

Examination of Centre Effects using the ANZData registry ANZSN 53rd ASM Darwin 5th September

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The AKTN operates within the UQ School of Medicine's
Centre for Kidney Disease Research (CKDR).

Peritoneal Dialysis centre effects' analyses

- Significant variation in PD outcomes is known to exist
- Identifying centre practices associated with outcomes is important as these practices may be modifiable and be relevant to quality improvement

Aim: To determine the relative contributions of patient characteristics and dialysis centre characteristics

Hypothesis: Centre factors are an important contributor to variation in important PD outcomes



Methods

PD outcomes of interest examined

- Incidence of peritonitis: published
- Technique failure : published
- Outcome of peritonitis : under review

Statistical method

- 2 level mixed effects models with random intercept for dialysis centres
- Fixed effects were patient and centre characteristics



Methods

Study populations

- Australian incident PD patients
- ANZData registry
- 2003-2013 (peritonitis)
- 2004-2014 (technique failure; cure of peritonitis)
- 51 centres: 8711 (Peritonitis); 9362 (technique failure); 4428 (cure of peritonitis)

Model building

Model 1

- *only centre (random effect) intercept only model*
- *obtain estimate for risk each centre & sd (sd1) relating to variation*

Model 2

- Model 1+ add patient characteristics (fixed effects)
- *obtain estimate for each centre & sd (sd2) relating to variation*
- ***% reduction in variation = $(sd1 - sd2) / sd1$***

Model 3

- Model 2 + add centre characteristics (as fixed effect)
- *obtain estimate for each centre & sd (sd3) relating to variation*
- ***Further % reduction = $(sd2 - sd3) / sd2$***

Methods

Patient characteristics:

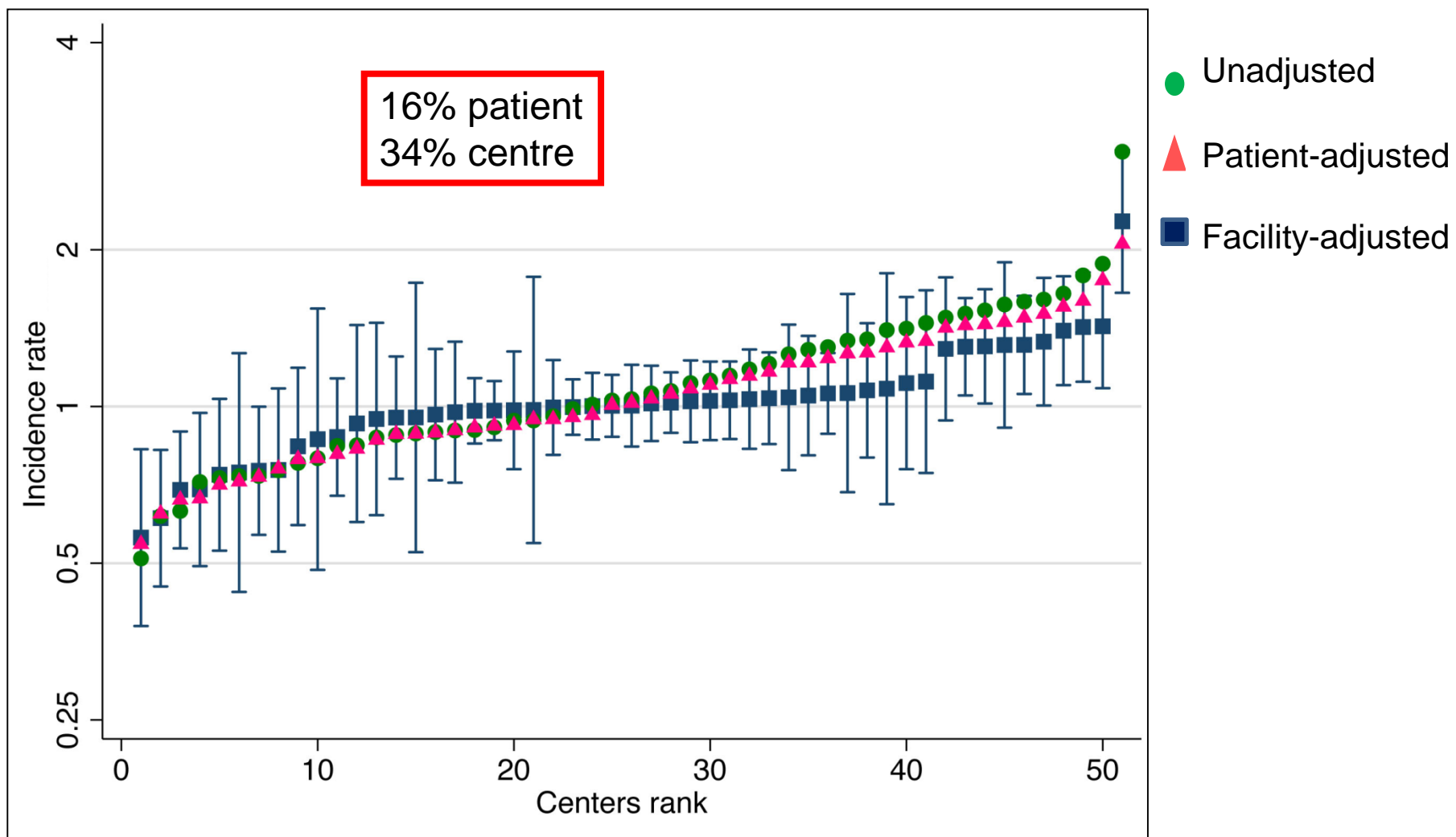
- Age, gender, race and diabetes + (patient level model)

Centre characteristics:

- Centre size, PD %, APD exposure, icodextrin exposure, PET performance, and *analysis-specific factors*
- 1st and 4th quartile compared with combined 2nd and 3rd quartile

Peritonitis rates

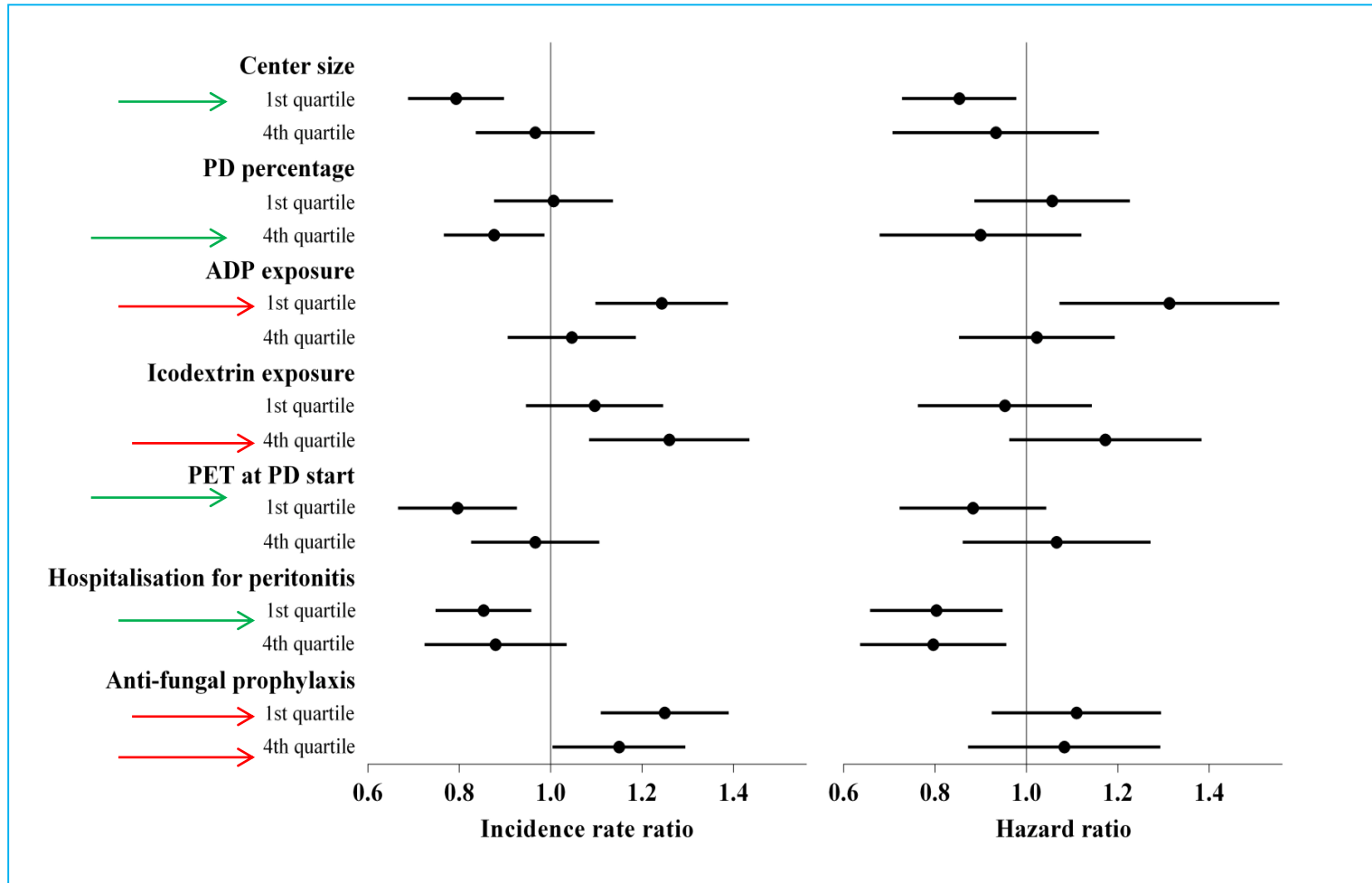
Centre Variation in Peritonitis Rates



Centre characteristics : Peritonitis risk

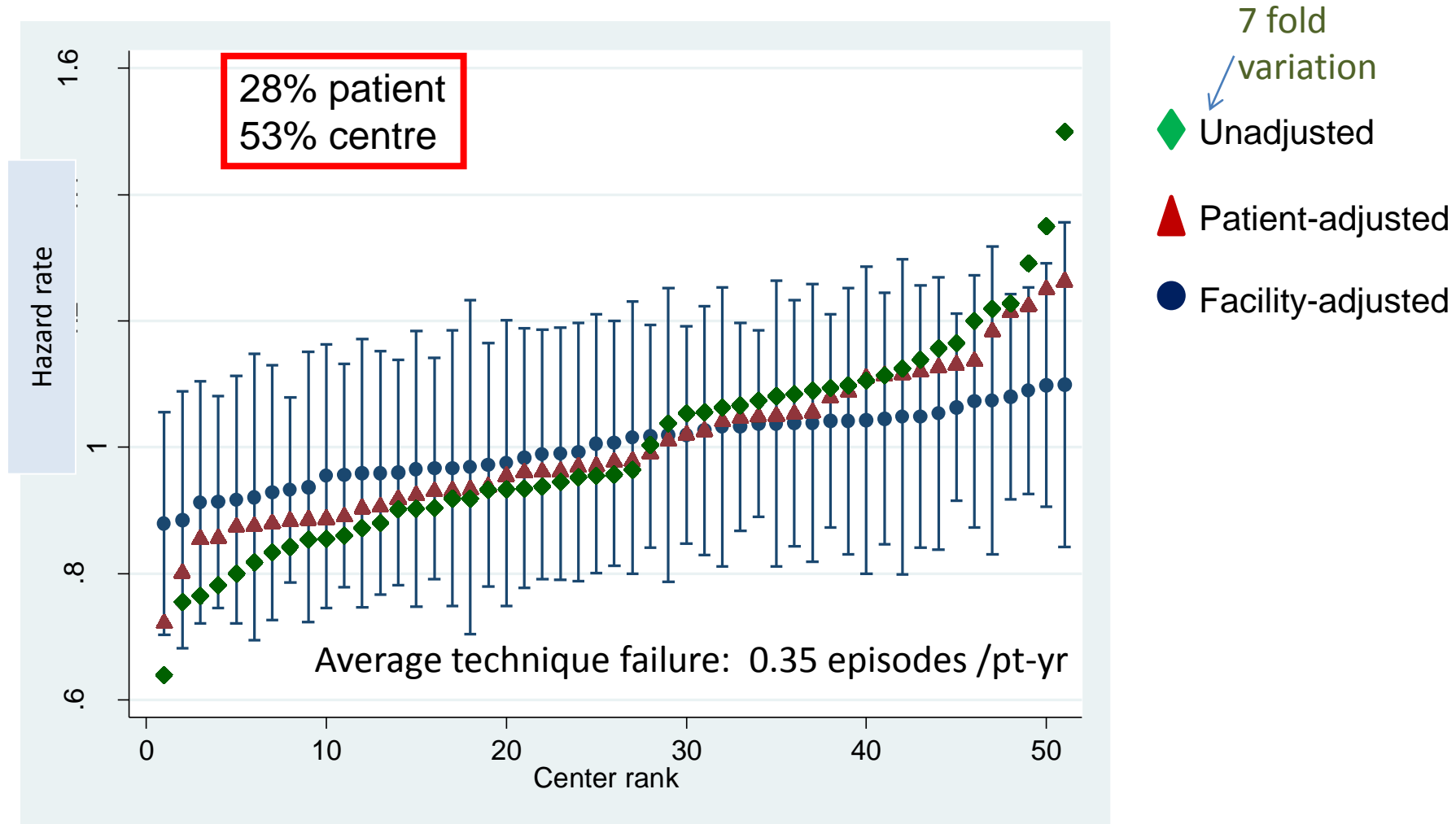
Center-level characteristics	Variation across centers (n=51)
Center size (total patient-years of follow-up)	220 (113-425)
Percentage of PD (versus overall dialysis population)	20% (16%-26%)
Transplantation center (n, %)	19 (37%)
APD treatments exposure (% patients in center)	73% (49%-85%)
Icodextrin solution exposure (% patients in center)	46% (30%-56%)
Biocompatible solutions exposure (% patients in center)	2% (0%-10%)
PET performed at PD initiation (% patients in center)	54% (36%-62%)
Anti-fungal prophylaxis (% peritonitis in center)	64% (24%-82%)
Hospitalisation for peritonitis (% peritonitis in center)	49% (28%-62%)
Catheter removal with peritonitis (% peritonitis in center)	20% (15%-24%)

Centre characteristics associated with peritonitis risk



Technique Failure

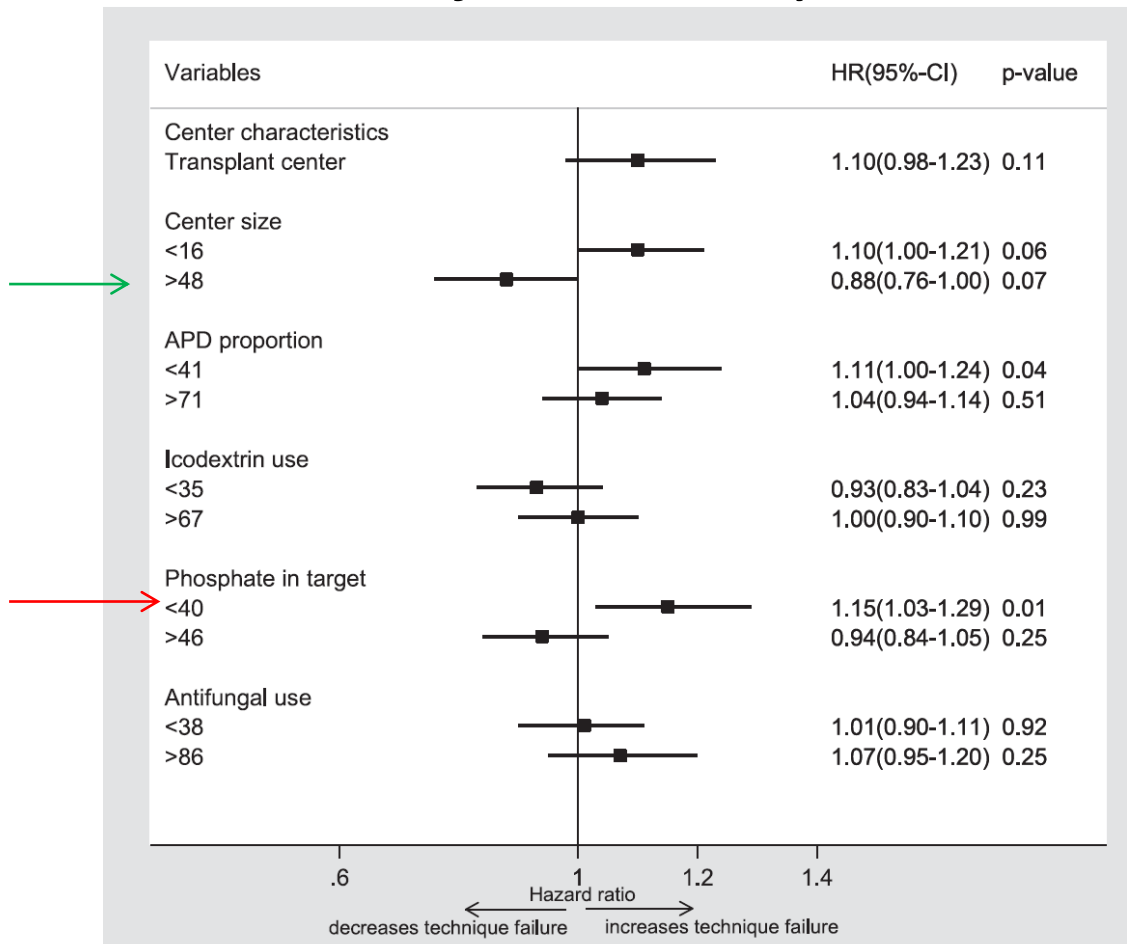
Centre Variation in Technique Failure



Center characteristics associated with technique failure

Adjusted analyses

% Patients on PD also predictive



Htay et al ; Clin J Am Soc Nephrol 2017; 12: 1090-1099

Peritonitis Cure with antibiotics

Paper under review

Conclusions 1

- Centre characteristics accounted for important variation in risk of peritonitis, technique failure, and cure of peritonitis with antibiotics
- Whether these factors are directly related to the outcomes or relate to surrogate markers for other characteristics of units is uncertain

Conclusions 2

- More methodological research is required
- More information on centre factors that may influence important outcomes is required

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