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How HRG4+ has changed the way we view coded data

Lessons from the implementation of HRG4+ and the 2017/18 national tariffs.

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Introductions

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But it's only a list?

- HRG4+ should not impact on how a coder codes – national coding rules still apply
- But… it may shift income and amplify areas of poor data quality
- This could increase the number of challenge coders get from finance colleagues, clinicians and commissioners
- We hope to give you some useful background and our perspective of the impact of these changes, taken from our own analysis and previous work with clients

Session outline

- HRG4 to HRG4+ - what has changed?
- Changes to the national tariff for 2017-19
- How the change to HRG4+ impacts on variation in data quality
- Case studies to show the impact of HRG4+
- But… we don't know everything – opportunity to ask questions and give your own experiences

How the structure of HRG4+ differs from HRG4

Why change?

- Reflect updated clinical practice
  - New devices or innovation
- Support service re-design
- Improve identification of resource for specialist care
- More accurately reflects complex care
  - Multiple complications and comorbidities that affect the clinical input for their care
  - Multiple procedures undertaken at the same time

HRG4/ HRG4+ what's the difference?

- Increase of 1,109 HRGs - 1,673 HRGs in 2016/17, 2,782 in 2017/18
- Increase of 30 subchapters – 51 subchapters in 2016/17, 81 in 2017/18
- Changes to HRG structure
  - Interactive complications and co-morbidities (CC)
  - Intervention splits
  - Increased recognition of multiple procedures
  - Coding quality
  - Specialist activity

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HRG4+ sub-chapter changes

Specialty	HRG4	HRG4+	Changes
ENT	CZ	CA/CB/CD	Procedures and disorders mirror other chapters and better reflect resource use
Cardiology	EA	ED/EY	Open procedures/interventional cardiology for acquired conditions to more appropriately differentiate between surgical and percutaneous procedures
Cardiology		EC	New split for congenital heart disease
Orthopaedics	HA/HB/HR	HE/HN/HT	Procedures and disorders mirror other chapters and better reflect resource use
Paediatrics	PA	18 x PA	Replaced with 18 new PA subchapters based on body systems that reflect equivalent adult activity
Vascular and Interventional radiology	QZ/RC	9 x Y	9 new vascular and IR subchapters in chapter Y vascular procedures and disorders and imaging interventions. A complete redesign of HRGs for vascular open procedures and both vascular and non-vascular imaging interventions, to more appropriately reflect the link
Diagnostics	RA	RD/RN	Better differentiate the expected resource use of high cost, complex scans, as well as nuclear medicine procedures
Immunology, Infectious Diseases and Poisoning	WA	WH/WJ	More appropriately reflect the difference in treatment of infectious diseases when compared to other conditions

How this change in structure feeds into the national tariff

How the changes are reflected in the national tariff

- Scope of national prices generally remains the same in 2017/18 (and 2018/19)
- Prices are based on 2014/15 reference costs submission by trusts
- Structure is the same as 2016/17
  - Base tariff
  - Adjustment for short stay
  - Adjustment for best practice
  - Excess bed days

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How the changes are reflected in the national tariff

- New national prices in four areas
  - cochlear implants (CA)
  - complex computerised tomography scans (RD)
  - complex therapeutic endoscopic, upper or lower gastrointestinal procedures (FZ), and
  - photodynamic therapy (JC).
- New areas of best practice tariff
  - Same day emergency care – seven new clinical scenarios added
  - COPD
  - Straight to test for lower GI investigations
  - Cardiac rehabilitation for MI

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Intervention splits

Intervention splits

- What are they?
  - Interventions splits have been implemented on diagnosis-driven HRGs within many subchapters, to acknowledge that ‘minor interventions’ have been undertaken
  - Did exist in 16/17 but only in a small number of HRGs (39 with tariff), most of them multiple trauma
- Two benefits…
  - include expected additional cost/ resource with performing these minor interventions
  - provide indication that patient condition more severe resulting in more intensive treatment
- Splits applied to 16 subchapters

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DZ11 Lobar, Atypical or Viral Pneumonia

A - Bronchoscopy with biopsy to rule out malignancy (E491)

B - Trans-oesophageal echocardiography (TOE) (U202) to rule out cardiac involvement

C - Non-invasive ventilation (NIV) (E852)

D - Cut scalp (S010) caused by fall on the ward (W192) requiring suturing (S411 Z481)

No interventions

Single intervention

Multiple interventions

DZ11R-DZ11V Lobar, Atypical or Viral Pneumonia, without Interventions

DZ11N-DZ11Q Lobar, Atypical or Viral Pneumonia, with Single Intervention

DZ11K-DZ11M Lobar, Atypical or Viral Pneumonia, with Multiple Interventions

Interactive complications and co-morbidities (CC)

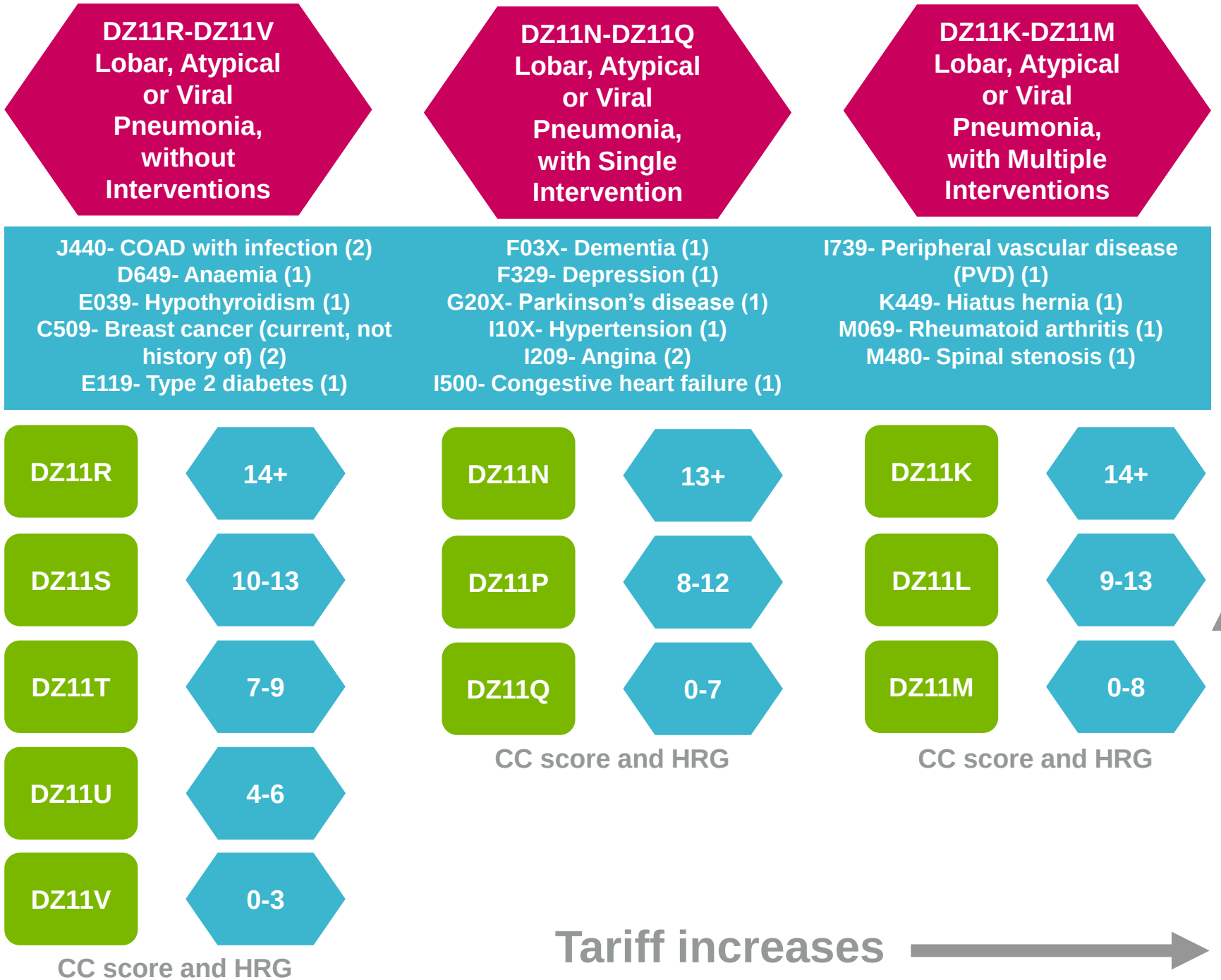
Interactive complications and co-morbidities (CC)

- What are they?
  - More HRGs have a CC split, list of eligible CCs has increased
  - Split by CC score rather than minor, intermediate, major
  - Introduced to more appropriately reflect the additional resource use expected when treating patients with multiple CCs
  - Implemented in the majority of HRG subchapters
- CC lists
  - Total score of all secondary diagnoses from values assigned to HRG subchapter-specific CC lists used to determine the HRG
  - Major CCs have nominal value of 2, other CCs have nominal value of 1
  - Increase in the number of diagnoses on subchapter-specific lists

Increase in number of CC splits in HRG4+

- Proportion of HRGs with CC split has increased by 15%
- Lower proportion of minor, higher proportion of intermediate and major

HRG split	HRG4		HRG4+		Change
	Number of HRGs	% of HRGs	Number of HRGs	% of HRGs	
HRGs without CC split	881	52.7%	1,030	37.0%	-15.6%
HRGs with CC split	**792**	**47.3%**	**1,752**	**63.0%**	**+15.6%**
With Intermediate CC	88	5.3%	682	24.5%	+19.3%
With Major CC	139	8.3%	360	12.9%	+4.6%
With Minor CC	215	12.9%	122	4.4%	-8.5%
Without CC	350	20.9%	588	21.1%	+0.2%
Total	1,673		2,782		


DZ11R-DZ11V
Lobar, Atypical or Viral Pneumonia, without Interventions
DZ11N-DZ11Q
Lobar, Atypical or Viral Pneumonia, with Single Intervention
DZ11K-DZ11M
Lobar, Atypical or Viral Pneumonia, with Multiple Interventions
J440- COAD with infection (2)
D649- Anaemia (1)
E039- Hypothyroidism (1)
C509- Breast cancer (current, not history of) (2)
E119- Type 2 diabetes (1)
F03X- Dementia (1)
F329- Depression (1)
G20X- Parkinson's disease (1)
I10X- Hypertension (1)
I209- Angina (2)
I500- Congestive heart failure (1)
I739- Peripheral vascular disease (PVD) (1)
K449- Hiatus hernia (1)
M069- Rheumatoid arthritis (1)
M480- Spinal stenosis (1)
DZ11R
14+
DZ11S
10-13
DZ11T
7-9
DZ11U
4-6
DZ11V
0-3
CC score and HRG
DZ11N
13+
DZ11P
8-12
DZ11Q
0-7
CC score and HRG
DZ11K
14+
DZ11L
9-13
DZ11M
0-8
CC score and HRG
Tariff increases

Distribution of activity in HRG4 compared to HRG4+

- 56.6% of activity grouping to major in HRG4 now groups to intermediate in HRG4+
- This is due to the move to a scoring system rather than based on the single most resource intensive secondary diagnosis

	Major				Intermediate				Without			Major	Intermediate	Without
HRG4	DZ11K	DZ11N	DZ11R	DZ11S	DZ11L	DZ11P	DZ11T	DZ11U	DZ11Q	DZ11M	DZ11V			
DZ11A (major)	0.9%	2.4%	4.7%	21.7%	1.7%	3.3%	26.4%	25.1%	2.7%	1.4%	9.7%	29.7%	56.6%	13.8%
DZ11B (intermediate)	0.0%	0.0%	0.2%	3.2%	0.0%	1.1%	11.8%	34.9%	2.5%	1.2%	45.2%	3.3%	47.7%	48.9%
DZ11C (without)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	99.2%	0.0%	0.0%	100.0%
Other HRGs	2.9%	1.0%	8.8%	26.5%	6.9%	7.8%	20.6%	14.7%	2.0%	2.9%	5.9%	39.2%	50.0%	10.8%

What is the impact of data quality on the change from HRG4 to HRG4+?

Impact of data quality

CHKS data quality profile

Good data quality NHS Foundation Trust

July 2017

1. Data quality heat map

HRG sub-chapter	Data quality rating		Ave diagnoses	Ave procedures	Unspecified PD	Unspecified SD	Unspecified procs	Unrecorded CCs	Chapter-specific CCs
YH Musculoskeletal Imaging	RED	0.31							-
GB Hepatobiliary Endoscopies	RED	0.37							
HN Orthopaedic Non-Trauma Pro	AMBER	0.47							
PD Paediatric Respiratory	AMBER	0.49		-			-		
AB Pain Management	AMBER	0.49							-
PL Paediatric Renal	AMBER	0.50		-			-		
HC Spinal	AMBER	0.53							
PH Paediatric Rheumatology	AMBER	0.54		-			-		
YA Neurological Imaging	AMBER	0.54							
PW Paediatric Infectious Diseases	AMBER	0.57		-			-		
PB Neonatal Disorders	AMBER	0.59						-	
ED Open Cardiac Procedures	AMBER	0.59							
NZ Obstetric Medicine	GREEN	0.60							
PQ Paediatric Immune System	GREEN	0.61		-			-		
HT Orthopaedic Trauma Procedu	GREEN	0.62							
PJ Paediatric Dermatology	GREEN	0.62		-			-		
PR Paediatric Nervous System	GREEN	0.64		-			-		
YR Vascular Imaging	GREEN	0.65							
CD Dental Procedures	GREEN	0.65							-
WJ Infectious Diseases...	GREEN	0.65							
PK Paediatric Diabetology, Endoc	GREEN	0.66		-			-		
BZ Eyes and Periorbita	GREEN	0.67							
CB ENT Disorders	GREEN	0.67							
KA Endocrine Disorders	GREEN	0.68							
PN Paediatric Non-Malignant Hae	GREEN	0.68		-			-		
HD Musculoskeletal Disorders	GREEN	0.68		-			-		
AA Nervous System	GREEN	0.69							
PX Paediatric Medicine	GREEN	0.69		-			-		
EB Cardiac Disorders	GREEN	0.69		-			-		
EY Interventional Cardiology	GREEN	0.70							
YL Urological Imaging	GREEN	0.70							-
SC Radiotherapy	GREEN	0.71		-	-			-	-
GA Hepatobiliary Surgery	GREEN	0.72							
MB Female Repro Disorders	GREEN	0.72							
YQ Vascular Open Procedures ar	GREEN	0.72							
YF Gastrointestinal Imaging	GREEN	0.73							
PP Paediatric Ophthalmic	GREEN	0.73		-			-		
EC Congenital Heart Disease Pro	GREEN	0.74							
JA Breast	GREEN	0.74							

CHKS data quality profile

Poor data quality NHS Foundation Trust

July 2017

1. Data quality heat map

HRG sub-chapter	Data quality rating		Ave diagnoses	Ave procedures	Unspecified PD	Unspecified SD	Unspecified procs	Unrecorded CCs	Chapter-specific CCs	Signs & symptoms	Number of spells	Observed price of spells (£000s)	Expected price of spells (£000s)	Variance (£000s)	Variance (%)
PV Paediatric Trauma Medicine	RED	0.11		-				-		-	317	£ 231	£ 263	-£ 32	-12.1%
VA Multiple Trauma	RED	0.18							-	-	382	£ 1,352	£ 1,844	-£ 492	-26.7%
SC Radiotherapy	RED	0.22		-	-			-	-	-	-	-	-	-	-
EB Cardiac Disorders	RED	0.22		-				-			3,977	£ 4,693	£ 4,995	-£ 303	-6.1%
CB ENT Disorders	RED	0.23									1,118	£ 1,067	£ 1,066	£ 1	0.1%
HE Orthopaedic Disorders	RED	0.23									1,294	£ 1,364	£ 1,471	-£ 107	-7.3%
YA Neurological Imaging	RED	0.24						-	-		3	£ 6	£ 9	-£ 4	-37.6%
YD Thoracic Imaging	RED	0.25							-		146	£ 94	£ 107	-£ 13	-12.0%
NZ Obstetric Medicine	RED	0.27								-	5,108	£ 12,979	£ 13,536	-£ 557	-4.1%
CD Dental Procedures	RED	0.28							-		1,132	£ 681	£ 641	£ 40	6.2%
PN Paediatric Non-Malignant Hae	RED	0.28		-			-				38	£ 33	£ 47	-£ 14	-29.8%
BZ Eyes and Periorbita	RED	0.29								-	5,032	£ 3,844	£ 3,579	£ 66	1.8%
HN Orthopaedic Non-Trauma Pro	RED	0.29									4,849	£ 15,484	£ 15,677	-£ 213	-1.4%
JC Skin Surgery	RED	0.29							-		2,493	£ 1,548	£ 1,742	-£ 194	-11.2%
SB Chemotherapy	RED	0.29		-			-	-	-	-	-	-	-	-	-
LA Renal	RED	0.30									2,558	£ 5,133	£ 2,349	£ 2,784	118.5%
PF Paediatric Gastroenterology	RED	0.31		-			-				827	£ 458	£ 530	-£ 72	-13.5%
PP Paediatric Ophthalmic	RED	0.31		-			-			-	37	£ 32	£ 32	£ 0	0.7%
GC Hepatobiliary Disorders	RED	0.31									1,431	£ 2,627	£ 3,101	-£ 474	-15.3%
PD Paediatric Respiratory	RED	0.32		-			-				1,305	£ 1,058	£ 1,259	-£ 202	-16.0%
CA ENT Procedures	RED	0.32									3,002	£ 2,972	£ 3,902	-£ 930	-23.8%
YF Gastrointestinal Imaging	RED	0.32									53	£ 104	£ 152	-£ 48	-31.7%
JD Skin Disorders	RED	0.33									1,487	£ 2,275	£ 2,593	-£ 319	-12.3%
WJ Infectious Diseases...	RED	0.34									1,414	£ 2,873	£ 3,385	-£ 512	-15.1%
FZ Digestive System	RED	0.34									23,735	£ 20,740	£ 24,034	-£ 3,293	-13.7%
MB Female Repro Disorders	RED	0.35									1,436	£ 942	£ 1,172	-£ 230	-19.6%
LB Urological/ Male Repro	RED	0.35									5,248	£ 5,655	£ 5,813	-£ 158	-2.7%
PW Paediatric Infectious Disease	RED	0.35		-			-				1,225	£ 970	£ 1,119	-£ 149	-13.3%
YG Hepatobiliary and Pancreatic	RED	0.35									103	£ 111	£ 183	-£ 72	-39.5%
DZ Thoracic	RED	0.36									6,882	£ 12,403	£ 15,345	-£ 2,942	-19.2%
HD Musculoskeletal Disorders	RED	0.37		-			-				4,160	£ 3,127	£ 3,978	-£ 851	-21.4%
PX Paediatric Medicine	RED	0.38		-			-				1,445	£ 894	£ 987	-£ 92	-9.4%
JA Breast	RED	0.38									1,124	£ 2,149	£ 2,031	£ 117	5.8%
GA Hepatobiliary Surgery	RED	0.39									737	£ 1,800	£ 2,163	-£ 363	-16.8%
GB Hepatobiliary Endoscopies	RED	0.39									343	£ 691	£ 739	-£ 48	-6.5%
PG Paediatric Hepatobiliary	RED	0.40		-	-			-			10	£ 18	£ 20	-£ 2	-9.1%
EC Congenital Heart Disease Pro	RED	0.40									31	£ 69	£ 181	-£ 112	-61.9%
SA Haematological	RED	0.40		-				-			5,369	£ 3,570	£ 4,380	-£ 809	-18.5%
WH Poisoning, Toxic Effects...	RED	0.40									2,195	£ 2,366	£ 2,393	-£ 27	-1.1%

Depth of coding

Quality of coding

CCs / signs & symptoms

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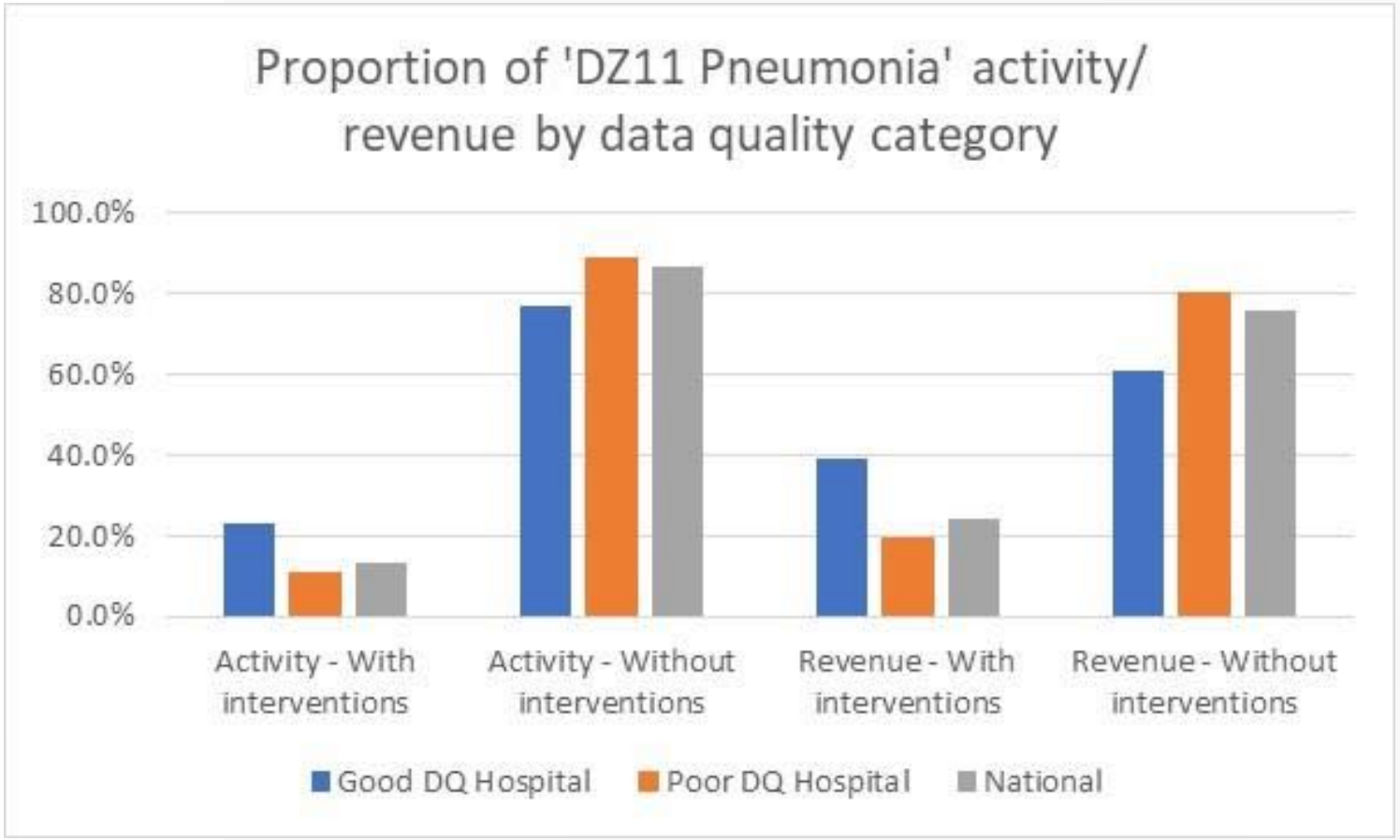
Impact on national tariff - interventions

HRG code	HRG name	Non-elective spell tariff 2017-18 (£)
DZ11K	Lobar, Atypical or Viral Pneumonia, with Multiple Interventions, with CC Score 14+	7,846
DZ11L	Lobar, Atypical or Viral Pneumonia, with Multiple Interventions, with CC Score 9-13	6,457
DZ11M	**Lobar, Atypical or Viral Pneumonia, with Multiple Interventions, with CC Score 0-8**	**4,530**
DZ11N	Lobar, Atypical or Viral Pneumonia, with Single Intervention, with CC Score 13+	6,807
DZ11P	Lobar, Atypical or Viral Pneumonia, with Single Intervention, with CC Score 8-12	4,426
DZ11Q	**Lobar, Atypical or Viral Pneumonia, with Single Intervention, with CC Score 0-7**	**3,487**
DZ11R	Lobar, Atypical or Viral Pneumonia, without Interventions, with CC Score 14+	5,494
DZ11S	Lobar, Atypical or Viral Pneumonia, without Interventions, with CC Score 10-13	3,797
DZ11T	Lobar, Atypical or Viral Pneumonia, without Interventions, with CC Score 7-9	2,805
DZ11U	Lobar, Atypical or Viral Pneumonia, without Interventions, with CC Score 4-6	2,154
DZ11V	**Lobar, Atypical or Viral Pneumonia, without Interventions, with CC Score 0-3**	**1,482**

Impact of data quality on trust revenue - interventions



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Impact on national tariff - comorbidities

HRG code	HRG name	Non-elective spell tariff 2017-18 (£)
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Impact of data quality on trust revenue - CCs

- Taken a sample of NHS trusts with differing data quality ratings and grouped and priced Q1 2017/18 data under HRG4 and HRG4+

- For activity belonging to HRGs with CC splits, trusts rated ‘Good’ for data quality increased revenue by a higher proportion than those rated ‘Poor’

DQ rating	HRG4 CC type	HRG4+ CC type	HRG4 revenue	HRG4+ revenue	Change in revenue
Good	With CC	With CC	£ 37.8m	£ 42.2m	11.4%
	Without CC	With CC	£ 4.6m	£ 5.9m	28.8%
Poor	With CC	With CC	£ 32.5m	£ 33.7m	3.8%
	Without CC	With CC	£ 4.3m	£ 5.4m	25.1%

Case study - impact to hospital on coding audit

- What impact will the implementation of HRG4+ have on our coding audit outcomes?
- Findings
  - 2016/17 activity at a client was audited by our coding audit team and the corrected coding was run through HRG4 and HRG4+ groupers to assess impact
  - Errors impacting the HRG (and therefore tariff) increased by 2.2% in HRG4+
  - In HRG4 payment was increased by 0.6% when errors corrected. This gap increased to 1.8% in HRG4+
  - Main cause of the new payment errors were missing comorbidities which did not drive a change to the HRG in HRG4

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Case study - impact to hospital on coding audit

- Conclusions
  - Coding errors are more likely to impact on price
  - Capture and coding of relevant/mandatory comorbidities through good source documentation even more crucial in HRG4+
  - Clinical engagement crucial to improve any issues with documentation

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Case study - impact to hospital on maternity coding

- CCG saw a 32% increase in income from deliveries in 2017/8 – was this accurate or a reflection of poor coding?
- Findings
  - Delivery HRGs have increased from 19 to 36 in HRG4+ due the increased CC splits
  - The number of comorbidities that can trigger a higher level of HRG within the maternity subchapter (NZ) has increased from 95 to 817 possible diagnosis codes
  - Still only two tariffs for with/without complications - both increased in value in 2017/18
  - The % of HRGs considered to involve a complication has increased by 33.9%
  - Caesareans with cc score 0 are considered complex (lower tariff in 16/17)
  - Clinical coding audit undertaken showed coding was accurate
  - A review of costs showed that income was relative to costs

Case study - impact to hospital on maternity

- Conclusions
  - Increase was real and due to factors described above and not due to poor coding
  - Delivery costs now covered by tariff (which was not the case in 16/17!)

Overall impact of data quality on hospital revenue

- Try not to focus on one specific area to assess impact as there will be some areas of gain and loss
- Overall hospitals with good data quality see a higher increase in revenue under HRG4+ than trusts with poor data quality

DQ rating	HRG4 revenue	HRG4+ revenue	Change in revenue
Good	£ 102.9m	£ 107.3m	4.20%
Poor	£ 106.4m	£ 107.0m	0.50%

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Conclusions

- Hospitals with poor data quality/low depth of coding will see a greater impact on revenue
  - Poor DQ hospitals will hit less intervention and high CC score HRGs
- Where income is significantly different this could be because
  - An issue with the previous version had been corrected (i.e. 16/17 price was too high/low)
  - There is a data quality issue at the hospital – is the activity correctly classified? Are you counting activity differently to other hospitals?
  - Issues with coding
    - Coding audits may see increase in error rates that impact on payment
    - High quality source documentation and good clinical engagement needed more than ever

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That's all Folks!