Modelling and forecasting pharmaceutical lifecycles

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Presentation Structure

- Introduction
  - Pharmaceutical Market
  - Product Life Cycle Literature
- Empirical Data
- Forecasting Methods
- Preliminary Results
- Graph Categories
- Final Conclusions

Introduction

- Marketing professionals increasingly encouraged to broaden their research into more non-traditional areas such as modelling and forecasting

- Brodie & McIntyre (1987)

- Armstrong et al (1987)

Research project - aims

- Aims
  1. To classify the patterns that are exhibited during the product lifecycle of pharmaceutical drugs
  2. Model these patterns
  3. Forecast the patterns at different points throughout the lifecycle of the drug
  4. This will allow us to discover which forecasting methods forecast the lifecycle better depending on the different stages
     1. Introduction
     2. Growth
     3. Maturity
     4. Decline

Pharmaceutical Market

- Moss (2008) states that research has focused on consumer products and brands disregarding other products and brands such as pharmaceuticals.

- In 2007 the top 10 pharmaceutical companies had a combined sales of just under £150 billion and commanded 45% market share

- 2 of these were UK companies – AstraZeneca and GlaxoSmithKline

Pharmaceutical Market continued

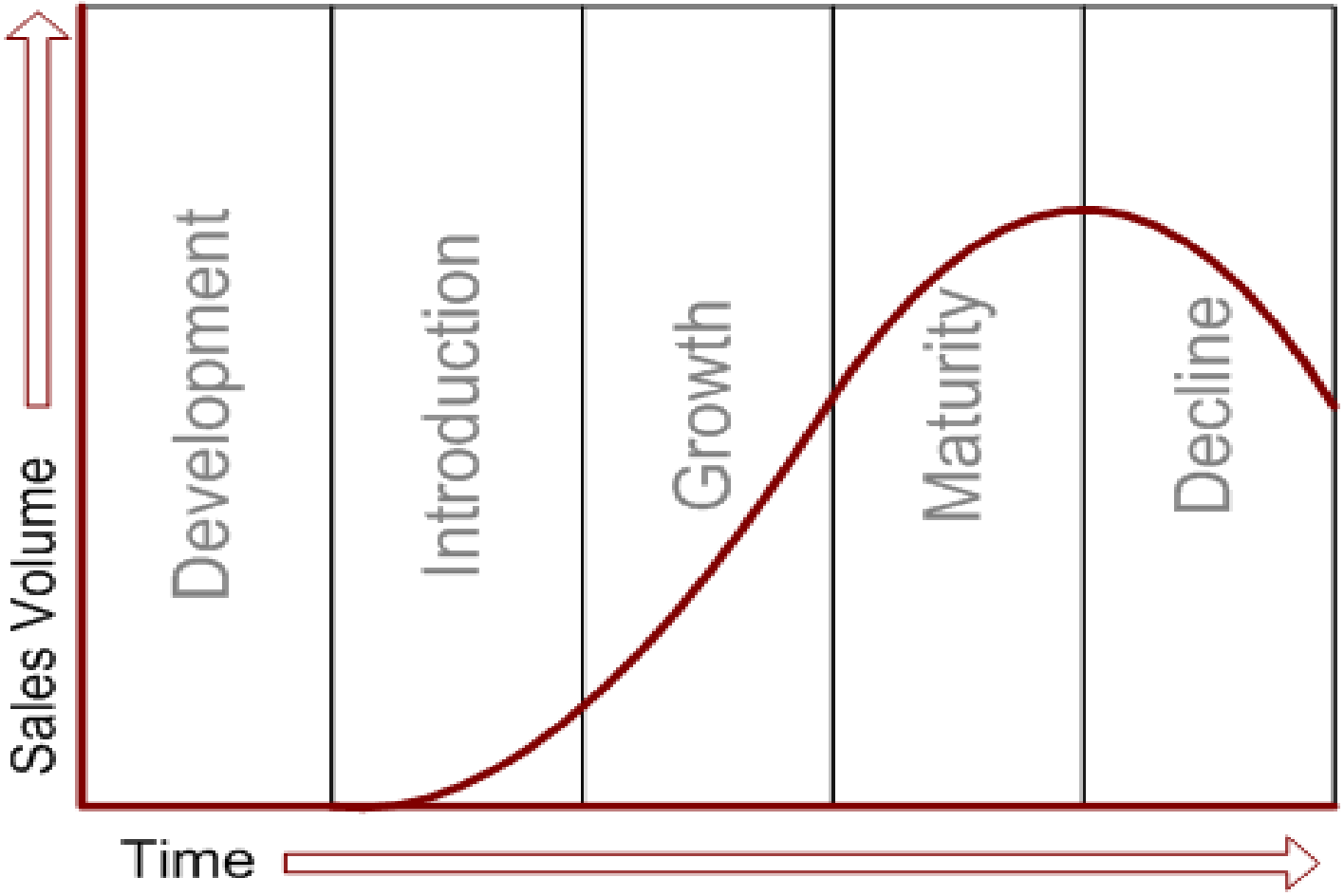
- In 2008 £4 billion was spent on R&D however this was expected to decrease due to the financial climate
- Patent Expiration – Major Problem
- UK patents last for 20 years from application
- 5 year extension can be applied for
- Generics enter the market

Pharmaceutical Market continued

- **A branded drug** is one made by a specific pharmaceutical company and is therefore given a name. The generic is the key compound that makes up the drug. In some cases the company can market both the branded and generic to appeal to a wider audience. An example is Sertraline.

- Brand name – Lustral by Pfizer
- Generic name – Sertraline.

Previous Research – Product Life Cycle



Research Project – The Data

- JIGSAW database
- Established in 1985 by ISIS research for the purposes of academic research
- Data from 1987 -2008
- 2.57 million script records
- Self Report Questionnaires from GP's
- Data is specifically relating to what drugs are prescribed

Forecasting Methods

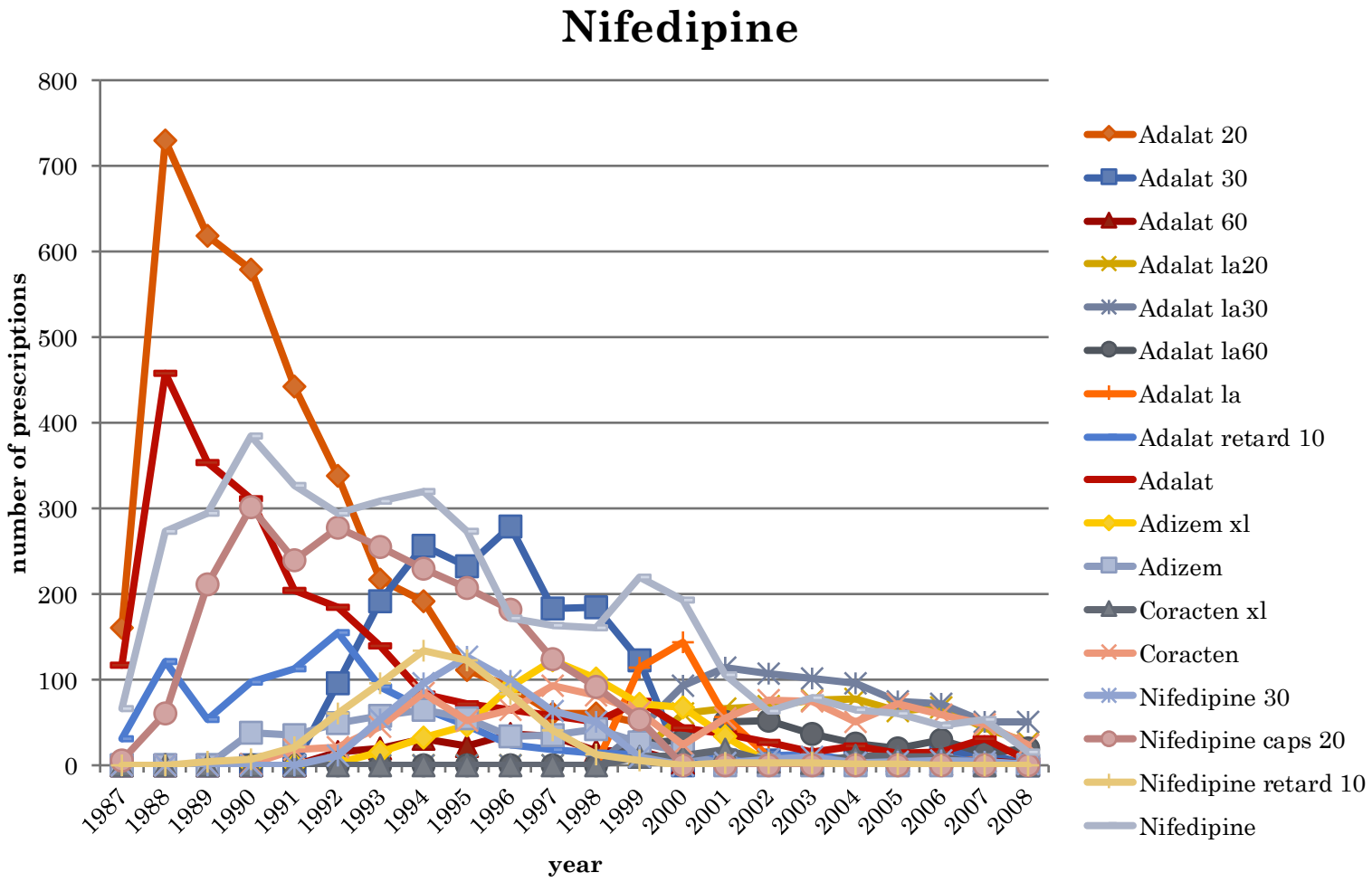
- Time Series Analysis

- Diffusion Models

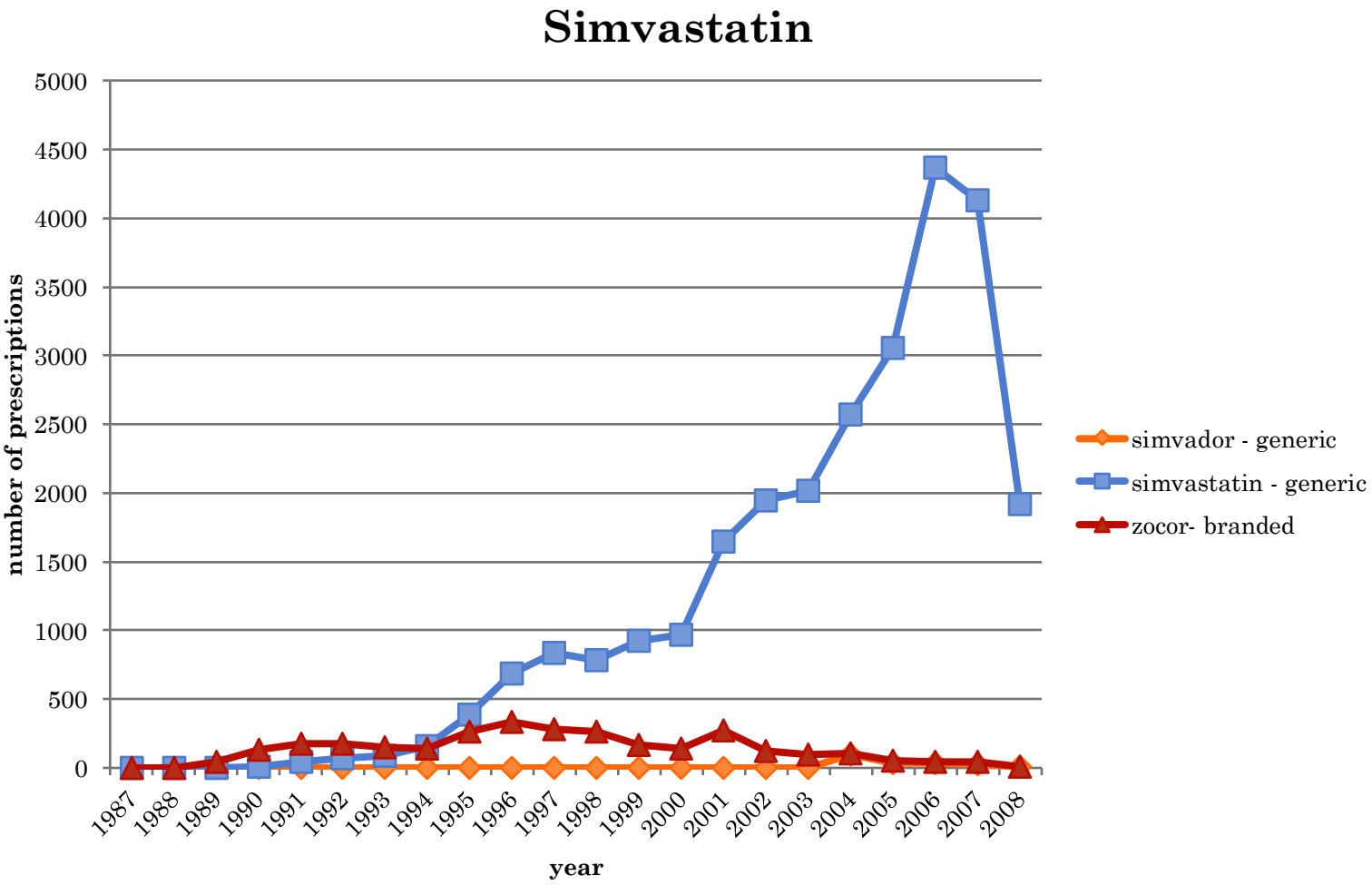
Pharmaceutical life cycle categories

High Branded Low Generic	High Generic Low Branded	Event Led Category	Generic 1st Branded 2nd Crossover	Branded 1st Generic 2nd Crossover
15	20	1	2	11
Salmeterol Salbutamol Piroxicam Oestrogen Nifedipine Mefenamic Acid Ketoprofen Ismo Beclomethasone Co-amilofruse Indocid Aluminium Hydroxide Glyceryl Felbinac Codydramol	Tramadol Meloxicam Simvastatin Ramipril Prednisol Paroxetine Paracetamol Omeprazole Lisinopril Lansoprazole Bendrofluazide Doxazosin Dihydrocodeine Amlodipine Citalopram Amitriptyline Ibuprofen Frusemide Fluoxetine Enalapril	Aspirin	Co-proxamol Co-codamol	Sertraline Ranitidine Propranolo Metoclopramide Naproxen Lofepramine Dothiepin Diclofenac Cimetidine Atenolol Indocid

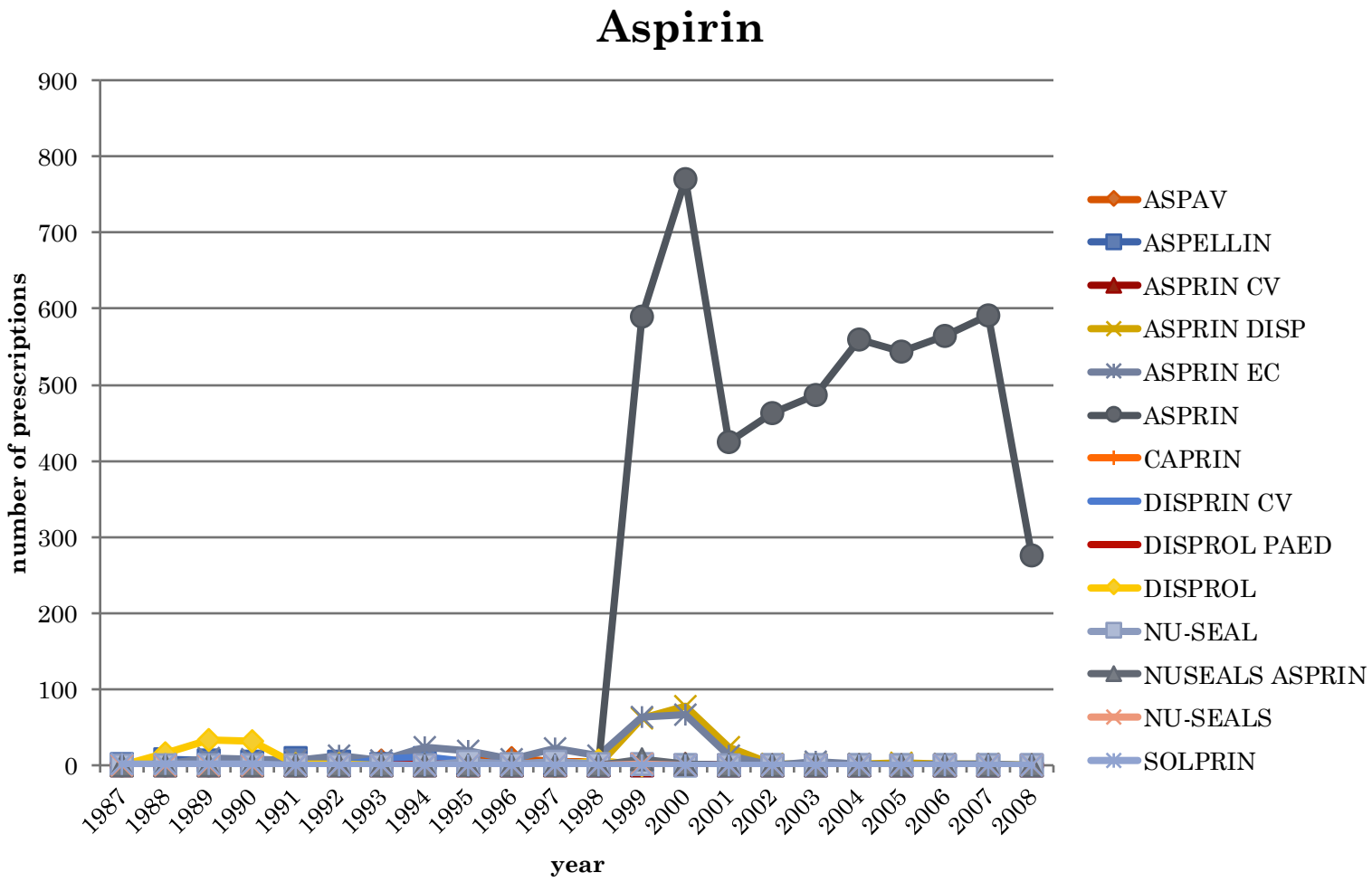
High branded low generic category



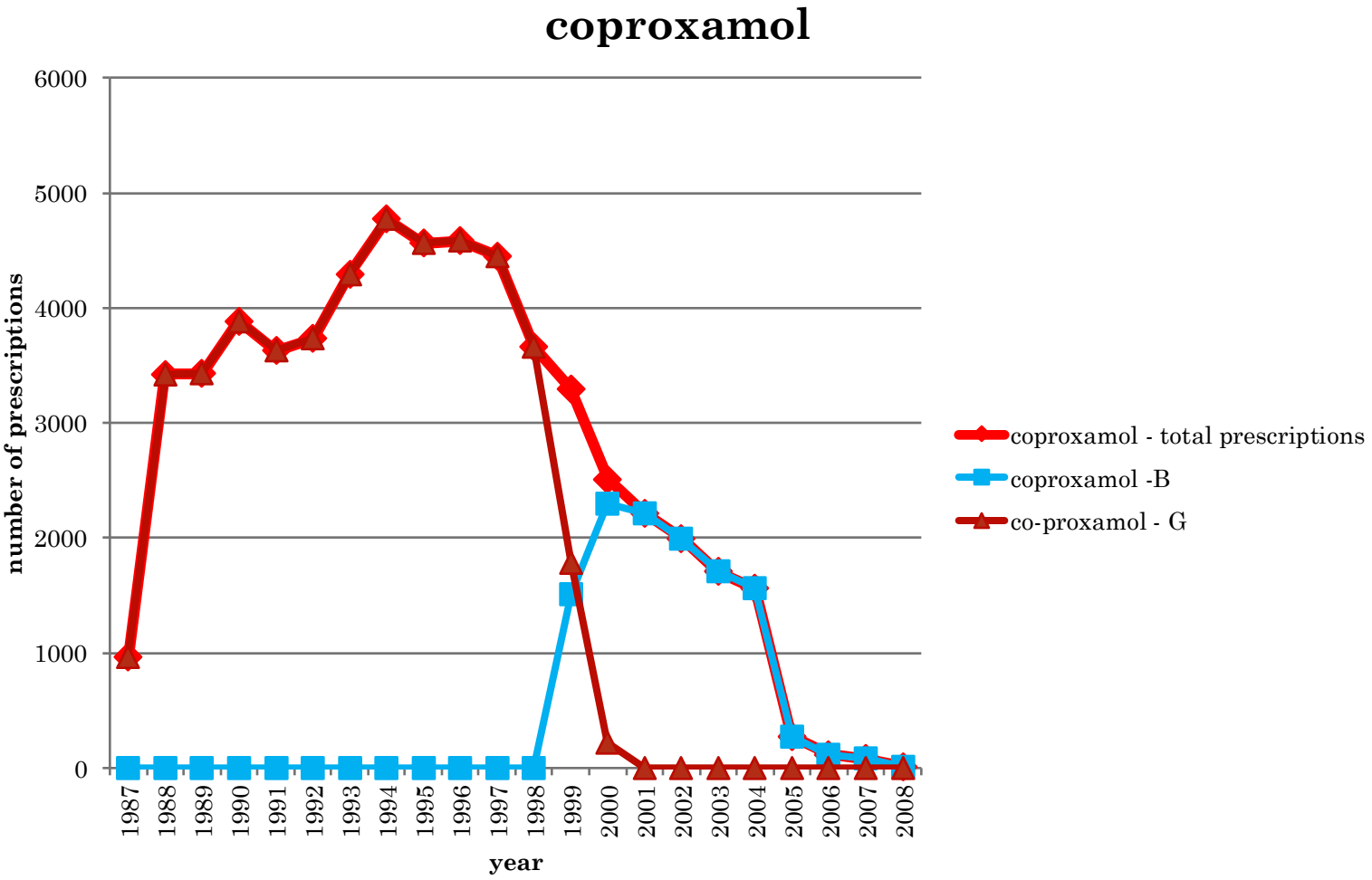
High generic low branded category



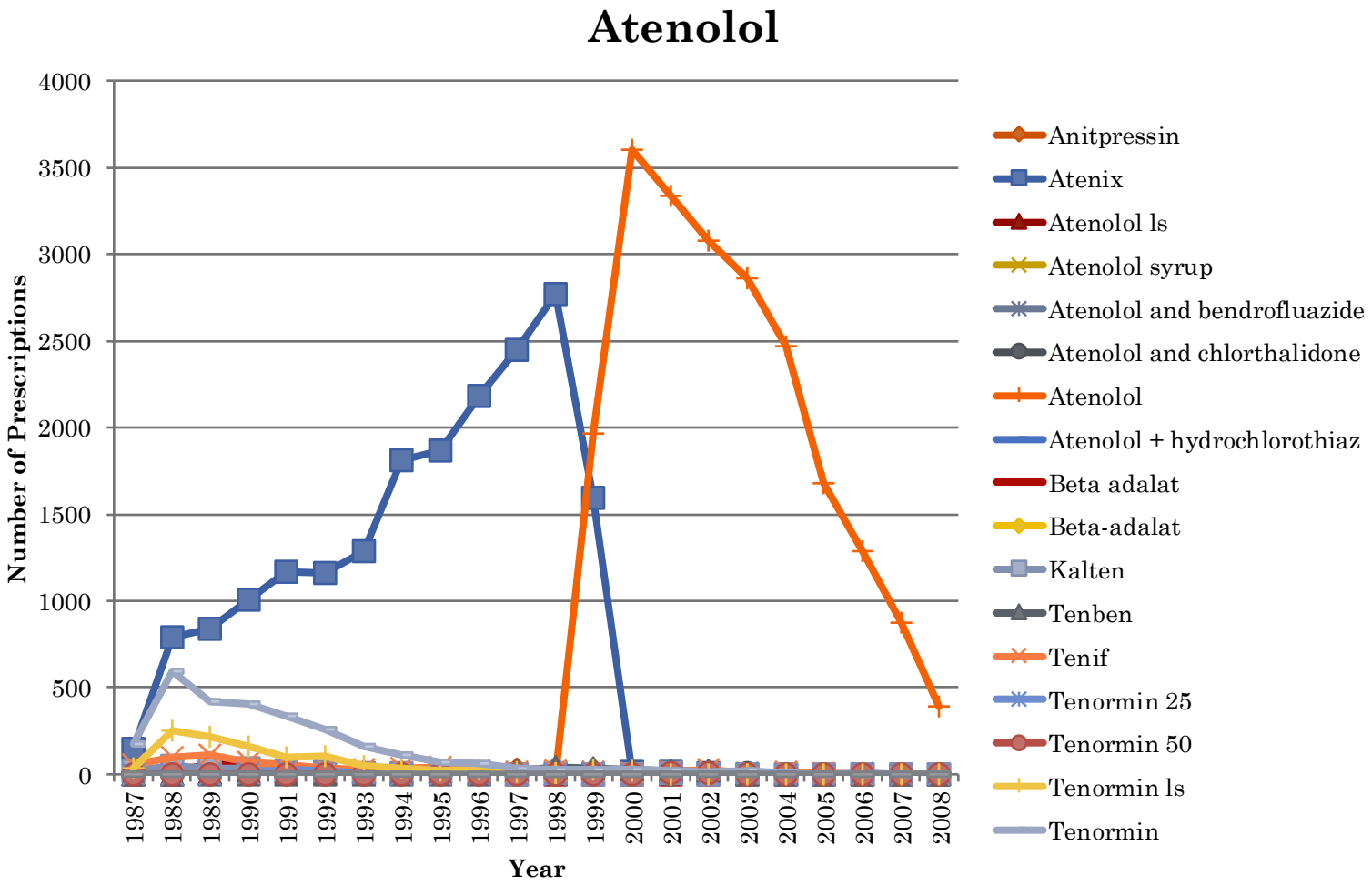
Event Led category



Generic 1st Branded 2nd crossover



Branded 1st generic 2nd crossover



Preliminary Results

- All the graphs show that different prescription drugs have differing life cycles.

- Branded 1st – Generic 2nd Cross over

Conclusions

- There are a number of different types of lifecycle that occur in the pharmaceutical market
- They can be modelled and forecasted
- The research will make contributions to:
  - The pharmaceutical industry
  - Modelling and forecasting research
  - The product lifecycle

Thank you

Any Questions?