



# Demand Modelling an approach from the UK

---

Andy Knapton

# Demand modelling

- Is really difficult
- You might think supply forecasting is hard
- But you should try demand forecasting
- So



**DON'T  
PANIC**

With apologies to Douglas Adams

# Demand Modelling Objectives

- **Systematic analysis of current and future national workforce demand**
- **To agree a methodology for demand modelling which has broad assent, and provides a basis for input to key workforce planning decisions, and financial allocations**
- **To provide a basis and context for other organisations to model their demand**
- **To support credible and fit for purpose analysis by incorporating key factors (drivers, constraints, and addressors)**
- **To provide a basis for comparison with workforce supply and identification of strategies to bridge any resultant gap**



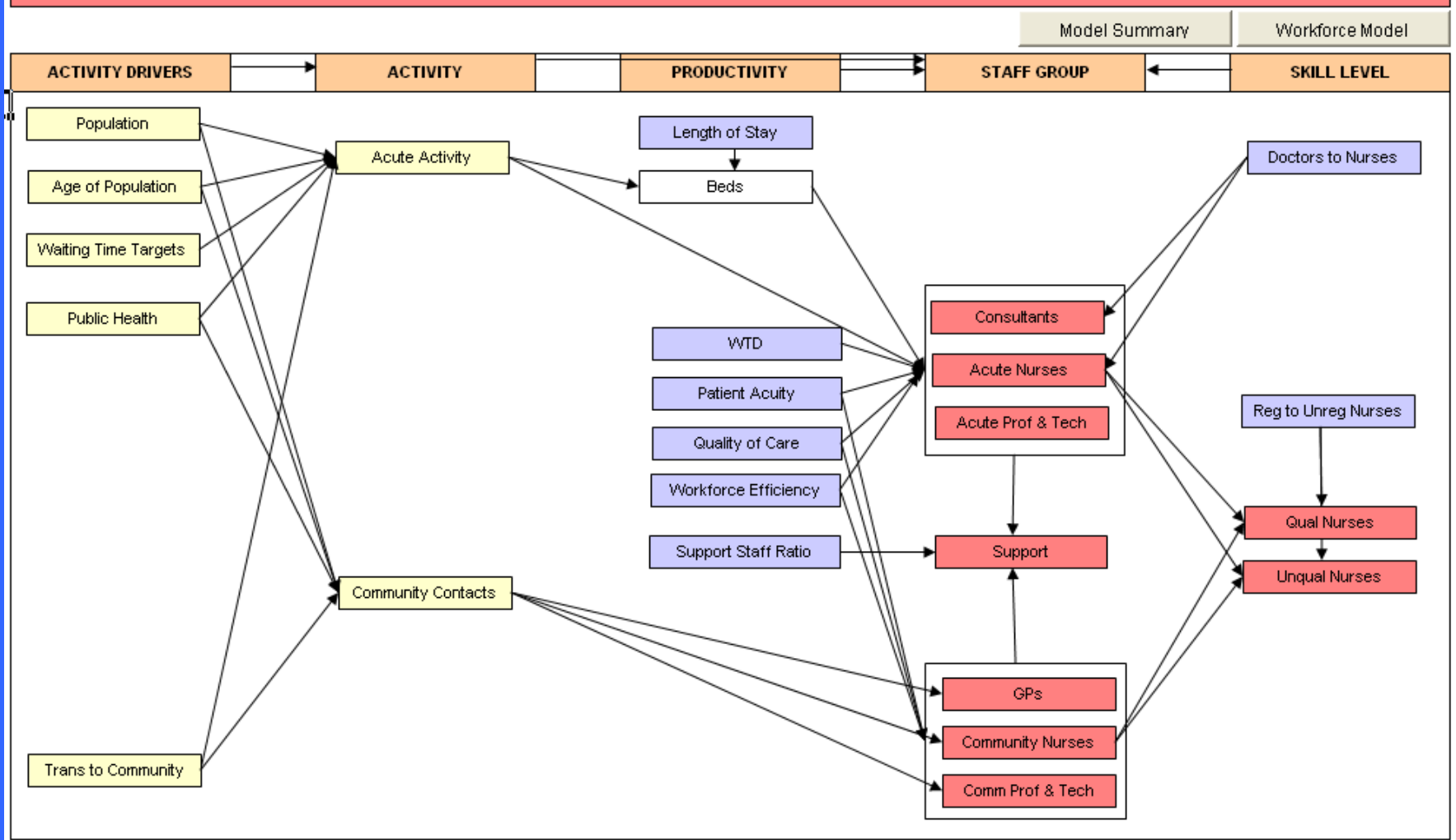
# Stage 1

- Take mental health
- Generate a model to incorporate demand drivers, addressors, constraints
- Test against purpose
- Test applicability to other groups
- Assess requirements for comprehensive extension to all service areas



# Description of Model – Mental Health

Mental Health Demand Model Overview - Driver Mapping



# Output of Model

- **Forecast demand for staff in the service area that the model relates to:**
  - broken down by staff group and qualified/unqualified
  - constrained (by finance) and unconstrained
  - possible to analyse for skill levels
- **Sensitivity analysis**
- **Data trends for comparison**



# Activity Forecasts

Microsoft Excel - Demand Model MH v2.0

File Edit View Insert Format Tools Data Window Help

Type a question for help

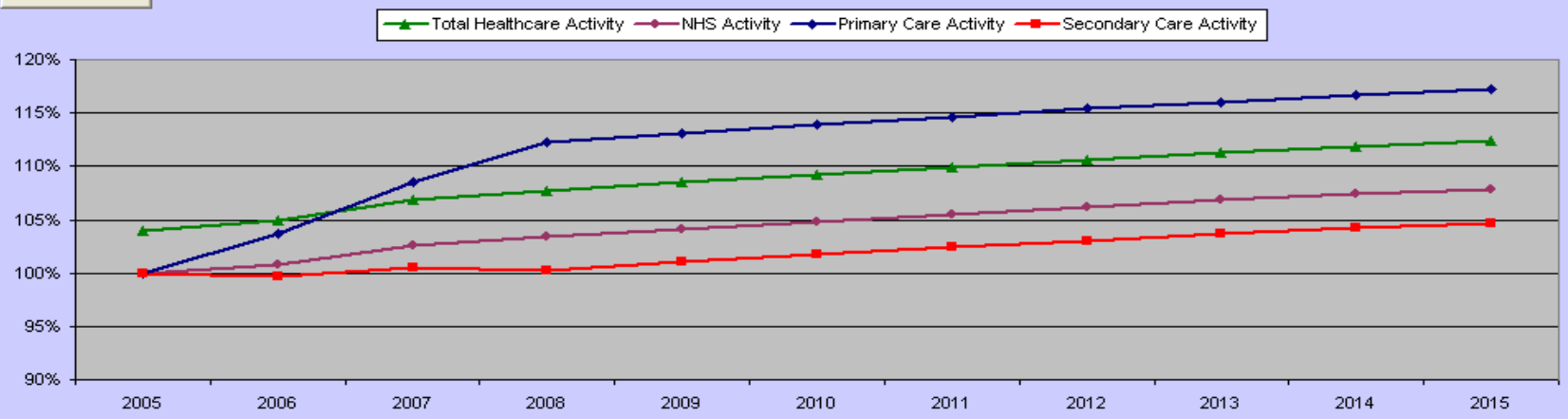
=E14\*(1-E15)

## ACTIVITY MODEL

Model Variables	MH%	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Population aged 75+	8%	3,911	3,951	3,988	4,025	4,076	4,137	4,209	4,288	4,368	4,444	4,502
Population aged 55 - 74	20%	10,157	10,262	10,378	10,502	10,609	10,721	10,845	10,984	11,130	11,293	11,500
Population aged 16 - 54	54%	26,975	27,155	27,304	27,427	27,548	27,642	27,713	27,767	27,797	27,805	27,771
Population aged 0 - 15	18%	9,671	9,607	9,550	9,512	9,482	9,467	9,457	9,444	9,449	9,467	9,503
Public Health			-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%
Waiting Times			0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total Healthcare Activity</b>		<b>104%</b>	<b>105%</b>	<b>107%</b>	<b>108%</b>	<b>108%</b>	<b>109%</b>	<b>110%</b>	<b>111%</b>	<b>111%</b>	<b>112%</b>	<b>112%</b>
IS Activity		4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
<b>IHS Activity</b>		<b>100%</b>	<b>101%</b>	<b>103%</b>	<b>103%</b>	<b>104%</b>	<b>105%</b>	<b>106%</b>	<b>106%</b>	<b>107%</b>	<b>107%</b>	<b>108%</b>
Trans out of Secondary Care			1.0%	1.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Effort in Primary Care			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Trans into Primary Care			2.9%	2.8%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Secondary Care Activity</b>		<b>100%</b>	<b>100%</b>	<b>101%</b>	<b>100%</b>	<b>101%</b>	<b>102%</b>	<b>102%</b>	<b>103%</b>	<b>104%</b>	<b>104%</b>	<b>105%</b>
<b>Primary Care Activity</b>		<b>100%</b>	<b>104%</b>	<b>109%</b>	<b>112%</b>	<b>113%</b>	<b>114%</b>	<b>115%</b>	<b>115%</b>	<b>116%</b>	<b>117%</b>	<b>117%</b>

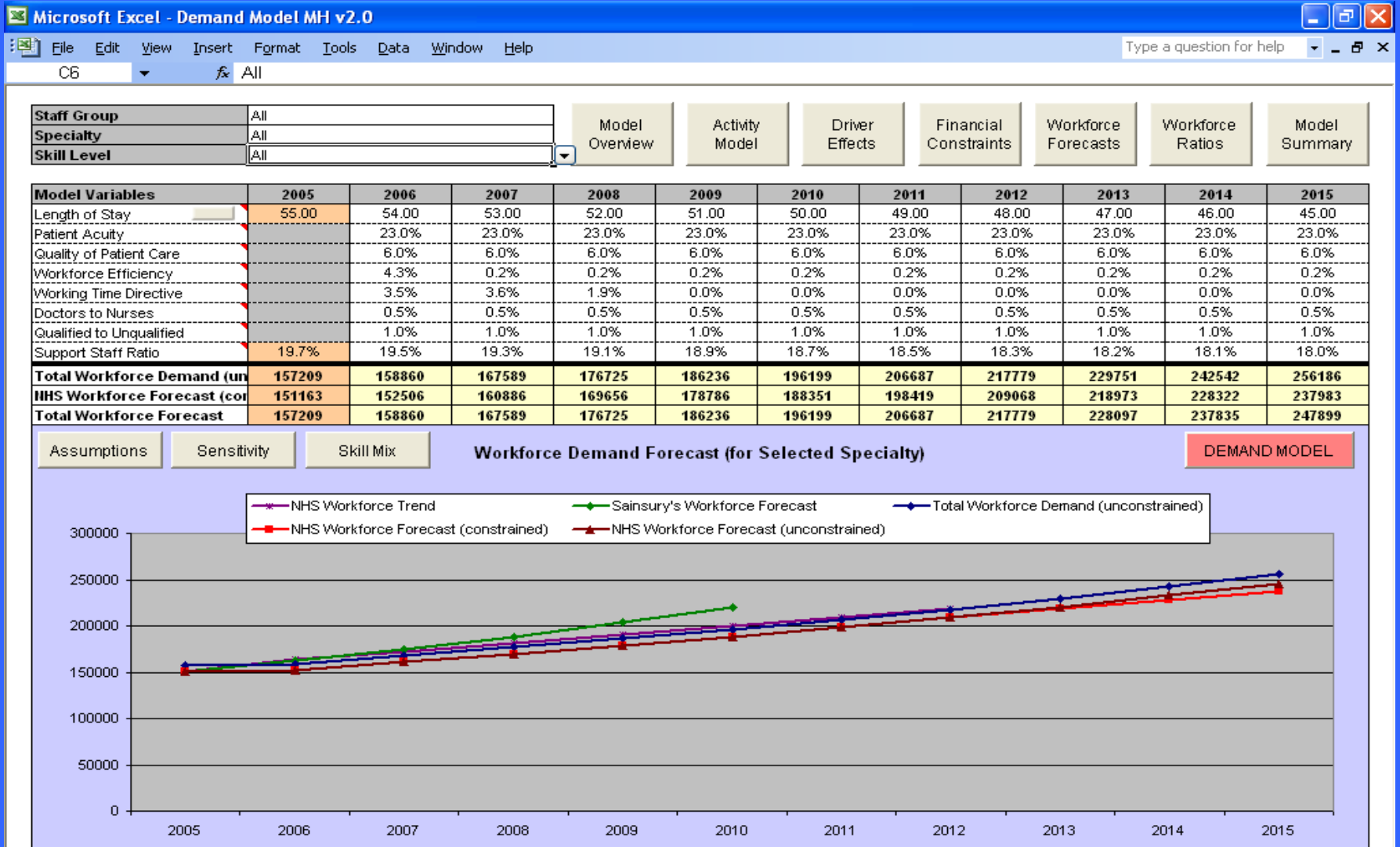
### Assumptions

### Activity Forecasts



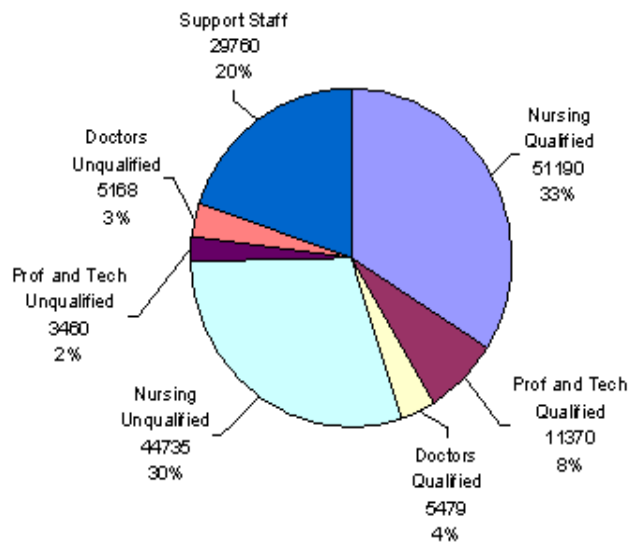


# Workforce Forecasts



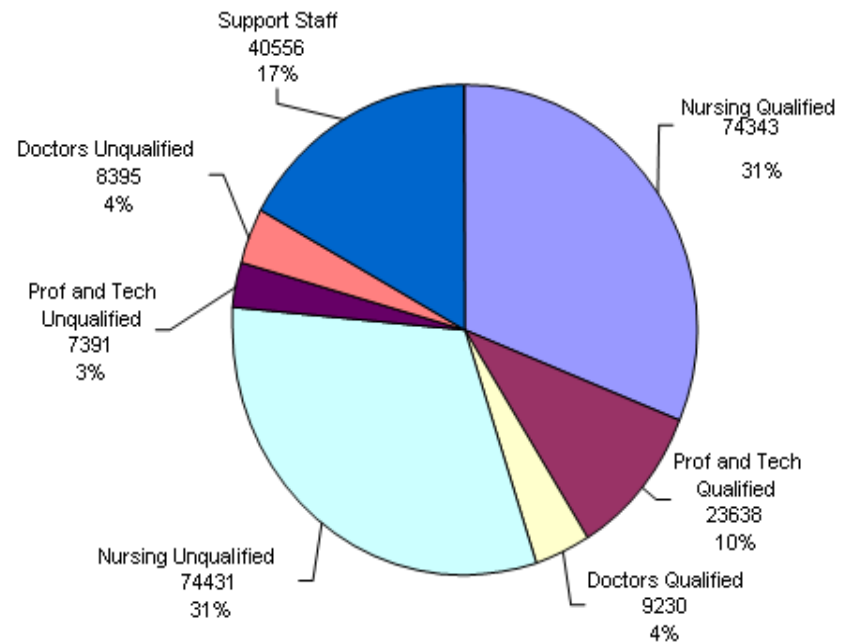
# Skill Mix Changes

Staff Categories proportions in 2005



Total staff count: 151,163

Staff Category proportions 2015



Total staff count: 237,983

# Sensitivity Analysis

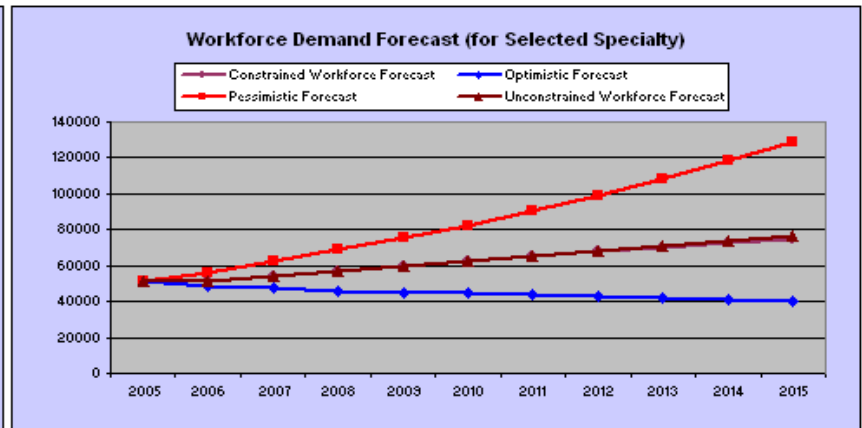
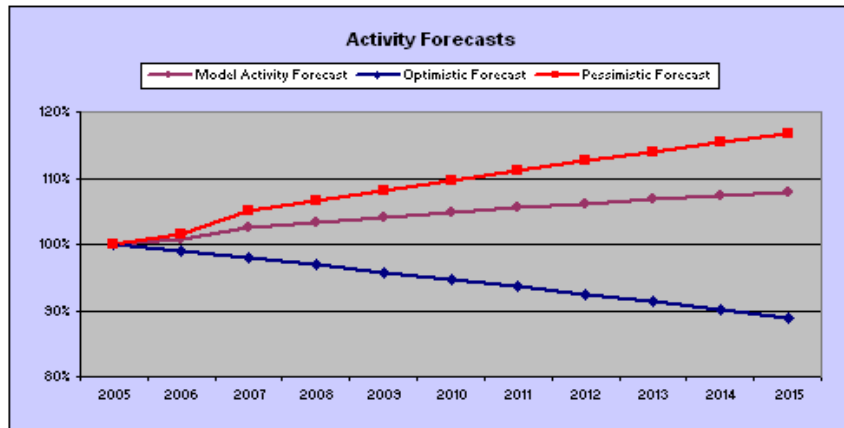


## SENSITIVITY ANALYSIS

<b>Staff Group</b>	Nursing
<b>Specialty</b>	All
<b>Skill Level</b>	Qualified

Sensitivity Data	Workforce Model
------------------	-----------------

Model Variables	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Activity Forecasts</b>											
Model Activity Forecast	100%	101%	103%	103%	104%	105%	106%	106%	107%	107%	108%
Optimistic Forecast	100%	99%	98%	97%	96%	95%	94%	92%	91%	90%	89%
Pessimistic Forecast	100%	101%	105%	107%	108%	110%	111%	113%	114%	115%	117%
<b>Workforce Forecasts</b>											
Unconstrained Workforce Forecast	51190	51479	54571	57253	59812	62443	65153	67951	70830	73795	76828
Optimistic Forecast	51190	48686	47326	46001	45221	44435	43650	42872	42097	41327	40553
Pessimistic Forecast	51190	56077	62712	68723	75302	82463	90266	98776	108041	118133	129088
Constrained Workforce Forecast	51190	51479	54571	57253	59812	62443	65153	67951	70320	72363	74343

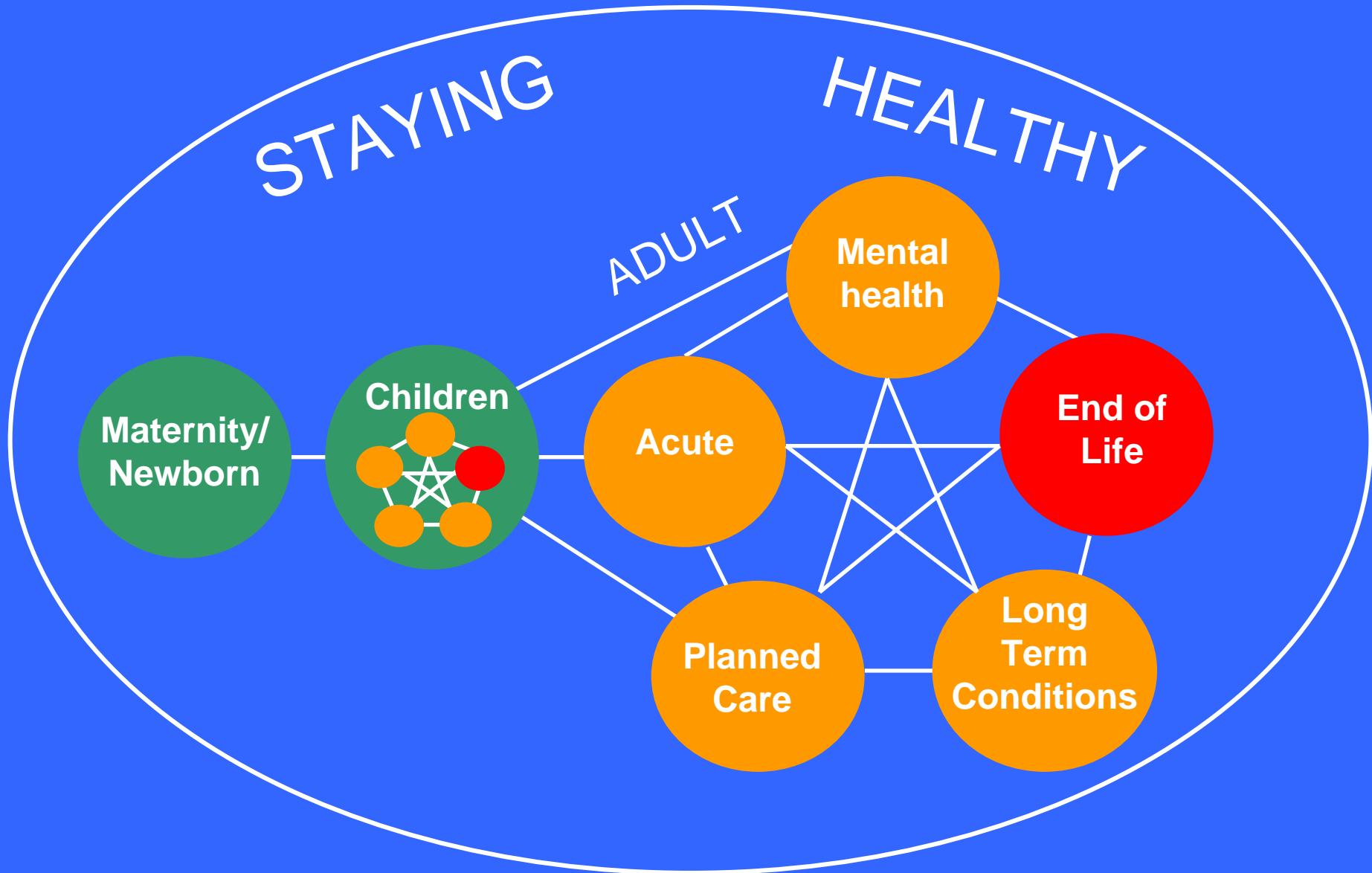


# Current Position Stage 2

- Model structure developed
- Applied to mental health
- Extended to eight NSR groups



# NSR '8' Linkages



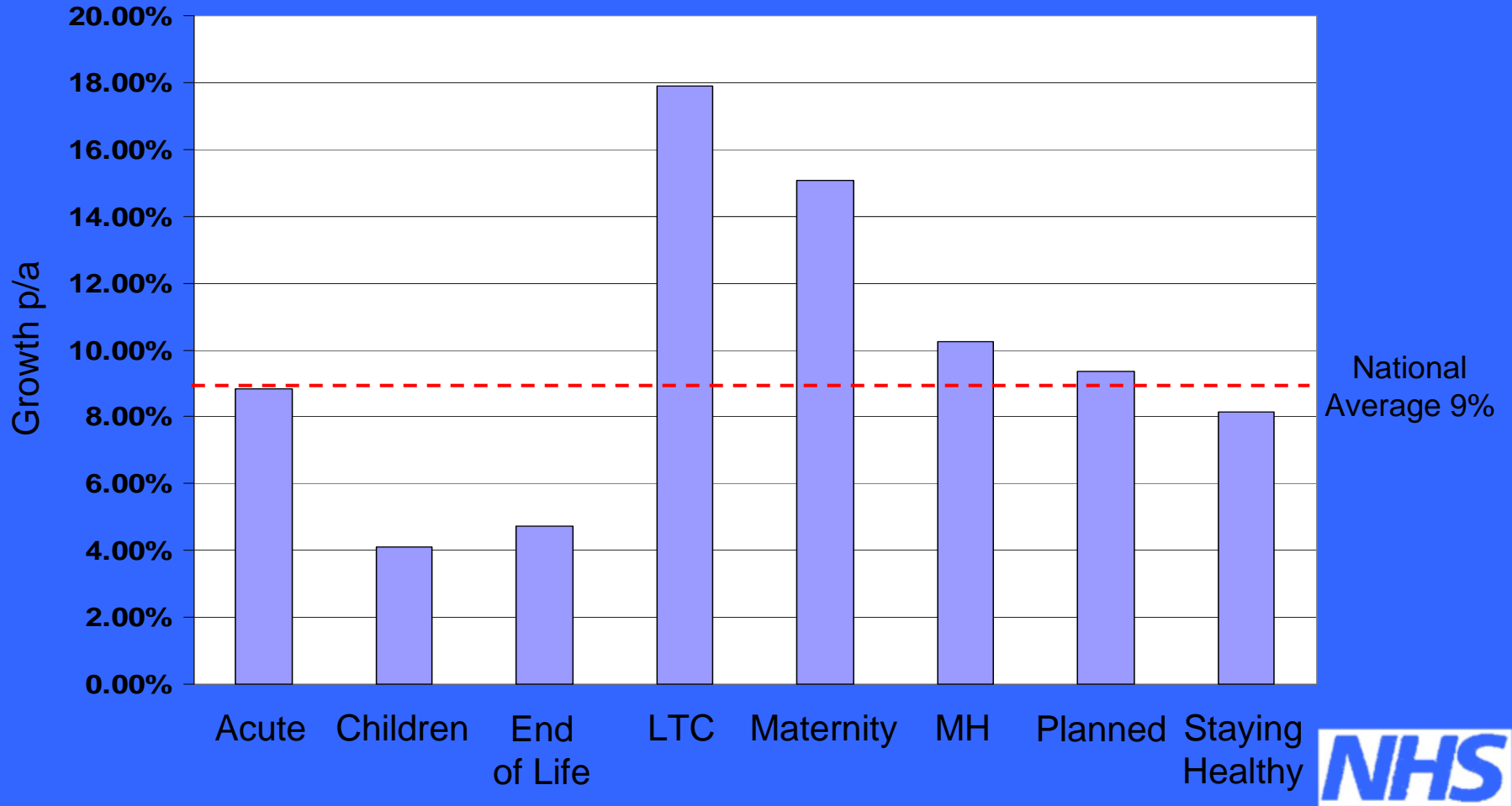
# Functionality

- High level demand drivers (eg activity, age distribution, etc)
- Allocates overall staffing to Darzi categories
- Projects forward future workforce needs
- Allows for skill mix change
- Costs future workforce needs
- Applies affordability adjustment



# Illustrative Relative Priorities

Overall Unconstrained Growth 2007-2010 (NEED)

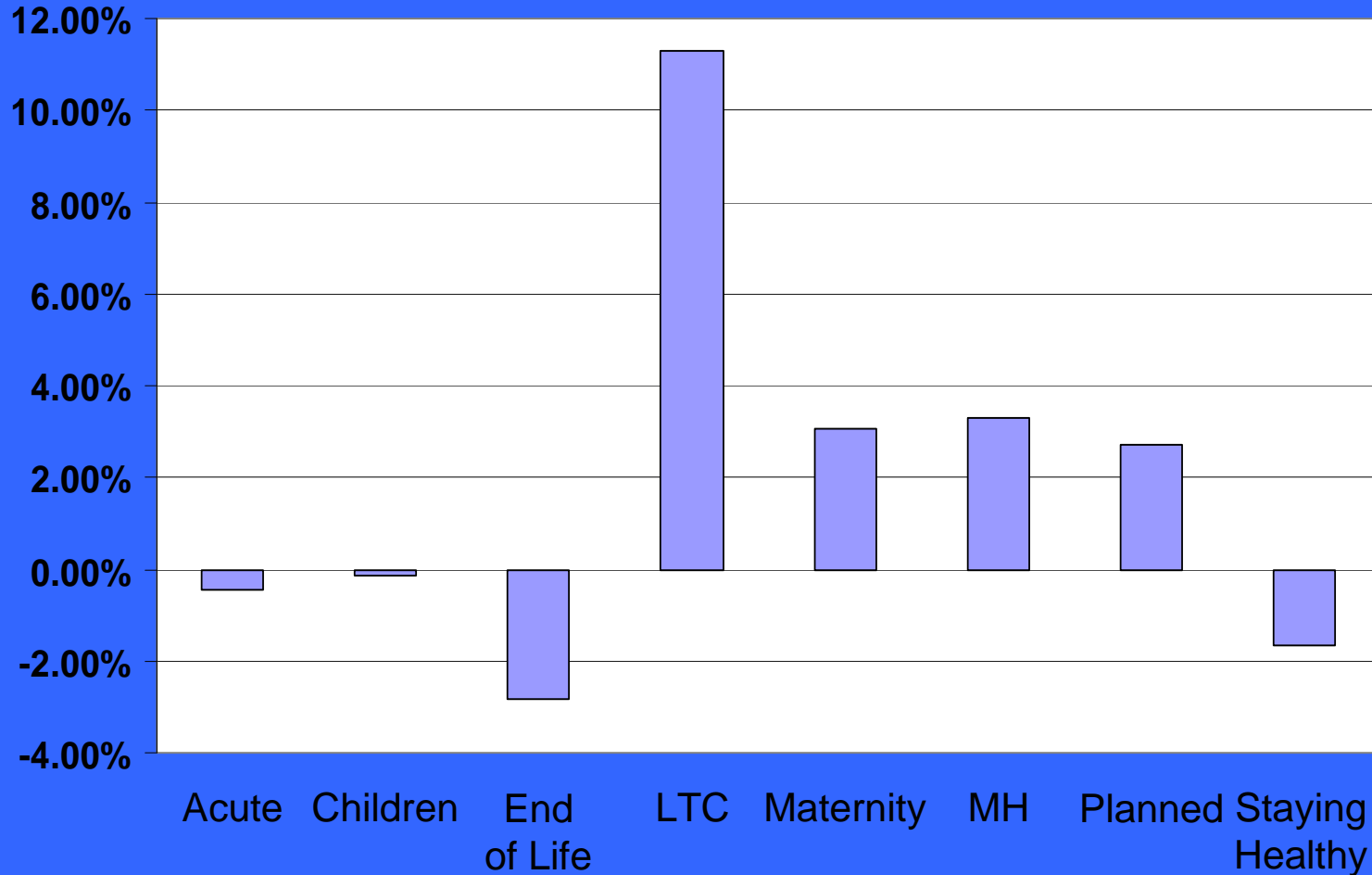


National Average 9%



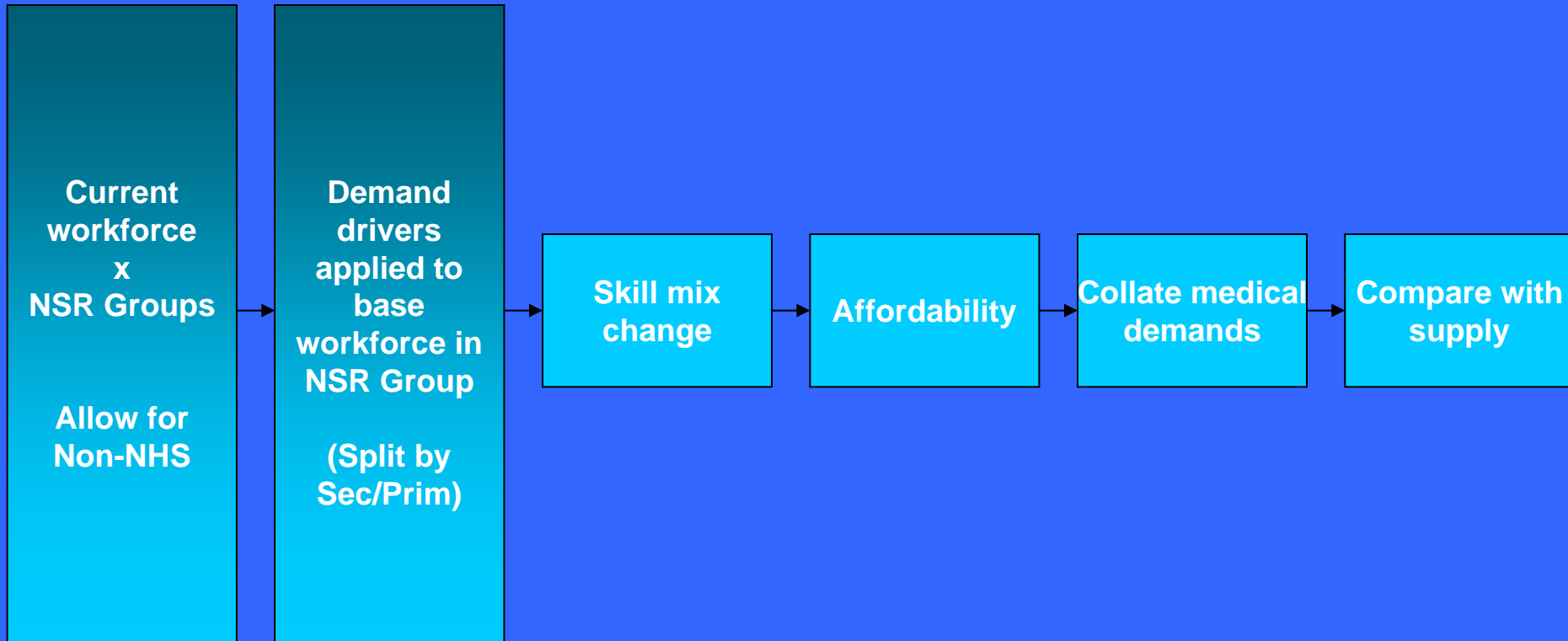
# Illustrative Relative Priorities

Overall Constrained Growth 2007-2010





# Medical Demand



# Learning Points

- **Steps in the process**
  - **subject expert input**
  - **literature and policy review**
  - **build and refine**
- **Be clear about purpose and avoid scope creep**
- **Be clear about definitions – eg need and demand**
- **Demand and supply forecasting are different**
- **Look at broad implications and scenarios**
- **Examine possible gaps and potential solutions**



# CONTACT

Andy Knapton



Andy.knapton@wrtnhs.org



01962 894951

[www.wrt.nhs.uk](http://www.wrt.nhs.uk)



Workforce Review Team