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Modelling the Costs of Illness and the Costs of Relapse in the Management of Schizophrenia in the UK

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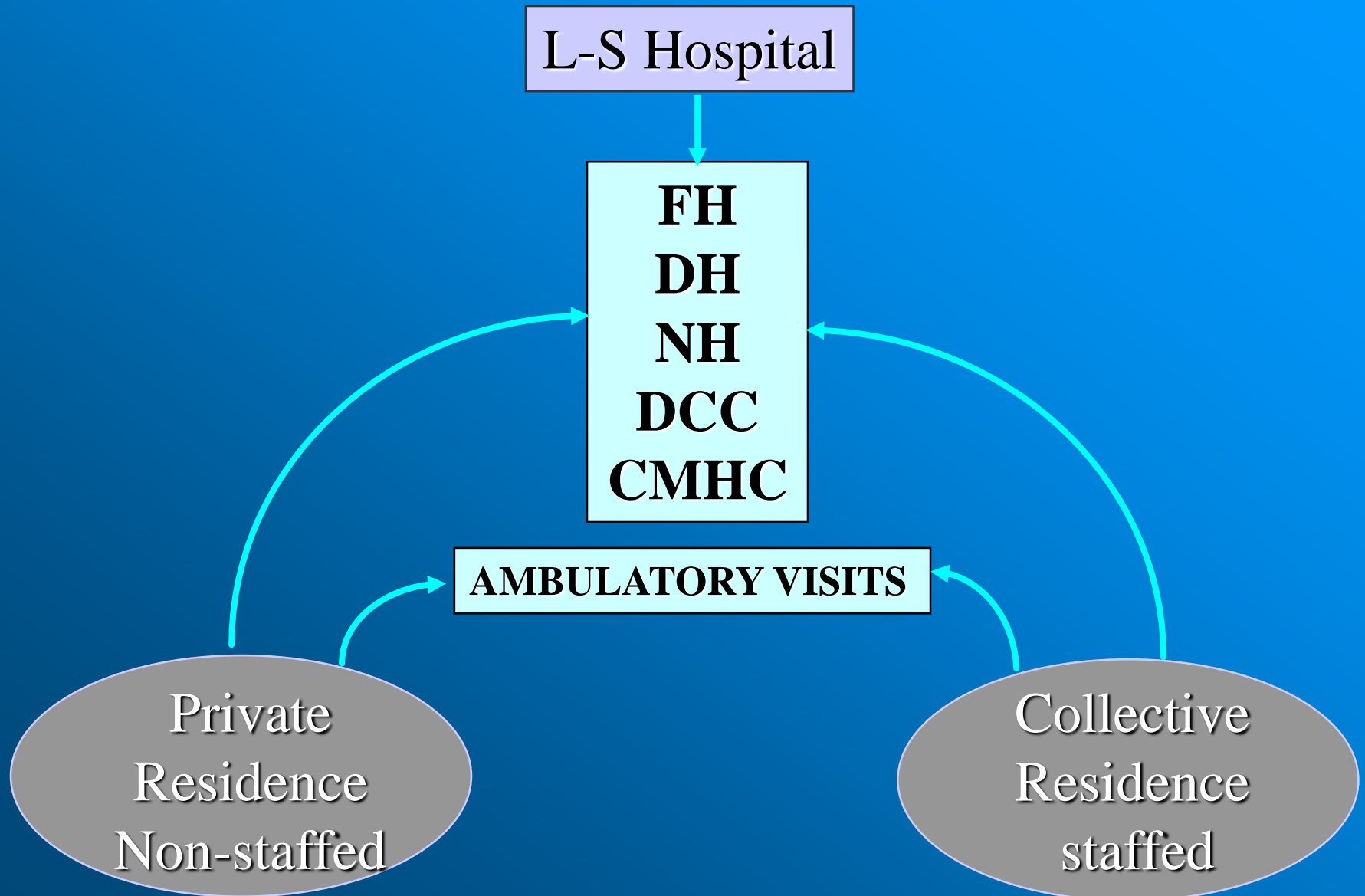
AIMS OF THE STUDY

- To compare the **toxicities** of atypical treatments for schizophrenic patients
- To study their consequences on **compliance** and **relapse**
- To specify **management pathways** in UK for patients under treatment
- To analyze the **mean cost** incurred by **relapsing** and **not relapsing** patients treated with atypical antipsychotics in the British society
- To analyze the **total 10 years** and **life time costs** incurred by the National Health Service

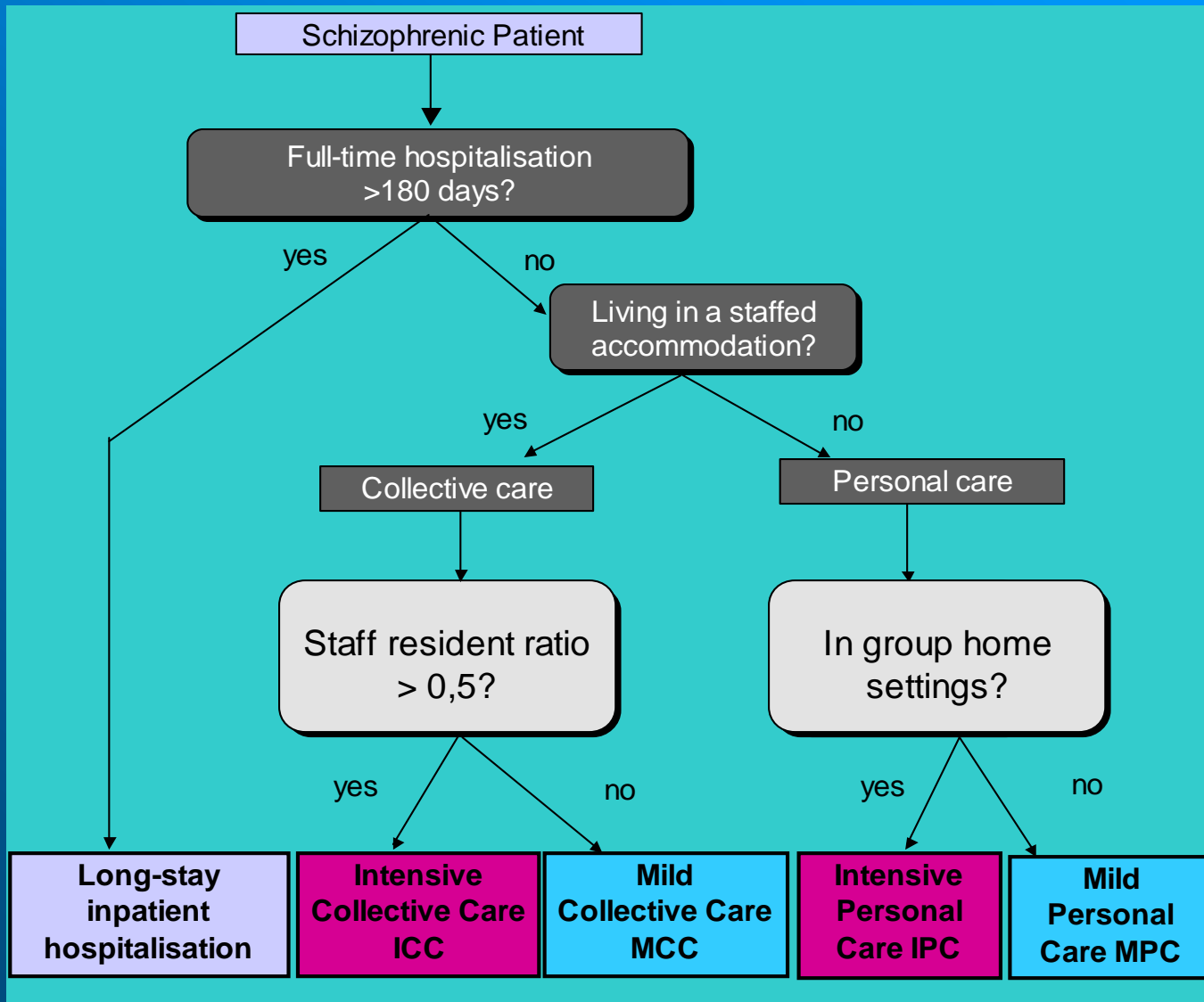
METHODS

- Simulation model
- Clinical states
- Management structures
- Clinical events
- 10 years and life time cost

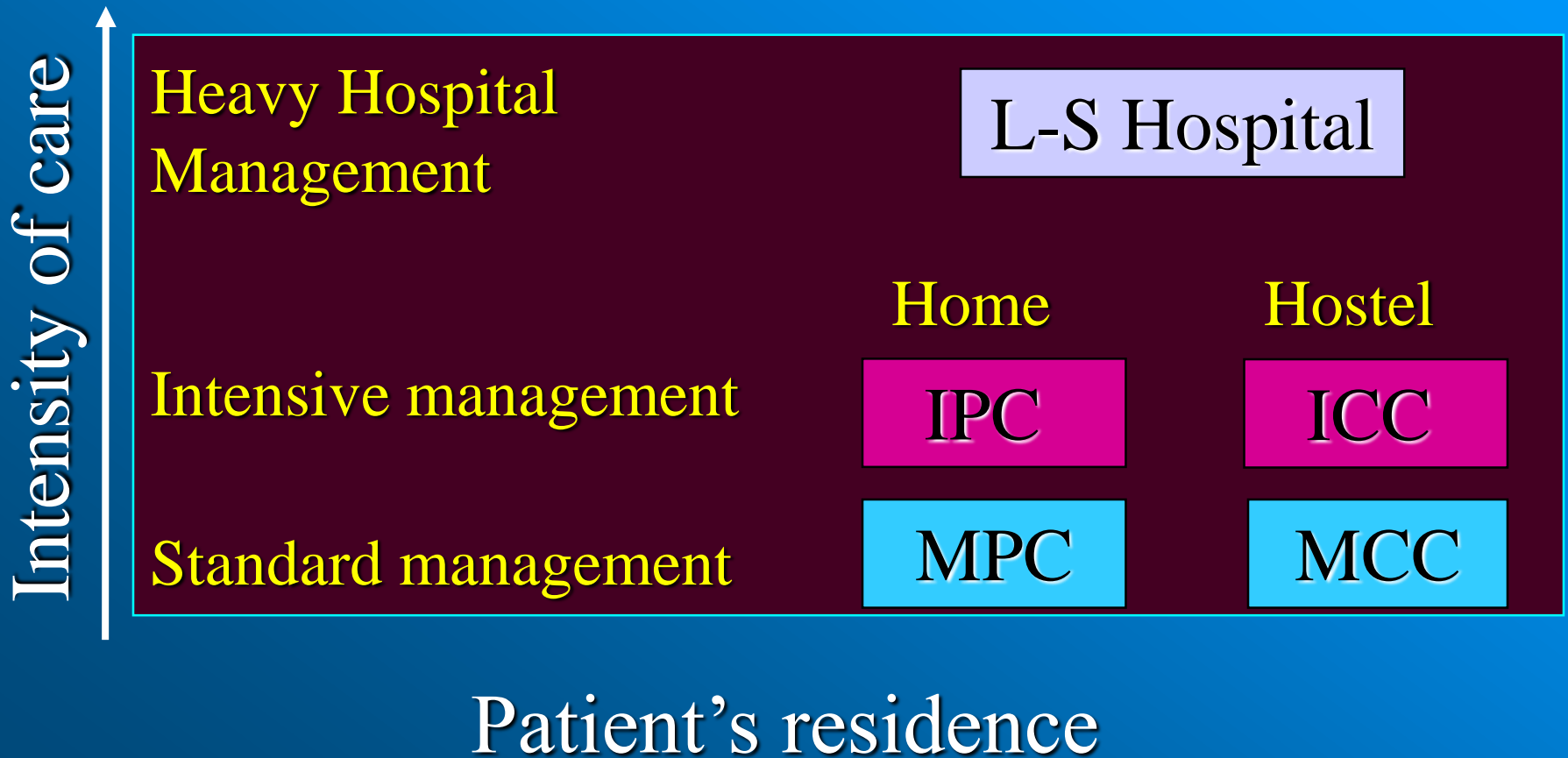
Mentally ill Patients' Accommodation in UK



Classification Algorithm



Patient's Care Management Groups



Clinical States

- Relapse (5 states)
- Non-Relapse (5 states)
- Chronic (5 states)
- Lost to follow up (1 state)
- Death (1 state)

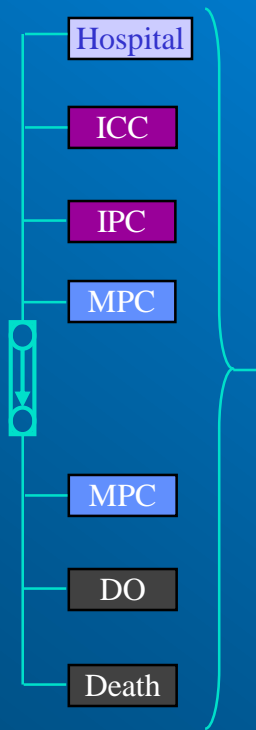
Simulation Model

- 17 Markov states (R_+ , R_- , chro, DO, DC)
- 8 160 variables
- 18 213 nodes
- Software Data for Windows version 3.15

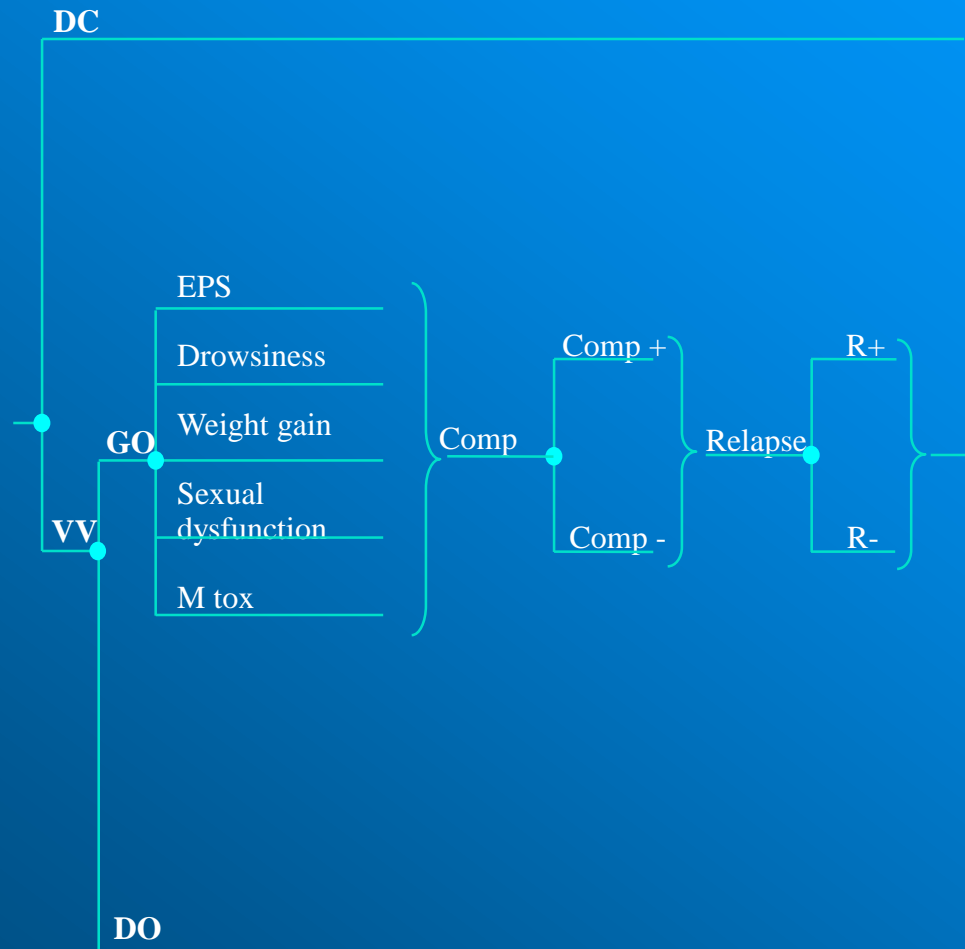
Markov Model in Schizophrenia



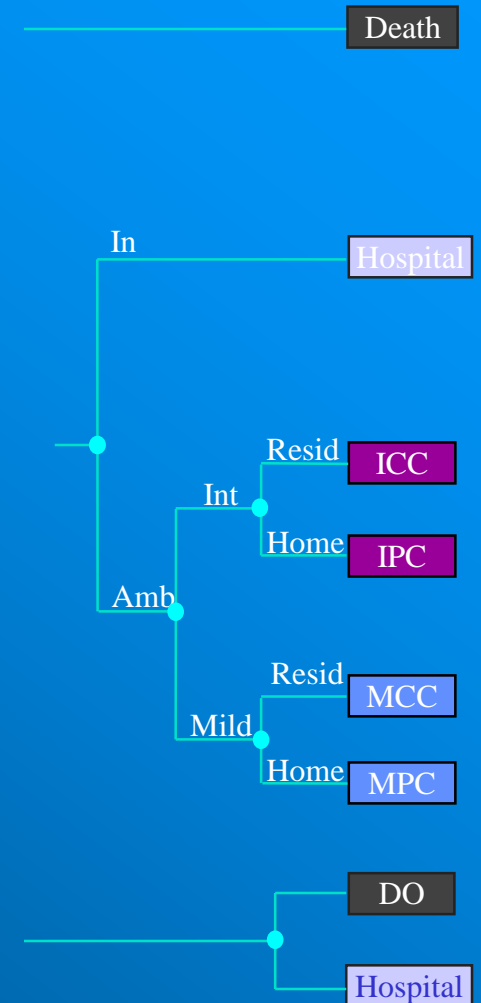
Markov Model in Schizophrenia



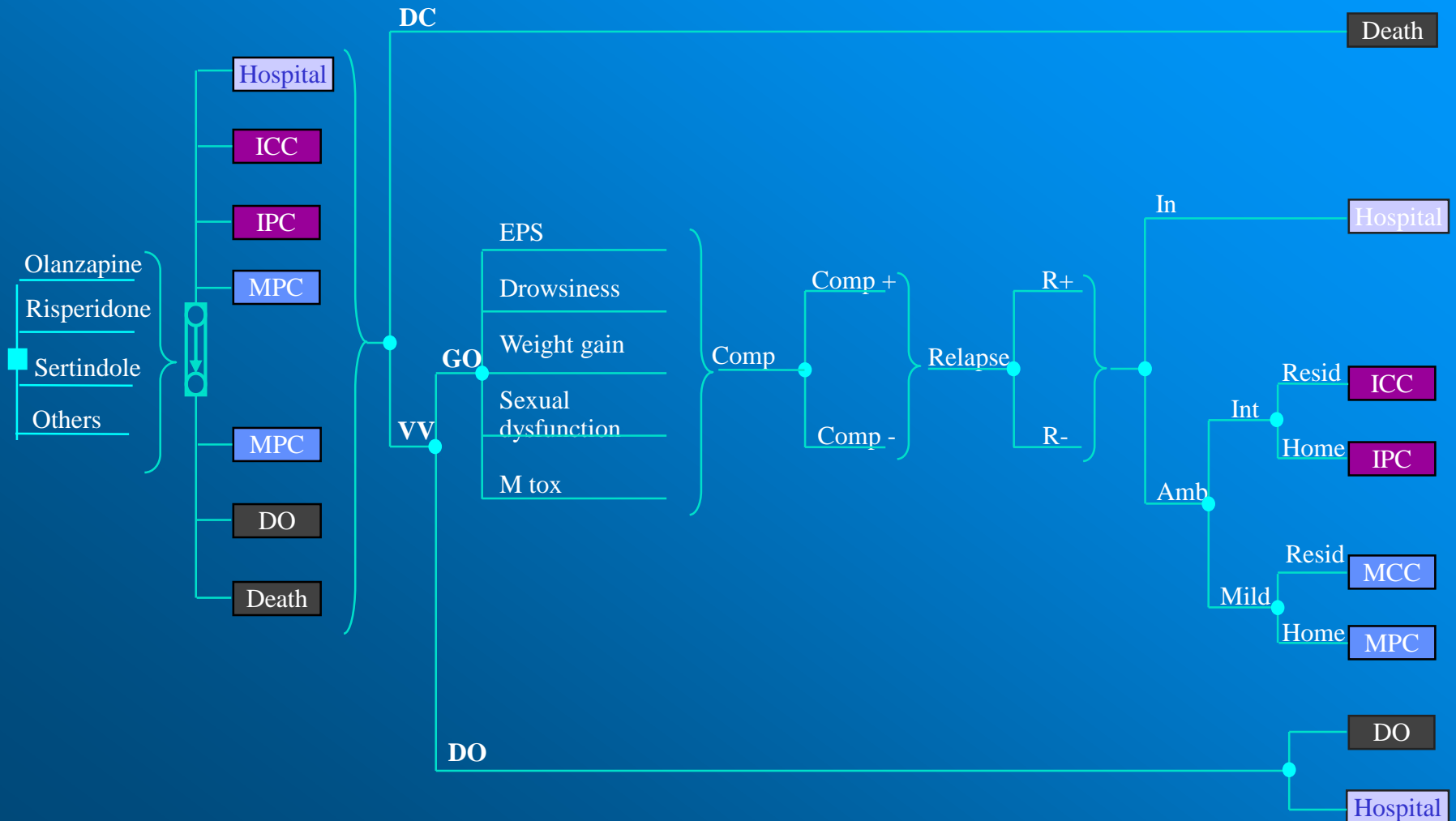
Markov Model in Schizophrenia



Markov Model in Schizophrenia



Markov Model in Schizophrenia



Frequency of Side Effects

Short term studies

	Sertindole	Olanzapine	Risperidone
	%	%	%
EPS	19	21	28
Drowsiness	8.2	26	7.9
Weight gain	20.6	30	15.7
Sexual dysfunction	2.8	1	0
Total	50.6	78	51.6

Compliance Rate Assumptions

	All products	Range
EPS	0.20	0.10-0.60
Somnolence	0.20	0.10-0.60
Weight Gain	0.40	0.10-0.60
Sexual disturbance	0.40	0.10-0.60
Minor toxicity	0.80	0.40-0.90

Non-compliance and Effectiveness

Relapse rate

Authors	Date	n	Annual rate	Probability per six months
Del Giudice	1975	57	76%	0.680
Weiden	1995	373	76%	0.510
Glaser	1996	nd	75%	0.509
Baldessarini	1990	3939	74%	0.490
Kissling	1993	1224	72%	0.470
Johnsson	1983	60	65%	0.400
Gilbert	1993	1224	61%	0.375
Davis	1995	278	46%	0.265

Compliance and Effectiveness

Relapse rate

Authors	Date	n	Annual rate	Probability per six months
Del Giudice	1975	25	44%	0,250
Weiden	1995	285	35%	0,194
			23%	0,117
Baldessarini	1990	3939	30%	0,160
Davis	1995	249	29%	0,157
Glaser	1996	nd	20%	0,105
Gilbert	1993	3114	20%	0,105
Kis sling	1993	270	16%	0,080
Johnsson	1983	60	16%	0,080

Prices of Anti-Psychotic Treatment

	Daily cost	Six monthly cost
Haloperidol 15 mg / day	0.36 £ ₀₁	65.61 £ ₀₁
Sertindole 16 mg / day	3.20 £ ₀₁	582.40 £ ₀₁
Olanzapine 15 mg / day	5.28 £ ₀₁	951.21 £ ₀₁
Risperidone 5 mg / day	3.24 £ ₀₁	590.86 £ ₀₁

Mean Consumption by Patient Per Six Months £₀₁

	L-S Hospital	Intensive Residential	Intensive home	Mild Residential	Mild home
COHORTE STUDY RELAPSE					
(n=77)					
Complete hospitalisation days		3 182.00	0.00	14 805.00	6 382.00
Day hospitalisation days		75.86	0.00	0.00	134.48
Ambulatory contacts		1 273.19	0.00	532.50	1 717.55
TOTAL		4 476.00	0.00	15 337.00	8 235.00
COHORTE STUDY NON-RELAPSE (n=68)					
Complete hospitalisation (days)		0.00	0.00	0.00	0.00
Day hospitalisation (days)		0.00	0.00	1 888.00	100.00
Ambulatory contacts		1 239.70	0.00	2 114.00	1 918.00
TOTAL		1 240.00	0.00	4 012.00	2 020.00
CHRONIC	25 662.00				

Discount Rate Assumptions

- Discount rate
 - 10 year : 3%
 - Lifetime : 6%
- Cost of management with other atypical antipsychotics
 - 10 year: Average (Sertindole, Risperidone & Olanzapine + 1.5%
 - Lifetime: Average (Sertindole, Risperidone & Olanzapine + 5%

Point Prevalence for Psychoses

- Adults aged 16-64 is 4/1000

	Population
United kingdom	52 000 000
Age group 16-64	45 000 000
Prevalence	180 000

Source: British survey, Office of Population Censuses and Surveys

RESULTS

- 10 years cost per patient, per clinical state
- Overall 10 years cost per patient
- Life years cost per patient, per clinical state
- Overall life years cost per patient

Projected 10 Years Cost per Patient by Clinical State £₀₁

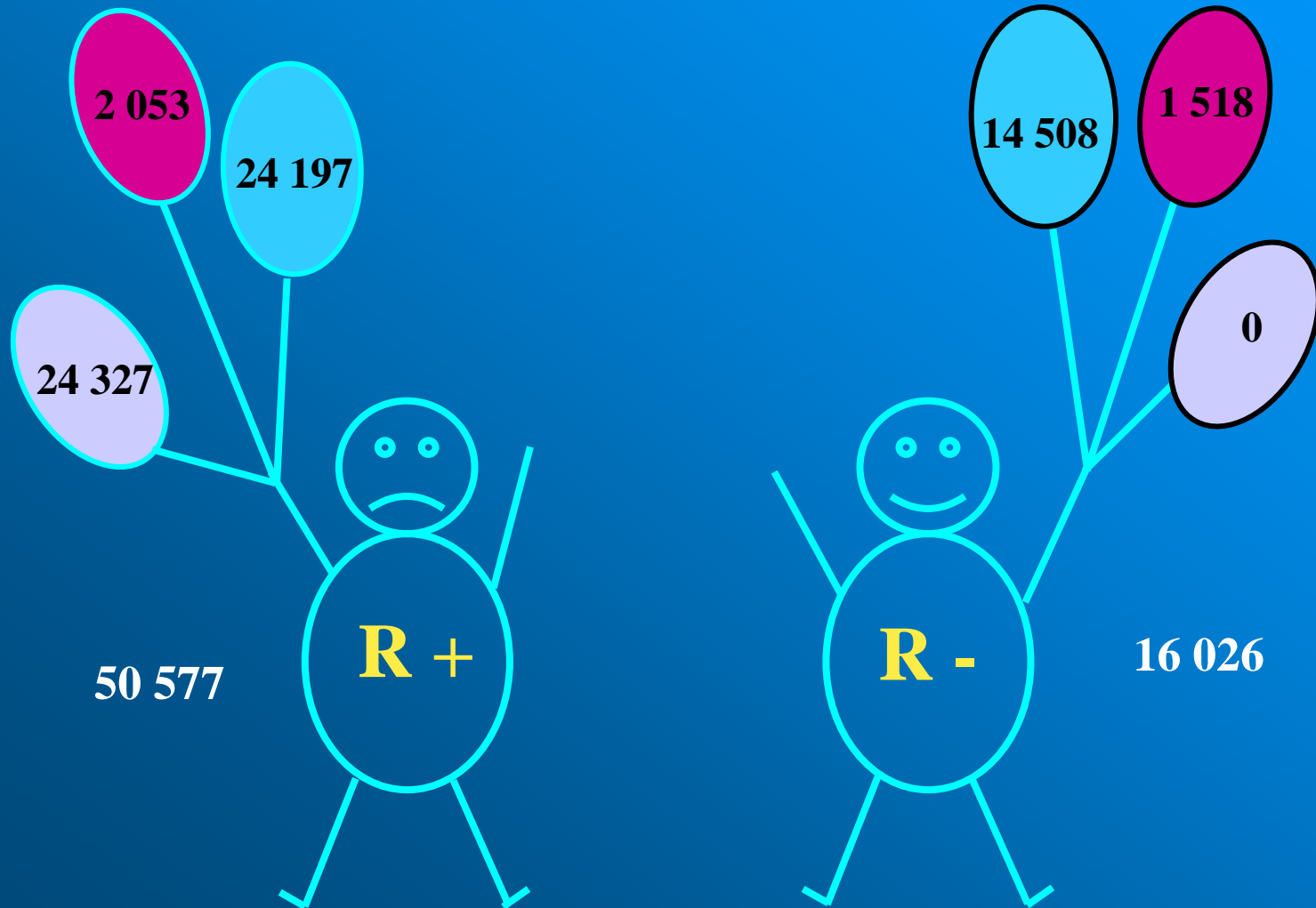
Cohorte	Olanzapine	Risperidone	Sertindole	Others
Relapse	53 097	48 670	47 959	50 657
Non-relapse	15 444	16 241	16 513	16 307
TOTAL	68 541	64 911	64 472	66 964

Overall 10 Years Cost per Patient £₀₁

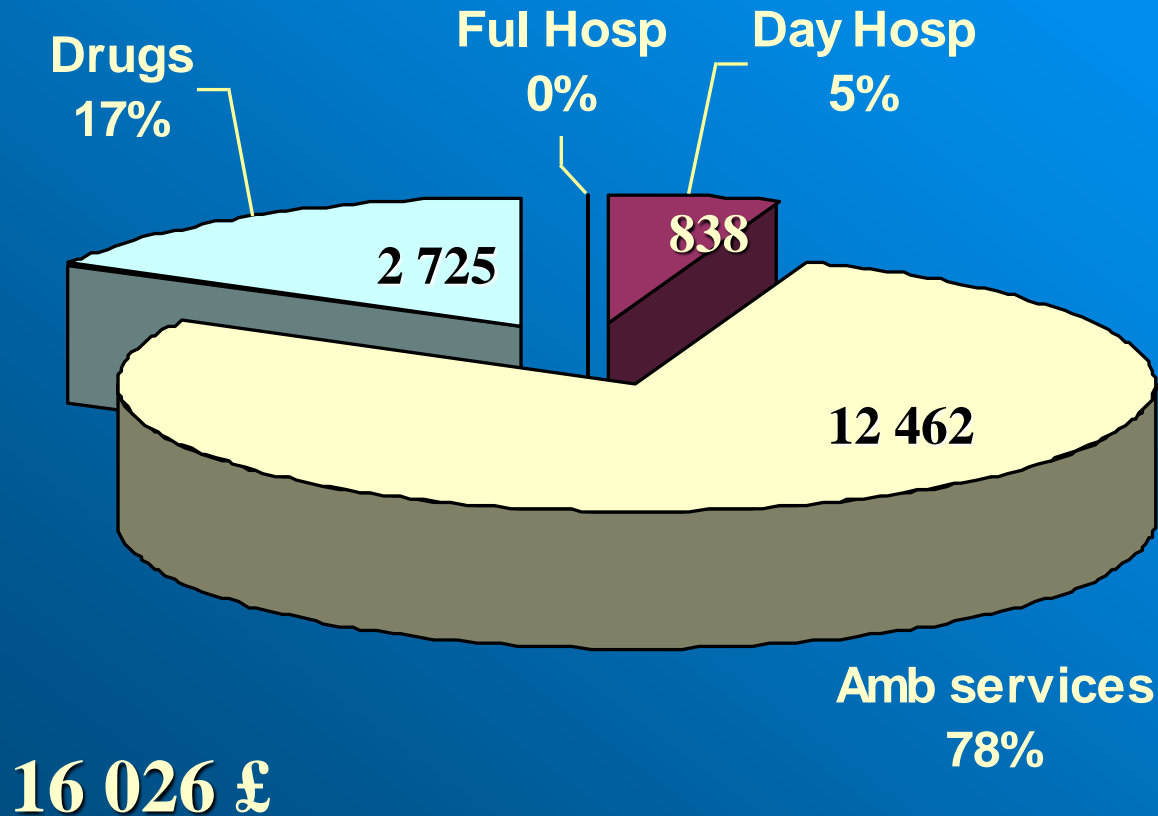
Drugs	Market share %	Weighted cost
Olanzapine	33.38	22 878
Risperidone	28.31	18 378
Sertindole	12.32	7 940
Others	25.99	17 407
Total	100	66 603

Predicted 10 Years Cost per Patient

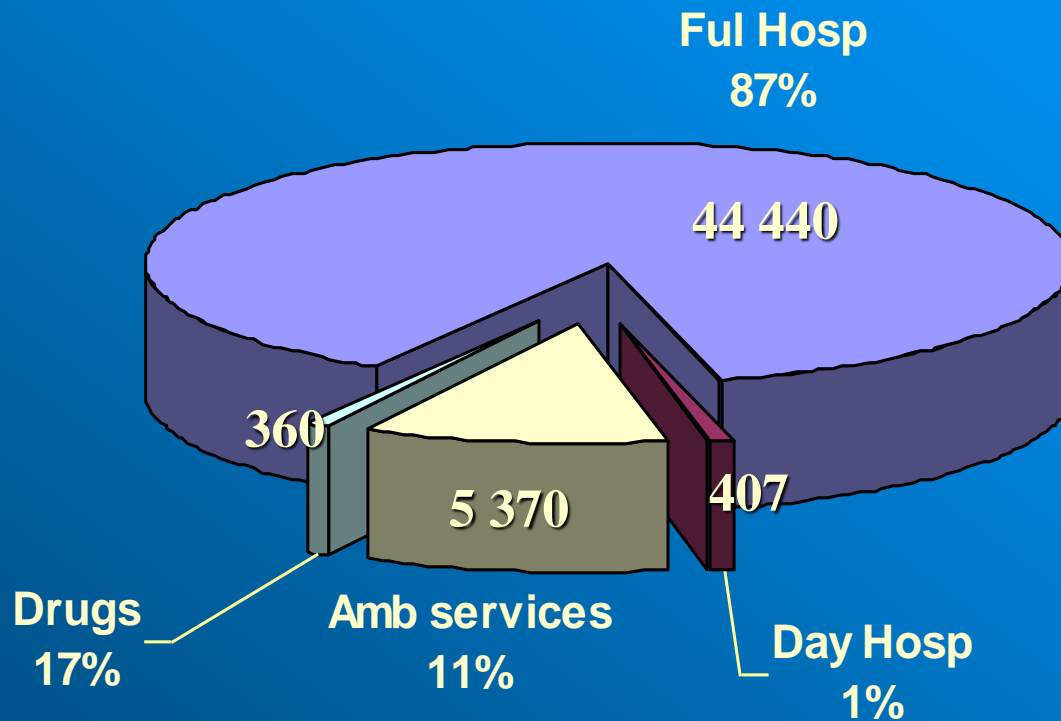
by Clinical Status and Type of Management £₀₁



10 Years Cost for non relapsing Patient by Type of Consumption £₀₁



10 Years Cost for relapsing Patient by Type of Consumption £₀₁



50 577 £

The Overall 10 Years Cost of the Schizophrenic Population £₀₁

£ 9,3 milliards

Projected Life Years Cost per Patient by Clinical State £₀₁

Cohorte	Olanzapine	Risperidone	Sertindole	Others
Relapse	78 966	72 041	71 563	76 395
Non-relapse	22 273	24 014	23 854	22 639
TOTAL	101 239	96 055	95 417	99 034

Overall Life Years Cost per Patient £₀₁

Drugs	Market share %	Weighted cost
Olanzapine	33.38	33 792
Risperidone	28.31	27 195
Sertindole	12.32	11 751
Others	25.99	25 743
Total	100	98 481

The Overall Life Time Cost of the Schizophrenic Population £₀₁

£ 13,6 milliards

Incremental Cost Effectiveness Ratio for UK

Strategy	Cost	Marginal Cost	Effectiveness	Marginal Effectiveness	$\Delta C/\Delta E$	
Sertindole	64 472		8.0520		8 006	
Risperidone	64 911	439	7.9466	- 0.1055	8 168	Dominated
Haloperidol	68 499	4 027	6.7176	- 1.3344	10 197	Dominated
Olanzapine	68 541	4 069	7.3069	- 7.3069	9 380	Dominated

Cost £₀₁ – Effectiveness : semesters without relapse – Time window : 10 years

Sensitivity Analysis

- Varying toxicity rates
- Varying compliance rates
- Varying relapse rates
- Varying hospitalisation rates
- Varying intensive home management rates
- Varying incremental costs between relapsers and non-relapsers
- Varying discounting rate

CONCLUSION

- Although sertindole demonstrates a better cost-effectiveness ratio than other typical or atypical antipsychotics,
- The **outcomes are modest** and question the decision making process on the sole basis of cost effectiveness analysis.
- It seems **quite difficult** on the current available data to **define tight recommendations** on which antipsychotic should be recommended as first line treatment.