

# GP Workforce Modelling for AMWAC

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16 November 2005



# Overview

- Description of analysis
- Data
- Key assumptions
- Results
- Issues

# Description of Project

- AMWAC GP Report 2005 (released last week!)
- Core technical working party
  - Paul Gavel
  - Justine Curnow
  - Susan Widderick
  - Richard Madden
  - Rob Bain
  - Ross Hetherington
  - Brett Lennon
  - Angela Mikalauskas
  - Julian Evans

# Overview of Modelling

Two key modelling steps:

1. Primary modelling:

Standardised Patient services and GP services, by SLA  
(1300)

(Amount of service expected, given characteristics of patient population and GP population)

2. Secondary Modelling:

Correlation of 'imbalance' indications with explanatory factors by GP Division (120)

(eg; price, GP to population ratio, population health statistics)

# Primary Modelling approach

Model 3 points for each “GP Division” (120)

- Utilisation
- Patient Service Model (‘Demand Model’)  
What we’d expect patients with those characteristics to utilise
- GP Work Output Model (‘Supply Model’)  
What we’d expect a GP with those characteristics to provide

# GP Utilisation

Private Practice services

Actual Medicare-billed Services in each SLA including Non-referred attendances, Enhanced Primary Care  
+  
BEACH gross-up for services not billed to Medicare

+

Hospital Services  
(non-metro areas only)

Occurrences of Service Provided to Non-admitted Patients including  
Emergency Services (A9.1)  
Other Medical, Surgical & Diagnostic (A9.6)  
Drug & Alcohol (A9.8)

+

Royal Flying Doctor Service

Actual Patient contacts

+

Aboriginal Medical Services

Actual Patient contacts

# Summary of Utilisation Data

## Summary of Services by Remoteness Area 2001

	M1	M2	R1	R2	R3	Rem1	Rem2
Medicare Services Provided	70,850,044	7,932,397	5,895,919	6,377,791	9,554,300	721,559	791,892
Hospital Services			1,253,201	1,069,154	1,505,484	356,737	594,498
RFDS Service	-	-	-	-	-	38,757	73,903
AMS Services	155,631	31,229	32,965	34,265	77,825	43,124	104,622
<b>Total</b>	<b>71,005,675</b>	<b>7,963,626</b>	<b>7,182,085</b>	<b>7,481,210</b>	<b>11,137,610</b>	<b>1,160,176</b>	<b>1,564,915</b>
Medicare	99.8%	99.6%	82%	85%	86%	62%	51%
Other	0.2%	0.4%	18%	15%	14%	38%	49%

# What's a "GP"?

## Medicare

More than 50% of work is Non-referred Attendances

More than \$1,000 services billed to Medicare during year.

## Medical Labour Force Survey

Self-select in survey as either:

- GP/Primary Care Practitioner; or
- Hospital Non-specialist - GP or GP Trainee (non-metro only)

More than 1 hour per week patient contact



# Patient Service Models

## Basic Model

- ✓ Age
- ✓ Gender

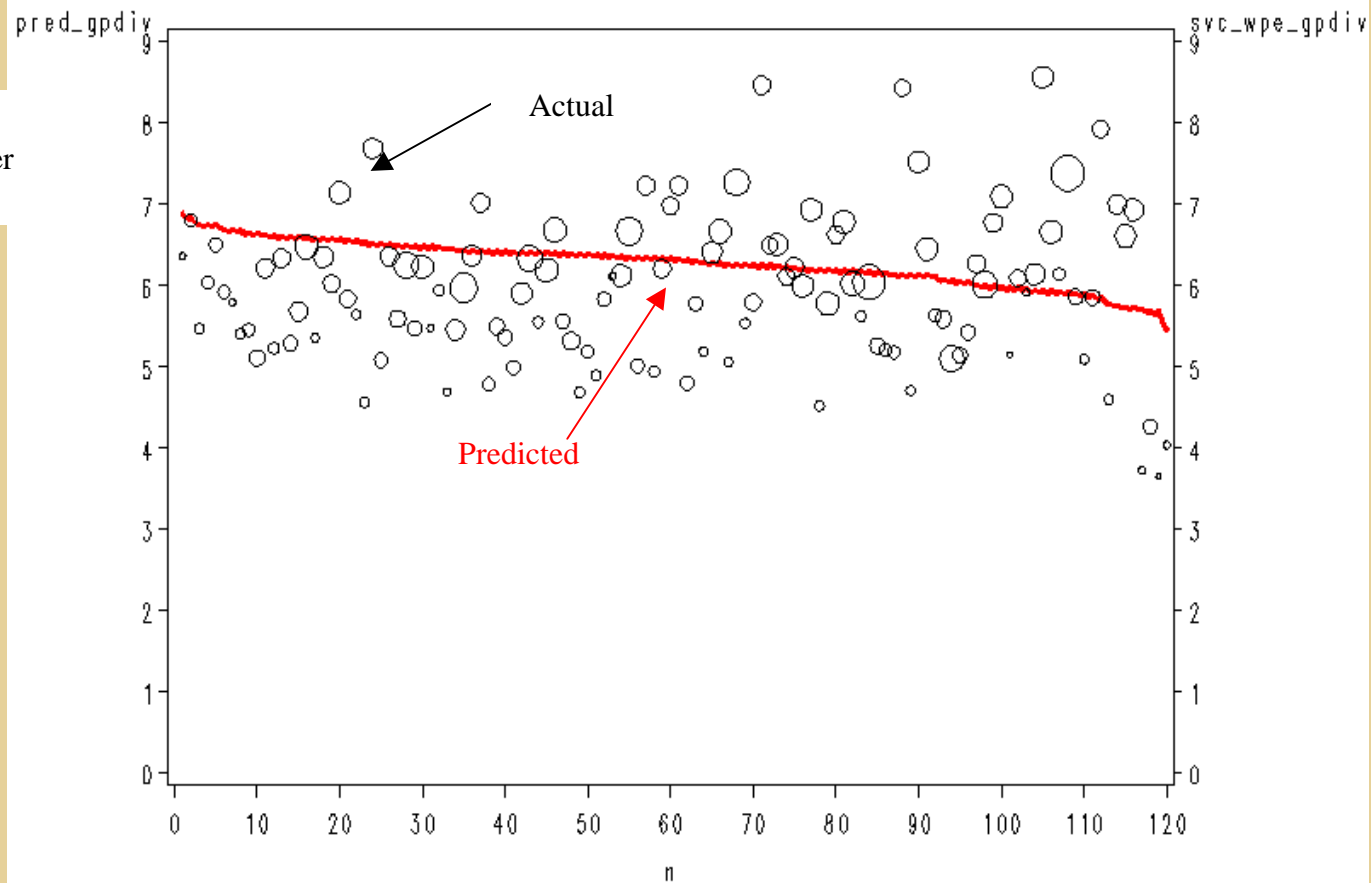
## Detailed Model

- ✓ Age
- ✓ Gender
- ✓ RRMA+
- ✓ State
- ✓ ATSI %
- ✓ Mortality Rate
- ✓ Hospital Flag  
(zero for metro areas)
- ✓ Depression Prevalence
- ✓ Diabetes Prevalence
- ✓ Asthma Prevalence
- ✓ Population Density

**Target:** Number of Services per WPE.

# Patient Service Model – Medicare Basic Model

Actual vs Predicted by GPDiv



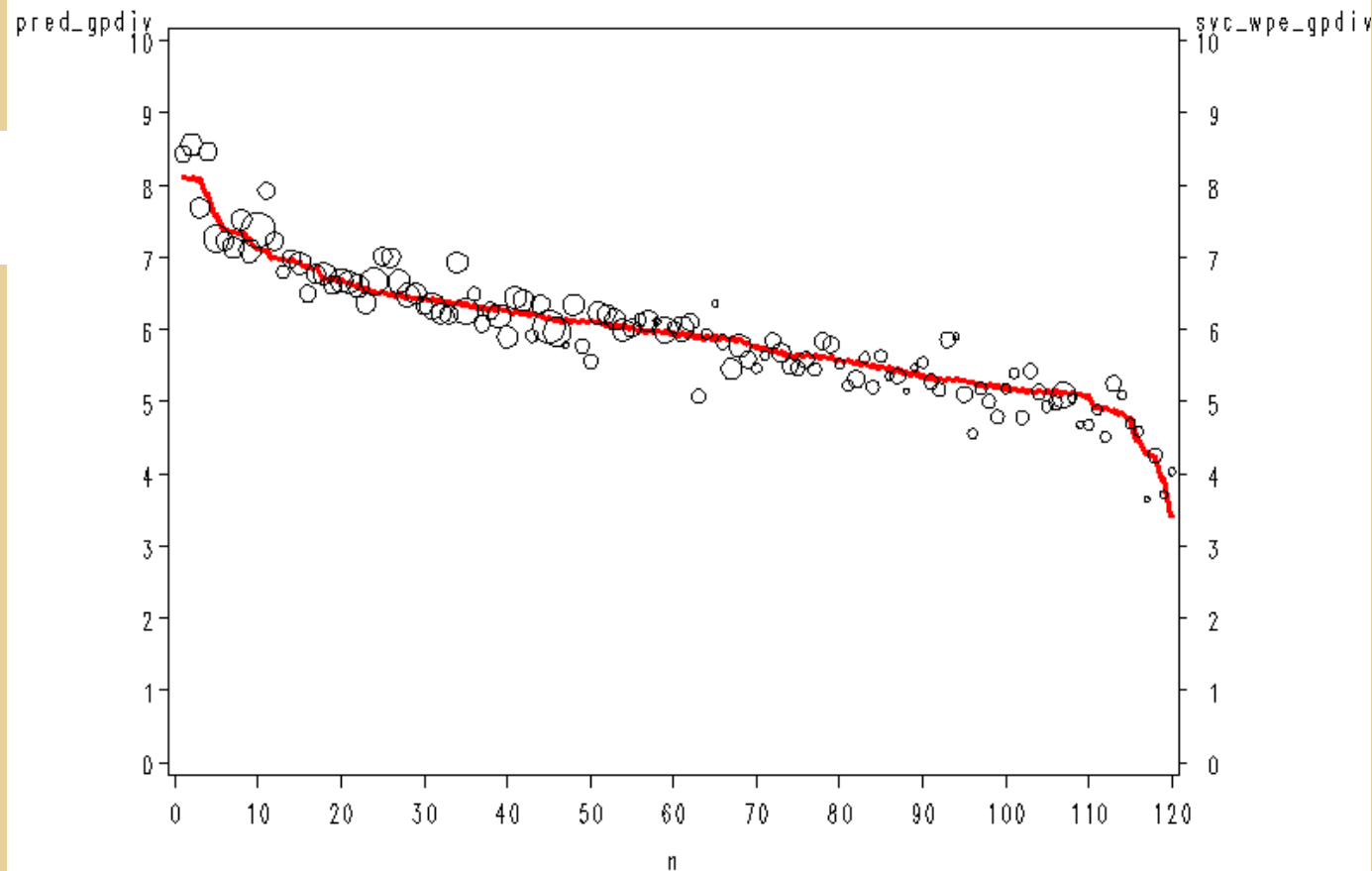
Average services per WPE p.a.

Variables used:  
Age, gender

R<sup>2</sup> = 9%

# Patient service Model – Medicare Detailed Model

Actual vs Predicted by GPDiv



Average services per WPE p.a.

Variables used:  
Age, gender,  
RRMA, SEIFA,  
population density,  
ATSI %

R2 = 91%

# GP Work Output Model

## Basic Model

- ✓ Age
- ✓ Gender
- ✓ GP Type (VRGP,OMP,Trainee)

## Detailed Model

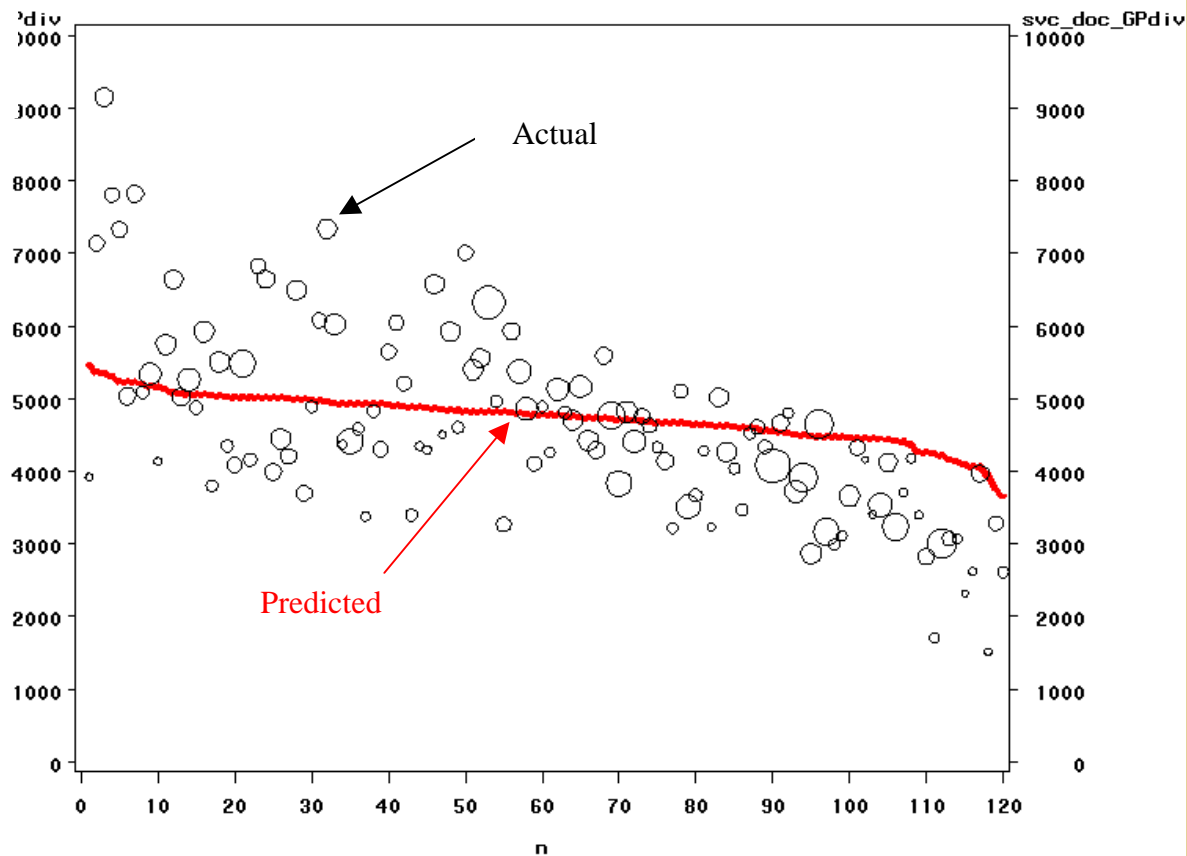
- ✓ Age
- ✓ Gender
- ✓ GP Type (VRGP,OMP,Trainee)
- ✓ RRMA +
- ✓ Population density
- ✓ State

**Target:** Number of Services per GP

# GP Work Output Model Basic Model

Actual vs Predicted by GPDiv

Average  
hours per GP  
p.w.

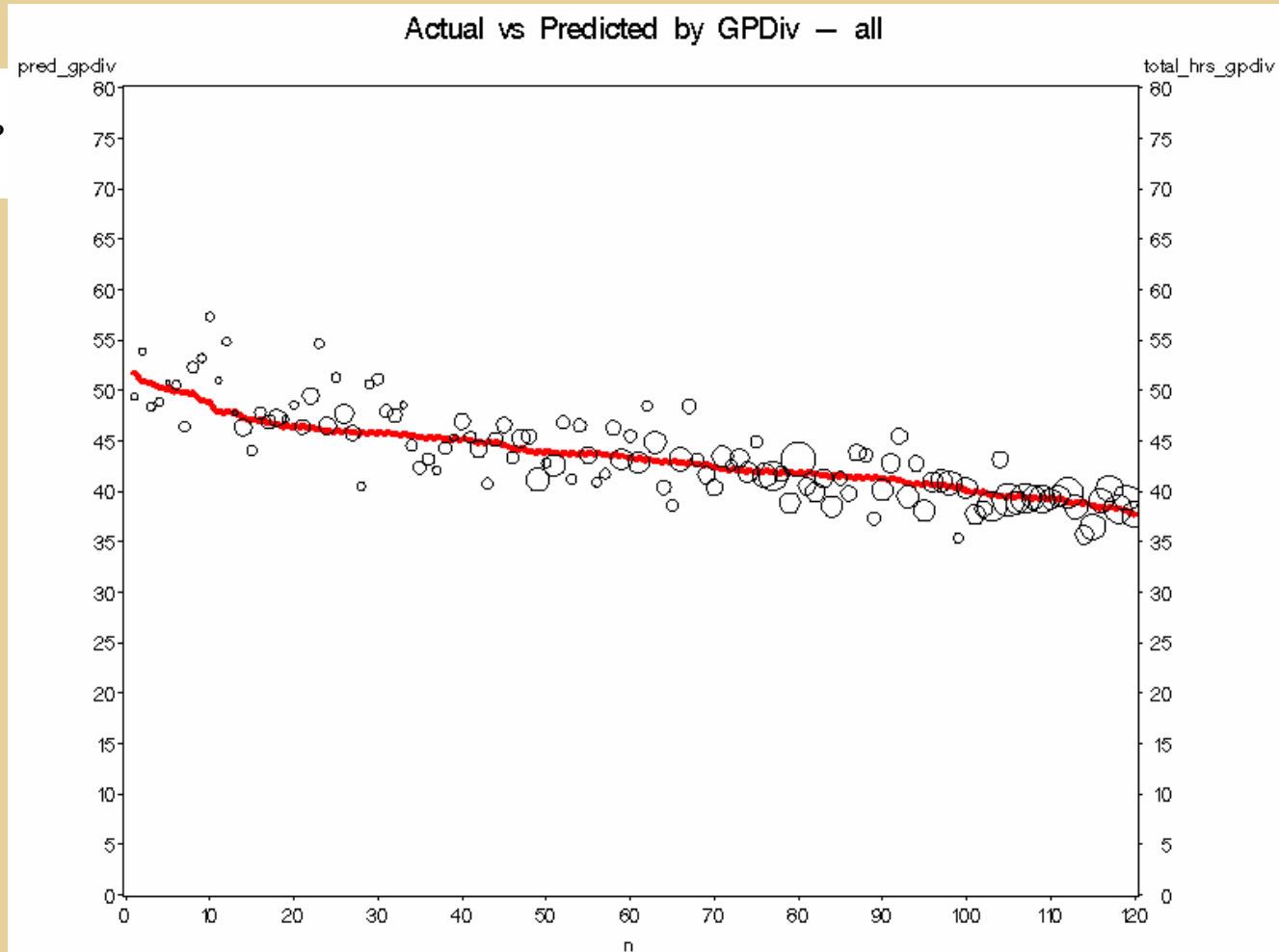


Variables used:  
Age, gender, GP  
Type

R<sup>2</sup> = 36%

# GP Work Output Model Detailed Model

Average  
hours per GP  
p.w.



Variables used:  
Age, gender, GP  
Type, RRMA,  
population density

$R^2 = 71\%$

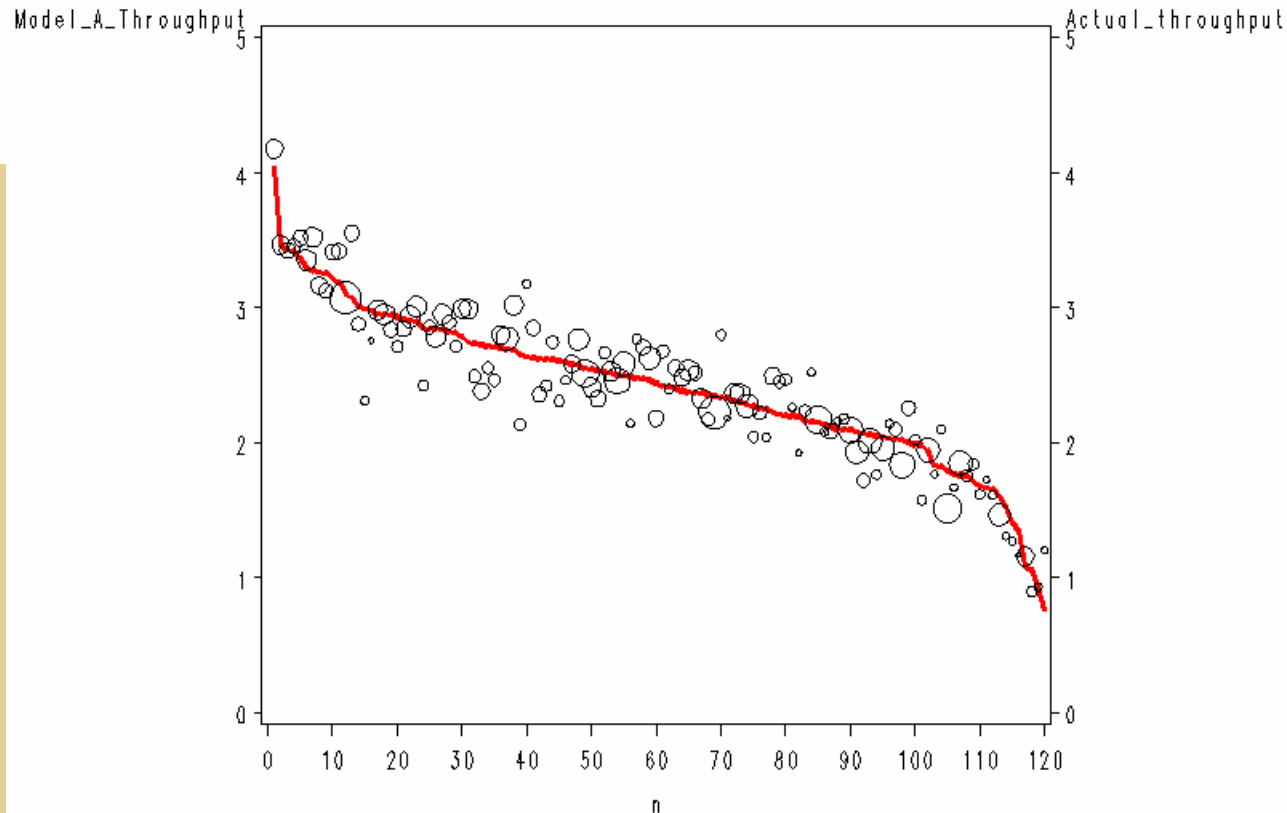
# Combining the models: “Throughput”

- Patient model is in Services; GP model is in Hours
- Use 2 GP models (services, hours) to model a conversion function, GP “throughput” or services provided per hour
- Fit is very good
- Results interesting in their own right!

# GP Throughput Detailed Model

Model\_A\_Throughput Buble Chart

Average  
services per  
GP hour  
worked

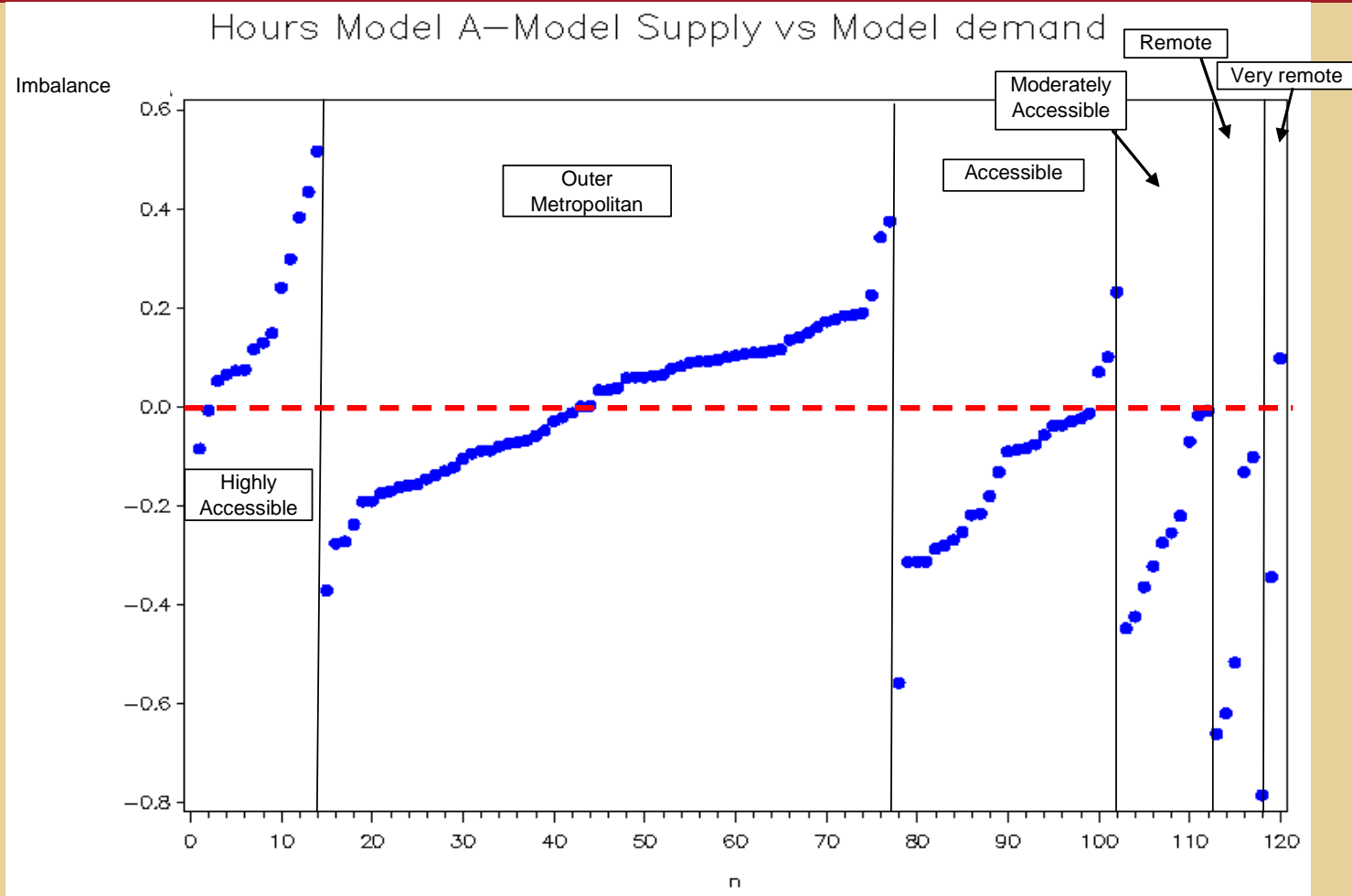


R2 = 91%

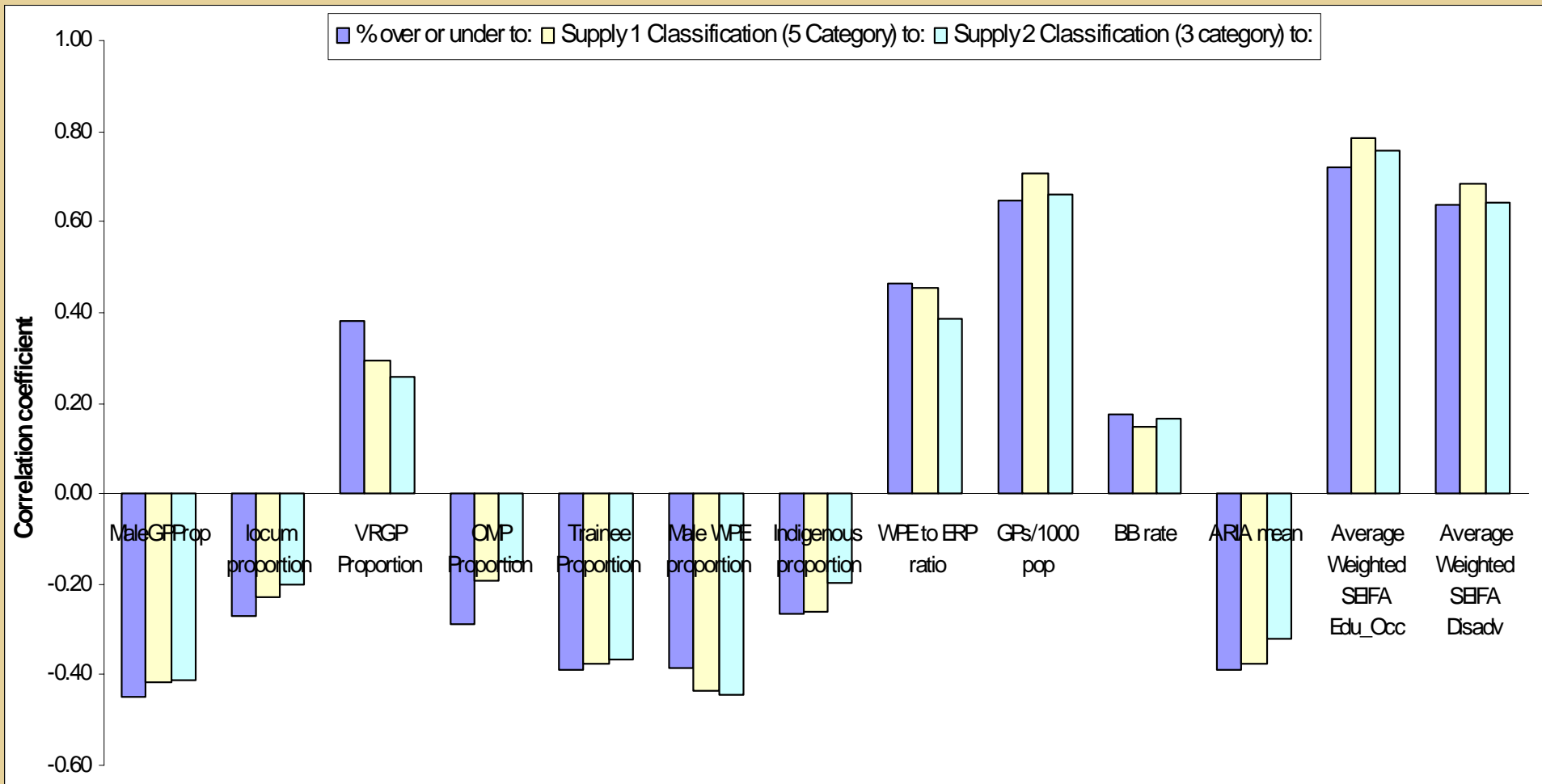


# RESULTS

## GP Imbalance (Detailed Models)



# GP Imbalance Detailed Models



# GP Shortage

## Range of model scenarios & results

<b>Scenario</b>	<b>Service or hours model</b>	<b>Model Parameters</b>	<b>Actual Supply or Modelled Supply</b>	<b>Number of Divisions with a shortage</b>	<b>Shortage (Headcount)</b>
1	Services	A	Actual	62	378
2	Services	A	Modelled	56	506
3	Services	B	Actual	62	846
4	Services	B	Modelled	61	976
5	Hours	A	Actual	69	1,665
6	Hours	A	Modelled	63	1,751
7	Hours	B	Actual	75	1,809
8	Hours	B	Modelled	68	1,961

# GP Shortage

## Final results and recommendations

- Technical modelling results were combined with qualitative results from consultations across approx. half of GP Divisions.
- Conclusion that, in Divisions with a shortage of GPs, the total shortage is around 800 to 1300.
- There is a similar level of excess across those Divisions with excess GPs.

# Issues

- “Relative expected” model
  - Implied norm is overall national average
  - What is need?
  - Have to judgementally scale results to create various scenarios
- Service records are neither work nor care volumes
  - Problem combining hospital & private practice volumes—no known relationship
- Use of socio/economic/geographic predictor variables
  - Does this perpetuate system problems?
  - What are our basic assumptions?