Discovery Health

Regional Variation in healthcare costs in South Africa

Linda Kemp
Shirley Collie

Agenda

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- Private healthcare insurance in South Africa
- The argument for analysing healthcare consumption regionally
- Methodology applied to obtain South African healthcare drainage districts
- Methodology to calculate disease burden index
- Are South African regional healthcare consumption patterns explained by the underlying burden of disease and access to benefits?
  - Cost of death in the last six months by region
  - Cost efficiency by region
  - Supply of beds per region
    - Are the regional supply of beds commensurate with the underlying demand
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- Concluding remarks

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Private healthcare insurance in South Africa

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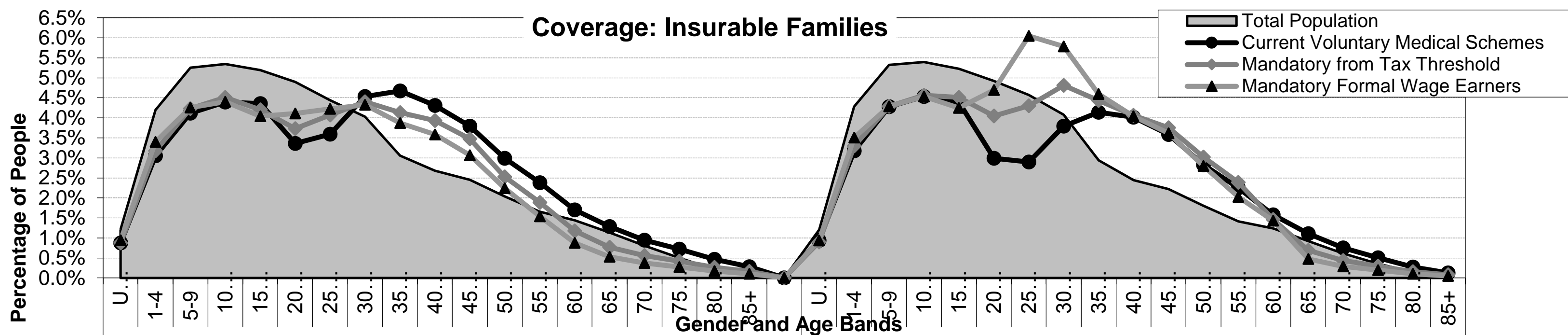
- Public healthcare available to all with cost in line with ability to pay
  - Can opt for private cover through medical aid
- Legislative framework for medical aids:
  - Open enrolment, community rating
  - No risk equalisation or mandatory enrolment
- Schemes must deal with selective joining and withdrawals
  - Different risk profiles for different schemes and benefit options



- Reimbursed on a fee for service basis
- Private healthcare expenditure per insured life has increased 3-4% above inflation for several years
- There are long terms concerns regarding the affordability and sustainability of private healthcare given the regulatory environment

Private healthcare insurance in South Africa

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South Africa

- Medical schemes are not-for-profit funders of private healthcare services
- 8.7 million lives were covered by medical schemes at end of 2012

Discovery Health Medical Scheme

- Roughly 2.5 million lives under administration
- Fastest growing open medical scheme (average growth of 5.5% p.a. since 2005)
- More than half the lives have been on the scheme for five years or longer
- Claims data provides opportunity for deep analysis

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The argument for regional healthcare analysis

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- Patients access local healthcare for the majority of their needs
  - Secondary and tertiary services may be further away
- Patterns of how general practitioners choose to refer to specialists and hospitals allows for consideration of a region as a healthcare system
- Dartmouth Atlas Project considers variations in how medical resources are distributed and used in the US based on Medicare data
  - Improve their understanding of the efficiency and effectiveness of health care systems
- Regional variation in cost of providing healthcare can exist due to disease burden, access issues, technology etc.
- Where variation is not due to disease burden: Dartmouth atlas promotes learning from regions that have attained sustainable growth rates and consumption levels

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Obtaining South African Drainage Districts

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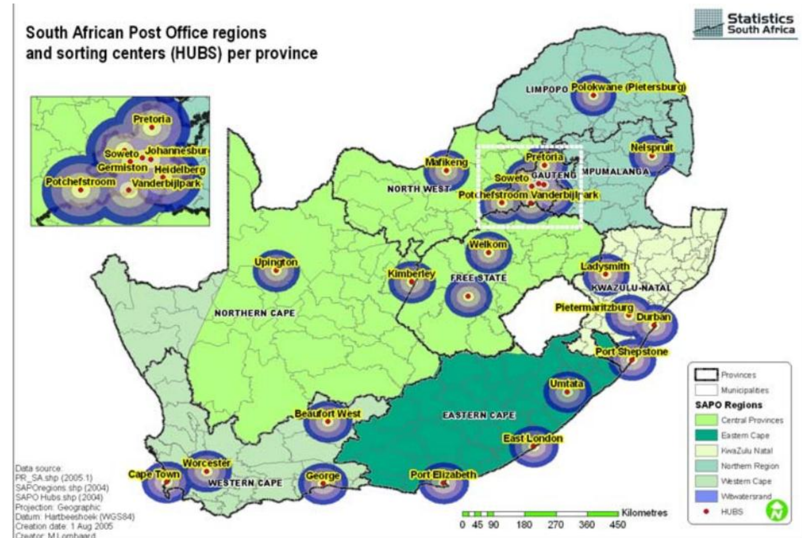
- Patients allocated to a district based on where they access the majority of their primary care
- **Hospital referral regions** defined as where patients receive the majority of major cardiovascular and neurosurgery care
- Hospital service areas are defined as areas where at least 60% of policyholders receive cardiovascular and neurosurgery care within the region
- Adjacent magisterial districts are collapsed into the hospital service areas where the majority of patients receive their care



Obtaining South African Drainage Districts

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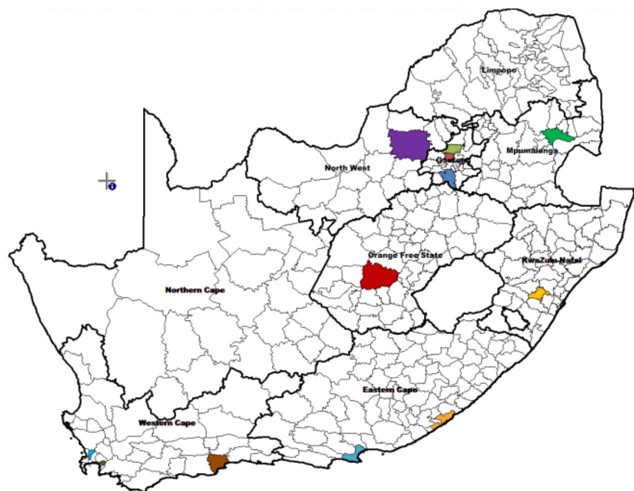

39,452
367,169
49,199
41,795
136,110
45,869
121,333
56,323
243,560
51,092
45,648
83,035
67,816

- Overberg
- Johannesburg
- Cape Peninsula
- Garden Route
- West Coast & Karoo
- Bloemfontein
- Rustenburg
- Nelspruit
- Maritzburg
- Durban
- Vereeniging
- Johannesburg North & Surrounds
- Pretoria
- Vaal Triangle
- Port Elizabeth
- East London
- None
- Polokwane
- Potchefstroom

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Development of disease burden index

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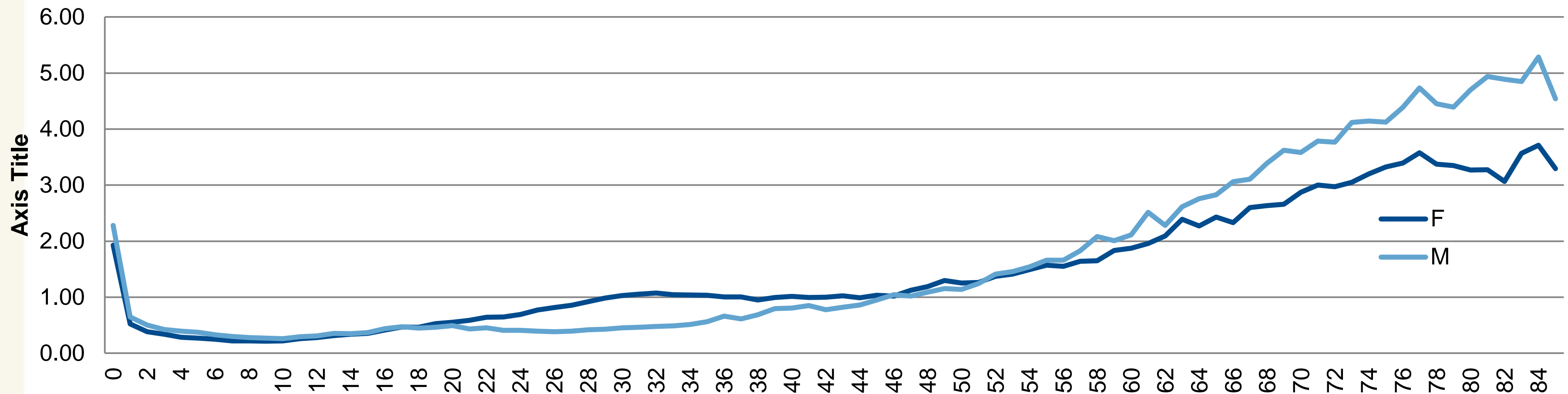

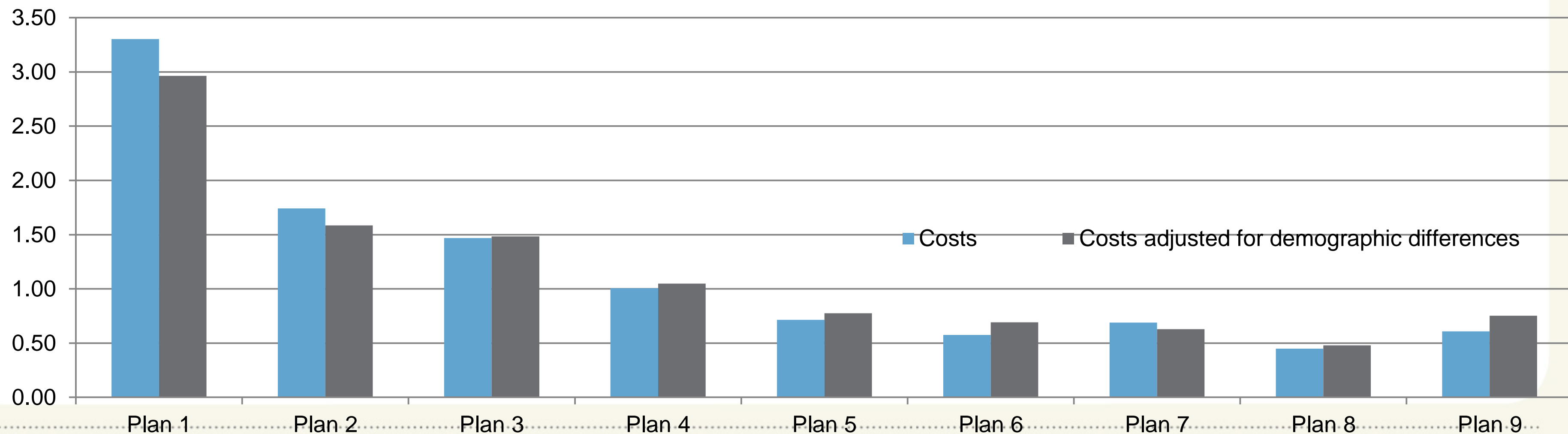

Development of disease burden index

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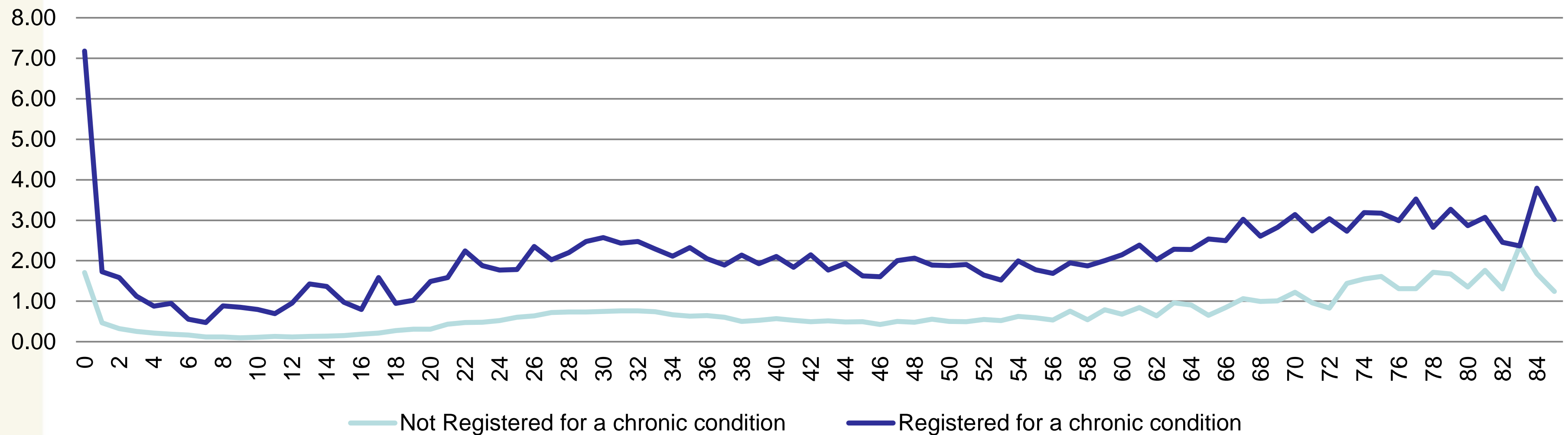

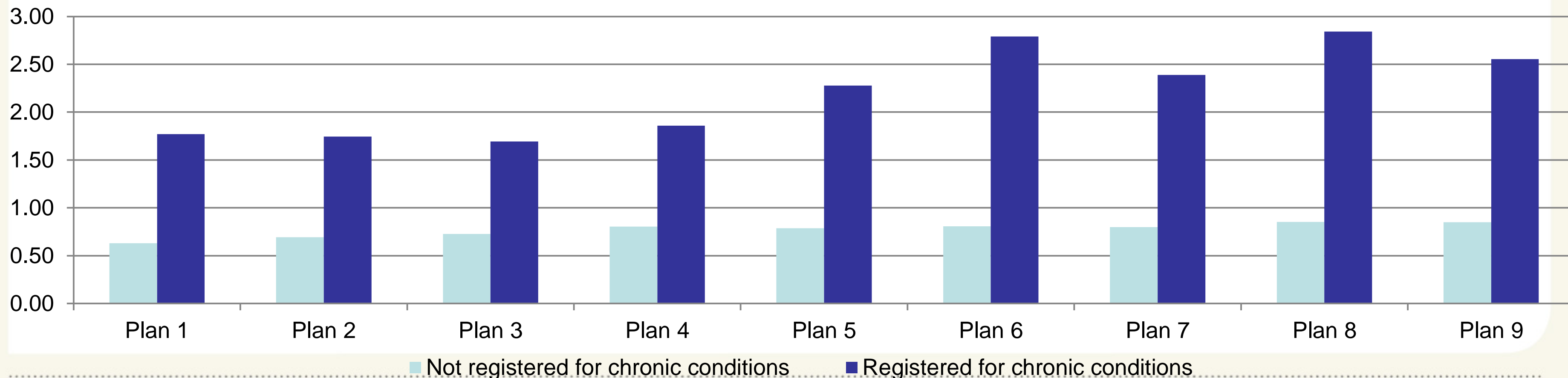

Development of disease burden index

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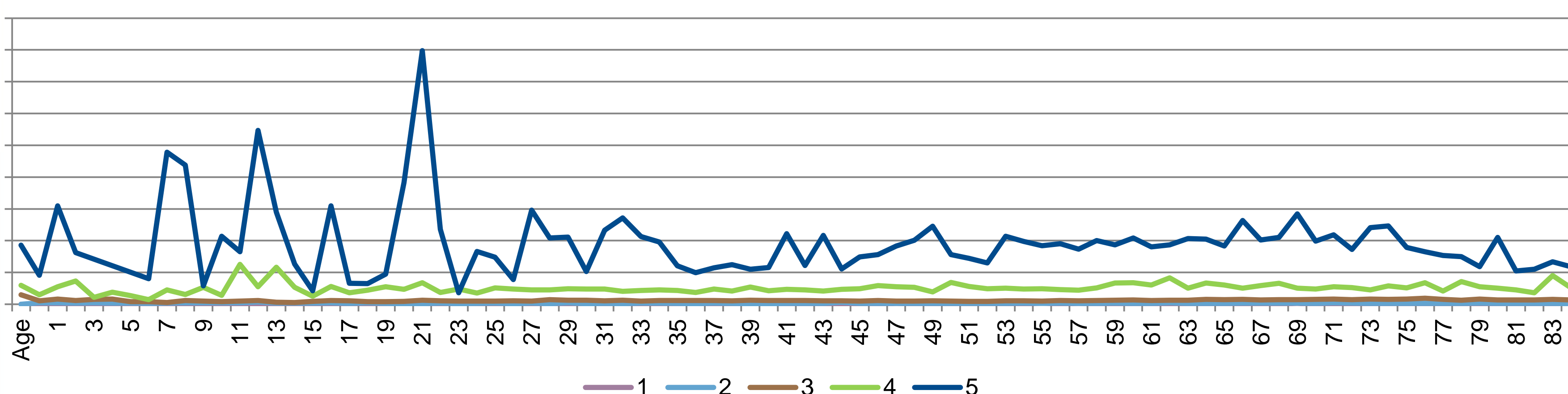
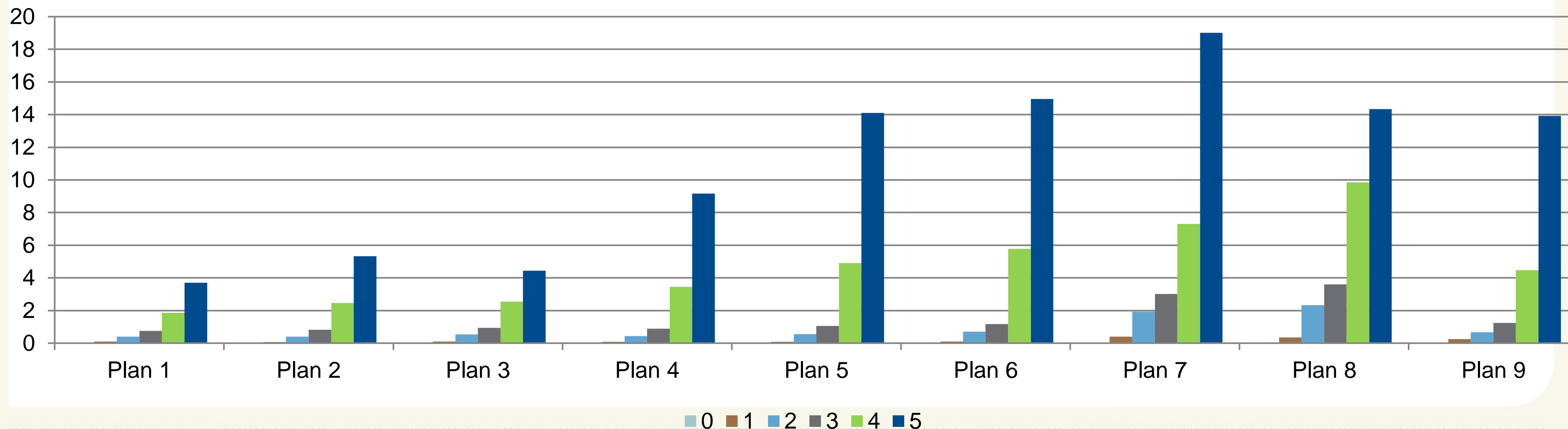
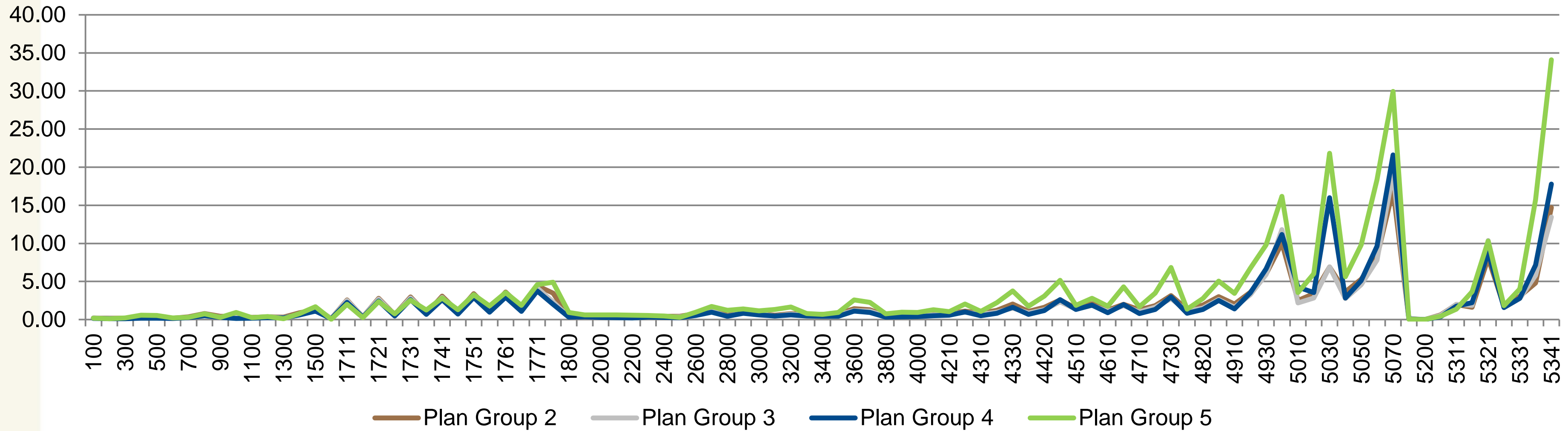
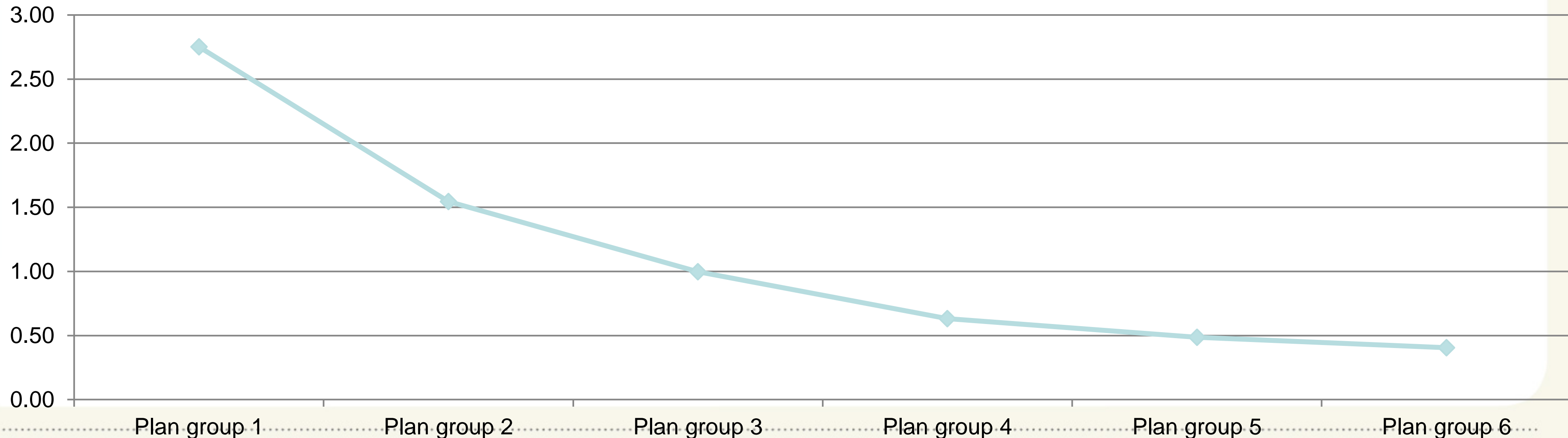




Disease burden index results





Disease burden - conclusions

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- Disease burden is a function of:
  - Age
  - Gender
  - Chronic conditions
  - Other clinical interactions
  - Access to benefits (including data considerations)
- Adjusting for the calculated disease burden allows all of these factors to be taken into account

Are South African regional healthcare consumption patterns explained by the underlying burden of disease and access to benefits?

Applications

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Discovery Health

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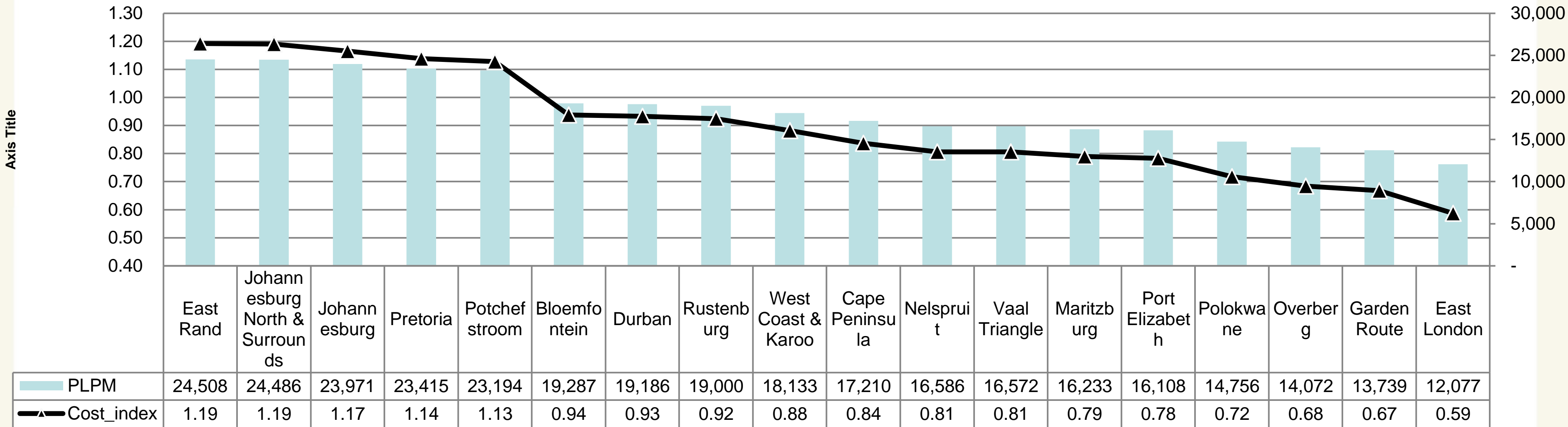
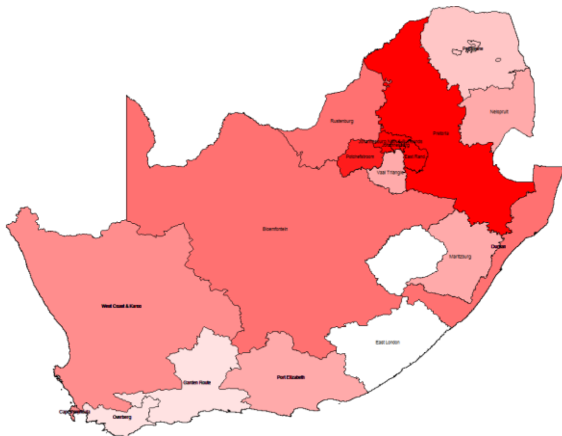
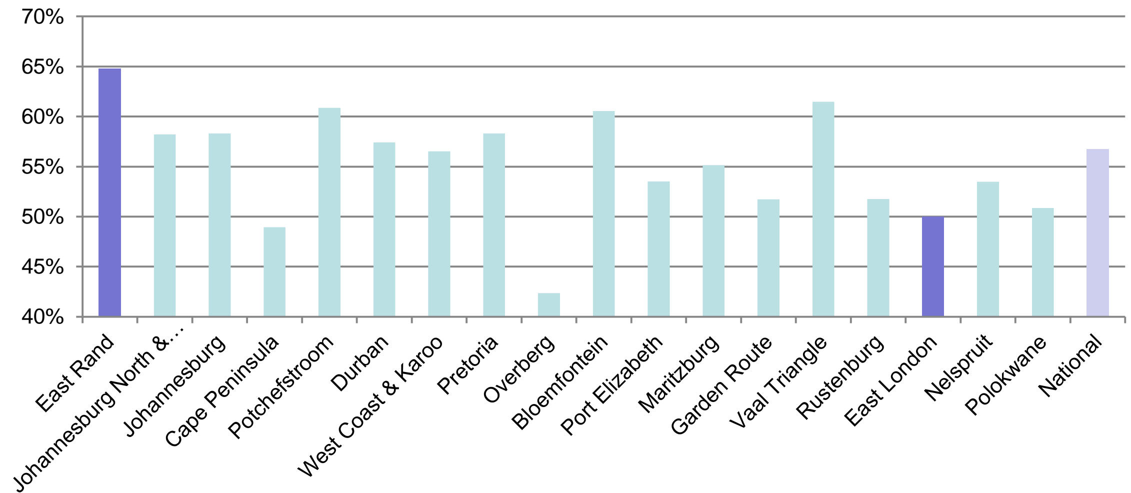
Healthcare costs in the last six months of life



	East Rand	Johannesburg North & Surrounds	Johannesburg	Pretoria	Potchefstroom	Bloemfontein	Durban	Rustenburg	West Coast & Karoo	Cape Peninsula	Nelspruit	Vaal Triangle	Maritzburg	Port Elizabeth	Polokwane	Overberg	Garden Route	East London
PLPM	24,508	24,486	23,971	23,415	23,194	19,287	19,186	19,000	18,133	17,210	16,586	16,572	16,233	16,108	14,756	14,072	13,739	12,077
Cost_index	1.19	1.19	1.17	1.14	1.13	0.94	0.93	0.92	0.88	0.84	0.81	0.81	0.79	0.78	0.72	0.68	0.67	0.59





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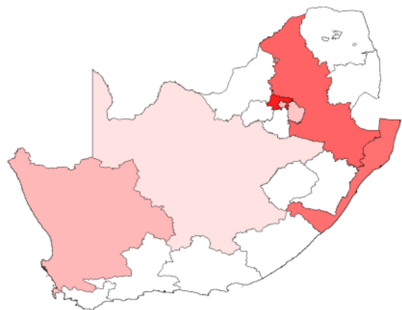
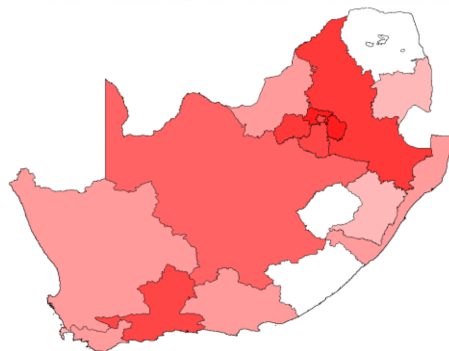
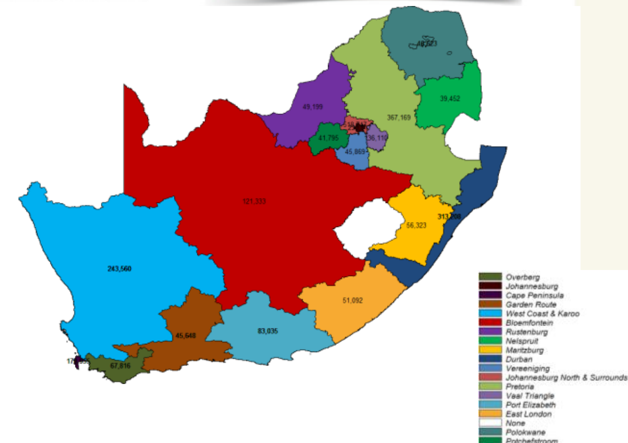
Regional variation

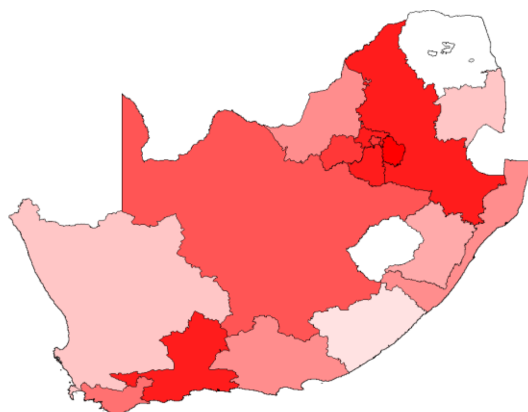


Proportion of DHMS lives

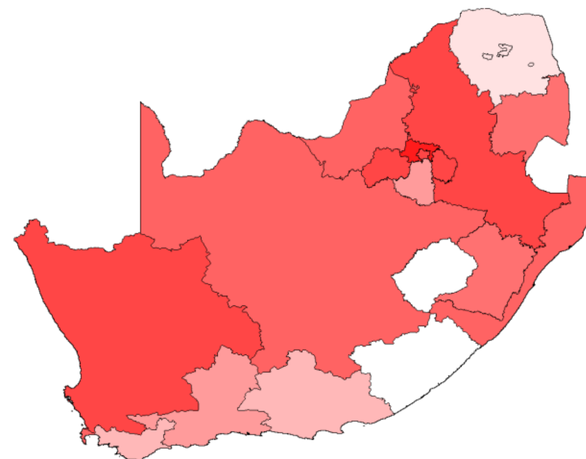


Paid PLPM





Disease Burden Index adjusting for access to benefits



Paid PLPM Disease Burden Adjusted

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Supply of hospital beds

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Estimate the demand for hospital beds in South Africa

Find areas with oversupply

Estimate impact

Intervene

Actual beds per referral region

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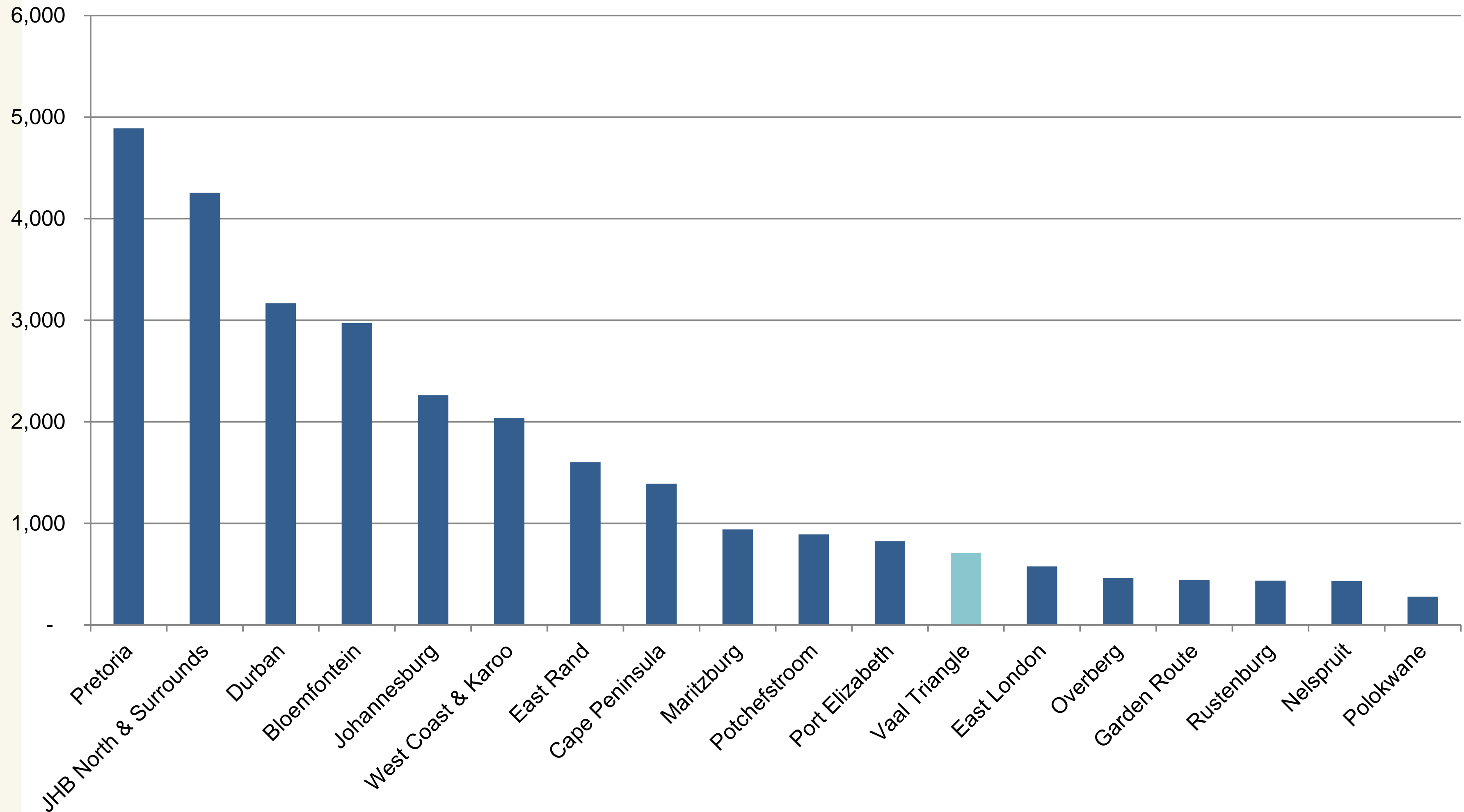

Variability in supply of hospital beds

Actual beds per 1,000 lives per region

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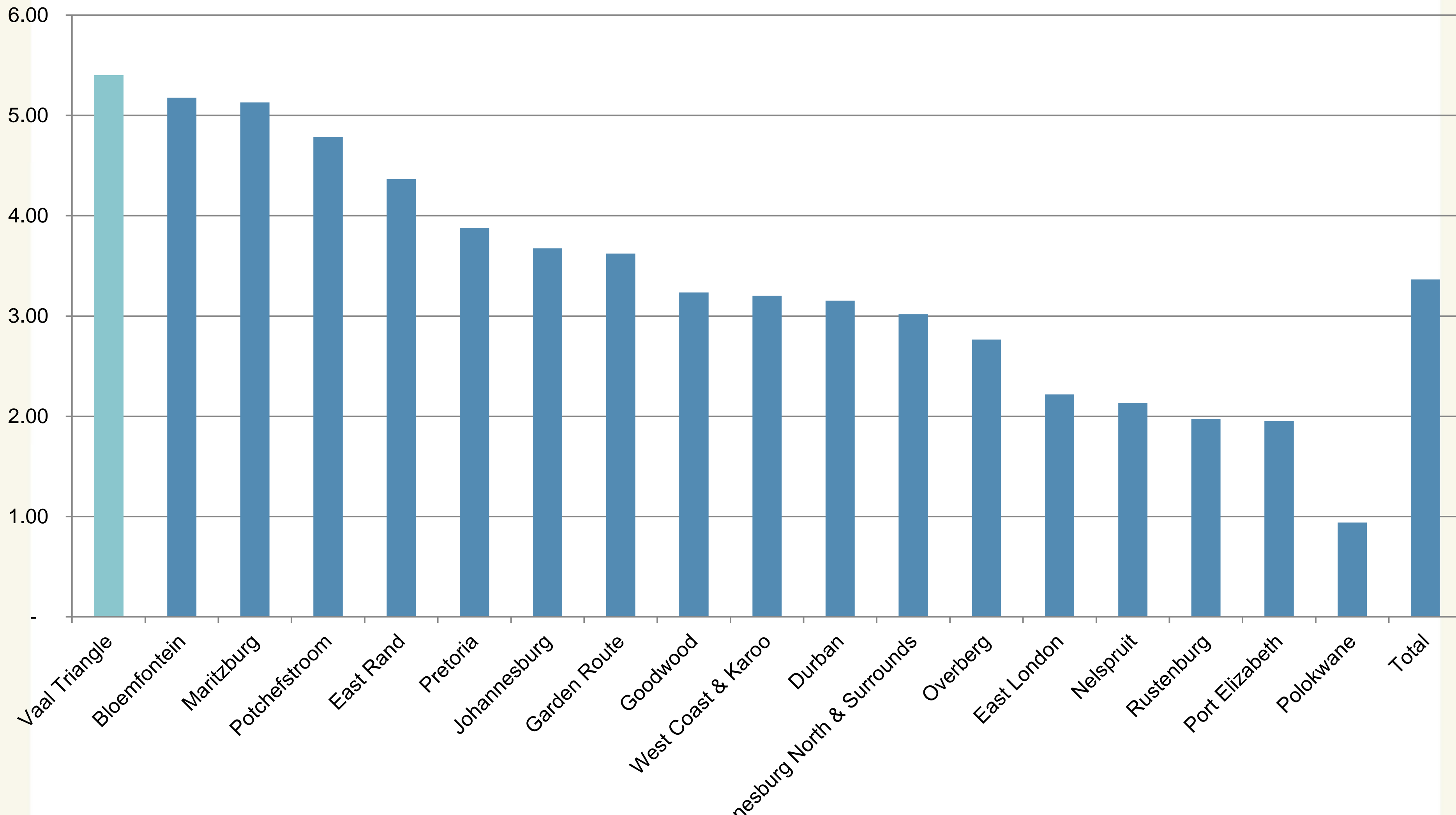

Variability in supply of hospital beds per 1,000 lives

Expected (required) beds methodology

- Use ACGs as risk adjustment tool
- Based on 2008 bed days per 1,000 lives per ACG
- Calculate required overall bed days in each region for 2012
- Assumptions:
  - ACG (disease burden) distribution of lives for DHMS is representative of population
  - 2008 provides a good benchmark for hospitalisation need of members by ACG
- Compare actual bed days per region in 2012 to required
- Back test for earlier years

ACG model results (70% occupancy) A/E

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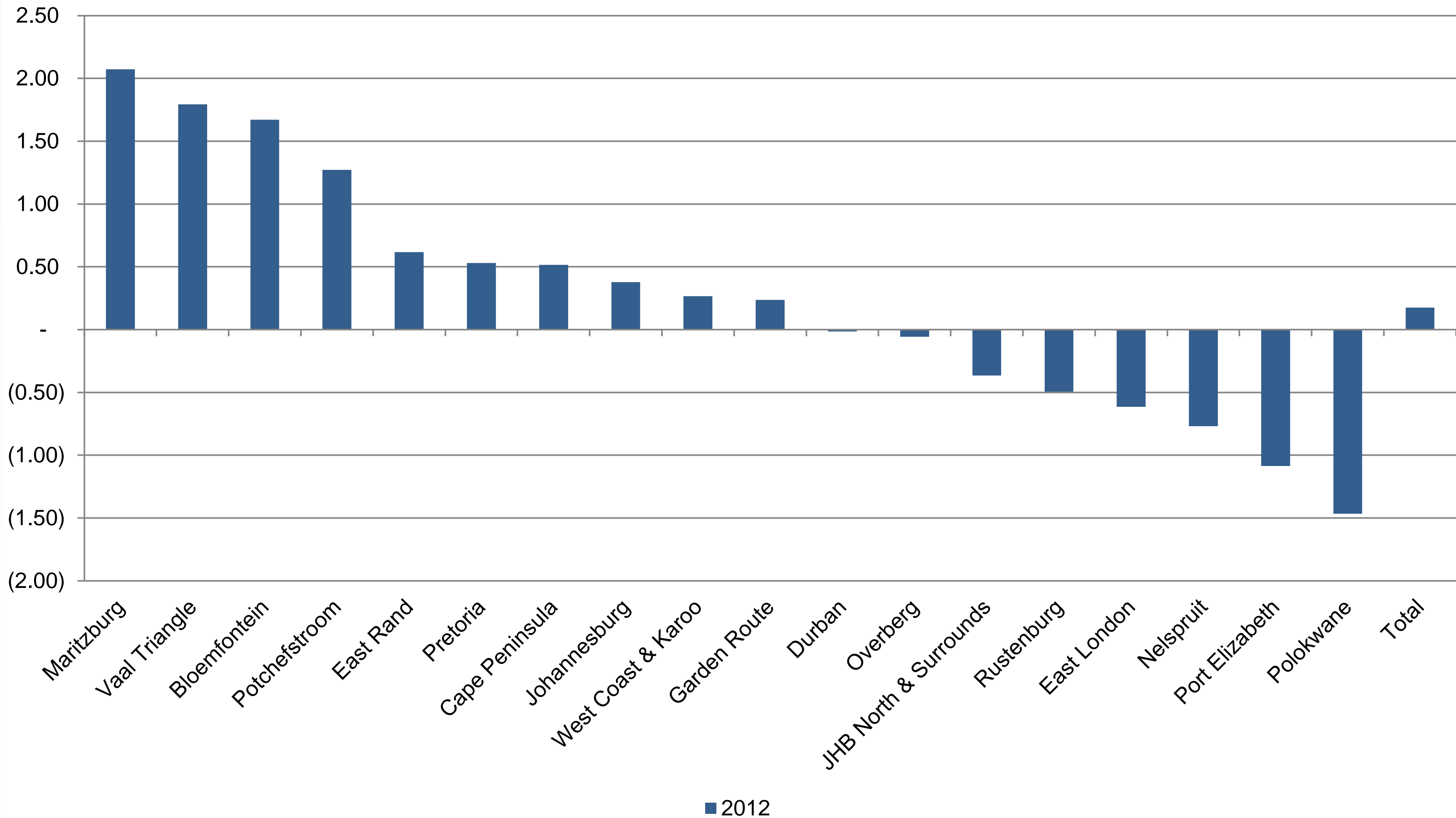

Over/under supply of beds per 1,000 lives per region assuming 70% occupancy

Over/under supply of beds at different occupancy rates

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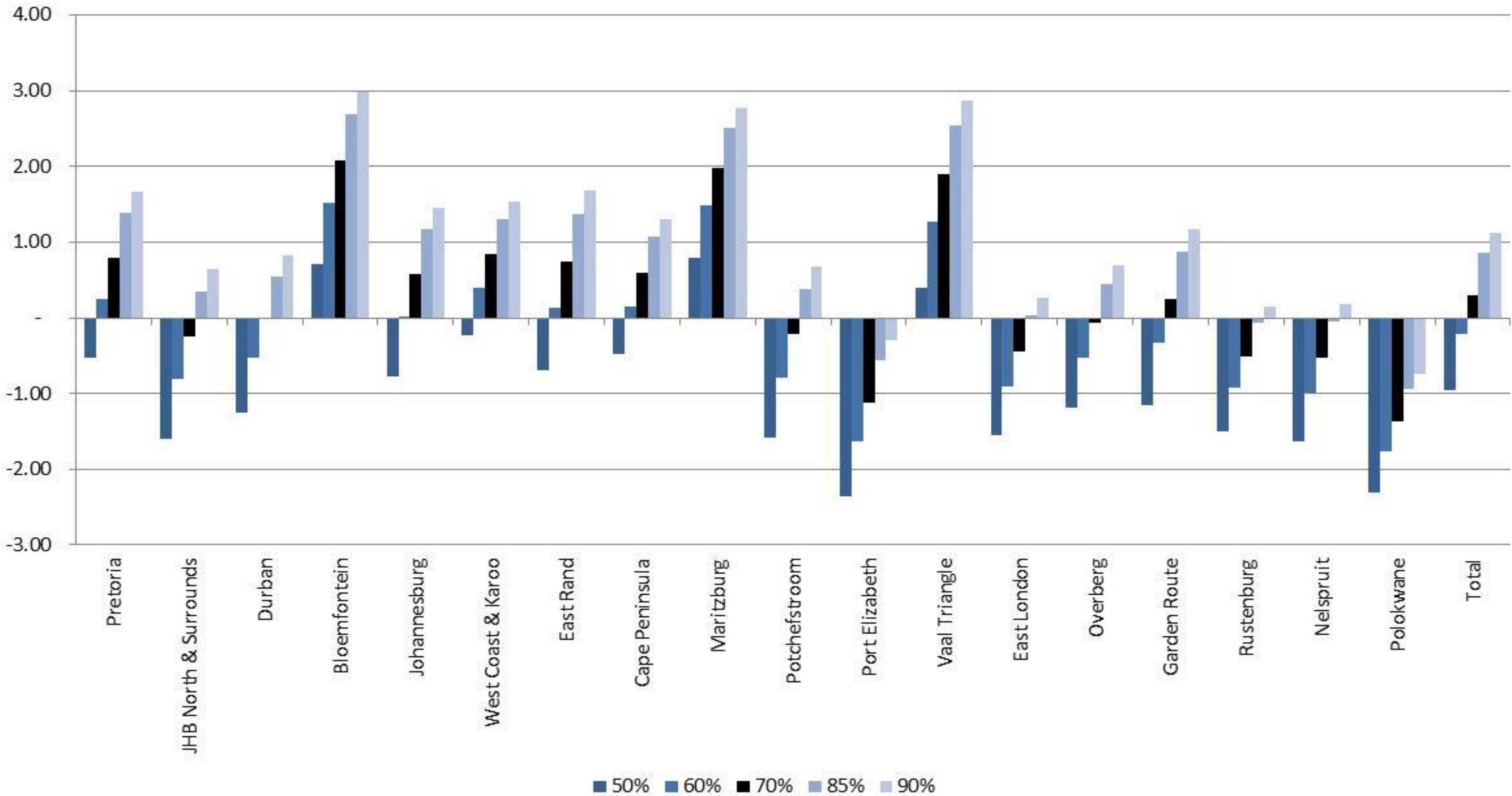

Over/under supply of beds per 1,000 lives per region assuming different levels of occupancy

Understanding the impact of competition

Other

Herfindahl concentration index

- Measure of competition among hospital networks in regions
- Concentration index measures representation of network by number of beds relative to industry

Example	Representation	Concentration Index	Indication
JHB & Surrounds	Combination	0.28	Moderate concentration
East London	100% Life Healthcare	1	High concentration

Herfindahl concentration index results

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Drainage region	Concentration index 2012	Major network in region	Oversupply of beds in 2012
East London	1.00	Life Healthcare	-0.61
Polokwane	0.86	Mediclinic	-1.47
Overberg	0.80	Mediclinic	-0.06
Potchefstroom	0.55	NHN	1.27
Garden Route	0.54	Mediclinic	0.24
Nelspruit	0.51	Mediclinic	-0.77
Port Elizabeth	0.50	Netcare	-1.09
West Coast & Karoo	0.49	Mediclinic	0.27
Durban	0.44	Life Healthcare	-0.02
Maritzburg	0.42	NHN	2.07
East Rand	0.38	Netcare	0.62
Johannesburg	0.36	Netcare	0.38
Bloemfontein	0.32	NHN	1.67
Vaal Triangle	0.32	Mediclinic	1.79
Rustenburg	0.32	Life Healthcare and Netcare	-0.49
Johannesburg North & Surrounds	0.28	Netcare	-0.37
Pretoria	0.26	Even split of networks	0.53
Cape Peninsula	0.25	Even split of networks	0.51
Total	**0.25**	**Even split of networks**	0.18

Does competition impact the admission rate?

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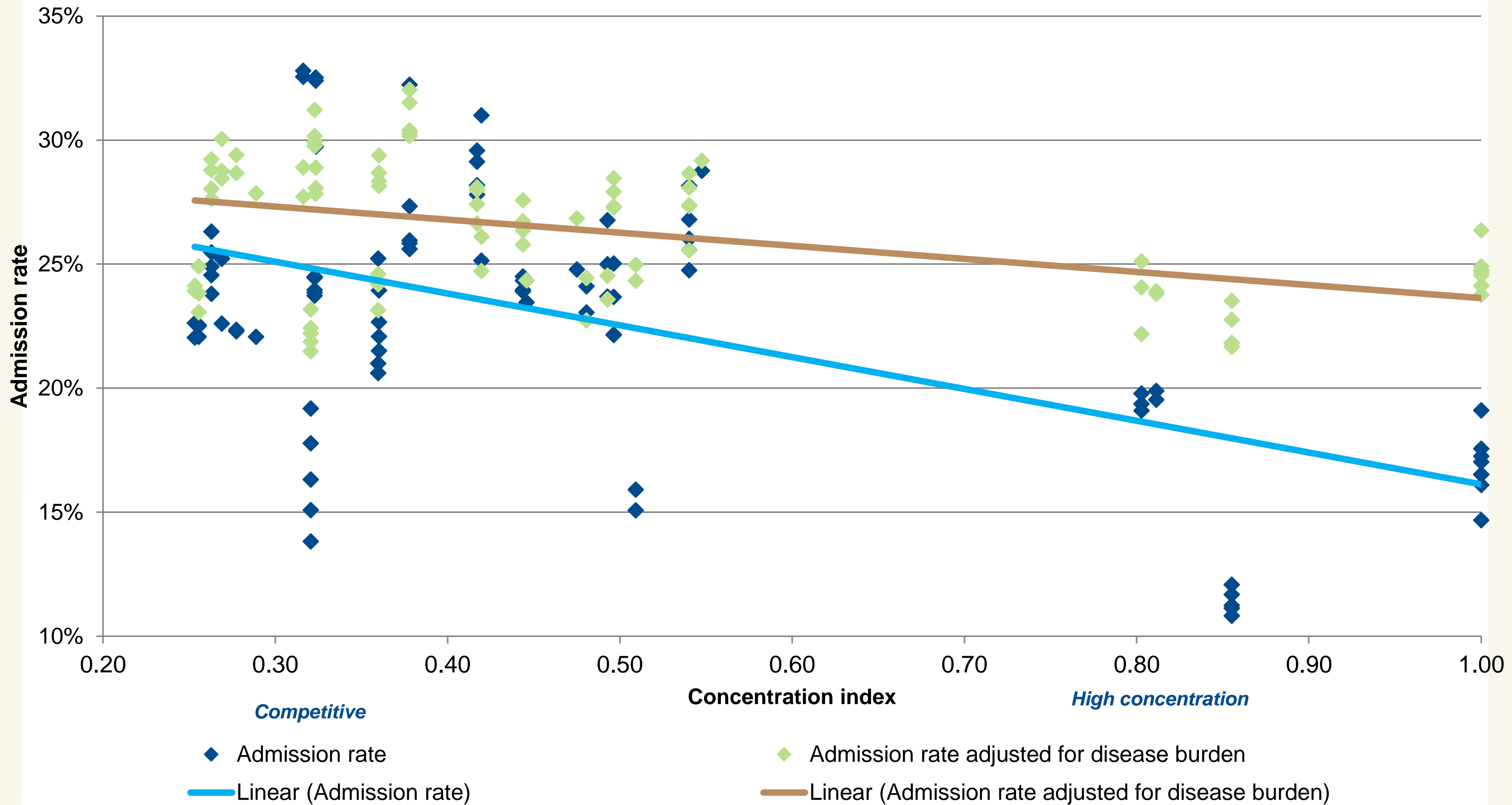

After adjusting for disease burden, the admission rate is higher in areas with high competition (low concentration)

Does competition impact the supply of beds?

More beds in highly competitive areas
Is this required based on disease burden?

Does competition impact the supply of beds?

Beds/1,000 lives

7.00
6.00
5.00
4.00
3.00
2.00
1.00
-

0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00

Concentration index

Competitive

High concentration

Actual beds per 1,000 lives
Required beds per 1,000 lives
Linear (Actual beds per 1,000 lives)
Linear (Required beds per 1,000 lives)

Disease burden does not explain the difference in number of beds between competitive and concentrated areas

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- Understanding referral regions gives insight into healthcare costs and throughput
- Costs are variable across referral regions
- Variation in costs may be driven by various underlying factors such as disease burden, supply of beds, concentration and competition mix