

Transparency and choices of citizens

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André van der Veen

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- Human Geographer
- 7 year research manager in the National Institute of Public Health and Environment (RIVM)
- Expert in Quality and Safety Assessment in health care, data mining and visualization, benchmarking, risk communication.
- Since 2005, general director of de Praktijk Index

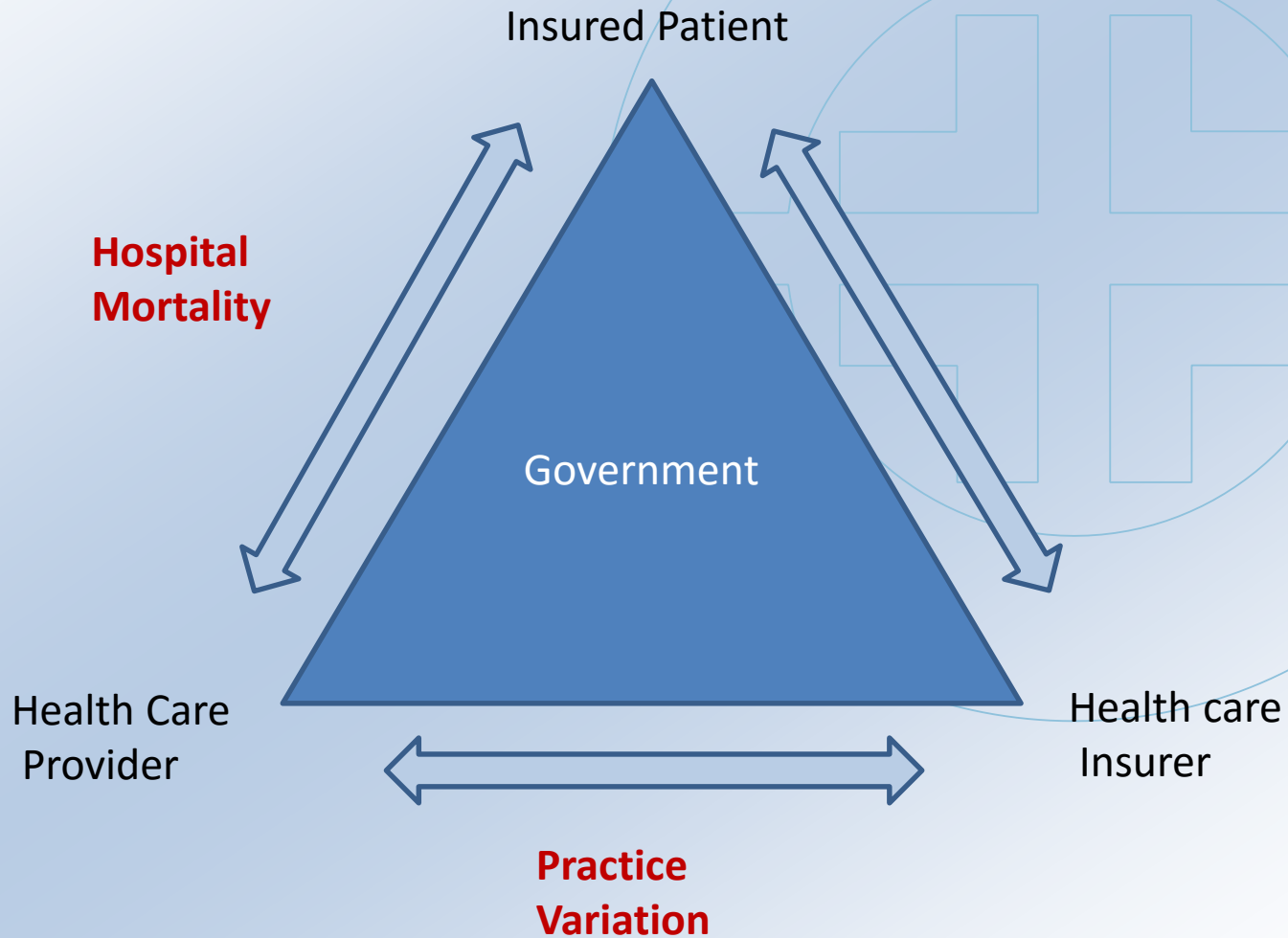
de Praktijk Index (DPI)

- Small Medium Enterprise (12-30 employees)
- Based in Bilthoven, the Netherlands

Specialized in:

- Outcome monitoring
- Medical coding
- Artificial intelligence and visualization

Healthcare Triangle



Content

- A metaphor
- Transparency in Hospital Mortality
- Transparency in Practice Variation
- Take home message

A metaphor

Process



Netherlands (NED)

Statistics

10	Shots	20
6	Shots on goal	9
3	Corner kicks	5
1	Free kicks	2
0 / 0	Penalty Kicks (Goals/Shots)	0 / 0
4	Offsides	2
20	Actual playing time	32
39%	Possession (%)	61%

Structure

Nr.	Name	age	Caps	Club	length	weight
1	Edwin VAN DER SAR	35	113	Manchester Utd. (ENG)	197	84
3	Khalid BOULAHROUZ	25	15	Hamburger SV (GER)	191	86
4	Joris MATHIJSEN	26	11	AZ Alkmaar (NED)	182	72
5	Giovanni VAN BRONCKHORST	31	60	Barcelona (ESP)	178	75
7	Dirk KUYT	25	22	Feyenoord (NED)	184	77
8	Phillip COCU	35	101	PSV Eindhoven (NED)	182	74
10	Rafael VAN DER VAART	23	38	Hamburger SV (GER)	175	70
11	Arjen ROBBEN	22	23	Chelsea (ENG)	181	80
13	Andre OOIJER	31	23	PSV Eindhoven (NED)	185	74
14	John HEITINGA	22	21	Ajax (NED)	180	75
17	Robin VAN PERSIE	22	14	Arsenal (ENG)	183	71
18	Mark VAN BOMMEL	29	40	Barcelona (ESP)	187	80
20	Wesley SNEIJDER	22	27	Ajax (NED)	170	72



Reputation

1	Brasil	5/2
2	Germany	7/1
3	England	7/1
4	Argentina	8/1
5	Italy	9/1
6	France	12/1
7	The Netherlands	12/1
8	Spain	14/1
9	Portugal	22/1
10	Czech Republic	25/1
11	Sweden	33/1

Outcome (of the primary process)



Portugal (POR)

1 : 0



Netherlands (NED)

Statistics

10	Shots	20
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Casemix



Based on historical data we know that Portugal is a strong opponent of the Netherlands

Matches	Won	Draw	Lost	Goals NL	Goals P
10	1	3	6	5	12

POR : NED

Expected outcome: 1,2 : 0,5

Complications



Portugal (POR)

12

9

2

20

Fouls Suffered

Yellow cards

Red Cards

Actual playing time



Netherlands (NED)

8

7

2

32

The Russian referee Ivanov gave 20 cards (6 yellow and 4 red), a record in the history of World Championship football

There is always a story behind each Indicator



Conclusion

- In the end all spectators, players and coaches are focussed on only one thing: the final result
- In the end many of them don't understand statistics
- Compared to process, outcome is relatively easy to measure and to understand, and it's rewarding
- However, the results should be corrected for case mix
- Good performance in process measures (f.i. compliance) is no guarantee for good outcomes
- But, understanding/analyzing the relation between process and outcome is the key to improvement



HSMR

Hospital Standardized Mortality Ratio

HSMR

- Outcome indicator
- Indicator for patient safety (in-hospital)
- Easy to understand
- Standardized for casemix
- Relatively valid
- Based on available routine administrative data
- Low registration cost
- Both relevant for *external* and *internal* use

Hospital Standardized Mortality Ratio(HSMR)

$$\text{HSMR} = \left(\frac{\text{Observed Mortality}}{\text{Expected Mortality}} \right) \times 100$$

Risk depends on

- Age
- Primary Diagnose (ICD 9 or ICD10 Classification)
- Secondary Diagnose (Comorbidity)
- Urgency
- Gender
- Year
- Socio-economic status
- Month of admission
- Patient source
- Ethnicity



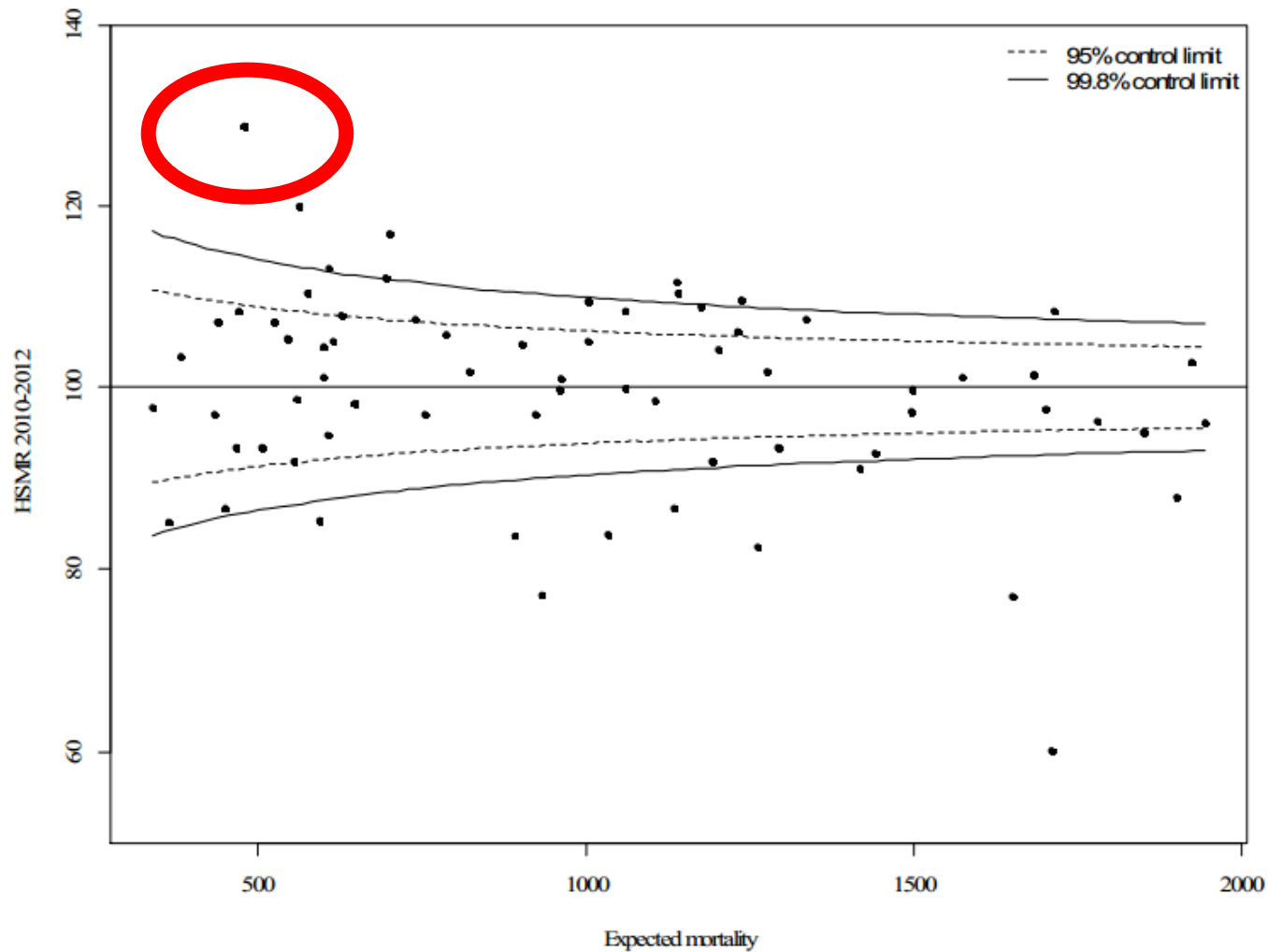
1. STERFTE IN NEDERLANDSE ZIEKENHUIZEN



Sterfte in 93 Nederlandse ziekenhuizen (2001–2003), gestandaardiseerd voor leeftijd, sekse, mate van spoed en duur van de opname. Het gaat hier om de sterfte binnen vijftig diagnosegroepen, die samen verantwoordelijk zijn voor 80 procent van de sterfgevallen; kleine ziekenhuizen en ziekenhuizen die slecht registreren, zijn niet in de tabel opgenomen.

De sterfte per ziekenhuis (gemiddelde en 5-procent betrouwbaarheidsinterval) is weergegeven als afwijking ten opzichte van het referentiejaar 2000 (sterfte in dat jaar is gesteld op 100 procent).

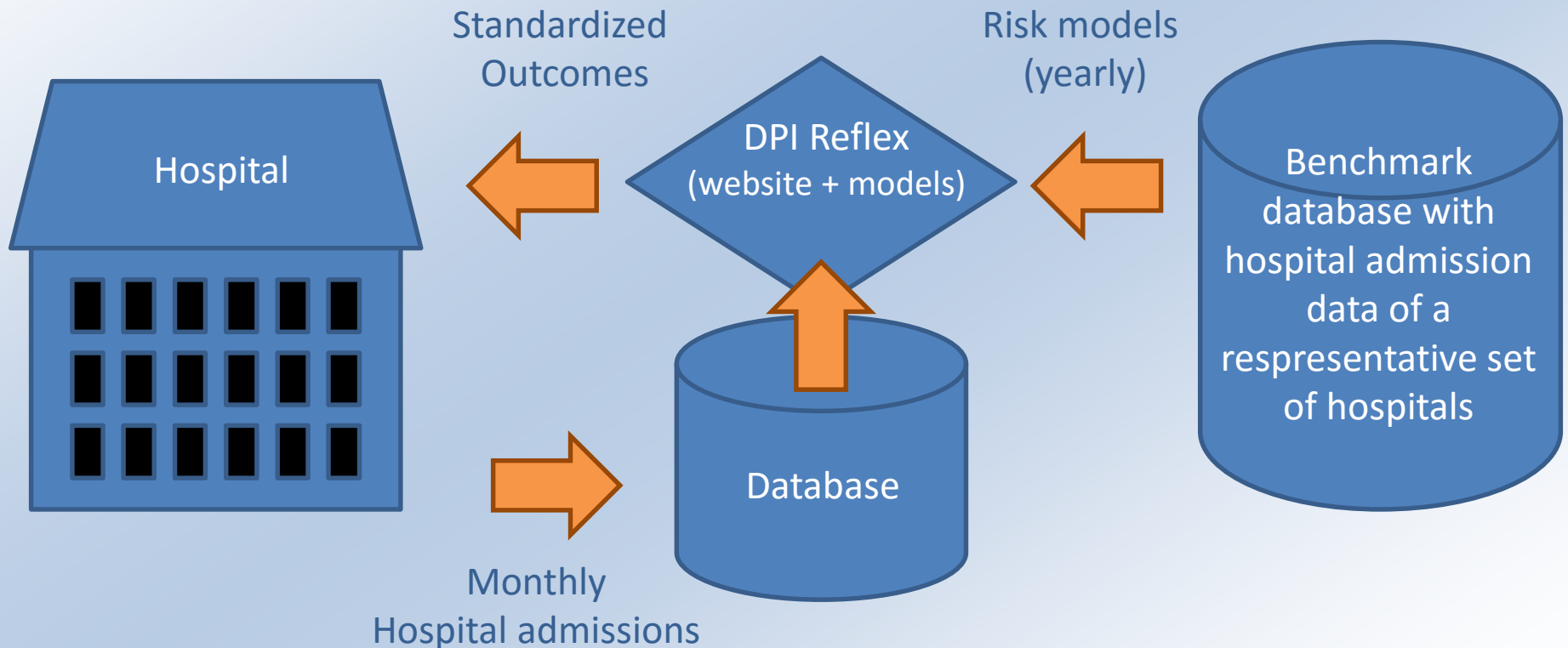
Funnel plot



Accuracy depends on variation in registration

- Completeness
- Correctness
- Timeliness
- Use it or loose it!

Reflex Configuration



Internal Applications

- **Early warning** system
- **Selection** tool for sentinel events that come up for case note reviews and root cause analysis
- **Monitoring** tool to measure effectiveness of interventions (trends)
- **Analysis** tool to evaluate complications
- **Goal setting** tool (savings, deadlines, priorities)
- **Business Intelligence** tool for board and management

Gráficos



Filtros rápidos



Número de admissões filtrado: 632

1 jan 2015 - 31 ago 2015



Editar filtros

Óbitos

5 óbitos durante a permanência no hospital.

112 é o índice. Isso significa **1** óbitos a mais do que estimado.



Diárias hospitalares

25 pacientes tiveram diárias hospitalares prolongadas.

86 é o índice. Isso significa **4** diárias prolongadas a menos do que estimado.



Readmissões

2 pacientes foram readmitidos dentro de 28 dias.

8 é o índice. Isso significa **22** readmissões a menos do que estimado.



Especialização

Grupo de diagnóstico

Procedimento

HSMR

ADMISSÕES ▼

ÓBITOS

DIÁRIAS HOSPITALARES

READMISSÕES

Medicina Interna

168

2

157

6

111

0

Pneumologia

95

0

3

115

22

1

Neurologia

51

0

36

1

0

Pediatria

48

1

407

3

102

0

Gastroenterologia

45

0

0

0

Admissões

Óbito no hospital: **Sim**✖[+ Editar filtros](#)

Mostrar como:



Gráfico



Tabela



Detalhes

NÚMERO DE ADMISSÃO	DATA DE ADMISSÃO	ESPECIALIZAÇÃO	GRUPO DE DIAGNÓSTICO	IDADE DO PACIENTE	STATUS DA ANÁLISE DO ARQUIVO	RISCO DE ÓBITO ↓
21647571	07 FEV 2015	Neurocirurgia	Outros acidentes de trans...	39	Concluído...	0%
21660504	10 MAR 2015	Cardiologia	Outras doenças das vias...	74	Concluído,...	8%
21648599	19 JAN 2015	Medicina Interna	Neoplasias [tumores] in situ	55	Concluído...	9%
21654580	20 DEZ 2014	Medicina Interna	Outras doenças respiratór...	94	Selecionado	20%
21660501	04 FEV 2015	Pediatria	Artropatias	2	Concluído	20%



Admissão #21660504

paciente do sexo masculino de 74 anos de idade é admitido
O diagnóstico é Outras arritmias cardíacas especificadas
Além disso, existem 7 diagnósticos secundários
4 dias depois ele evoluiu para óbito

O arquivo está incorreto.
0 gatilhos foram encontrados
A partir do qual 0 indica-se um evento adverso
Medidas adicionais podem ser:
Insira os dados corretos no sistema de entrega de dados e confira o arquivo novamente após a atualização mensal.

[Visualizar resultados da análise do arquivo](#)

Paciente paciente do sexo masculino,
74 Anos

Código do paciente 12544

Tipo de admissão Clínico, Urgente

Diagnóstico

CÓDIGO	DESCRIÇÃO	SPL	E/M/C
I49.8	Outras arritmias cardíacas especificadas	CAR	
G93.1	Lesão encefálica anóxica, não classificada em outra parte	CAR	C
I25.1	Doença aterosclerótica do coração	CAR	
I25.2	Infarto antigo do miocárdio	CAR	
I25.5	Miocardiopatia isquêmica	CAR	
I46.0	Parada cardíaca com ressuscitação bem sucedida	CAR	
I50.1	Insuficiência ventricular esquerda	CAR	
Z86.4	História pessoal de abuso de substâncias psicoativas	CAR	

Procedimentos

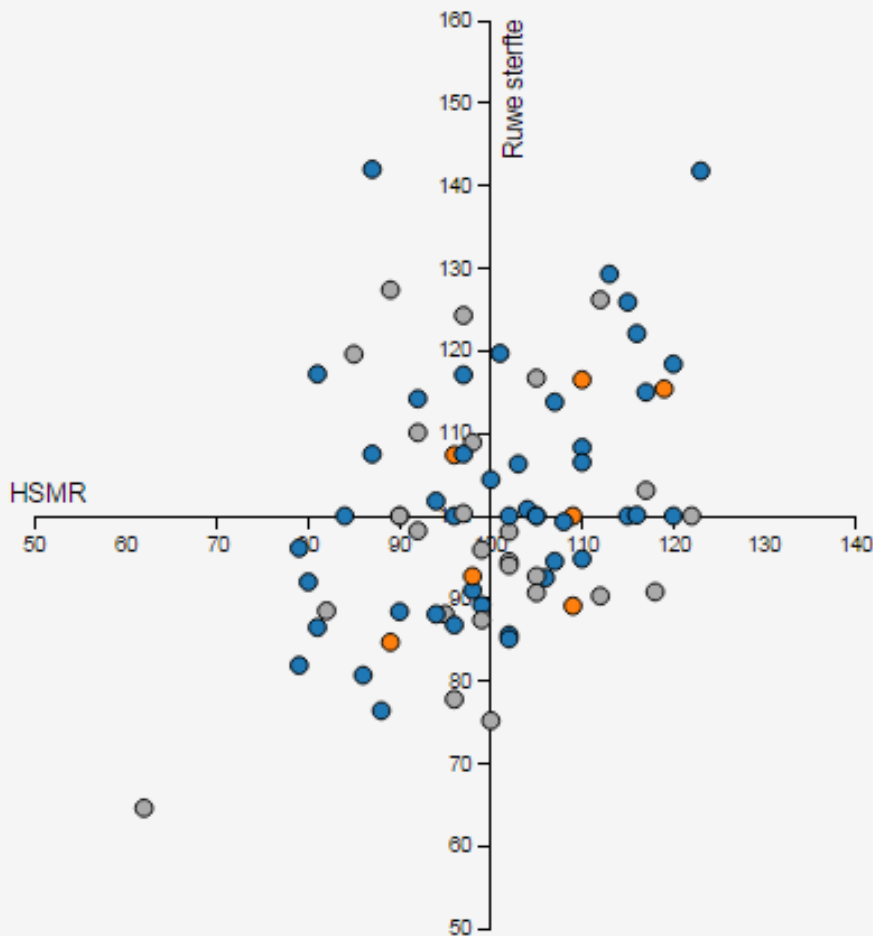
Validity and Accuracy

Type ziekenhuis :

Alle ▼

Diagnosegroep :

HSMR ▼



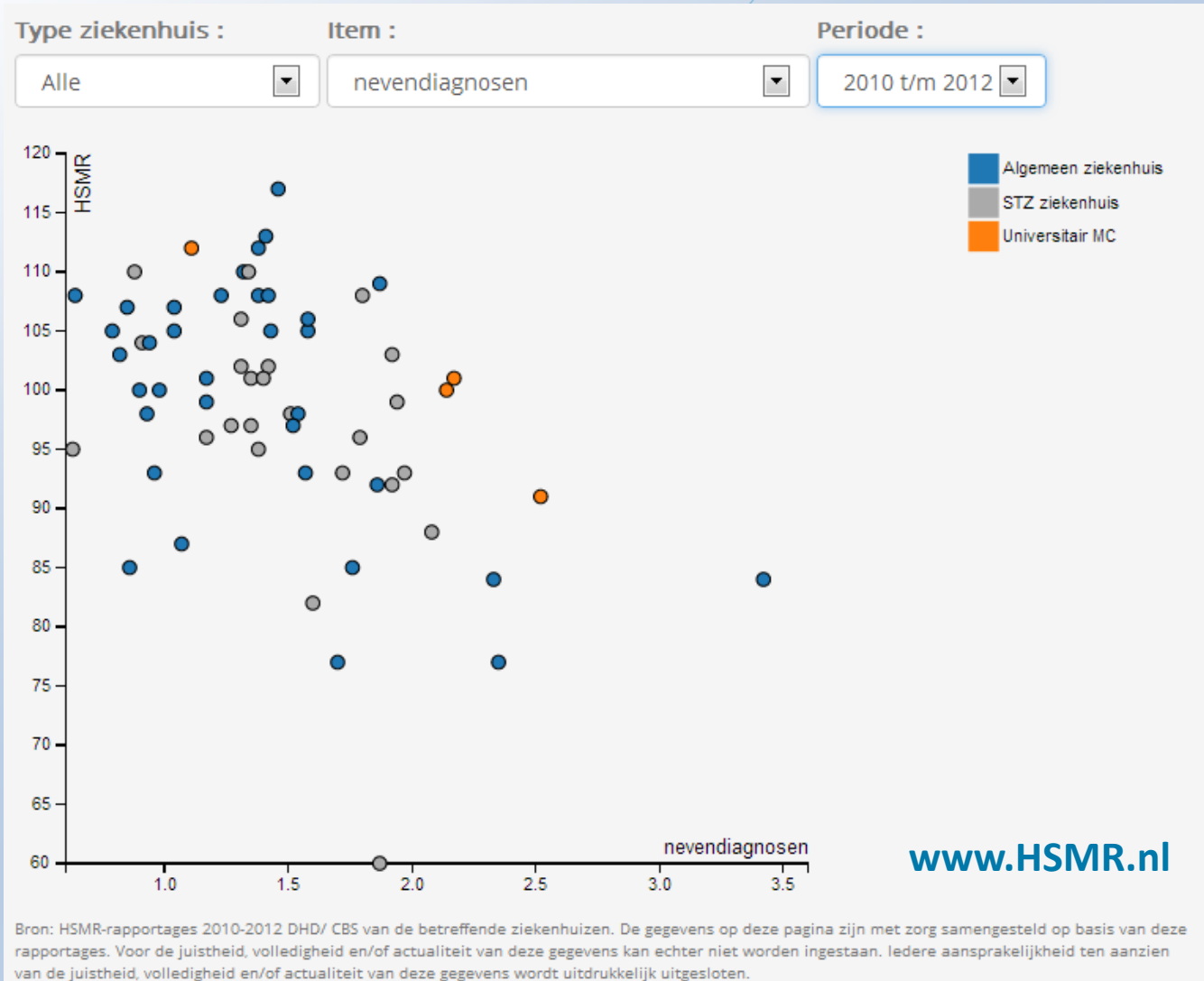
Beweeg uw cursor over de punten voor detailinformatie. De cirkel om een punt geeft het 95% betrouwbaarheidsinterval weer.

Bij ziekenhuizen waarvan de ruwe sterfte niet bekend is gemaakt, is de waarde gezet op 100.

www.HSMR.nl



Coding versus HSMR



Practice variation

- variation in use of healthcare is accounted for by the willingness and ability of doctors to offer treatment rather than differences in illness or patient preference (Wennberg).
- concerns the efficiency, effectiveness and even the (un)warrantedness of healthcare
- Volumes and spending per capita per region

Practice variation

- Volume driven health care system
- Pay for output
- No waiting list, but increasing volumes
- Focus on production, not on outcome or value
- There is inadequate insight in practice variation in the NL

Back hernia



3. Welke behandelingen zijn er mogelijk?

niet opereren

Fysiotherapie, medicijnen of bewegen:

- ❖ Bij alleen rugpijn en geen beenpijn.
- ❖ Bij beenpijn die korter duurt dan zes weken of al langer duurt dan zes maanden. Zonder operatie is na **6-18** weken 90% hersteld.

90%



wel opereren

Soms is een operatie wel nodig:

- ❖ Bij ernstige verschijnselen zoals verlamming of problemen bij het plassen is een operatie noodzakelijk.
- ❖ Wanneer de ingezette behandeling niet voldoende helpt en de beenpijn langer dan drie maanden maar korter dan zes maanden aanwezig is.

10%



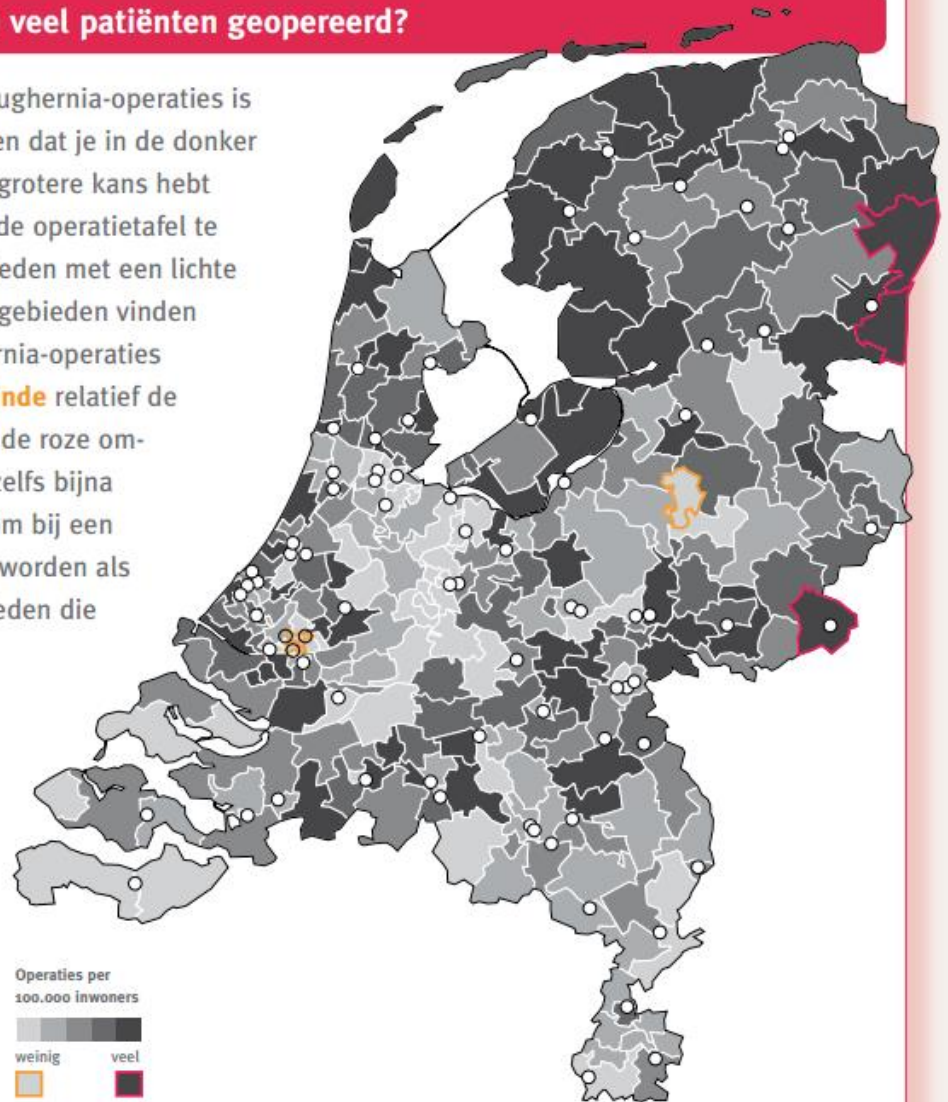
Wanneer u of uw arts denkt aan een operatie bespreek dan altijd bovenstaande vuistregels.

Back hernia

6. Waar worden (te) veel patiënten geopereerd?

De praktijkvariatie voor rughernia-operaties is groot. Het kaartje laat zien dat je in de donker gekleurde gebieden een grotere kans hebt om bij een rughernia op de operatietafel te belanden, dan in de gebieden met een lichte tint. In de **roze omlijnde** gebieden vinden relatief de meeste rughernia-operaties plaats, in de **oranje omlijnde** relatief de minste. De inwoners van de roze omlijnde gebieden hebben zelfs bijna **5 maal** zoveel kans om bij een rughernia geopereerd te worden als de inwoners van de gebieden die oranje omlijnd zijn.

Deze grote regionale verschillen worden veroorzaakt doordat in sommige ziekenhuizen de medisch specialist eerder overgaat tot een operatie dan in andere ziekenhuizen.



Back hernia



8. Wat kost een behandeling?



Operatie

€ 4.000,-

Revalidatie

30x fysiotherapie à € 30,-

€ 900,-



Totaal

€ 4.900,-

Jaarlijks worden er in Nederland ongeveer 10.000 mensen aan een rughernia geopereerd.

Bronnen: Diverse tarievenlijsten Nederlandse ziekenhuizen en fysiotherapiepraktijken | FysioRoadmap, 2011. Protocol: "Status na HNP operatie lumbaal".

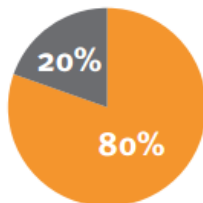
Ik betaal zelf:

€ 960,-

€ 360,- eigen risico en eerste 20 behandelingen fysiotherapie

Basisverzekering betaalt:

€ 3.940,-



Aanvullende verzekeringen kunnen mogelijk meer vergoeden.
Bekijk goed of het zinvol is om u aanvullend te verzekeren.

Bron: rijksoverheid.nl - Basisverzekering.



C-section

Where	C-section average %
World	19%
USA	33%
Finland	16%
UK	24%
WHO recommendation	15%
Brazil	52%
Brazil private hospitals	85%
Brazil public hospitals	45%
State São Paulo	61%

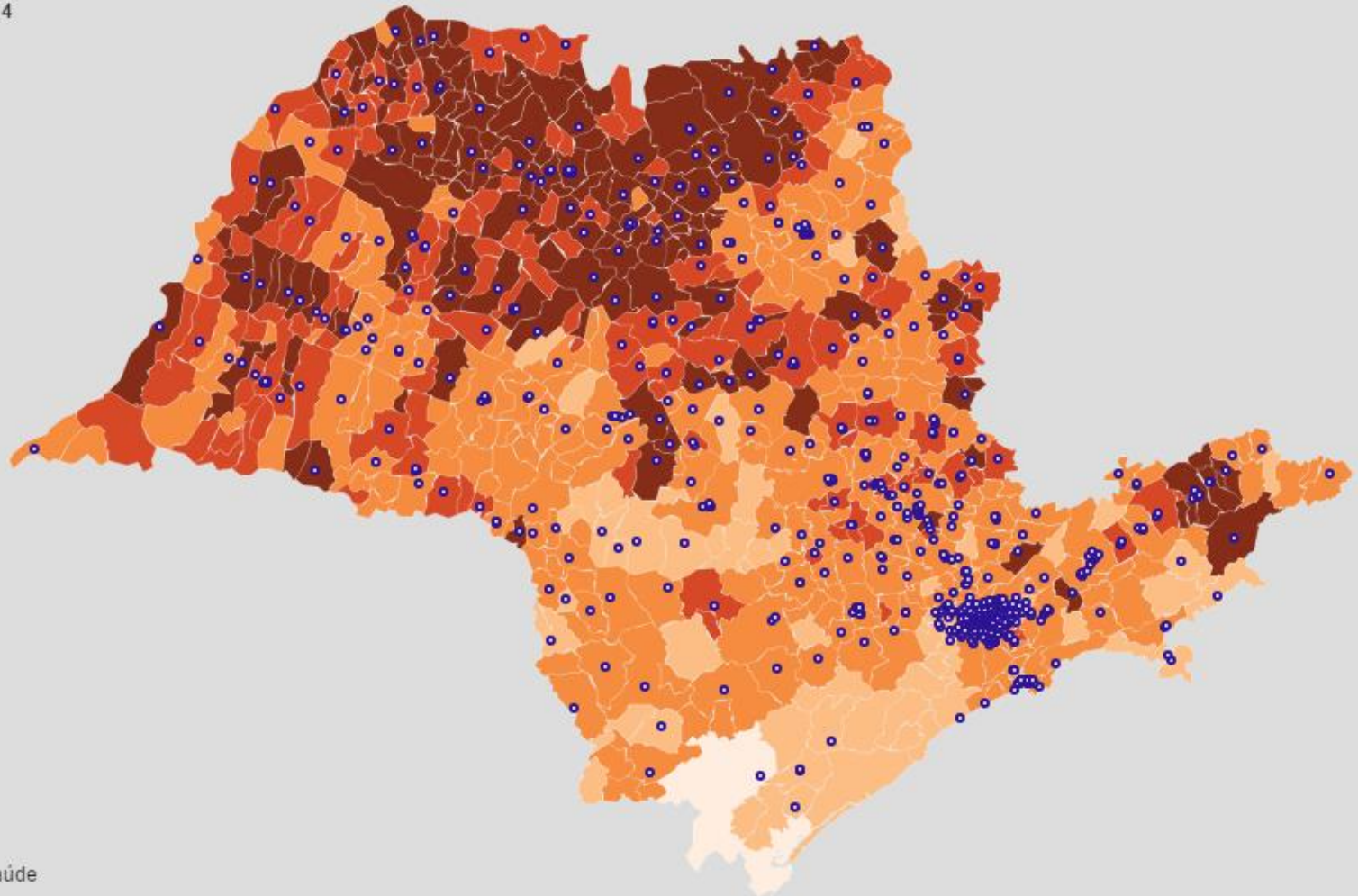
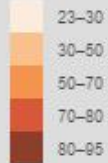
C-section

Factor 2-3 variation

Cesarianas: variação na prática médica e disponibilidade de hospitais gerais 2010-2014

percentage, 2010-2014

percentage



- ☒ percentage
- ☒ Sao Paulo hospitals

Fonte: Ministério da Saúde

C-section

	% C-section	# municipalities	# C-sections
Total São Paulo 2013	61%	646	610.896

Potential reduction

Benchmark	% C-section	# municipalities above	# C-sections above
Average São Paulo	61%	461	28.666
median São Paulo	71%	321	10.107
10 percentile São Paulo	50%	581	75.098
World	19%	646	262.056

C-section

factor 5

The Netherlands general hospital	cost
natural delivery outpatient services	€ 957
natural delivery day case	€ 1.231
natural delivery clinical	€ 3.464
C-section	€ 5.317

factor 1,3

São Paulo Public hospitals	cost
natural delivery	€ 154
C-section	€ 217

Conclusions

- There is a lot of data going around
- Use it or loose it
- Beware of overkill of information
- Beware of administrative burden
- Public: Focus on a few (outcome) indicators
- Insurer: Analyse practice variation and focus on value instead of costs
- Hospitals: focus on outcome instead of output, analyse the fast amounts of data in your hospital

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Maakt verbetering zichtbaar

