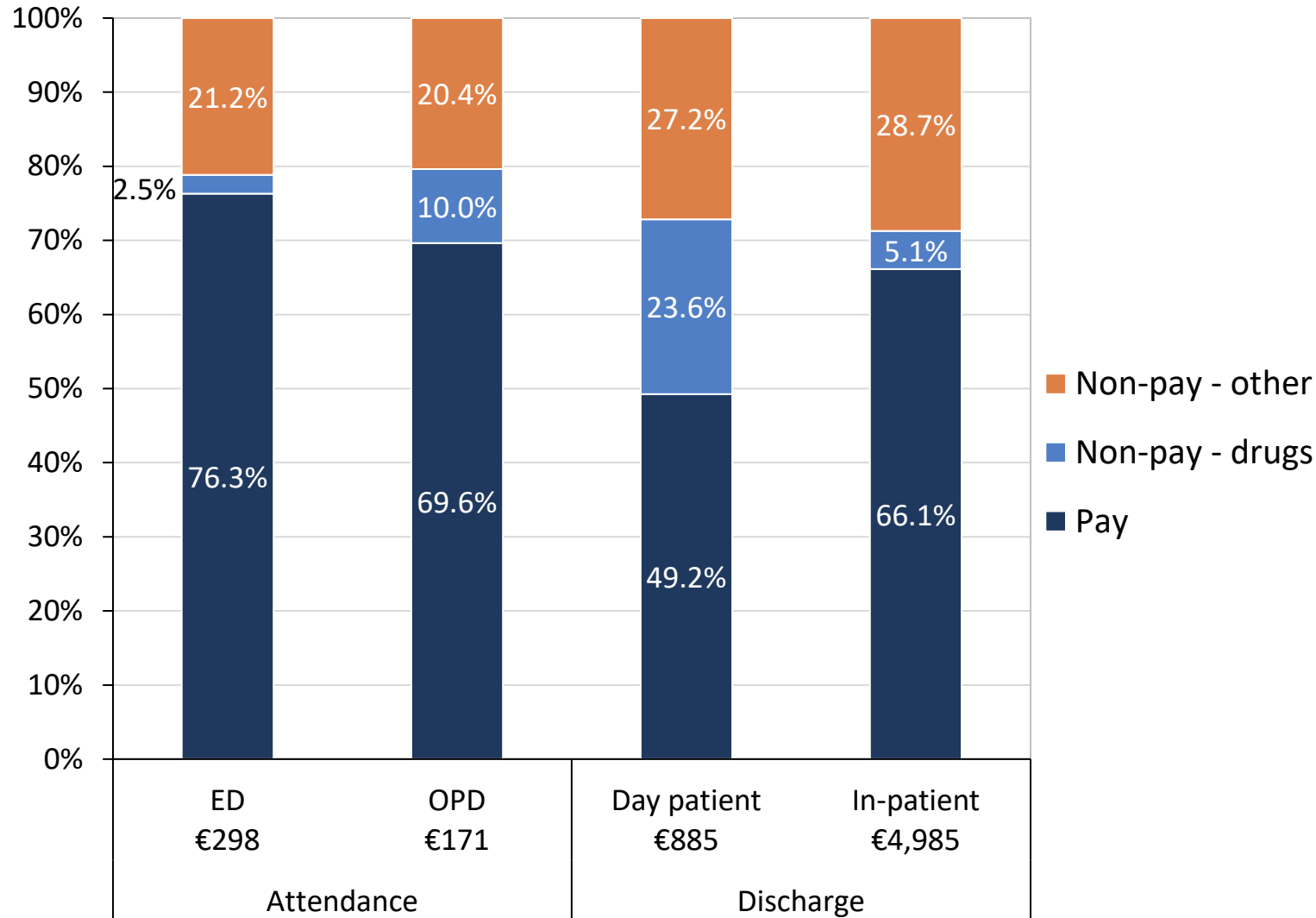
Day
patient
€920m

In-patient
€3,220.5m

Residual €672m

Public acute adult psychiatric in-patient unit/hospital* €179m

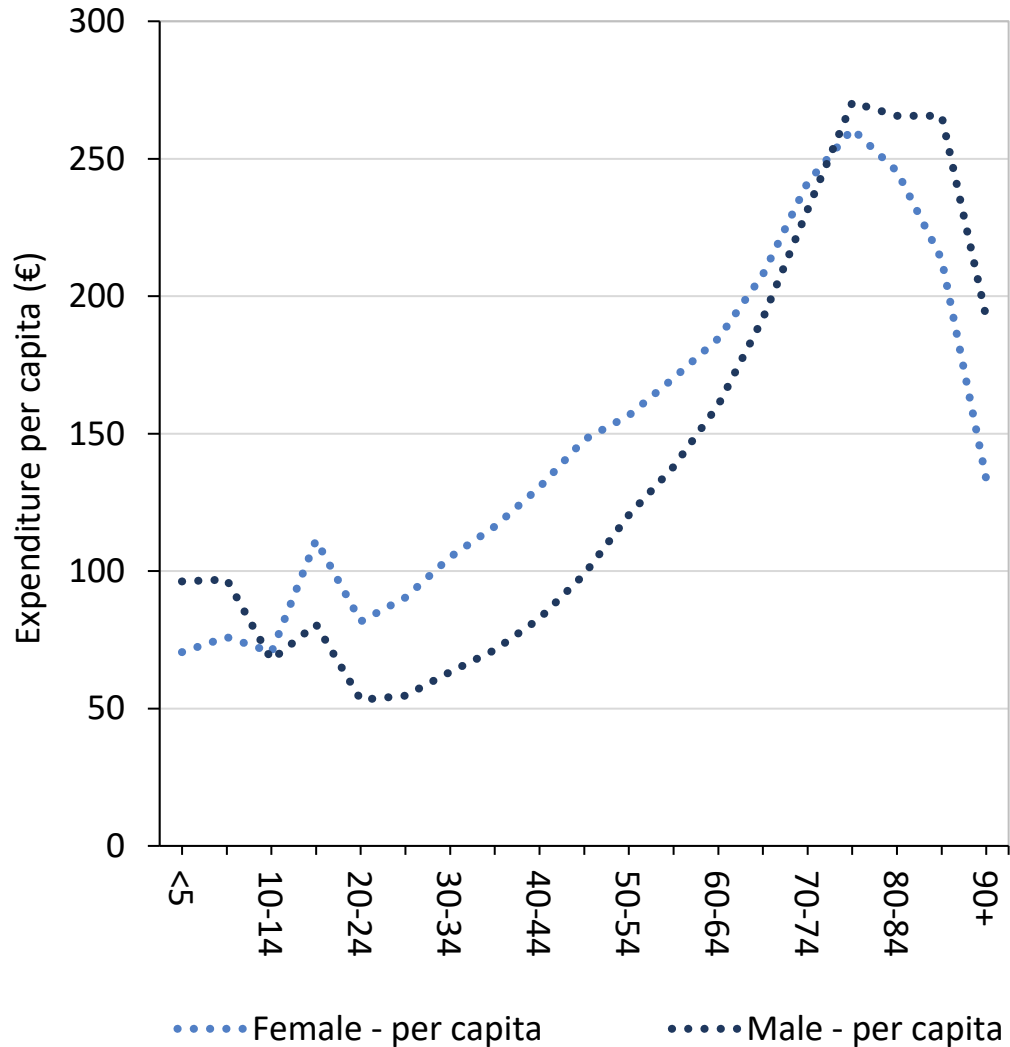
UNIT COST BY COMPONENT



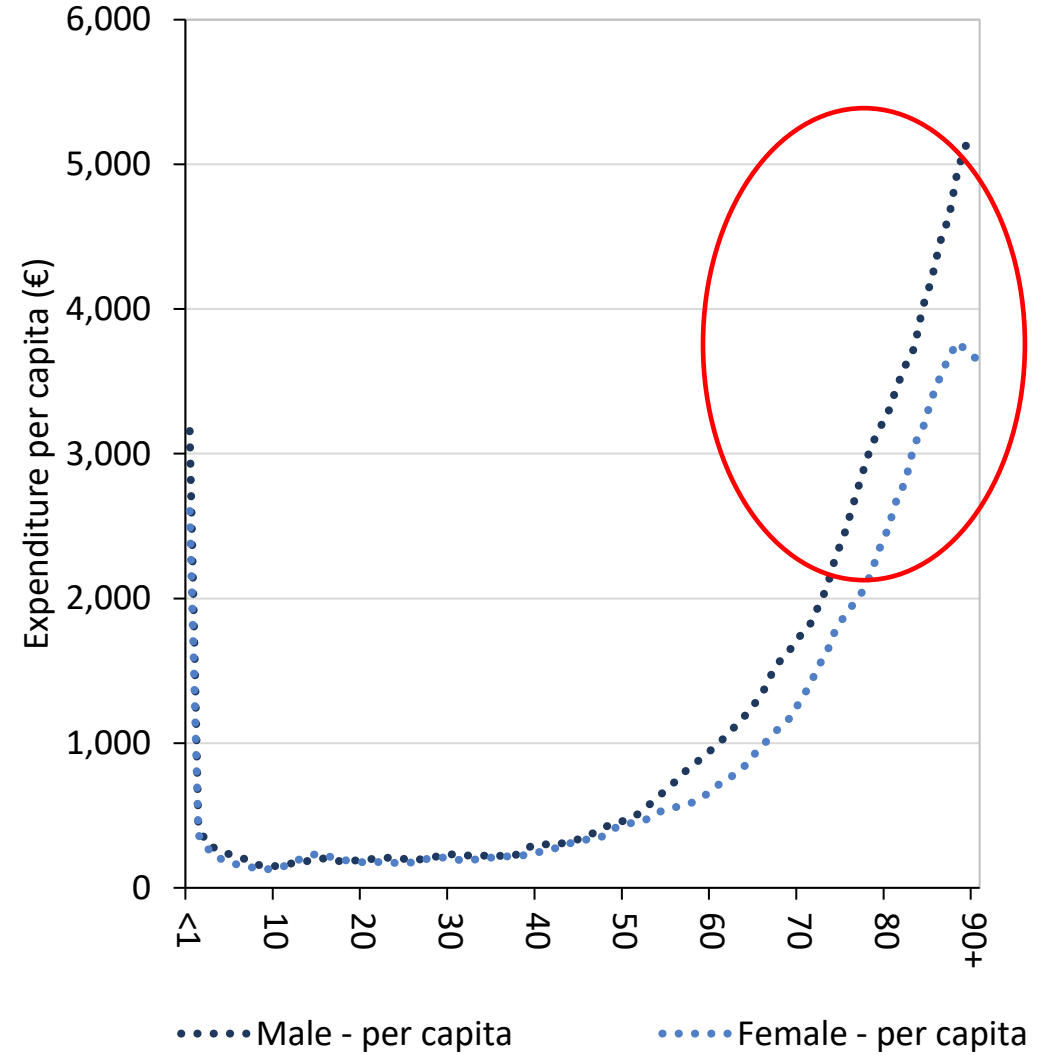
- The proportion of the unit cost related to each component varies across services
- Across all services pay is the single largest component of care costs
- For day-patients drugs account for approximately a quarter of the cost of care delivery

BASELINE EXPENDITURE 2018

Outpatients (excl. mat)



In-patients (excl. mat)





FINDINGS

PROJECTIONS 2018-2035

PROJECTIONS OF EXPENDITURE, 2018-2035

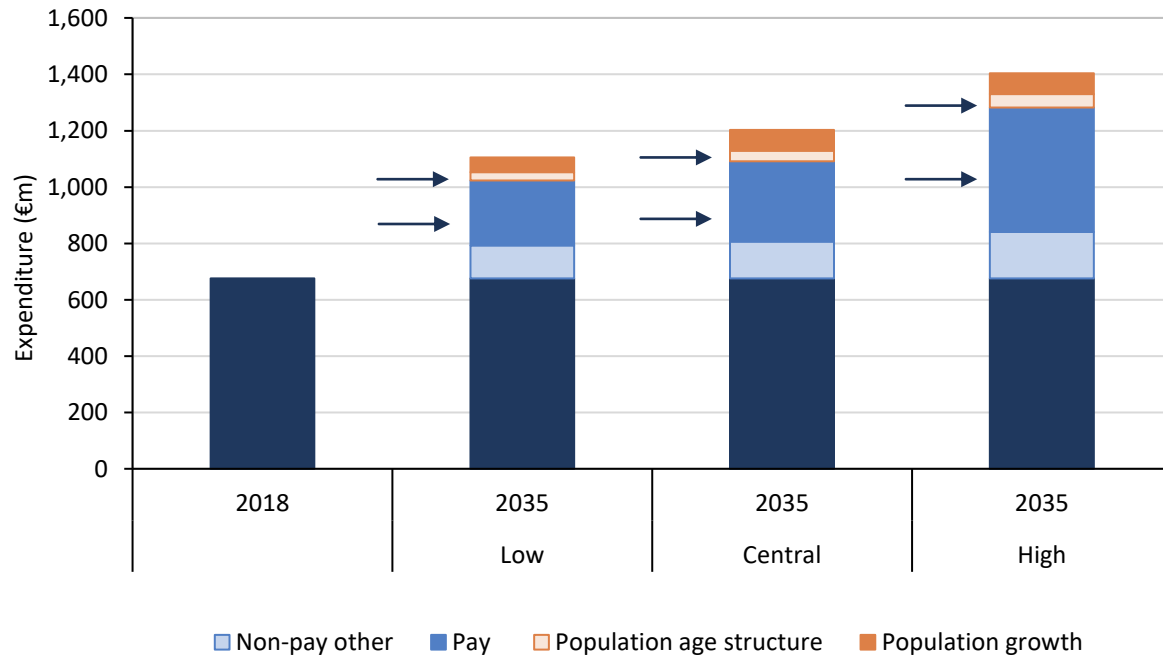
		Projected HCE growth 2018–2035 (%)		
		Low	Central	High
Emergency department	Real	12	17	19
	Nominal	62	78	109
Outpatient department	Real	12	16	18
	Nominal	63	78	108
Day patients	Real	21	27	31
	Nominal	92	119	161
In-patients	Real	25	33	38
	Nominal	86	109	150
Psychiatric In-patients	Real	16	19	25
	Nominal	69	81	120

PROJECTIONS OF EXPENDITURE, 2018-2035

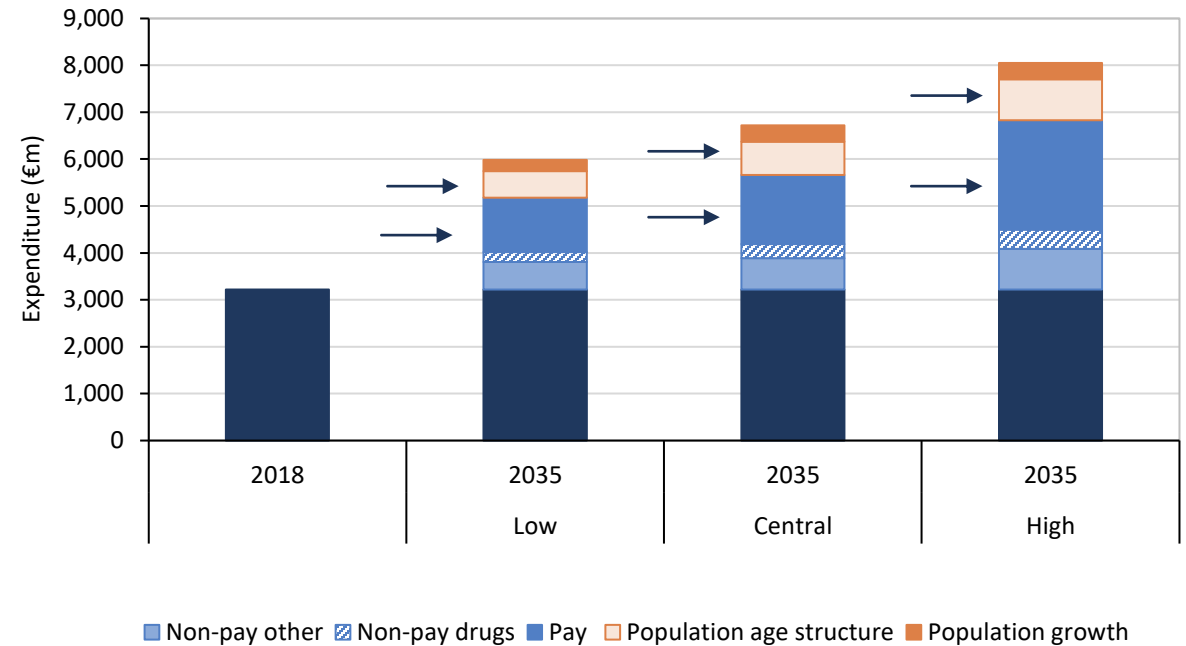
		Projected HCE growth 2018–2035 (%)			Projected HCE growth 2018–2035 (average annual %)		
		Low	Central	High	Low	Central	High
Emergency department	Real	12	17	19	1	1	1
	Nominal	62	78	109	3	4	4
Outpatient department	Real	12	16	18	1	1	1
	Nominal	63	78	108	3	4	4
Day patients	Real	21	27	31	1	1	2
	Nominal	92	119	161	4	5	6
In-patients	Real	25	33	38	1	2	2
	Nominal	86	109	150	4	4	6
Psychiatric In-patients	Real	16	19	25	1	1	1
	Nominal	69	81	120	3	4	5

DECOMPOSITION EXAMPLES – OUTPATIENT & IN-PATIENT

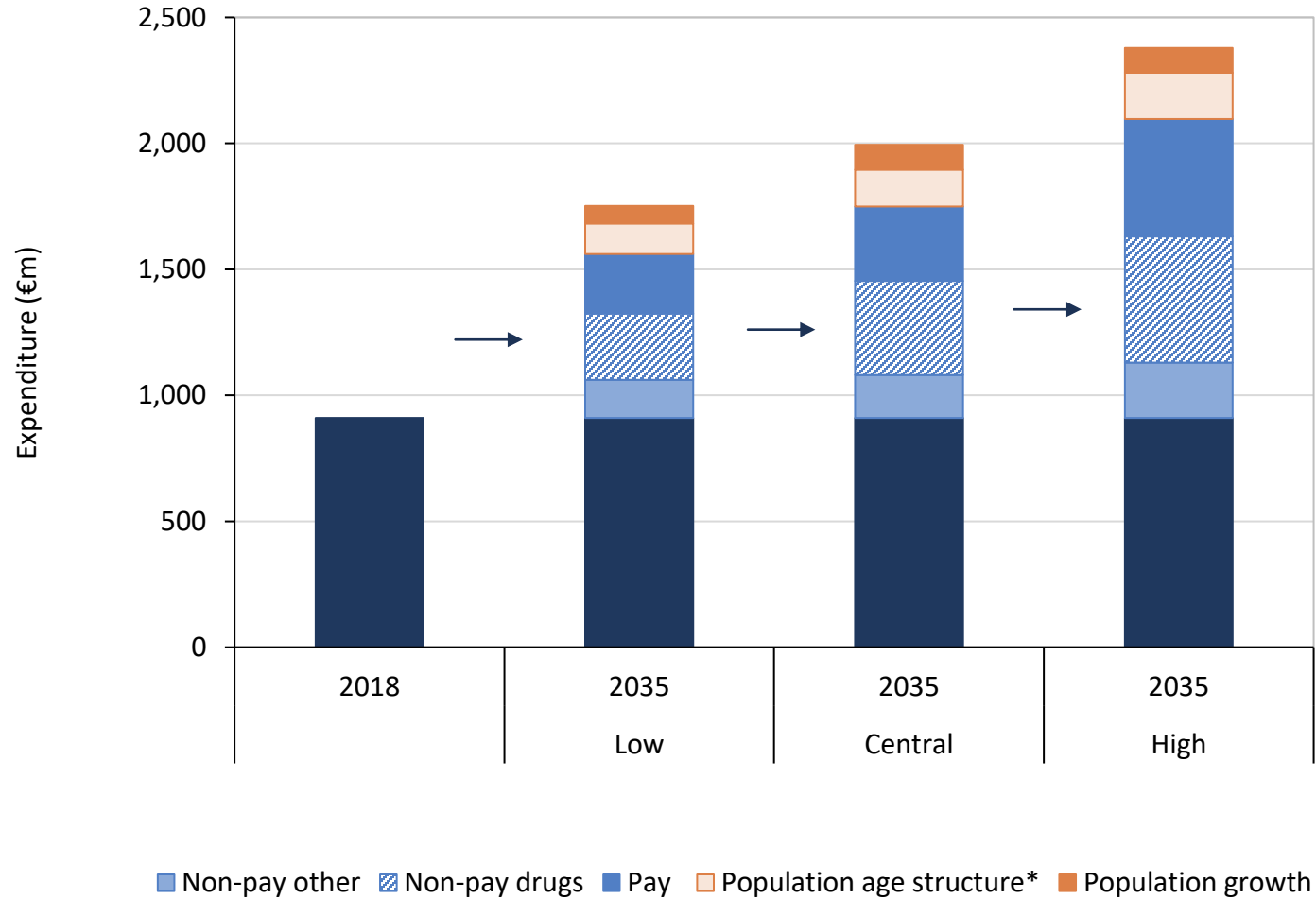
Outpatient



In-patient



DECOMPOSITION – DAY PATIENTS



PROJECTIONS OF GROSS HOSPITAL EXPENDITURE

- In nominal terms, we project gross expenditure requirements for public acute hospital care of between €10.8bn and €14.4bn by 2035, compared to expenditure of €5.9bn in 2018
 - 82 to 143 per cent increase

	Nominal expenditure growth (average annual)				
2013-2018			4.5		
	Low	Central	High	Progress	Central – adjusted
2018-2025	3.3	4.1	5.3		
2026-2030	3.8	4.4	5.5		
2031-2035	3.8	4.3	5.4		
2018-2035	3.6	4.3	5.4		

AGGREGATE EXPENDITURE GROWTH

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2026-2030	3.8	4.4	5.5	4.2	
2031-2035	3.8	4.3	5.4	4.1	
2018-2035	3.6	4.3	5.4	4.1	

AGGREGATE EXPENDITURE GROWTH

- In nominal terms, we project gross expenditure requirements for public acute hospital care of between €10.8bn and €14.4bn by 2035, compared to expenditure of €5.9bn in 2018

	Nominal expenditure growth (average annual)				
2013-2018	4.5				
	Low	Central	High	Progress	Central – adjusted
2018-2025	3.3	4.1	5.3	4.5	6.0
2026-2030	3.8	4.4	5.5	4.2	4.4
2031-2035	3.8	4.3	5.4	4.1	4.3
2018-2035	3.6	4.3	5.4	4.1	5.1

SUMMARY

- Public acute hospital expenditure in 2018 was **€5.9bn**
- This is projected to increase by
 - between **1.2** to **1.7%** on average, per year in **real terms** to 2035
 - Driven by growing and ageing population
 - between **3.6** to **5.4%** on average, per year in **nominal terms** to 2035
 - Driven by the increasing cost of care delivery, particularly pay
- Projected growth greatest for acute day patient and in-patient care
 - Older age profile, complexity adjustment, drugs

POLICY IMPLICATIONS

- Significant investment in capacity and workforce (including resources to address unmet demand)
- Some acute care could be more appropriately delivered in the community and would be expenditure saving to the acute system (but in turn would require community investment)
- What role for productivity in offsetting some of the projected cost increases?
- Finally – demographic change should be welcomed!
 - while additional resources will be required to finance care needs, sustainability should be viewed in the context of growing national income and tax base

WHAT'S NEXT FOR HIPPOCRATES?

■ 2021

- Projections of private hospital expenditures to 2035
- Non-acute expenditure projections to 2035
- National and regional projected workforce requirements

THANK YOU

- A big thank you to our data providers!



An
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