BCKD 2023

BC KIDNEY DAYS

Trends after transfer from home dialysis: Can we do better?

Simon Davies

Keele University

Scope

- Stating the problem
- Its not all about mortality – what about the experience of modality transfer?
- How are we going to continue to improve?
  - Understanding modality transition
  - Evidence that this is also centre-level issue (ANZDATA, PDOPPS)
  - What centre-level ‘levers’ do we have?
  - Making the case for understanding centre ‘culture’
  - Characterizing Centre Culture – lessons form Inter-CEPt

INTEGRATED
International Group Research
Assessing Transition Effects in Dialysis

PDOPPS
Peritoneal Dialysis Outcomes and Practice Patterns Study

ANZ DATA
Australia & New Zealand Dialysis & Transplant Registry

Inter-CEPt

SONG-PD

1 CORE OUTCOMES
Critically important
to all stakeholder groups
Report in all trials

2 MIDDLE TIER
Critically important to
some stakeholder groups
Report in some trials

3 OUTER TIER
Important to some or
all stakeholder groups
Consider for trials

PD-INFECTION
CARDIOVASCULAR DISEASE
MORTALITY
TECHNIQUE SURVIVAL
LIFE PARTICIPATION

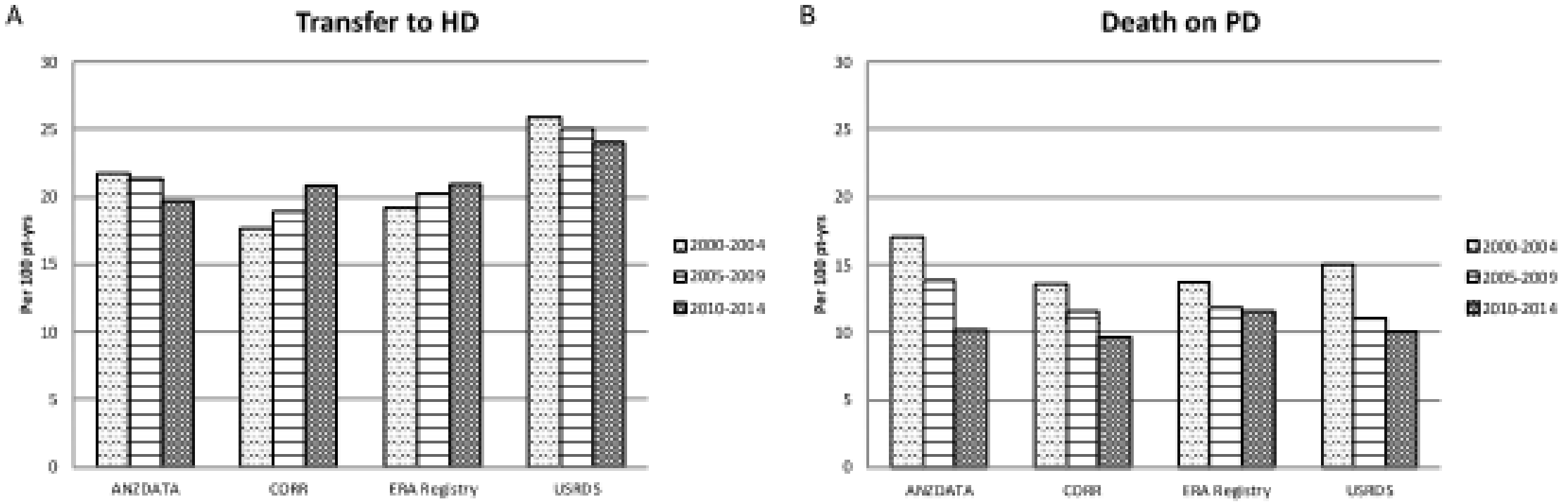
2 Anemia
Blood pressure
Bone disease
Catheter complications
Diabetes
Fatigue
Fluid
Gastrointestinal problems
Hospitalization
Impact on family/friends
Membrane function
Mobility
PD-pain
Peritoneal sclerosis
Potassium
Residual kidney function
Sleep

3 Ability to travel
Appearance
Body temperature
Calcium
Cramping
Dizziness
Flexibility with time
Itch/skin
Lipids
Memory/cognition
Mood
Pain (non-PD)
Parathyroid hormone
Restless legs
Sexual function
Weight change

Mortality Trends After Transfer From Peritoneal Dialysis to Hemodialysis

Annie-Claire Nadeau-Fredette[1,2,16], Nidhi Sukul[3,4,16], Mark Lambie[5,16], Jeffrey Perl[6], Simon Davies[5], David W. Johnson[7,8,9], Bruce Robinson[10], Wim Van Biesen[11], Anneke Kramer[12], Kitty J. Jager[12], Rajiv Saran[13], Ronald Pisoni[10] and Christopher T. Chan[14]; and on behalf of the INTEGRATED Study Group[15]

6683 (ANZDATA)
5847 (CORR)
21,574 (ERA Registry)
80,459 (USRDS).



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ANZ DATA AUSTRALIA & NEW ZEALAND DIALYSIS & TRANSPLANT REGISTRY

Mortality Trends After Transfer From Peritoneal Dialysis to Hemodialysis

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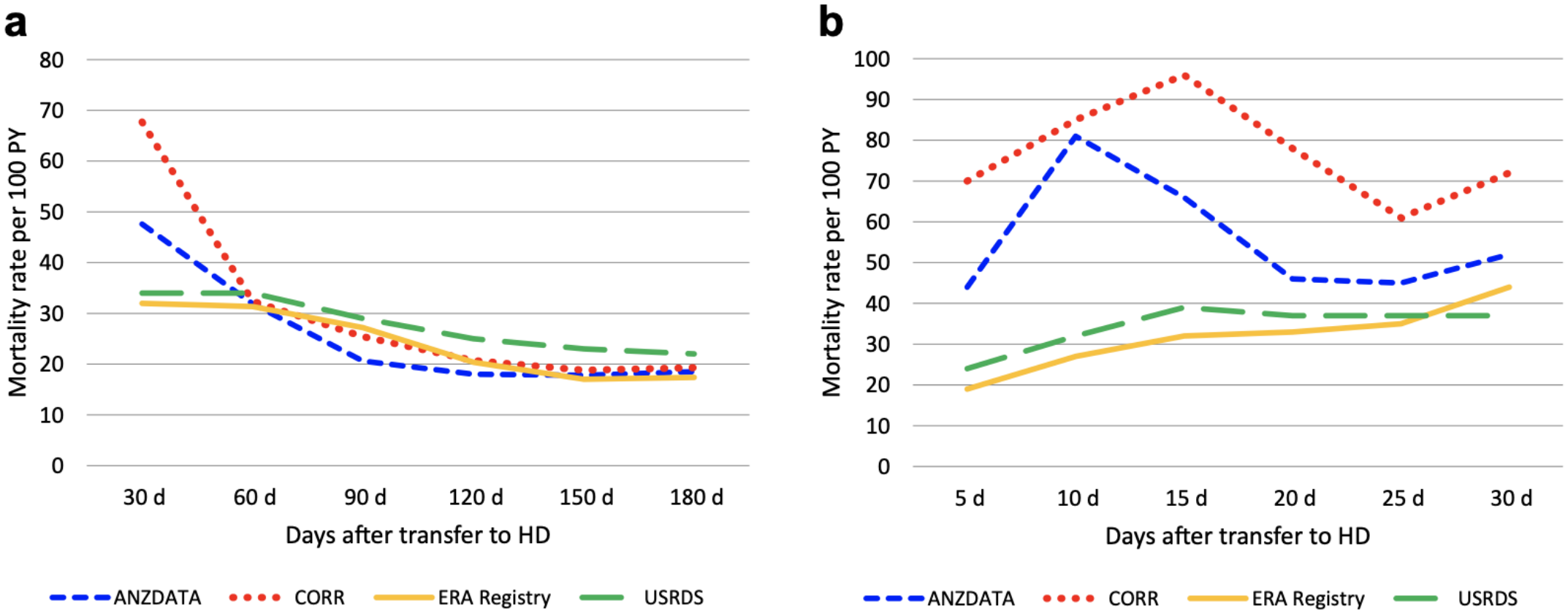
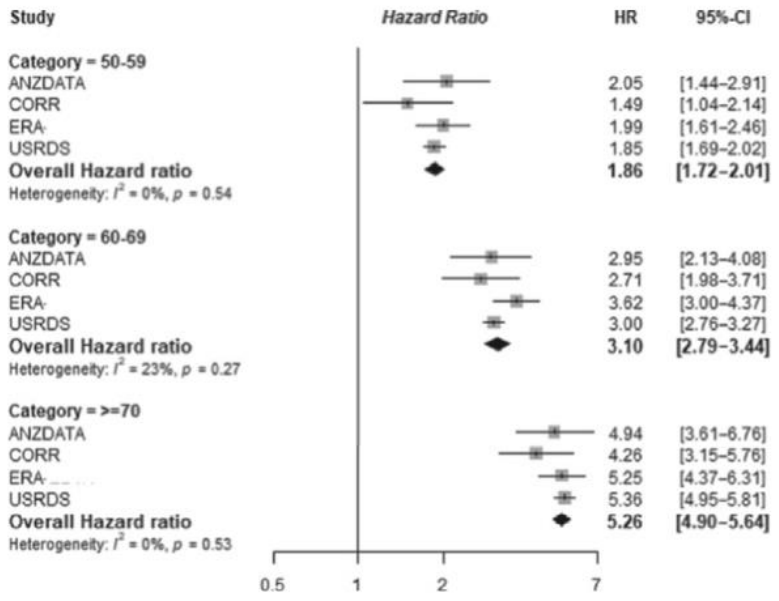
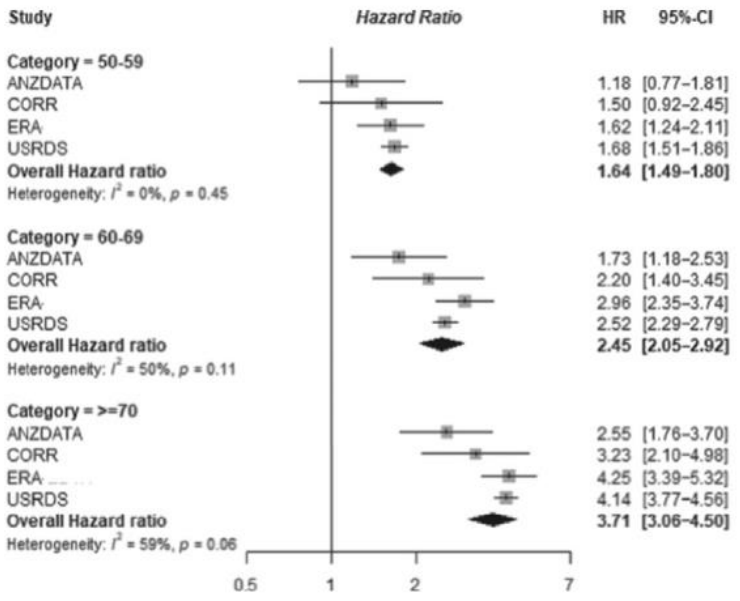


a Age

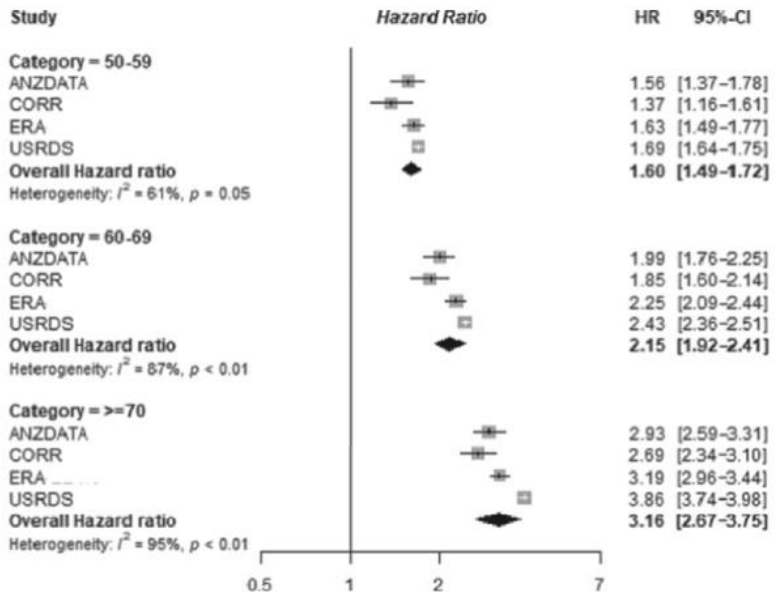
<u><90 days after transfer</u>



<u>90-180 days after transfer</u>

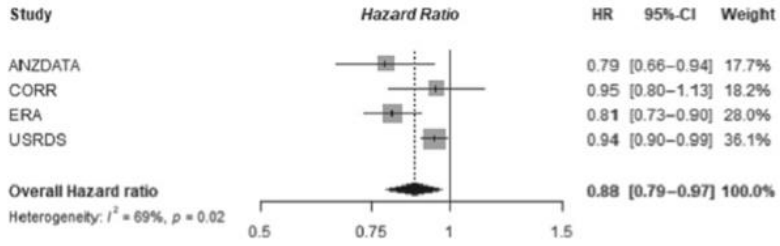


<u>>180 days after transfer</u>

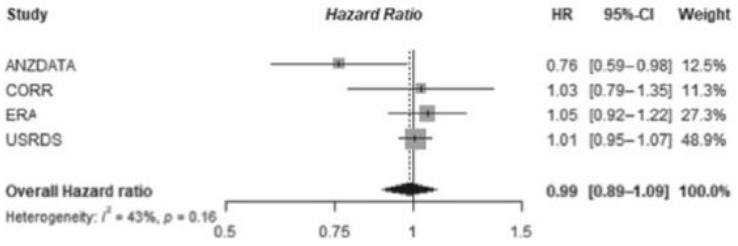


b Sex

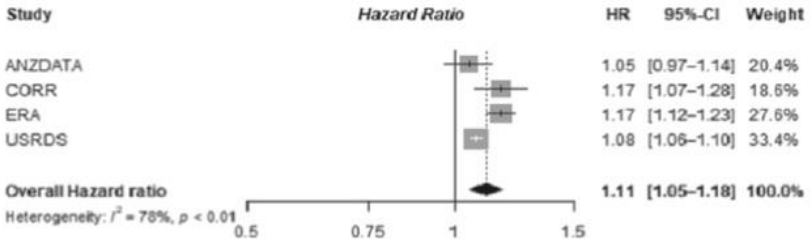
<u><90 days after transfer</u>



<u>90-180 days after transfer</u>



<u>>180 days after transfer</u>



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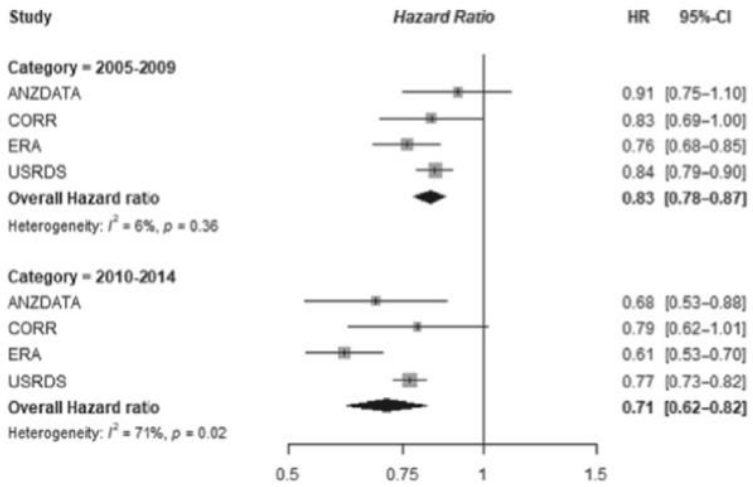
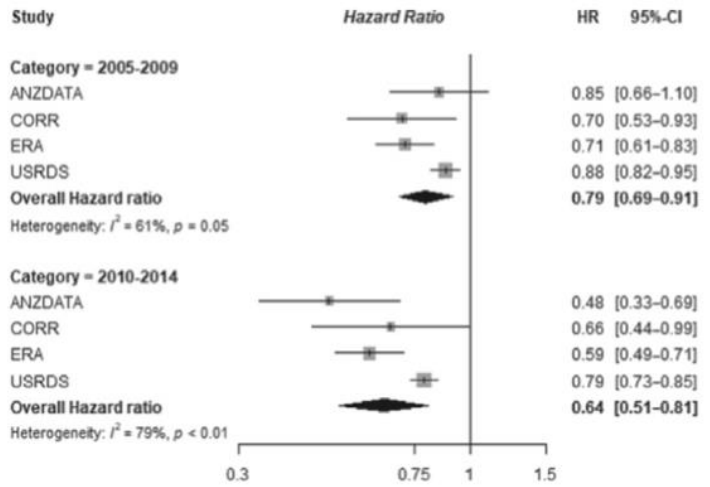
c Cohort years

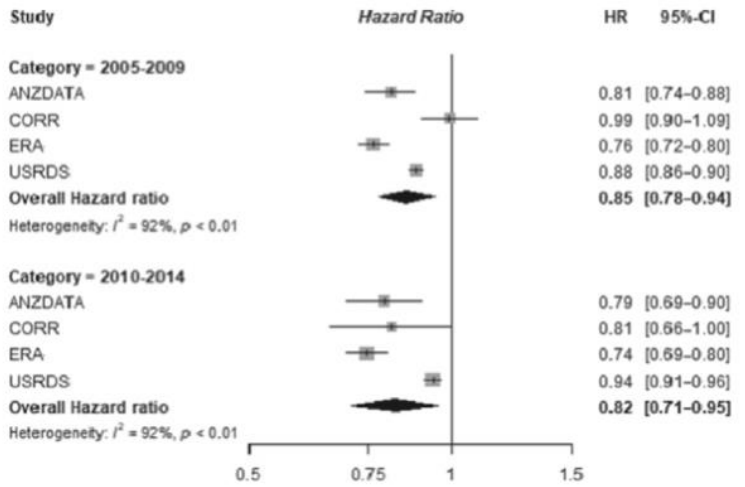
<90 days after transfer



90-180 days after transfer

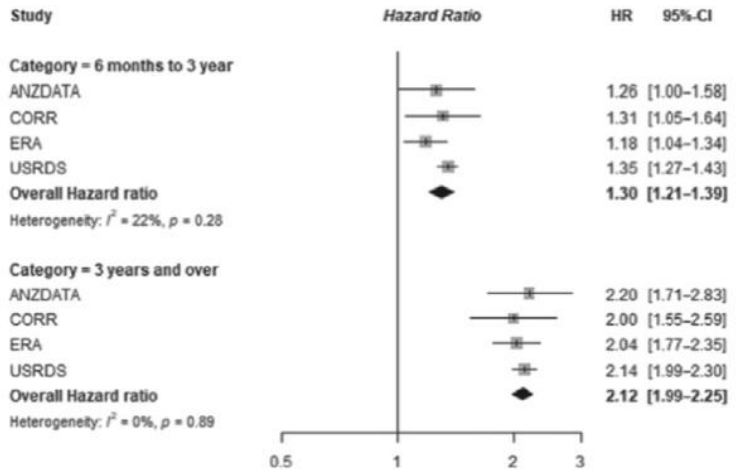


>180 days after transfer

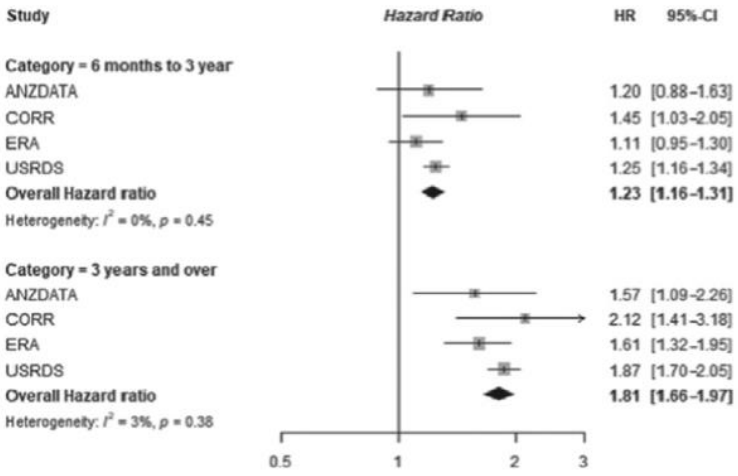


d PD duration

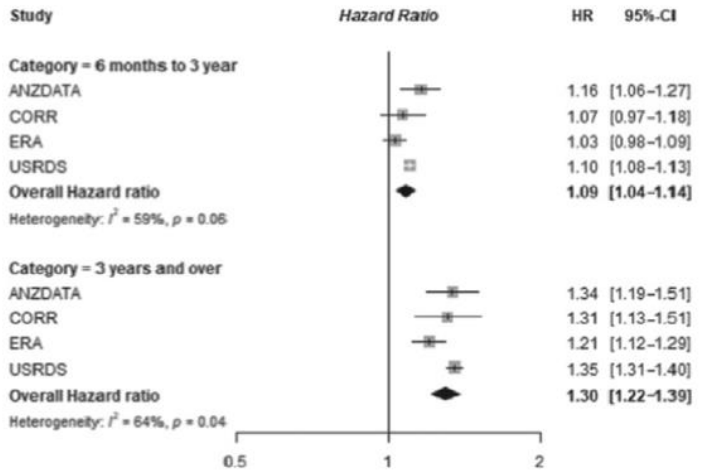
<90 days after transfer



90-180 days after transfer



>180 days after transfer



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Mortality and modality switching

- Mortality on PD has decreased over time
- Modality switch rate is converging
- Mortality after switch is
  - Increased after transfer – maximal first 30 days and detectable up to 150 days
  - There are regional differences (not clear why)
  - Risk factors are
    - Age (being older)
    - Sex (<90 days female, 90-180 days =, >180 days male)
    - Cohort period: Morality risk after switch is falling
    - PD duration: increased risk > years is about double

PERITONEAL DIALYSIS INTERNATIONAL

Original Article

Peritoneal Dialysis International
1–8
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Patients' experiences of transitioning between different renal replacement therapy modalities: A qualitative study

Els Holvoet[1], Sofie Verhaeghe[2], Simon Davies[3], Gill Combes[4], Karlien François[5], David Johnson[6,7,8], Wim Van Biesen[1] and Liesbeth Van Humbeeck[1]

PLOS ONE

RESEARCH ARTICLE

Renal staffs' understanding of patients' experiences of transition from peritoneal dialysis to in-centre haemodialysis and their views on service improvement: A multi-site qualitative study in England and Australia

Janet E. Jones[1]*, Sarah L. Damery[1], Kerry Allen[2], David W. Johnson[3¤a¤b], Mark Lambie[4], Els Holvoet[5], Simon J. Davies[4]

PERITONEAL DIALYSIS INTERNATIONAL

Original Article

Peritoneal Dialysis International
1–8
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How do patients and their family members experience the transition from peritoneal dialysis to incentre haemodialysis? A multisite qualitative study in England and Australia

Kerry Allen[1], Sarah L Damery[2], Kim Sein[2], David W Johnson[3], Simon J Davies[4], Mark Lambie[4], Els Holvoet[5] and Gill M Combes[2]

What did these studies tell us?

- Common themes for patients: *although every situation is unique*
  - **resistance to change and fear of HD**; (anticipation of loss, loss of control, but in retrospect there can be gains/re-gain of control; preconception about HD – not always correct in retrospect)
  - **transition experience shared with family**; (Can be a relief for the family)
  - **bodily adjustment and sense of self**. (incontinence, fistulas, higher care requirements, transport – but some improvements…no fluid in belly)
- What do staff see as good clinical practice around transition?
  - **Effective communication and planning** (patients understanding why)
  - **Avoid negative perceptions of alternative modality**
  - **Good continuity of care across transfer** (?same team/consultant)
  - **Access to psychological services**

If we are to improve mortality after modality switch we need to understand modality transitions better

- Classifying/Defining modality switch
  - Causes for switching change over time

- Switching needs to be understood on the context of competing risks
  - Transplantation opportunity – time on treatment
  - Death – the elderly may die before transition occurs, maybe some switching is futile?

- Which factors are associated with switching risk?
  - Patient level factors
  - Centre level factors
  - Are these centre level factors modifiable?

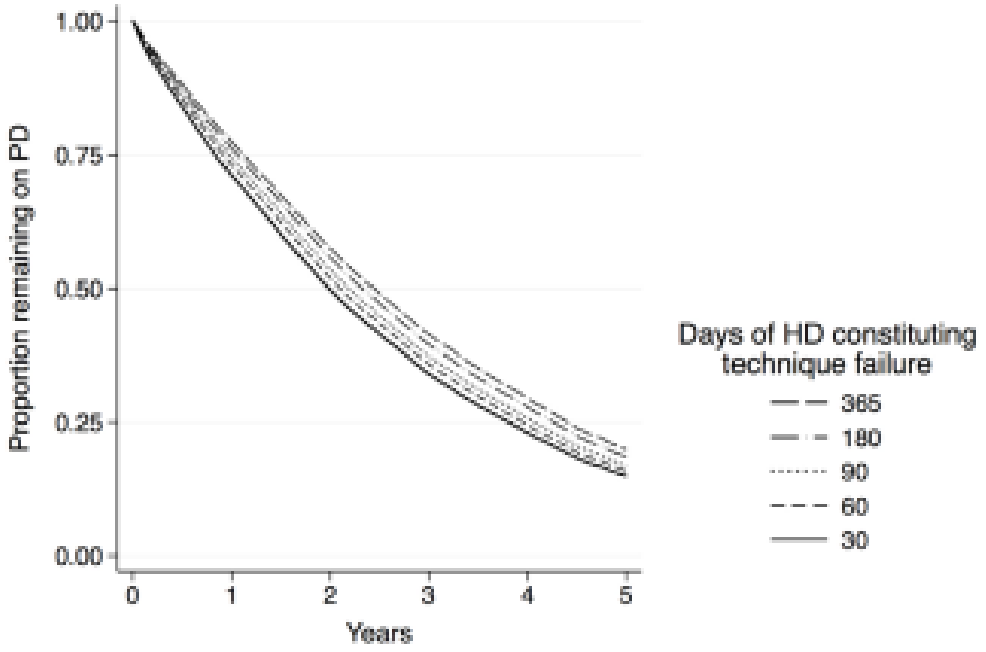
Outcome measures for technique survival reported in peritoneal dialysis: A systematic review

Emma Elphick[1], Matthew Holmes[1], Matthew Tabinor[1], Yeoungjee Cho[2,3,4], Thu Nguyen[5], Tess Harris[6,7], Angela Yee Moon Wang[8], Arsh K Jain[9], Daniela Ponce[10], Josephine SF Chow[11,12,13,14], Annie-Claire Nadeau-Fredette[15], Adrian Liew[16], Neil Boudville[17], Allison Tong[18], David W Johnson[2,3,4], Simon J Davies[1], Jeffrey Perl[19], Karine E Manera[18] and Mark Lambie[1]

- 17 different definitions over 25 trials
- Where defined, 5 included death, 5 did not
- Minimum time on HD (reported in 6 studies)
  - 30 days (2 trials)
  - “permanent transfer” (2 trials)
  - “any duration” (1 trial)
  - “on PD until end of follow up” (1 trial)

DURATION OF HEMODIALYSIS FOLLOWING PERITONEAL DIALYSIS CESSATION IN AUSTRALIA AND NEW ZEALAND: PROPOSAL FOR A STANDARDIZED DEFINITION OF TECHNIQUE FAILURE

Patrick G. Lan,[1,2,3] Philip A. Clayton,[1,2,3] David W. Johnson,[4,5] Stephen P. McDonald,[1,6,7] Monique Borlace,[6] Sunil V. Badve,[4] Kamal Sud,[8,9] and Neil Boudville[10]

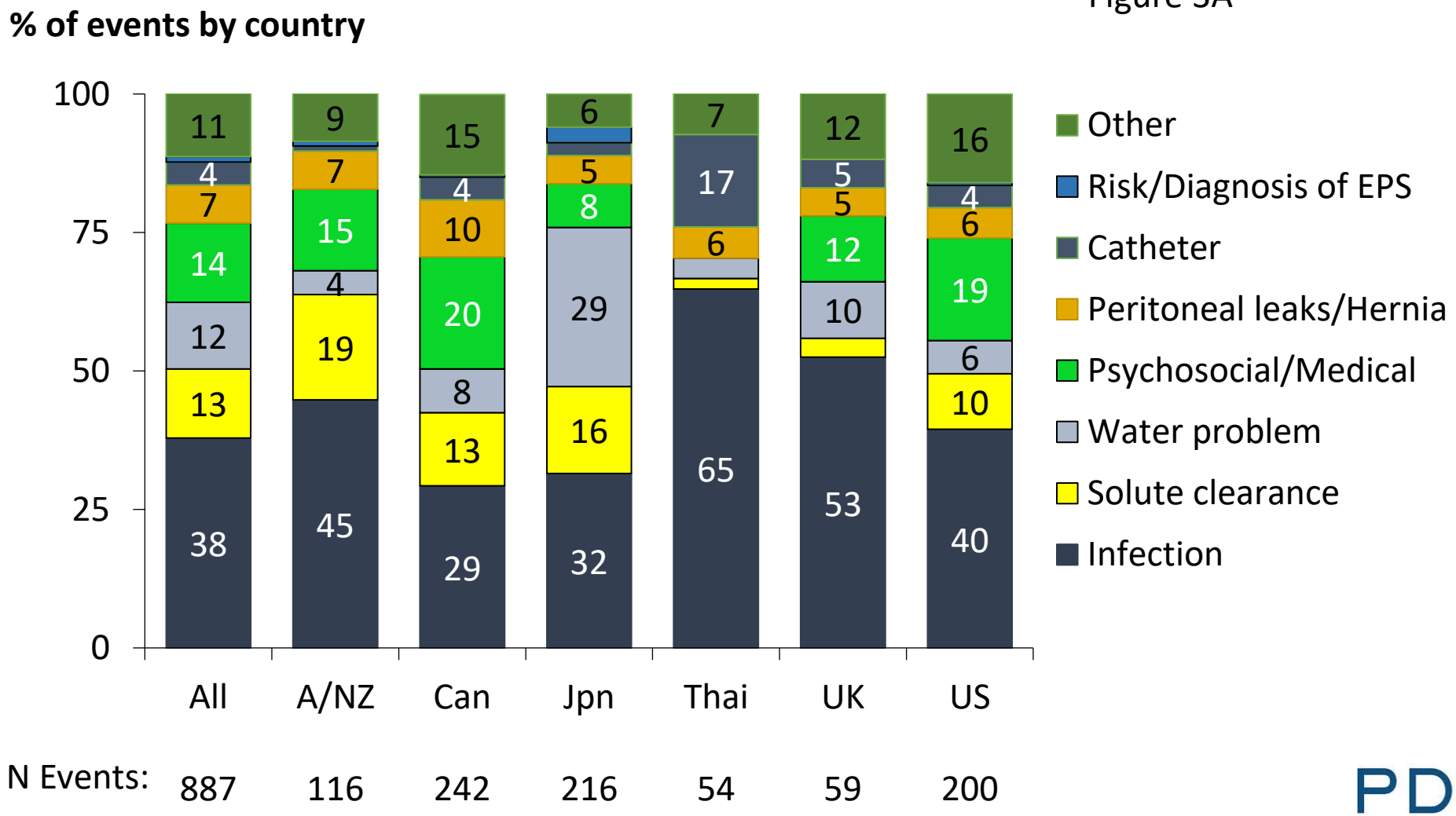


Reasons for Technique Failure by Definition

Reason for failure/cessation of PD	Definition 30 days (*n*=11,467)	60 days (*n*=11,217)	90 days (*n*=11,037)	180 days (*n*=10,695)	365 days (*n*=10,274)
Death	4,535 (40%)	4,670 (42%)	4,788 (43%)	4,922 (46%)	4,954 (48%)
Infection	3,166 (28%)	3,104 (28%)	2,938 (27%)	2,677 (25%)	2,502 (24%)
Inadequate dialysis	1,206 (11%)	1,216 (11%)	1,206 (11%)	1,173 (11%)	1,083 (11%)
Mechanical	1,380 (12%)	1,070 (10%)	976 (9%)	853 (8%)	756 (7%)
Encapsulating peritoneal sclerosis	19 (<0.2%)	19 (<0.2%)	19 (<0.2%)	20 (<0.2%)	16 (<0.2%)
Social	907 (8%)	903 (8%)	890 (8%)	865 (8%)	819 (8%)
Other	115 (1%)	105 (1%)	100 (1%)	87 (1%)	78 (1%)
Not reported	139 (1%)	130 (1%)	120 (1%)	98 (1%)	66 (1%)

Reason switched to HD by country

Figure 3A

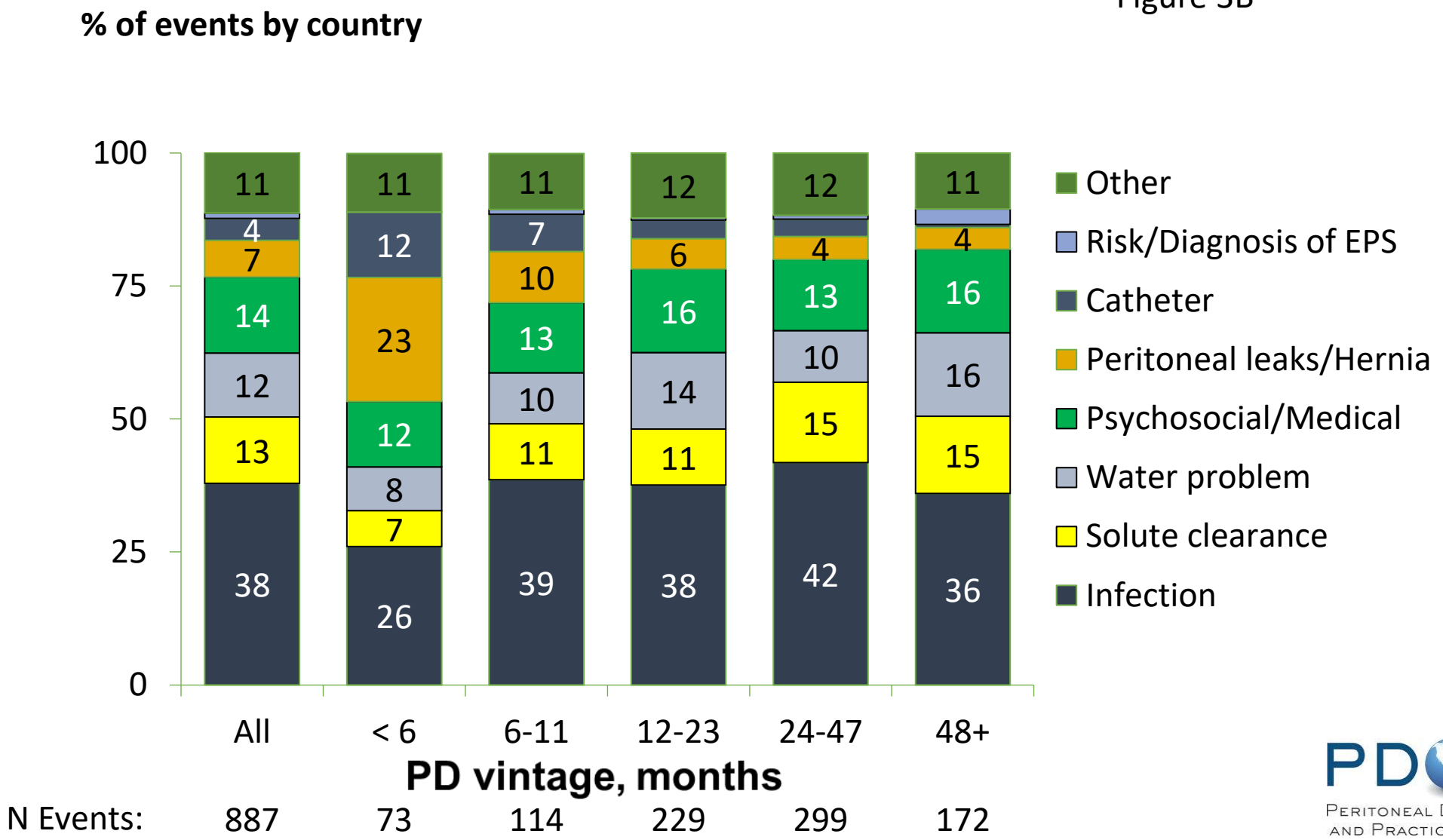


PDOPPS
Peritoneal Dialysis Outcomes and Practice Patterns Study

Lambie et al, CJASN 2022

Reason by PD vintage at time of switch

Figure 3B



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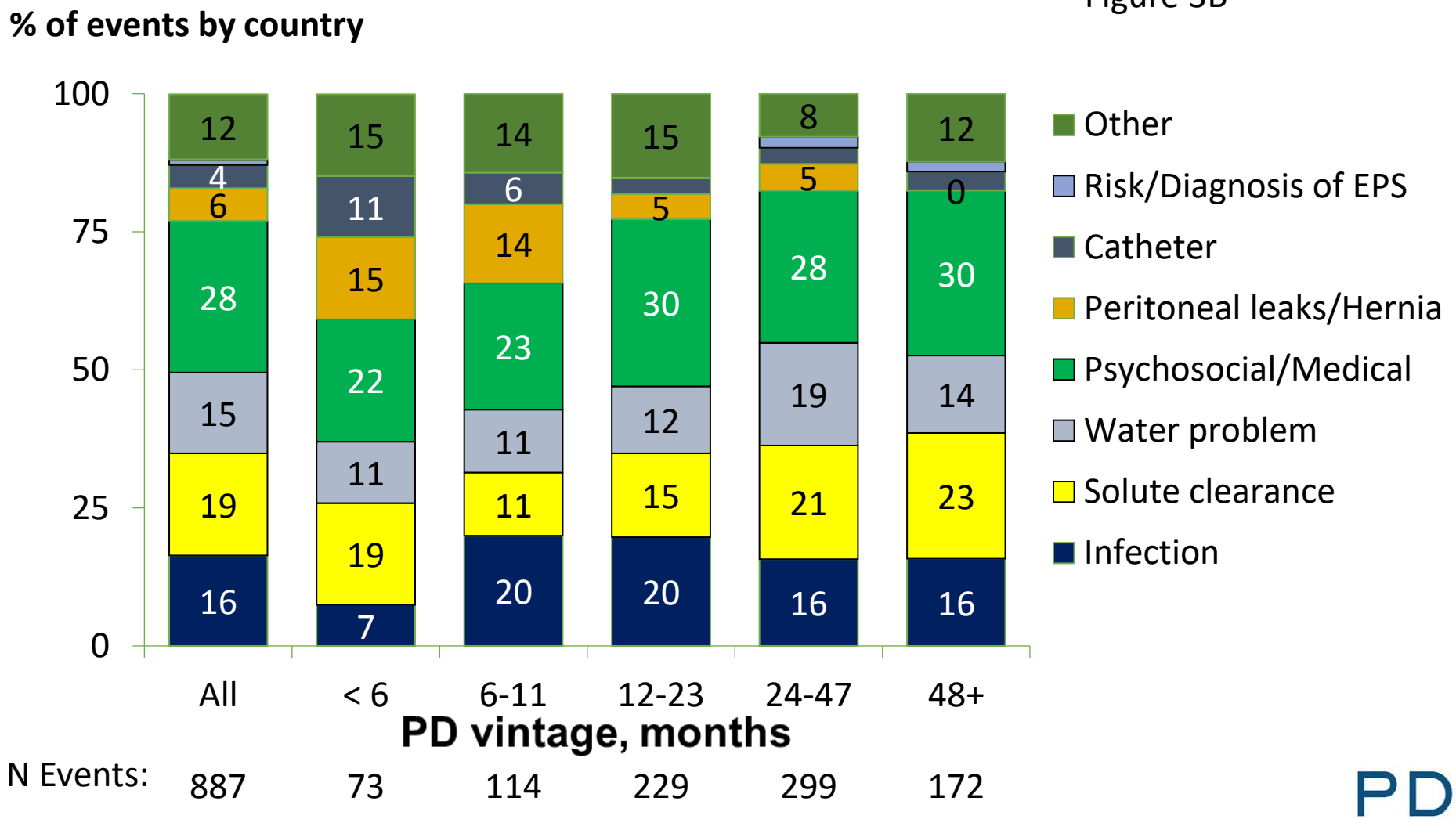
Lambie et al, CJASN 2022

Secondary reason by PD vintage at time of switch

Figure 3B



N Events:	887	73	114	229	299	172

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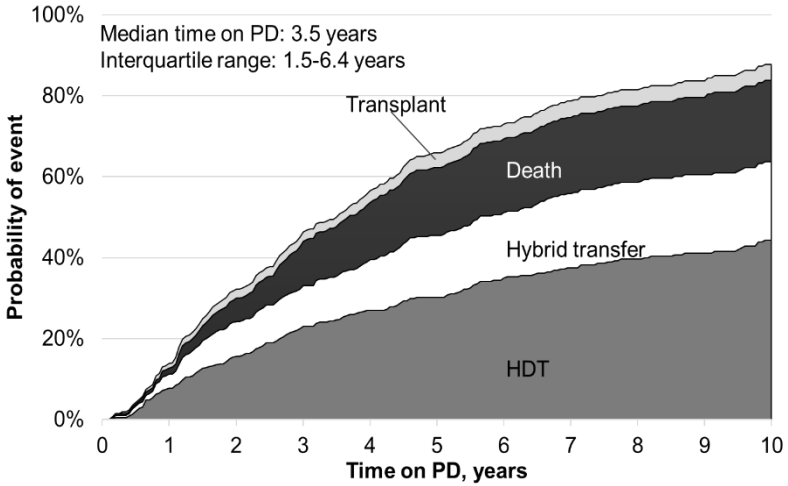
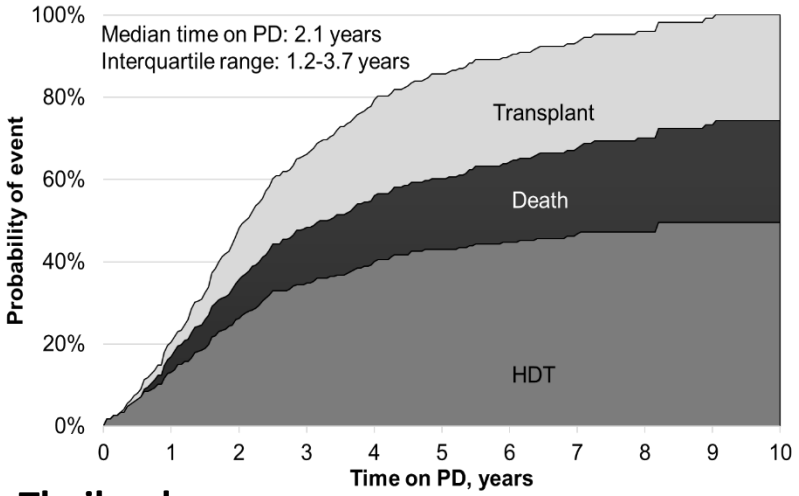
Peritoneal Dialysis Outcomes and Practice Patterns Study

International Comparisons of Outcomes - PDOPPS

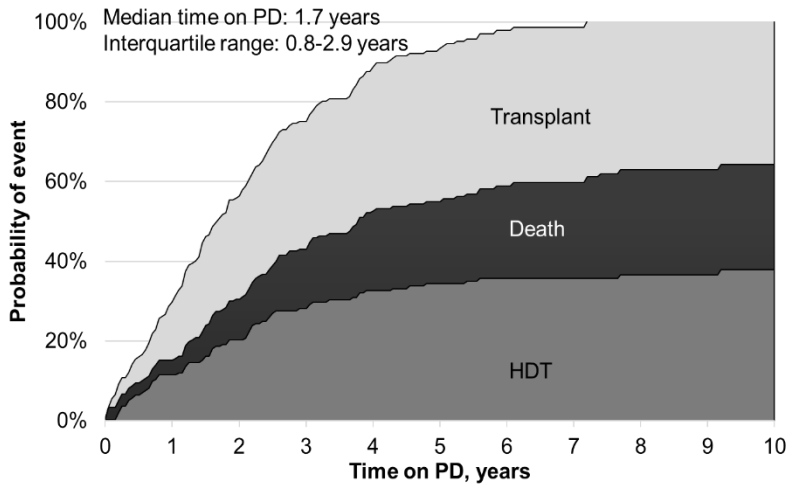
Japan



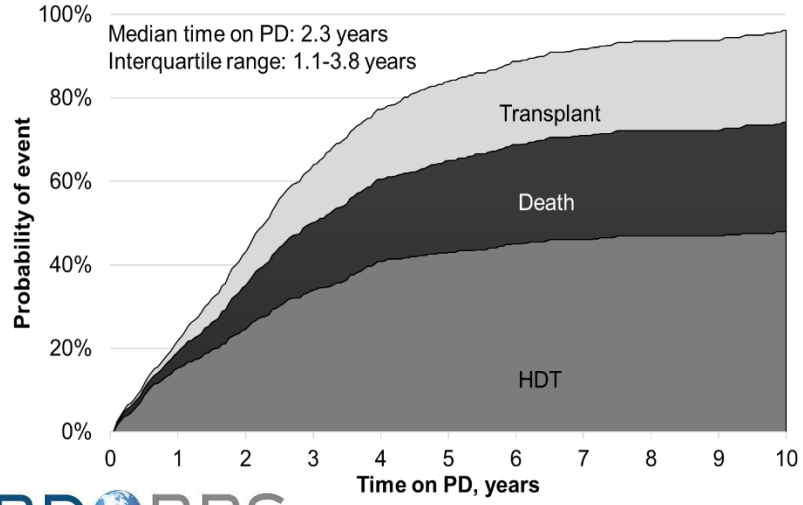
Australia/NZ



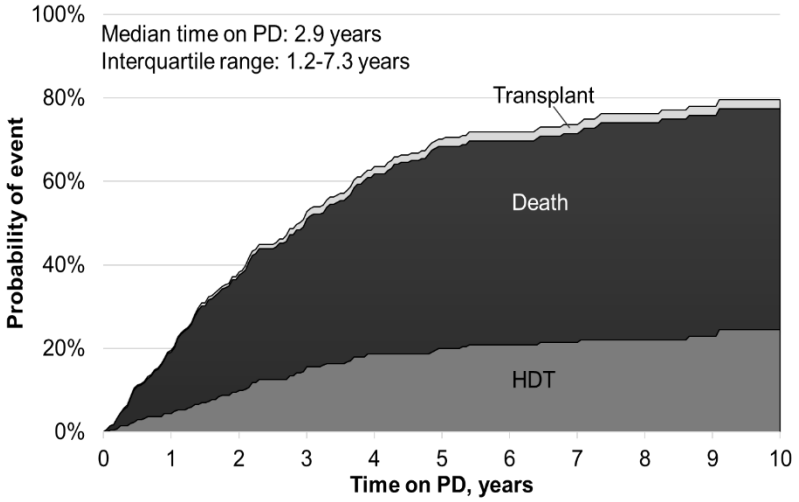
UK



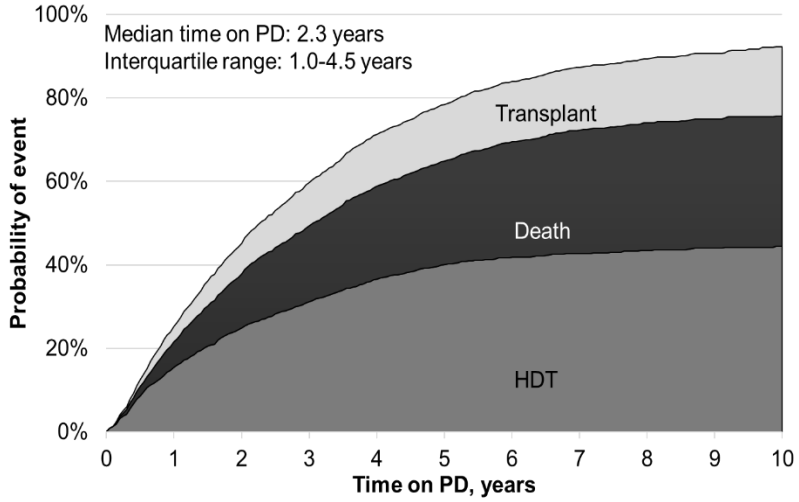
Canada



Thailand



US



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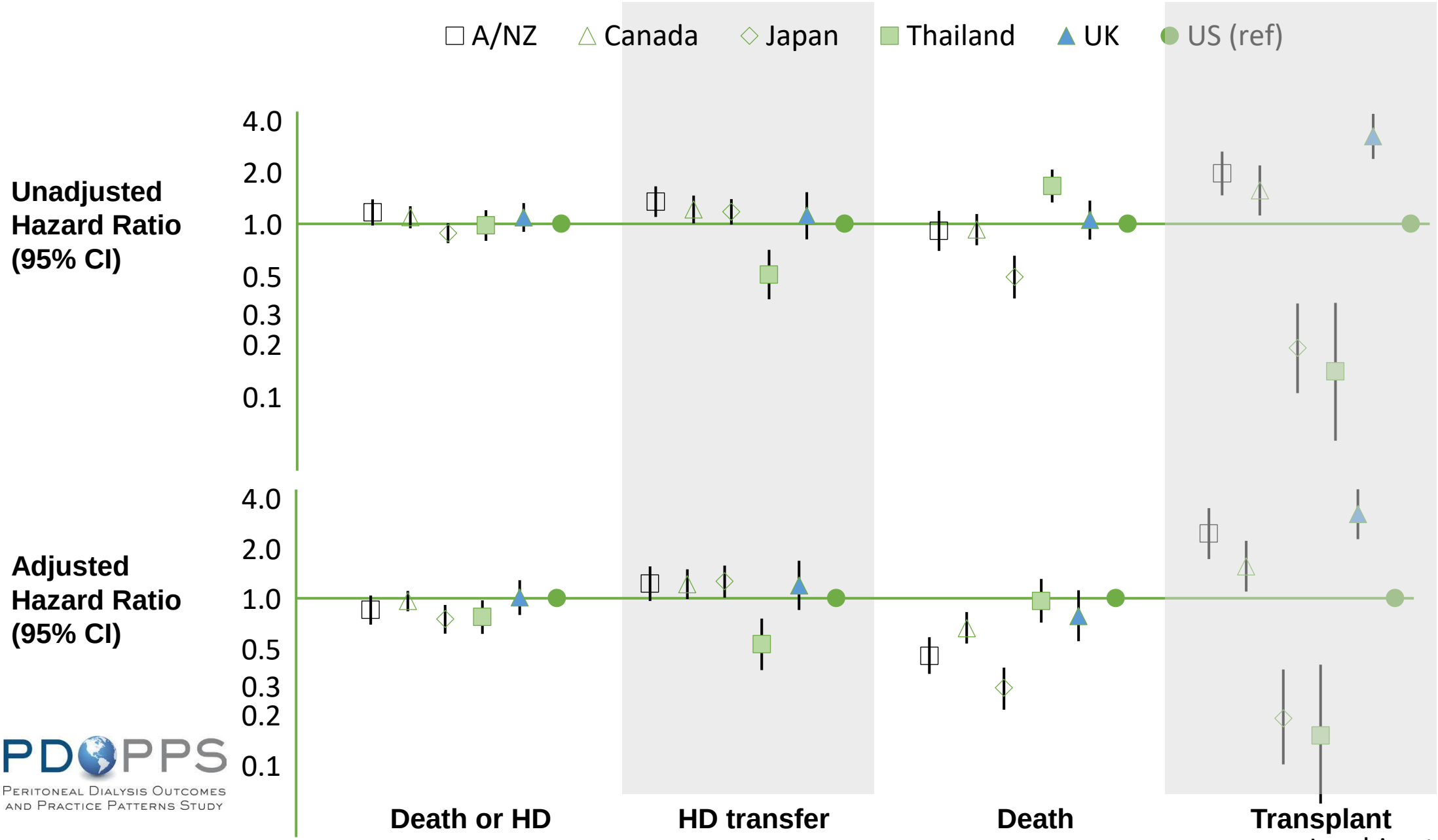
Hazard ratios of PD Discontinuation by Country



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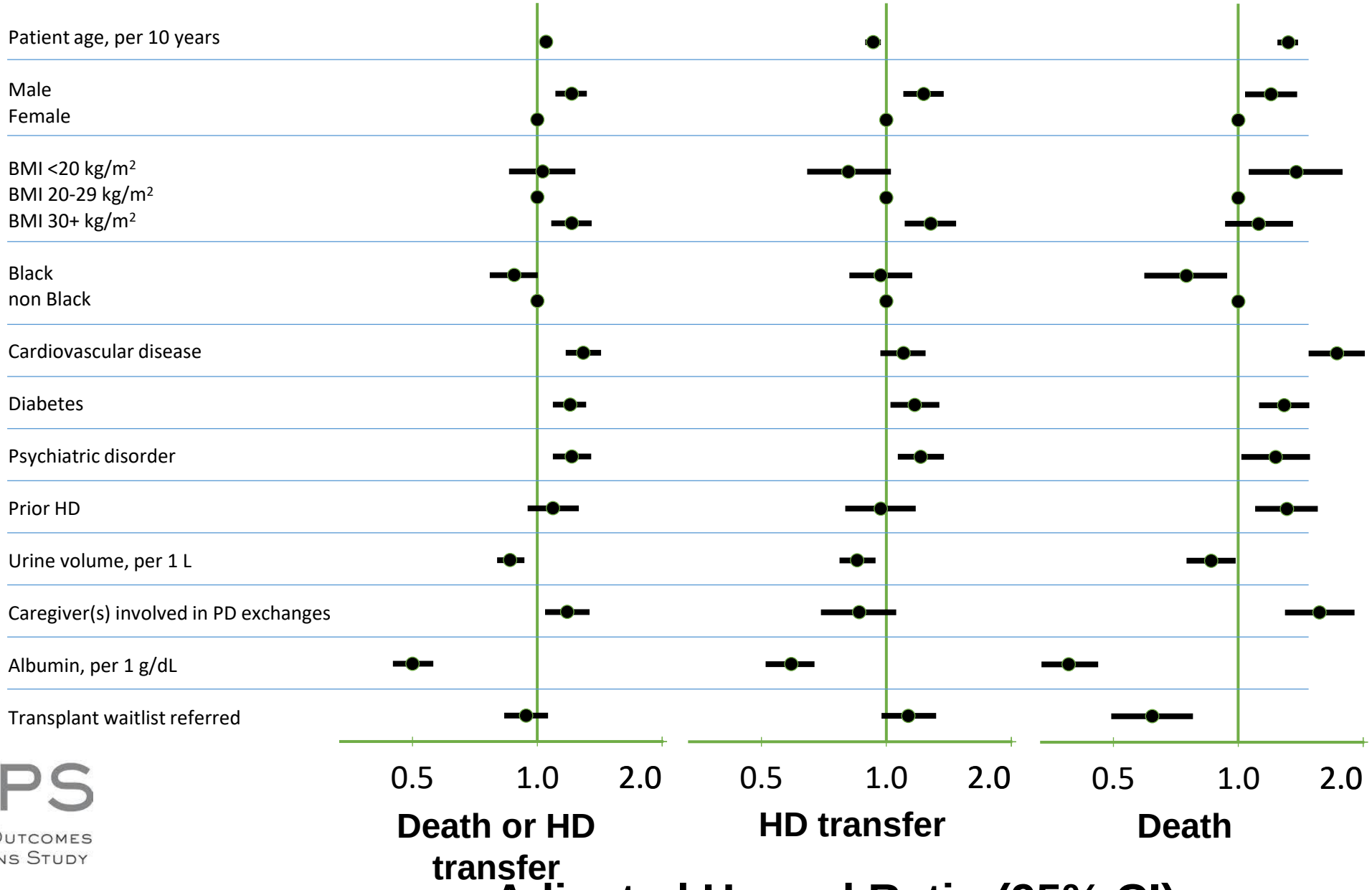
Patient factors



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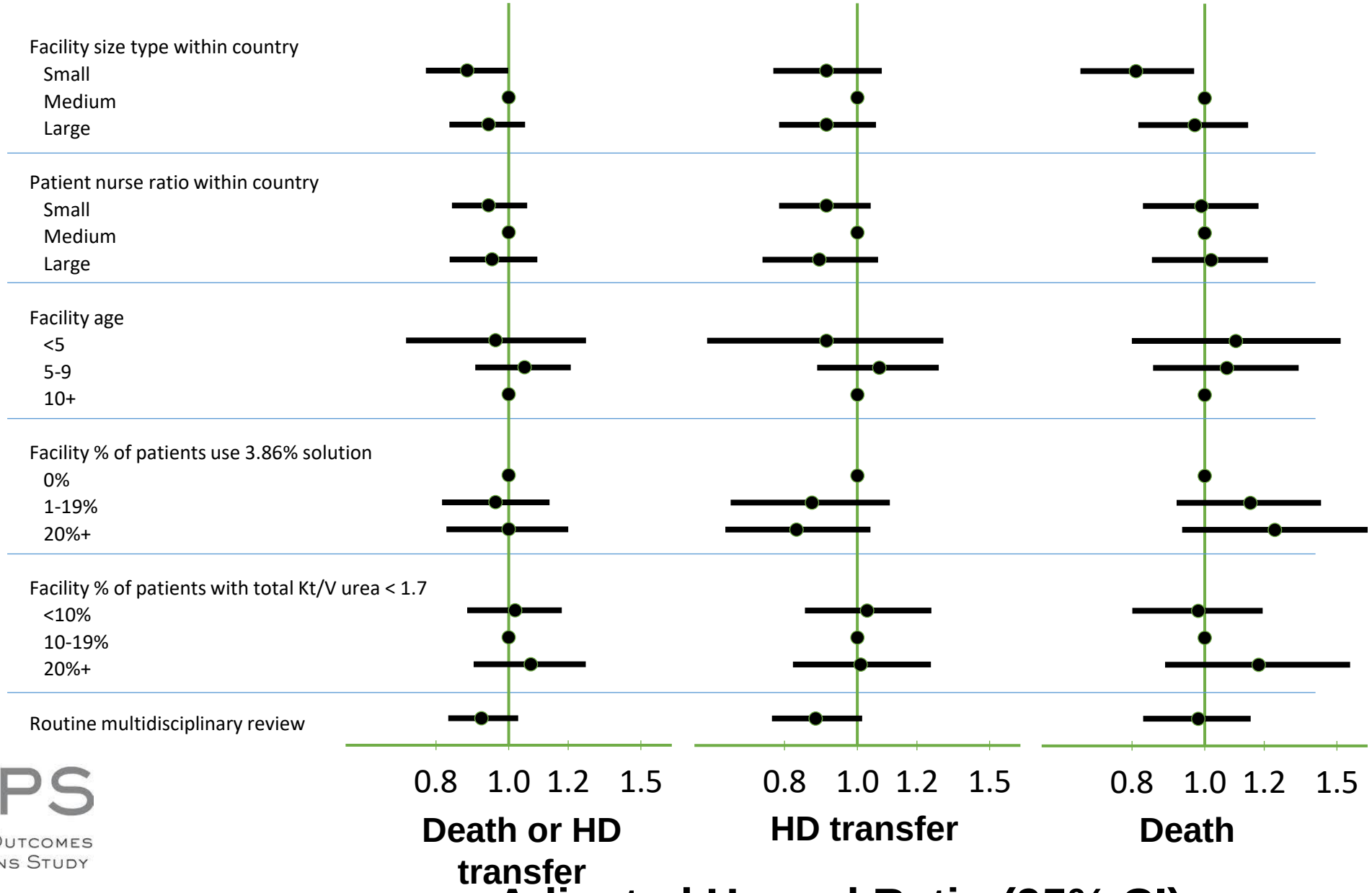
Facility factors



PDOPPS
Peritoneal Dialysis Outcomes and Practice Patterns Study

Multicenter Registry Analysis of Center Characteristics Associated with Technique Failure in Patients on Incident Peritoneal Dialysis

Htay Htay, Yeoungjee Cho, Elaine M. Pascoe, Darsy Darssan, Annie-Claire Nadeau-Fredette, Carmel Hawley, Philip A. Clayton, Monique Borlace, Sunil V. Badve, Kamal Sud, Neil Boudville, Stephen P. McDonald, and David W. Johnson

- Similar patient characteristics predict as for PDOPPS
  - Younger age
  - Male sex
  - Higher BMI
  - Comorbidity
  - Primary renal disease
  - RRT starting modality
  - Socioeconomic status
  - Ethnicity

Table 3. Multivariable Cox shared frailty models for death-censored technique failure defined as 30 and 180 days

Covariates	Technique Failure 30 d			Technique Failure 180 d		
	HR	95% CI	*P* Value	HR	95% CI	*P* Value
Era (2004–2009)	1.0	Reference		1.0	Reference	
Era (2010–2014)	0.93	0.86 to 0.99	0.04	0.82	0.75 to 0.89	<0.001
Patient-level characteristics						
Age (decade)	0.93	0.91 to 0.96	<0.001	0.93	0.90 to 0.96	<0.001
Men	1.07	0.98 to 1.14	0.06	1.12	1.04 to 1.22	<0.01
Race			<0.001			<0.001
White	1.00	Reference		1.00	Reference	
Asian	0.79	0.70 to 0.89	<0.001	0.80	0.70 to 0.92	0.002
ATSI	1.12	0.97 to 1.30	0.12	1.19	1.01 to 1.40	0.04
MP	0.85	0.69 to 1.03	0.10	0.86	0.68 to 1.08	0.19
Other	0.67	0.52 to 0.87	0.003	0.67	0.50 to 0.90	<0.01
BMI, kg/m^2			<0.001			<0.001
<18.5	1.06	0.88 to 1.30	0.53	1.0	0.79 to 1.25	0.99
18.5–24.9	1.00	Reference		1.00	Reference	
25–29.9	1.08	0.99 to 1.17	0.07	1.04	0.95 to 1.14	0.41
≥30	1.27	1.17 to 1.39	<0.001	1.32	1.20 to 1.46	<0.001
Smoking status			0.03			0.08
Nonsmoker	1.00	Reference		1.00	Reference	
Current smoker	1.09	0.98 to 1.21	0.10	1.08	0.96 to 1.22	0.19
Former smoker	1.10	1.02 to 1.19	0.01	1.10	1.00 to 1.20	0.03
Diabetes mellitus	0.98	0.87 to 1.10	0.73	1.01	0.89 to 1.16	0.87
Cardiovascular disease	1.12	1.04 to 1.21	0.003	1.08	0.99 to 1.18	0.07
Chronic lung disease	1.05	0.96 to 1.16	0.29	0.98	0.88 to 1.10	0.75
Primary renal disease			<0.001			0.004
GN	1.00	Reference		1.00	Reference	
Diabetes nephropathy	0.98	0.86 to 1.11	0.73	0.96	0.82 to 1.11	0.54
Hypertension	0.83	0.74 to 0.94	0.002	0.86	0.75 to 0.98	0.02
Polycystic kidney disease	1.20	1.04 to 1.38	0.01	1.11	0.94 to 1.31	0.22
Other/unknown	0.86	0.78 to 0.95	0.003	0.85	0.76 to 0.95	<0.01
Late referral	1.06	0.98 to 1.16	0.15	1.02	0.92 to 1.23	0.71
Initial modality of RRT (PD)[a]						
Overall	0.69	0.63 to 0.76	<0.001	0.70	0.62 to 0.79	<0.001
At 6 mo	0.73	0.67 to 0.79	<0.001	0.73	0.66 to 0.80	<0.001
At 1 yr	0.76	0.70 to 0.82	<0.001	0.76	0.70 to 0.83	<0.001
At 2 yr	0.84	0.78 to 0.91	<0.001	0.82	0.75 to 0.90	<0.001
Initial PD modality (CAPD)	0.98	0.90 to 1.07	0.70	0.86	0.80 to 0.93	<0.001
IRSAD scores[b]			0.91			0.71
<934	1.00	Reference		1.00	Reference	
934–983	1.02	0.93 to 1.12	0.66	1.03	0.93 to 1.15	0.52
>983–1032	1.02	0.93 to 1.13	0.64	1.05	0.94 to 1.17	0.39
>1032	0.99	0.90 to 1.09	0.90	0.99	0.88 to 1.11	0.91

Multicenter Registry Analysis of Center Characteristics Associated with Technique Failure in Patients on Incident Peritoneal Dialysis

Htay Htay, Yeoungjee Cho, Elaine M. Pascoe, Darsy Darssan, Annie-Claire Nadeau-Fredette, Carmel Hawley, Philip A. Clayton, Monique Borlace, Sunil V. Badve, Kamal Sud, Neil Boudville, Stephen P. McDonald, and David W. Johnson

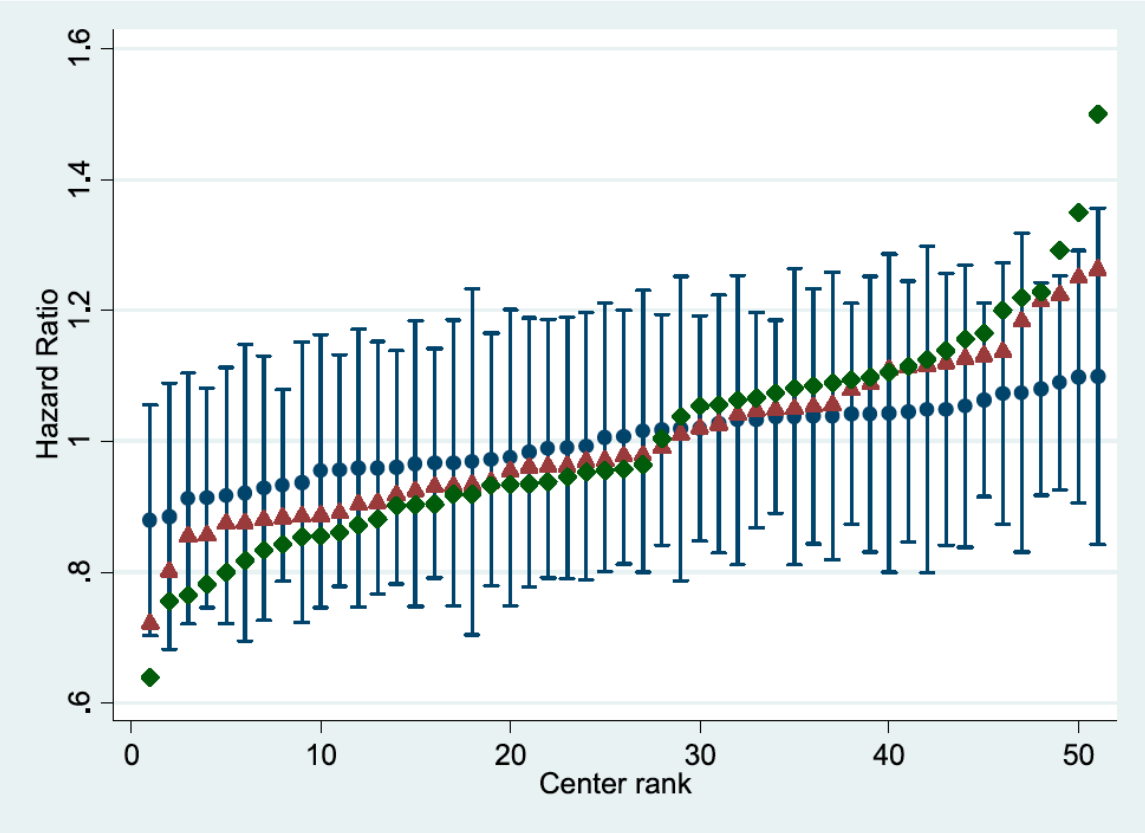


Figure 2. | Variation in hazard of technique failure across 51 Australian peritoneal dialysis centers during the period of 2004–2014 in unadjusted (green diamonds), patient-level adjusted (red triangles), and patient- and center-level adjusted (blue circles) models with SEMs. Dialysis centers are ranked by hazard of technique failure.

Variation between Centres:

Reduce by **15%** when adjusted for patient factors

Reduced by a further **37%** when adjusting for centre level characteristics

Some variation remains

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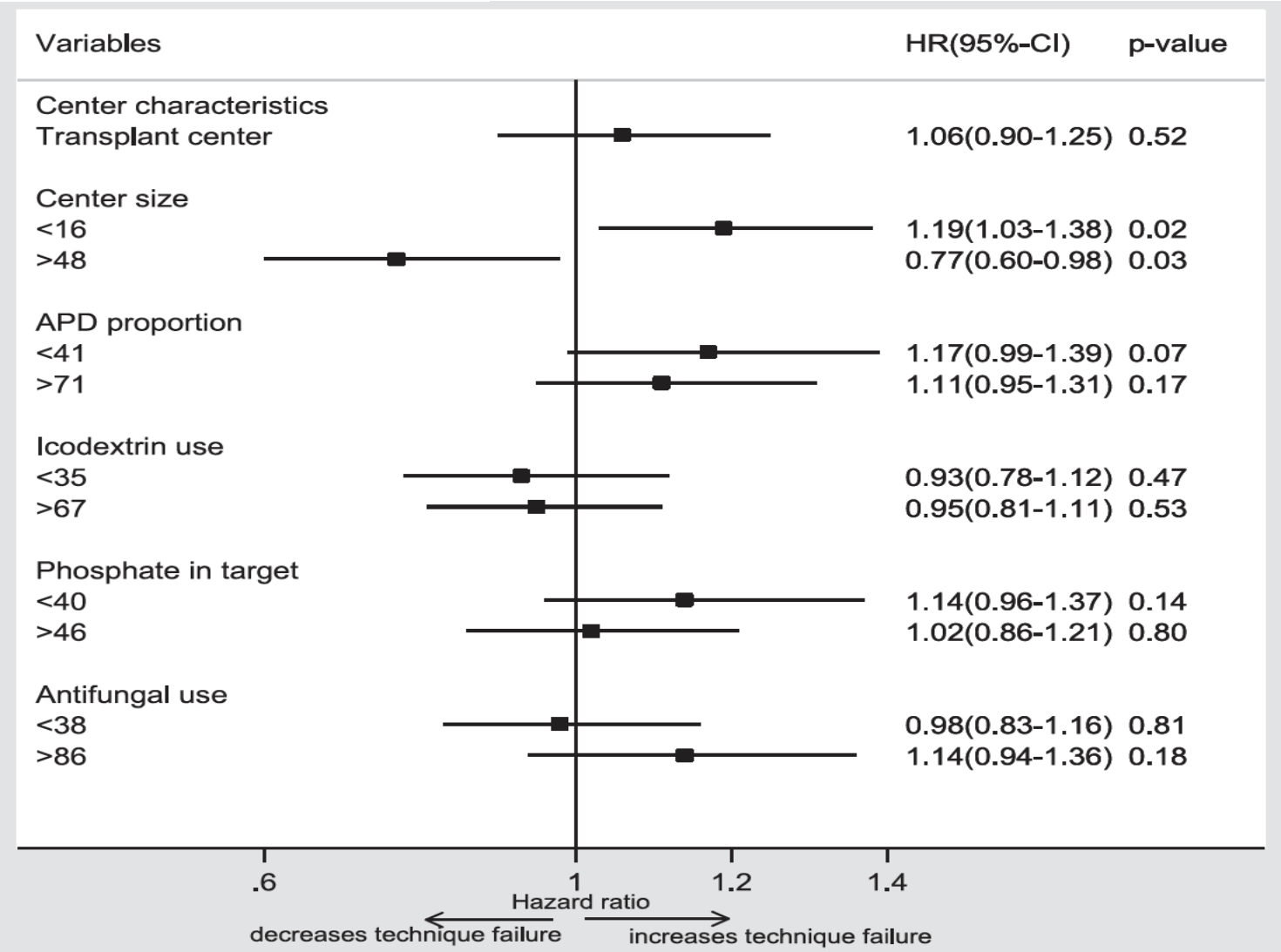

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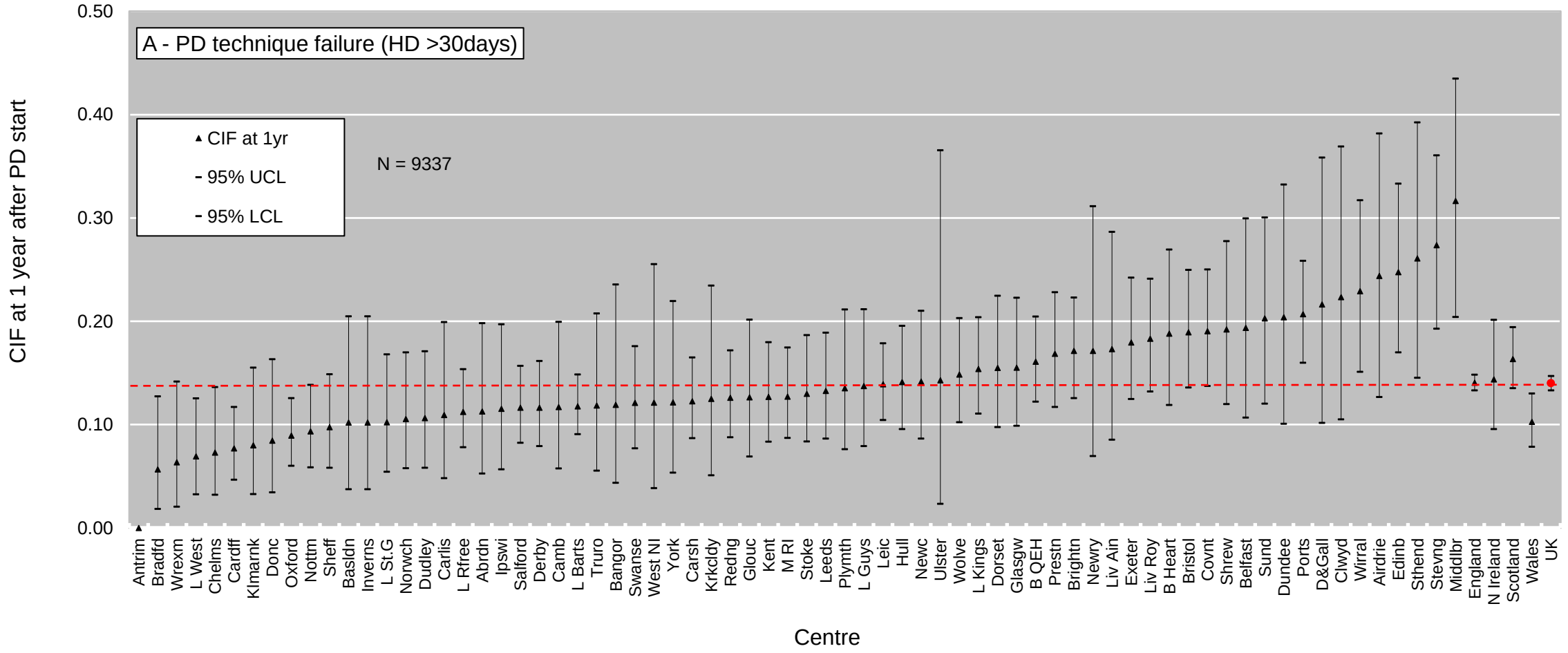
Table 3. Multivariable Cox shared frailty models for death-censored technique failure defined as 30 and 180 days

Covariates	Technique Failure 30 d			Technique Failure 180 d		
	HR	95% CI	*P* Value	HR	95% CI	*P* Value
Center-level characteristics						
Transplant center	1.06	0.90 to 1.25	0.52	1.05	0.89 to 1.25	0.54
Center size (incident patients per 1 yr)			0.004			<0.001
<16	1.19	1.03 to 1.38	0.02	1.23	1.07 to 1.43	<0.01
16–48	1.00	Reference		1.00	Reference	
>48	0.77	0.60 to 0.98	0.03	0.79	0.63 to 0.99	0.04
APD exposure,[c] %			0.15			0.04
<41	1.17	0.99 to 1.39	0.07	1.14	0.97 to 1.35	0.11
41–71	1.00	Reference		1.00	Reference	
>71	1.11	0.95 to 1.31	0.17	1.22	1.04 to 1.42	0.01
Icodextrin use,[c] %			0.69			0.68
<35	0.93	0.78 to 1.12	0.47	0.94	0.79 to 1.22	0.50
35–67	1.00	Reference		1.00	Reference	
>67	0.95	0.81 to 1.11	0.53	0.94	0.81 to 1.10	0.46
Phosphate in target,[c] %			0.32			0.66
<40	1.14	0.96 to 1.37	0.14	1.08	0.91 to 1.29	0.37
40–46	1.00	Reference		1.00	Reference	
>46	1.02	0.86 to 1.21	0.80	1.05	0.89 to 1.24	0.60
Antifungal use,[d] %			0.32			0.47
<38	0.98	0.83 to 1.16	0.81	0.95	0.80 to 1.11	0.50
38 86	1.00	Reference		1.00	Reference	
>86	1.14	0.94 to 1.36	0.18	1.07	0.90 to 1.29	0.44

UK Kidney Association



What does our current understanding of switching tell us?

- Classifying modality switch
  - Causes for switching change over time – peritonitis remains the main problem

- Switching needs to be understood on the context of competing risks
  - Transplantation – time on treatment – does not equate to technique failure – but it does cause attrition of healthier patients from the PD pool, at least partly explaining why time on PD is a risk factor for post-switch mortality
  - Is some switching futile or inappropriate?- this is suggested, but more research needed

- Which factors are associated with switching risk?
  - Patient level factors – these are the mostly same as for the post-switch mortality risk (these are hard to change)
  - Centre level factors – these matter; size/experience/team working seems important – but there must be something else….
  - Are these centre level factors modifiable? - Probably

The Inter-CEPt study

Intervening to eliminate the centre effect variation in home dialysis use.

- In depth, ethnographic study of centres that achieve good home dialysis outcomes, with inclusion of BAME and socioeconomically deprived groups
- National survey of practices linked to actual outcomes linked to the UKRR, accounting for competing risks
- In depth health economic analysis and modelling
  Intervention bundle

Inter-CEPt

UNIVERSITY OF BIRMINGHAM

Keele University

The University Of Sheffield.

Funded by NIHR

Open access Protocol

BMJ Open

Intervening to eliminate the centre-effect variation in home dialysis use: protocol for Inter-CEPt—a sequential mixed-methods study designing an intervention bundle

Maatla Tshimologo,[1] Kerry Allen,[2] David Coyle,[3] Sarah Damery,[4] Lisa Dikomitis ,[1,5] James Fotheringham,[6] Harry Hill,[6] Mark Lambie,[1] Louise Phillips-Darby,[1] Ivonne Solis-Trapala ,[1] Iestyn Williams,[2] Simon J Davies [1]

Ethnography: Summary of What we found

- Patients liken choosing their dialysis modality to an act of faith – so it is all about **trust**
- Sites have different ways of organizing their services, there is **no ideal model**.
- What all sites shared were aspects of their **culture, attitudes and behaviour** that led to good uptake of home therapies.
- Sites acknowledge that there were inequalities and welcome greater investment in people's **social, psychological and cultural needs**

The survey: Methods

SURVEY DESIGN

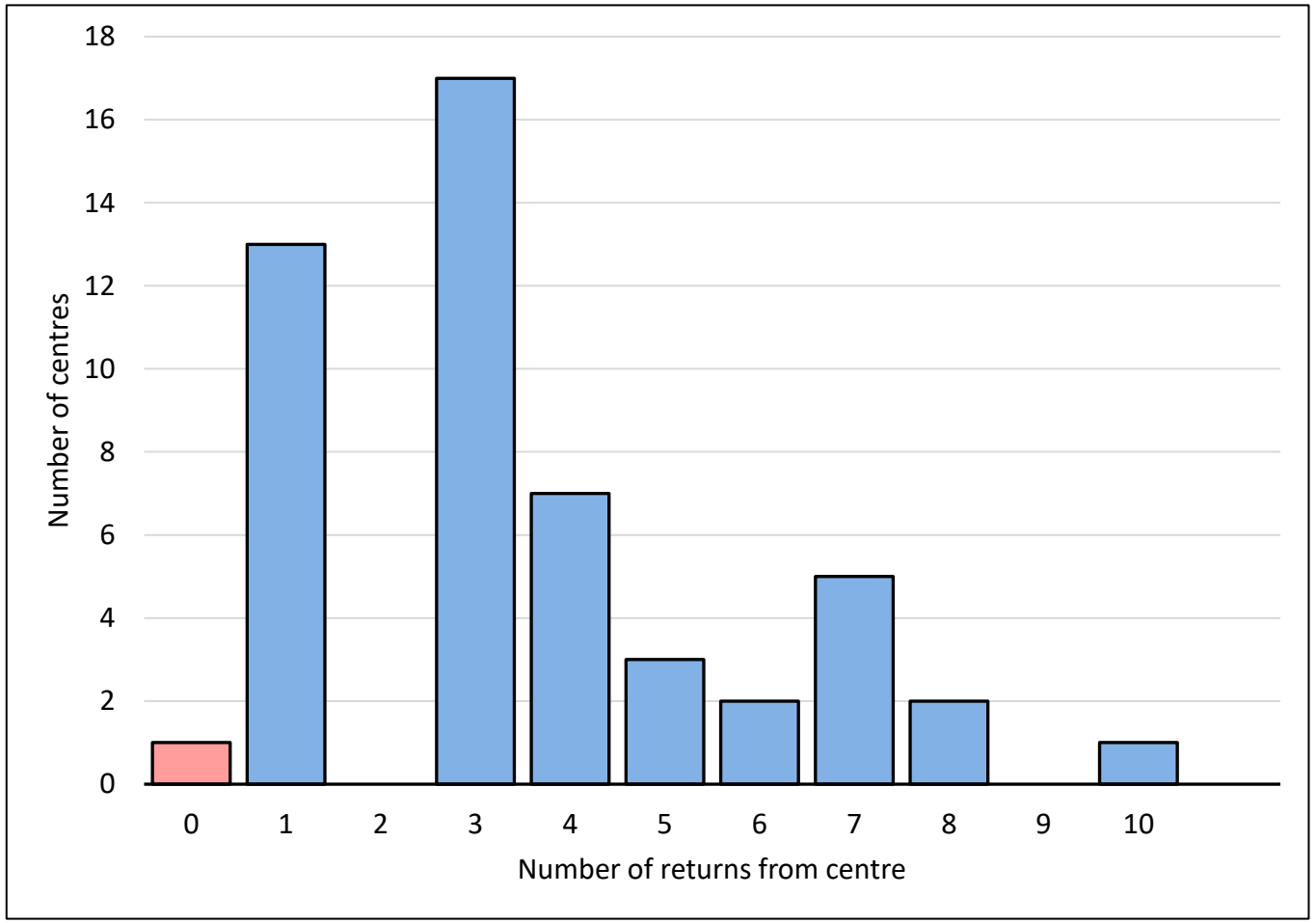
- Developed by drawing on ethnography findings, literature, clinical input, NASSS framework
- Sent electronically to all 51 renal units in England (June – September 2022)
- Aimed for responses from varied roles (centre managers, clinical leads, home therapies consultants and nurses, Advanced Kidney Care clinic staff)
- Categorical and Likert scale responses

SURVEY ANALYSIS

- Individual-level responses combined into a single centre-level response following pre-determined aggregation rules
- Descriptive analysis explored centre practice through pairwise correlations between aspects of practice and home dialysis uptake rates (UKRR 2019 incidence data)

Services offered by the renal unit	Information to support modality choice	Vascular and catheter access	Finances and commissioning
Pre-dialysis education	Home dialysis training	Clinical leadership and home dialysis attitudes	Engagement with wider regional networks
Challenges to offering home therapies to different groups	Unit support for patients choosing home dialysis	Organisation of PD and HHD services (staffing, machines)	COVID-19

Survey responses



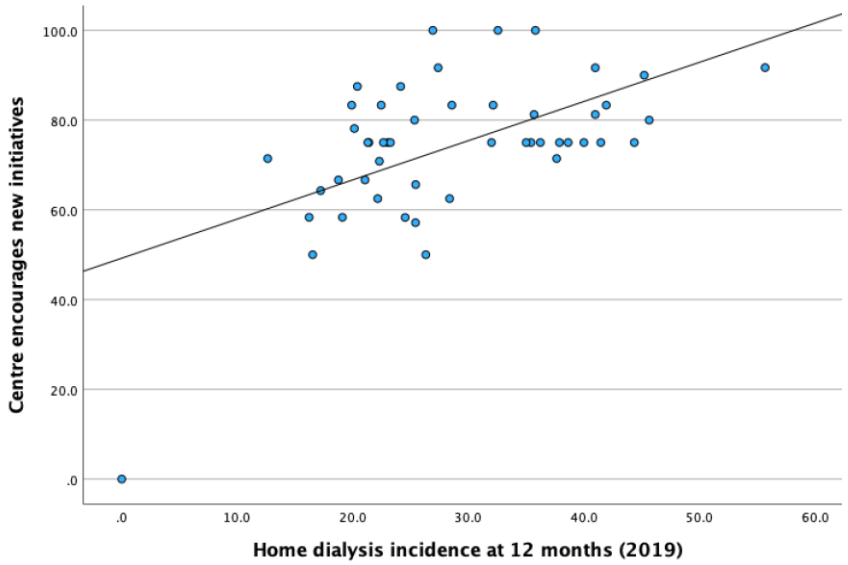
- 180 responses returned
- 50/51 centres represented (98.0%)
- Range per unit 1-10
- Mean per unit 3.5

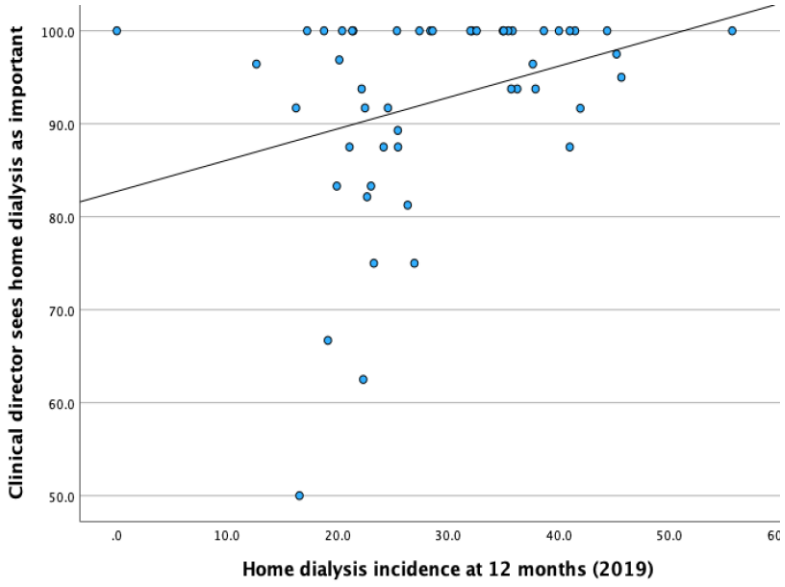
- Mean roles represented per unit 3.2 (range 1-7)

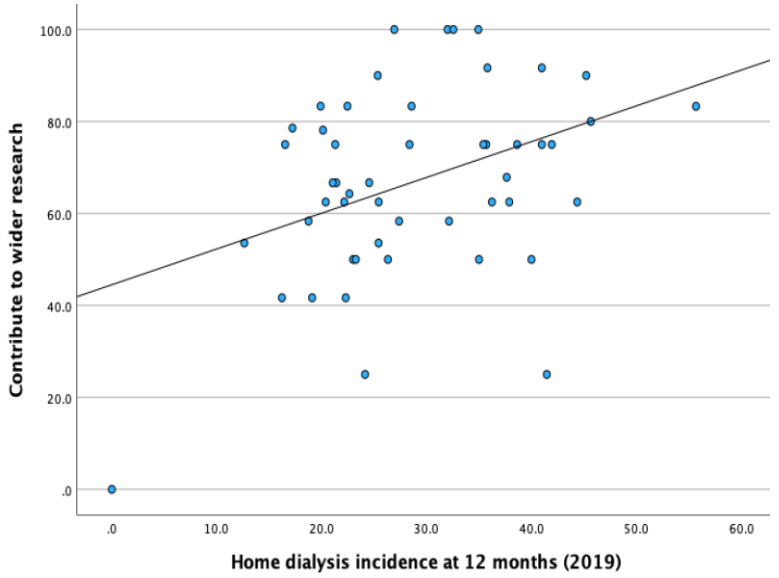
Nurses (n=58; 32%)
AKC staff (n=41; 23%)
Clinical leads (n=37; 21%)
Physicians (n=35; 19%)
Managers (n=9; 5%)

Non-responder analysis showed no systematic difference in rates of home dialysis uptake between responding and non-responding units for each question

Results: clinical leadership and organisational culture





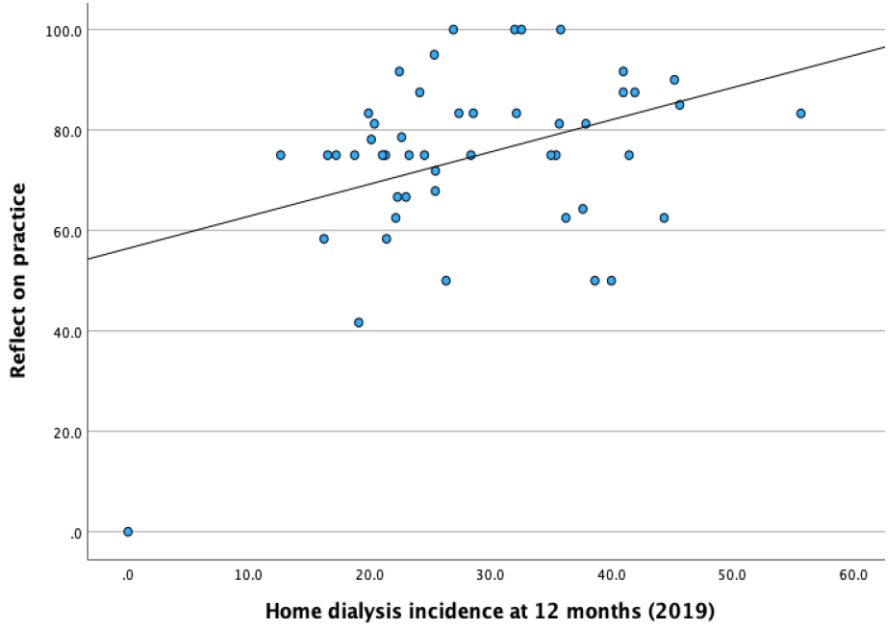


Centre has an organisational culture that values trying new initiatives
Correlation coefficient 0.57 (95% CI: 0.34 to 0.73)

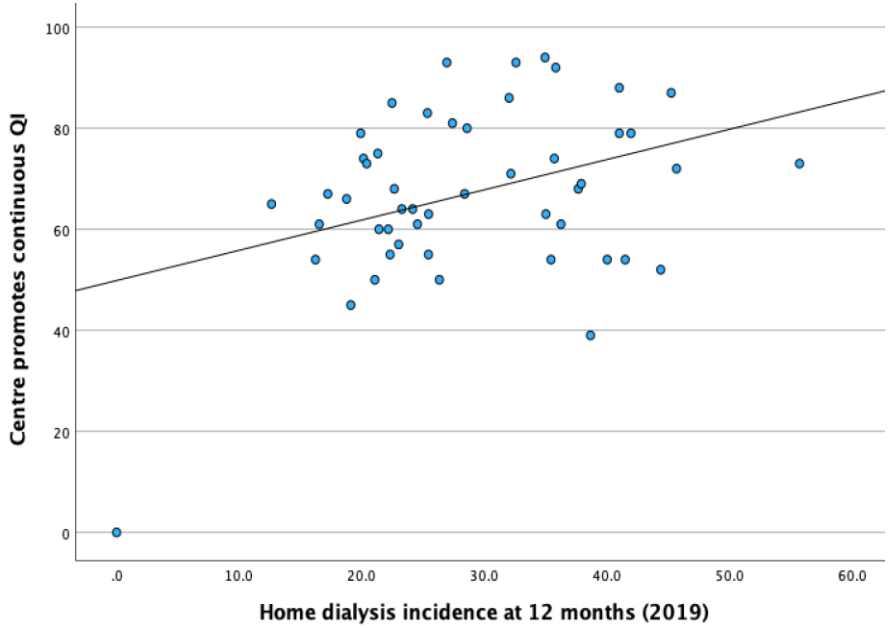
Staff perceive that clinical lead/director sees home dialysis as important
Correlation coefficient 0.32 (95% CI: 0.05 to 0.55)

Staff are given opportunities to contribute to research
Correlation coefficient 0.39 (95% CI: 0.13 to 0.61)

Results: clinical leadership and organisational culture



Staff have opportunities to learn from others and reflect on practice
Correlation coefficient 0.38 (95% CI: 0.11 to 0.60)



Centre has strong commitment promoting continuous quality improvement
Correlation coefficient 0.29 (95% CI: 0.01 to 0.53)

Hypothesized ordering of factors - proposed causal pathway

Uptake of home therapy within 1 year of starting RRT

Centre Practice

- **Pre-emptive transplant**
- Challenges treating BME patients
- **Roadshow in previous 2 years**
- Does your centre support patients with
  - Home modifications/ equipment
  - Water & electric costs
  - Special treatment registration
  - PIP advice
  - Social care/social worker
  - Renal psychologist
  - Advice for working age patients
  - Advice about council tax reduction
- **QI initiatives in past 5 years**

Centre Culture

- How well does centre support quality improvement initiatives
  - Opportunities to reflect on practice
  - Trying new initiatives
  - Routine collection of feedback data
  - Opportunities to discus practice and learn form others
  - **Opportunities to contribute to wider research**
  - Centre support for developing business cases
  - Staff supported to develop own research
- Service related factors which limit access to home therapies for patients
  - Attitudes of other staff
  - Lack of time to address barriers to growth
  - Insufficient coordination within centre
  - **Lack of support from senior managers/leaders**

Centre characteristics

- Transplant centre
- **Offer assisted PD**
- Centre size
- Service related factors which limit access to home therapies for patients
  - Financial stresses on budgets
  - Stresses on ICHD capacity
  - **Stresses on staff capacity**
  - Difficulty recruiting staff with right expertise
  - Difficulty retaining staff with right expertise

Patient Demographics

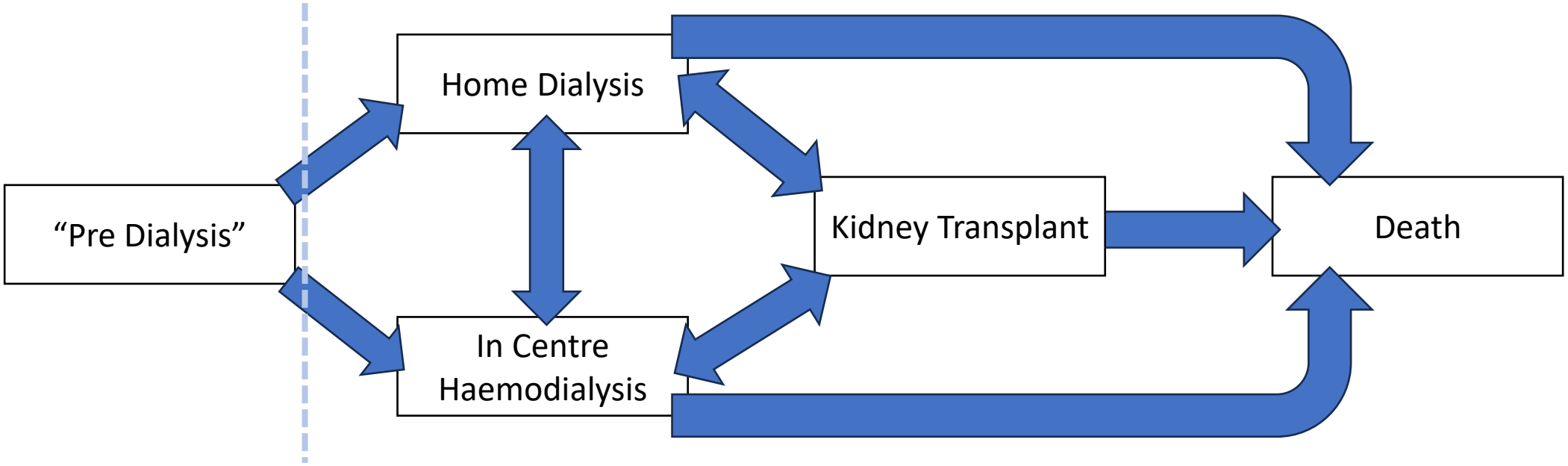
- **Age**
- Sex
- **Ethnicity**
- **SES**

Patient Characteristics

- Transplant waitlist status
- **Diabetes as PRD**
- **Distance from centre**

Inter-CEPt

Modality Transitions – multistate model



Hazard ratios for transitions in modality

	In centre HD to PD	In-centre HD to home HD
Ethnicity		
Asian	0.67 (0.62,0.73)	0.29 (0.26,0.34)
Black	0.63 (0.58,0.70)	0.47 (0.41,0.53)
White	REF	REF
Deprivation group		
1	REF	REF
2	0.90 (0.83,0.98)	0.94 (0.85,1.05)
3	0.80 (0.74,0.87)	0.70 (0.63,0.78)
4	0.71 (0.65,0.76)	0.60 (0.54,0.67)
5	0.62 (0.58,0.67)	0.49 (0.44,0.54)
Sex		
Male	0.96 (0.91,1.01)	0.90 (0.84,0.96)

	PD to In-centre HD	Home HD to In-centre HD
Ethnicity		
Asian	0.87 (0.83,0.93)	0.82 (0.67,1.01)
Black	1.17 (1.09,1.25)	0.82 (0.67,1.01)
White	REF	REF
Deprivation group		
1	REF	REF
2	1.03 (0.98,1.10)	1.02 (0.8,1.17)
3	0.99 (0.93,1.05)	0.81 (0.70,0.94)
4	1.04 (0.98,1.11)	0.87 (0.75,1.01)
5	1.06 (0.99,1.12)	0.84 (0.73,0.98)
Sex		
Male	0.86 (0.82,0.89)	1.05 (0.95,1.15)

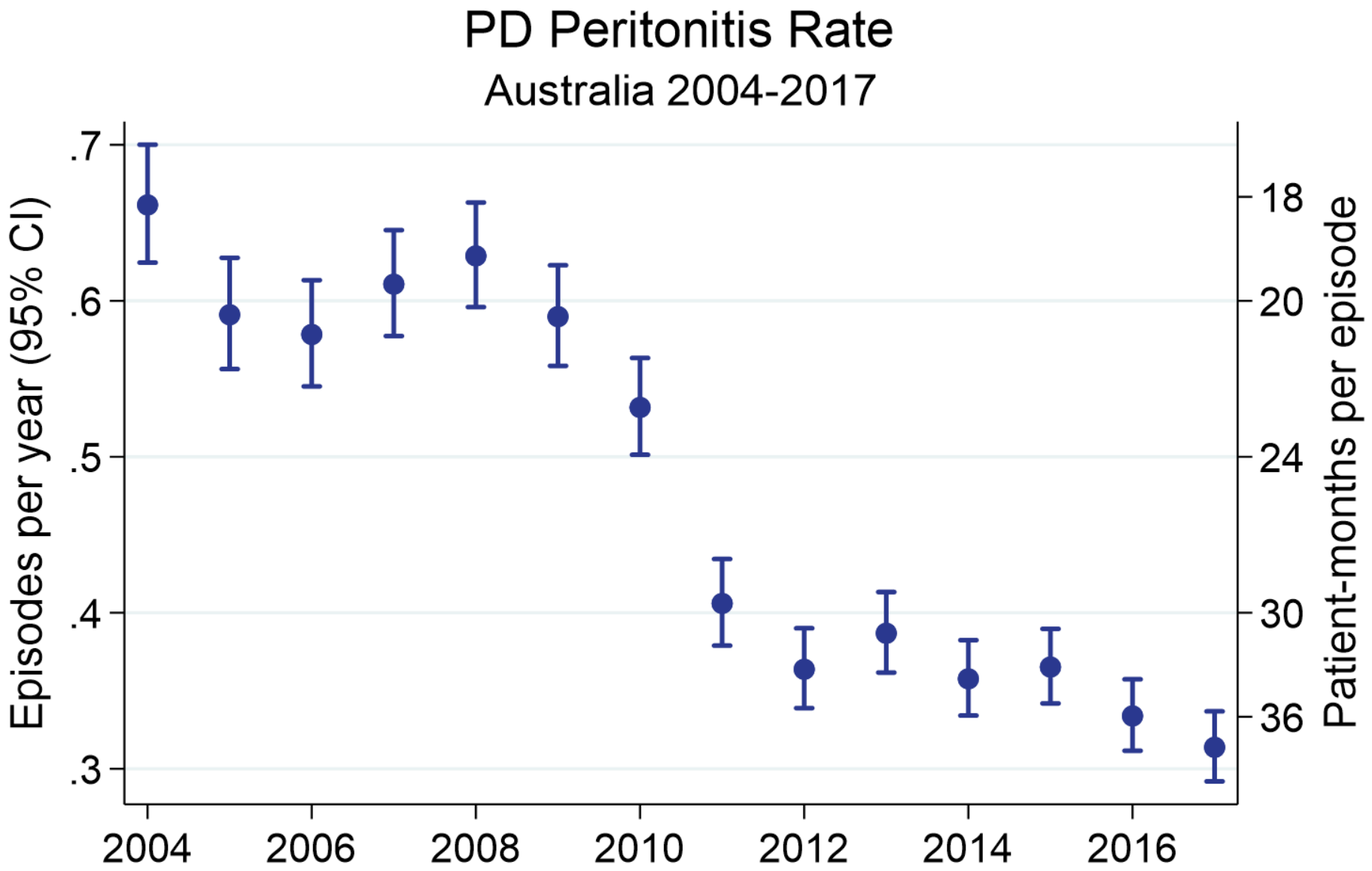
THIS IS KEELE

Inter-CEPt National Survey: Descriptive Analysis

- 50/51 units in England responded
- Confirmed the findings of the ethnography
- How services were organized did not associate with home therapy use
- Availability of assisted dialysis increased use
- Measures of culture and leadership were important
- Quality improvement was especially important
- Self-rated perception of how well a centre met patients needs correlated strongly with home therapy use

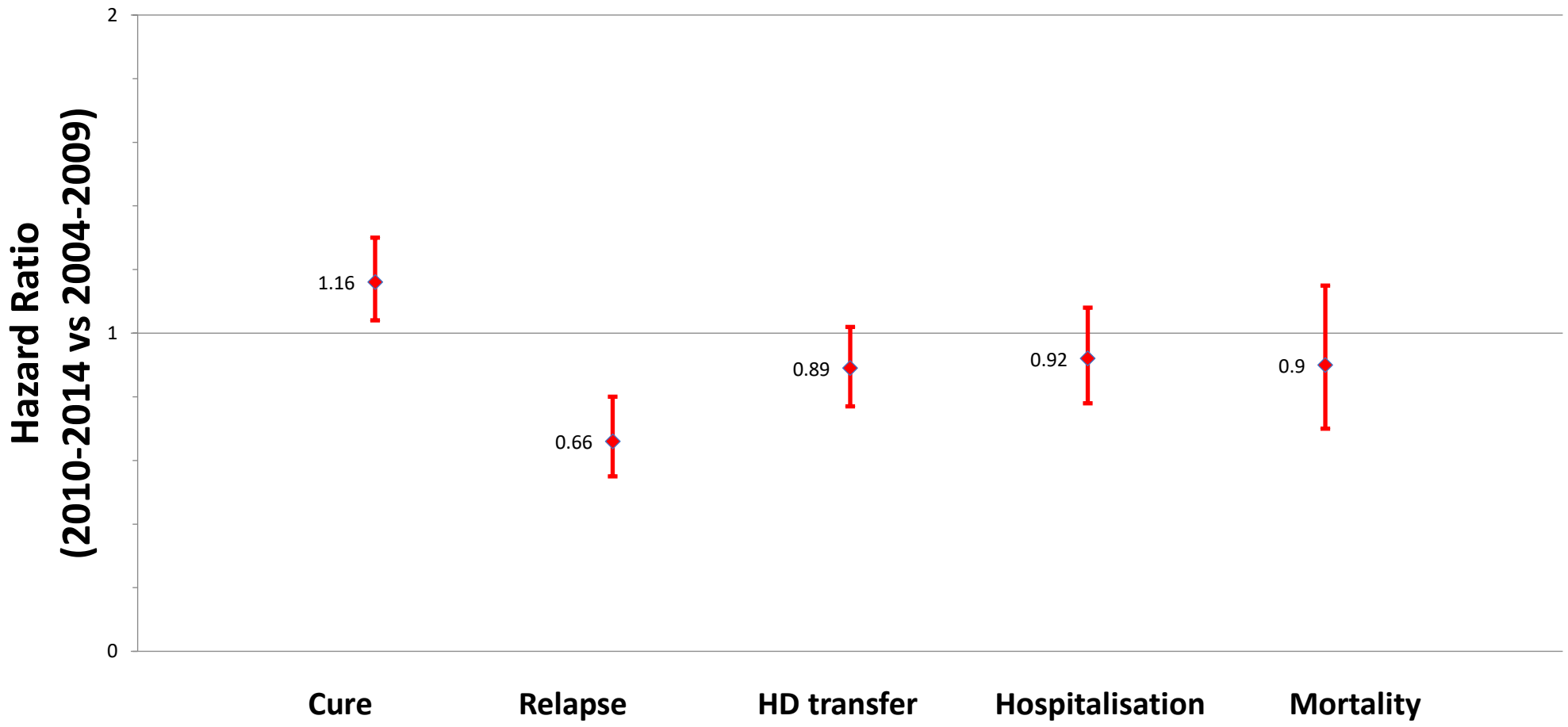
Quality improvement

- Best examples of this in PD relate to infection management
  - Australian experience
  - SCOPE Dialysis Collaborative

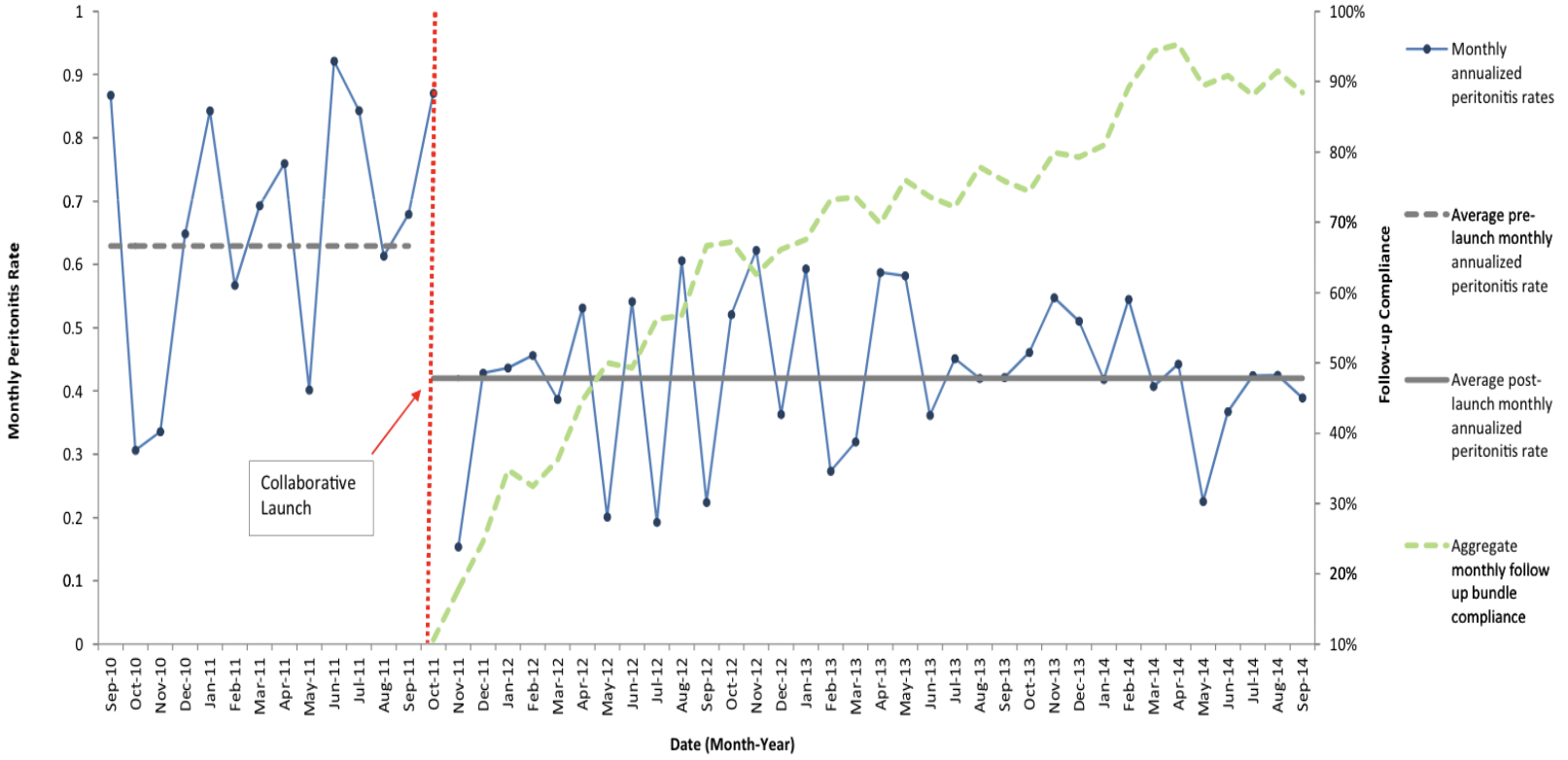


2018 ANZDATA Annual Report, Figure 5.23

Peritonitis Outcomes (Australia)



SCOPE Dialysis Collaborative: Impact of Standardized Infection Control PD Procedures and Reporting on Peritonitis Rates in Pediatric Peritoneal Dialysis Patients



CHILDREN'S HOSPITAL ASSOCIATION

Peritonitis rate dropped **37%**; **58%** reduction in hemodialysis BSI rate for original 16 HD centers

Neu et al KI 2016

Summary

- PD to HD transition-related mortality is improving but remains a concern
- There are opportunities to reduce this mortality – and perhaps more importantly the experience of modality switch by
  - Preventing unnecessary switch (futile, infection related)
  - Managing the switch better (infection, timing, managing expectations, supporting patients better)
- A key tool is quality improvement (needs a committed team and time to execute)
- Centre culture is at the heart of good practice – a coherent MDT, strong leadership, continuity of care, supportive patient/carer environment

Acknowledgements - Funding

- Baxter HealthCare
- *Japanese Society of Peritoneal Dialysis*
- *Kidney Research UK*
- *Canadian Institute for Health Research*
- *National Health and Medical Research Council of Australia*
- *Research for Patient Benefit Programme, National Institute for Health Research, UK*
- *Thailand Research Foundation, National Research Council of Thailand and Chulalongkorn University*
- National Institute for Health and Social Resea (Health Services and Delivery Research)

INTEGRATED
International Group Research Assessing Transition Effects in Dialysis

PDOPPS
Peritoneal Dialysis Outcomes and Practice Patterns Study

Inter-CEPt