Variation in Conditions and Global Practice Patterns in Patients Initiating Dialysis

Bruce Robinson, MD MS

Arbor Research Collaborative for Health

Ann Arbor, MI USA

KDIGO Controversies Conference on Advanced CKD

3 Dec 2016

Acknowledgements, 2016

The DOPPS Program would not be possible without the support for independent scientific research to improve patient care from the following organizations:

Principal Funders:

Amgen Baxter Healthcare Kyowa Hakko Kirin

Country/Project-Specific Support:

ERA-EDTA, Vifor Fresenius Renal Pharma, Keryx, Amgen, AstraZeneca, Relypsa, Roche, Proteon, Janssen, Hexal, Japanese Society for PD, Societies of Nephrology in Germany, Italy & Spain

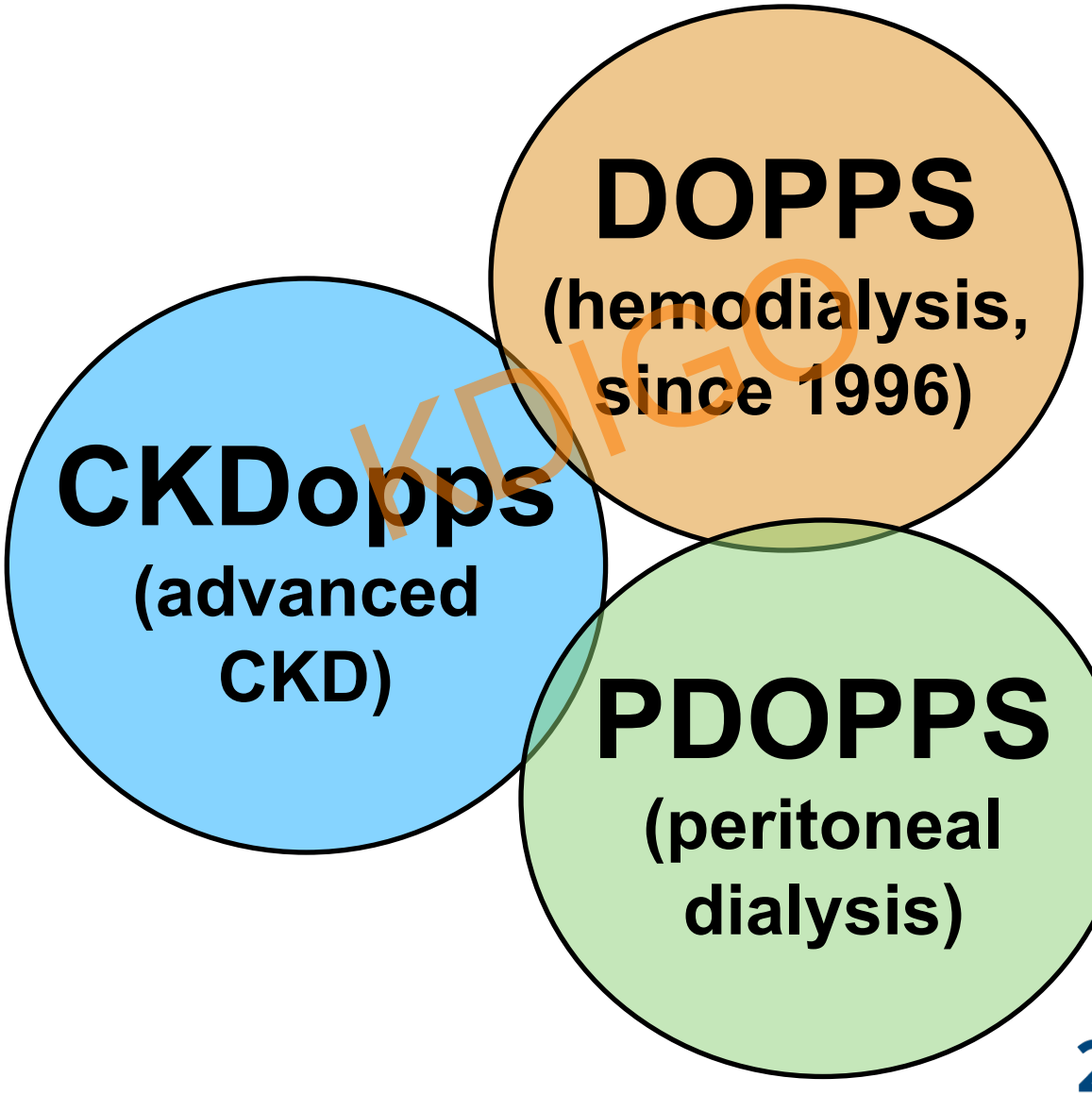
Public Funding of Projects/Ancillary Studies In:

Australia, Canada, France, Thailand, United Kingdom, United States

All support for the DOPPS program is provided without restrictions on publications

DOPPS Program Area

Three Major Projects, One Common Goal



Canada
Belgium
France
Germany
Italy
China
Japan
Spain
Sweden
UK
USA
GCC-6
Turkey
Russia

Brazil
France
Germany
USA
Japan

Australia
Canada
Japan
UK
USA
Thailand
New Zealand

DOPPS

20 YEARS ARBOR RESEARCH COLLABORATIVE FOR HEALTH

Global Practice Patterns at Dialysis Start
Outline

- **Framing data:**
  - Age, mortality, practice variation
- **Need to improve practices:**
  - vascular access
- **Need to prioritize patient choice:**
  - Modality selection & withdrawal
- **Preliminary CKDopps data:**
  - Poor performance against KDIGO

Framing Data

Age, mortality, practices
at time of dialysis transition

Key Practice Changes & Impact
Burden of Dialysis (HD)

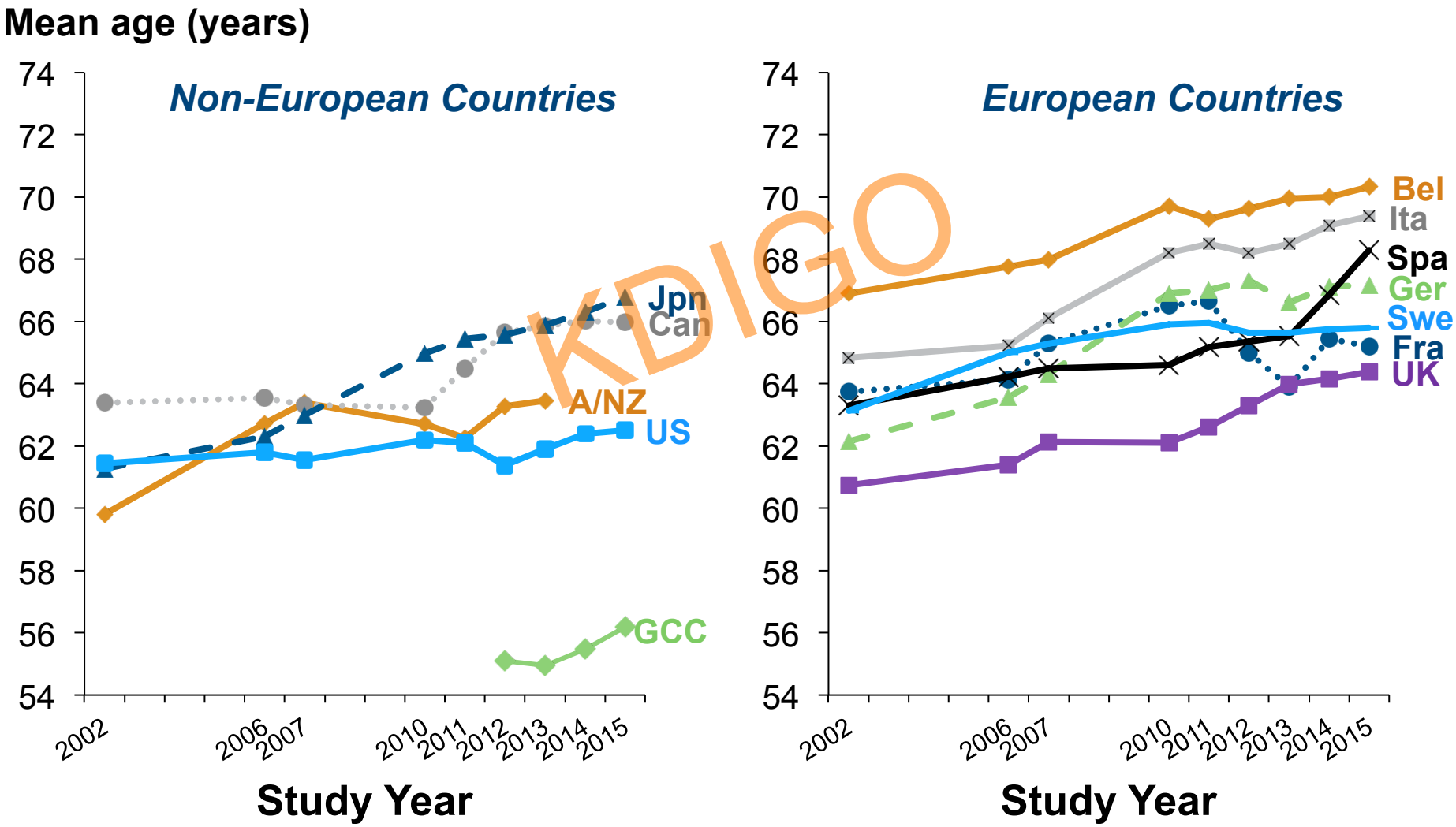
- **Good news: Stable incidence rates, declining mortality on dialysis**
- **Realities: Rising incidence counts, prevalent counts, and age on dialysis = higher societal burden**
- **Access to modalities other than ICHD is too low, in US and elsewhere**

DOPPS

Robinson et al, Lancet. 2016;388:294-306

Age Trends by Country

DOPPS 2-5 (2002-2013)



DOPPS

Age Comparison: US to Japan

Table: Mean age among ESKD patients

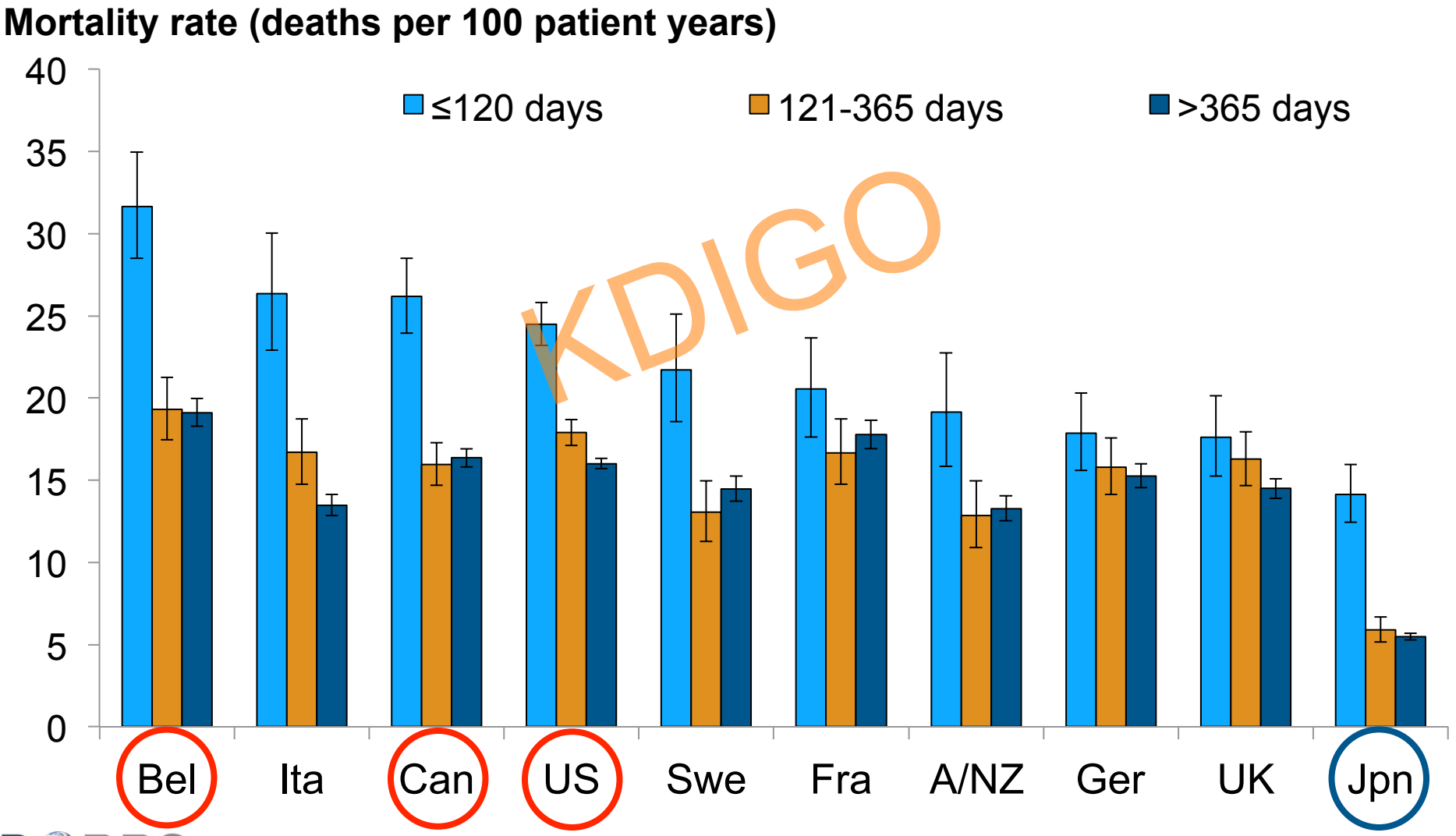
	1996	2013	Change over time
JSDT:			
• New patients	62	69	+7
• All patients	59	67	+8
USRDS:			
• New patients	60	62	+2
• All patients	54	59	+5

In Japan
38% of new dialysis patients are age 75+
32% of all dialysis patients are age 75+

JSDT. Therapeutic Apheresis and Dialysis 2015;19:540-574
USRDS ADR reference tables, 2015

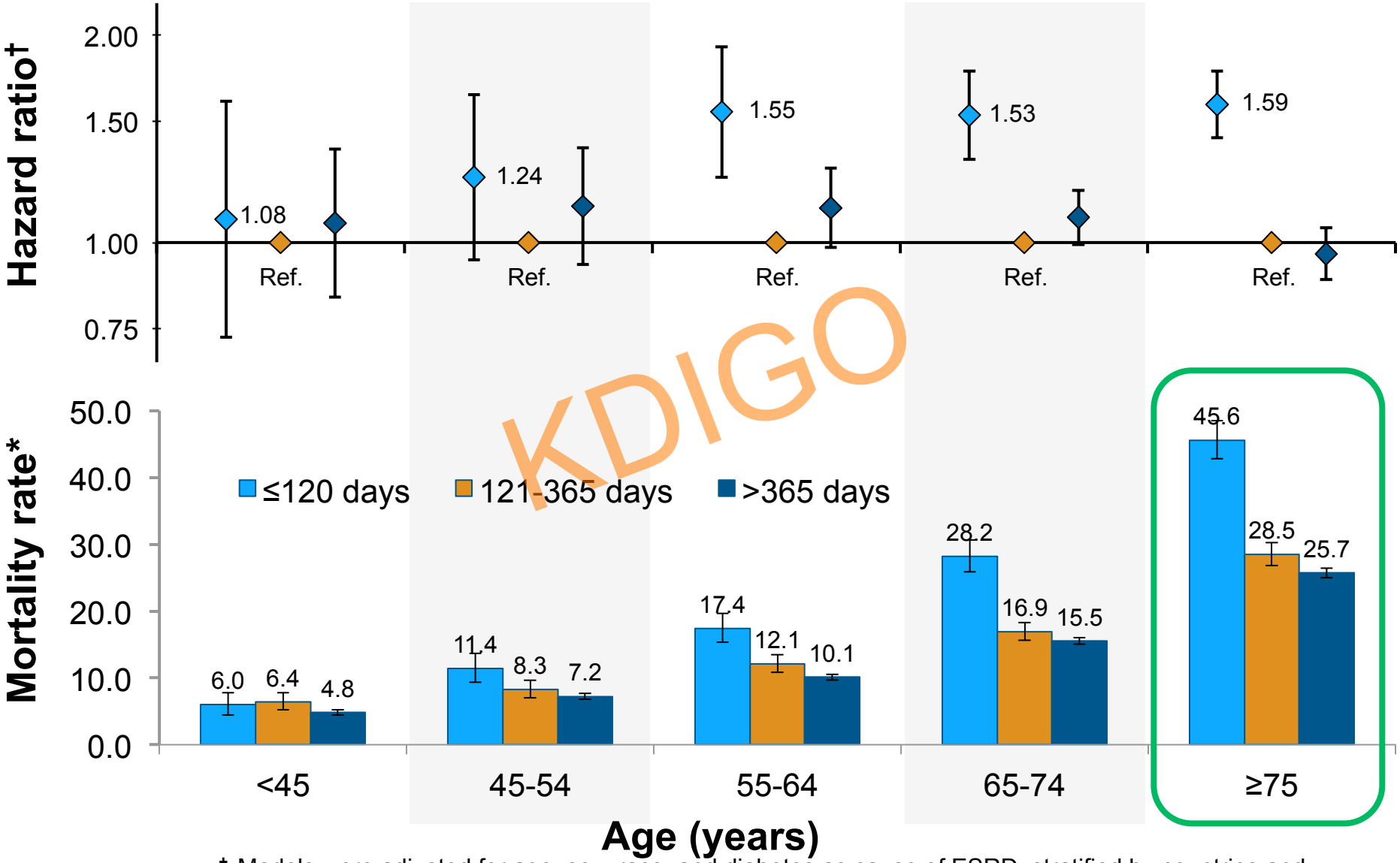
High Mortality Rates After Dialysis Start:

DOPPS 2-5 (2002-2015)



DOPPS

Association of mortality with age and vintage



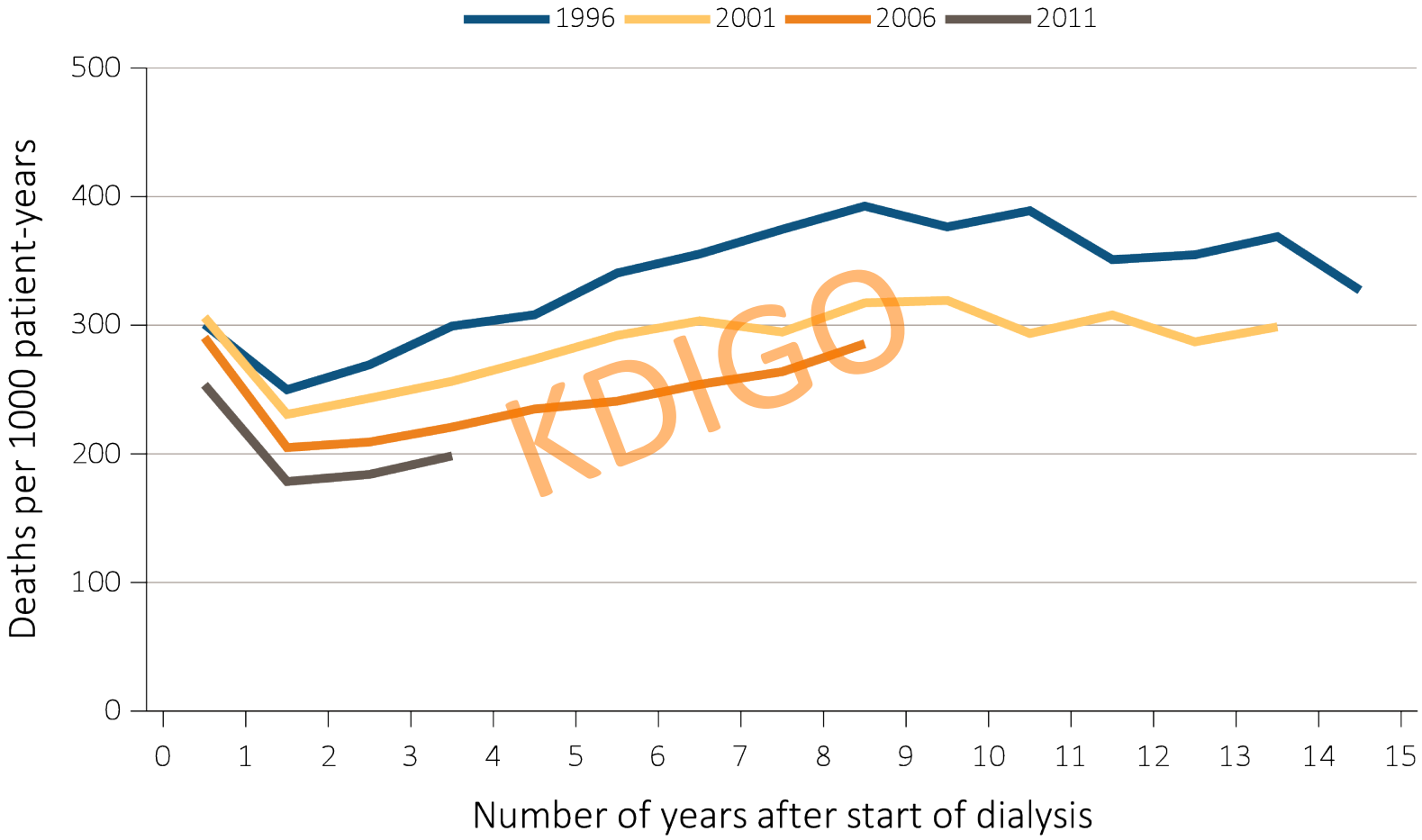
† Models were adjusted for age, sex, race, and diabetes as cause of ESRD, stratified by countries and study phase, and accounted for facility clustering.

* Mortality rate: unadjusted number of deaths per 100 patient-years. Error bars correspond to 95% confidence intervals calculated using the Byer approximation.

DOPPS

Robinson et al. *KI 85*(1):158-65, 2014

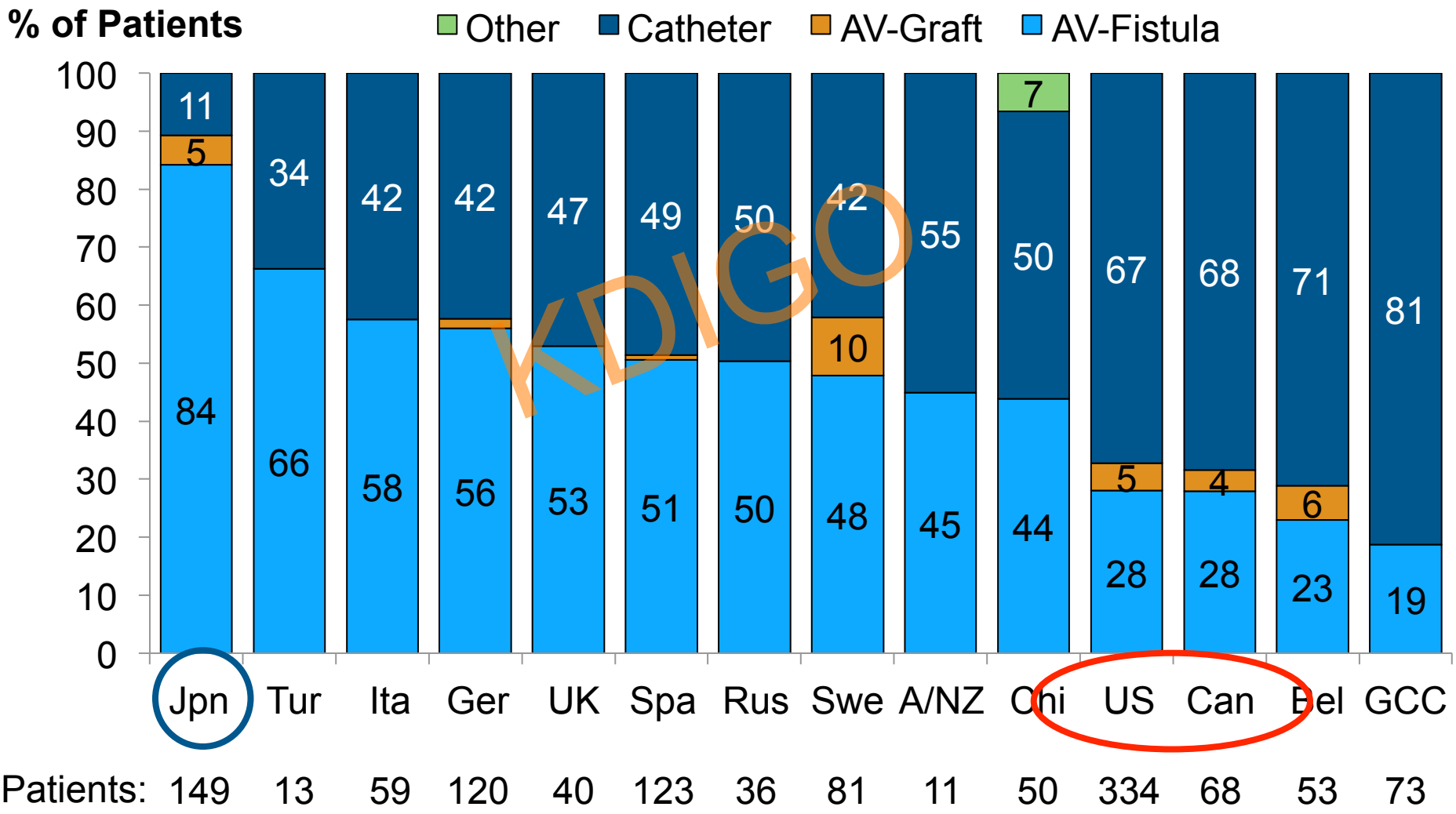
Figure 6.2.a Adjusted all-cause mortality (deaths per 1,000 patient-years) by treatment modality, cohort (year of ESRD onset), and number of years after start of dialysis among incident hemodialysis patients, 1996, 2001, 2006, and 2011



Data Source: Special analyses, USRDS ESRD Database. Adjusted for age, sex, race, and primary diagnosis. Reference population: period prevalent ESRD patients, 2011. Abbreviation: ESRD, end-stage renal disease.

Vascular access use[a] – incident patients

DOPPS 5 (2012-2014)



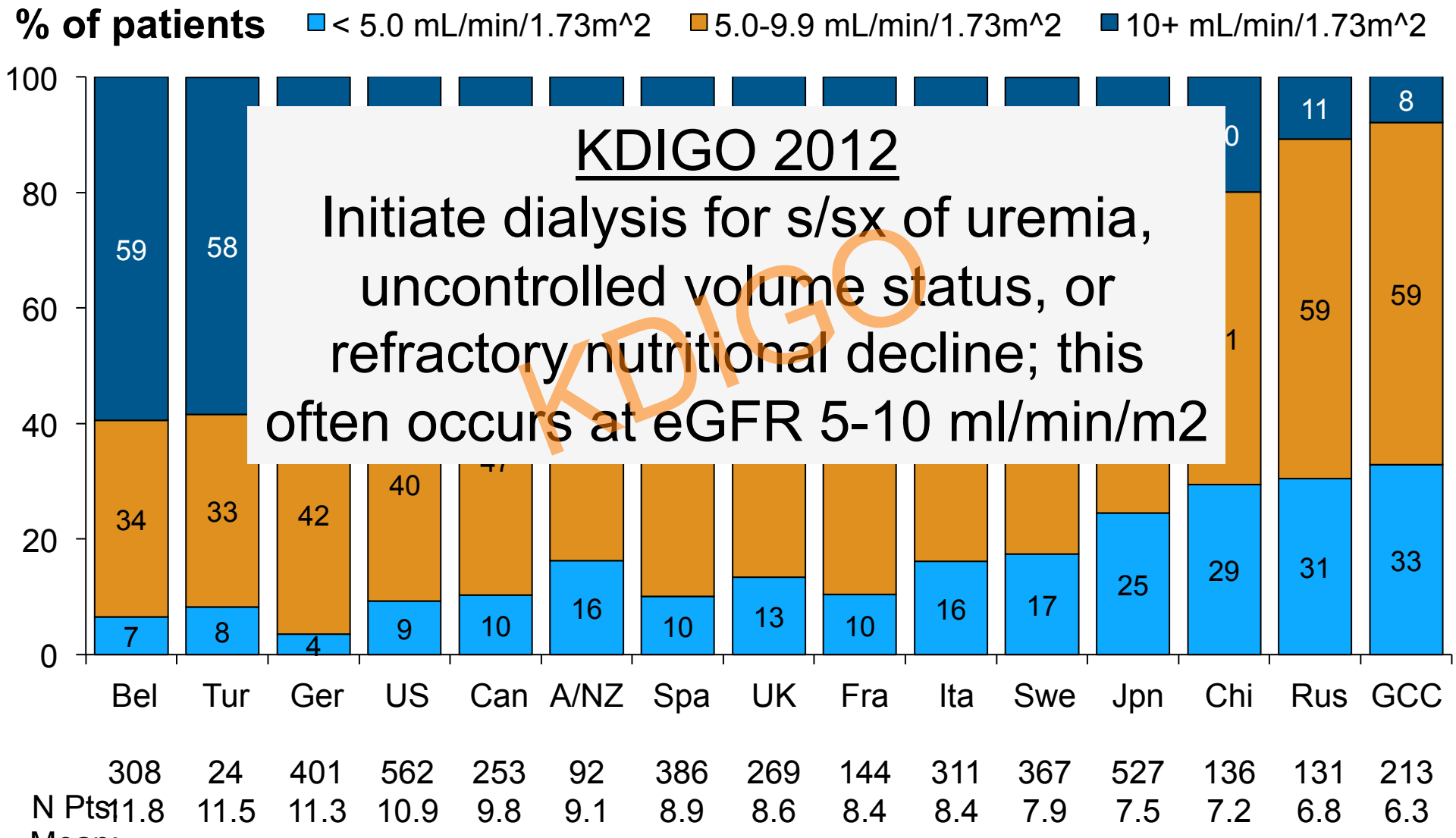
[a] At study entry for patients on dialysis ≤60 days at DOPPS enrollment

DOPPS

Pisoni et al. *Am J Kidney Dis.* 2015;65(6):905-915

eGFR at dialysis initiation

DOPPS 4.5 (2009-2015)



KDIGO 2012

Initiate dialysis for s/sx of uremia, uncontrolled volume status, or refractory nutritional decline; this often occurs at eGFR 5-10 ml/min/m2

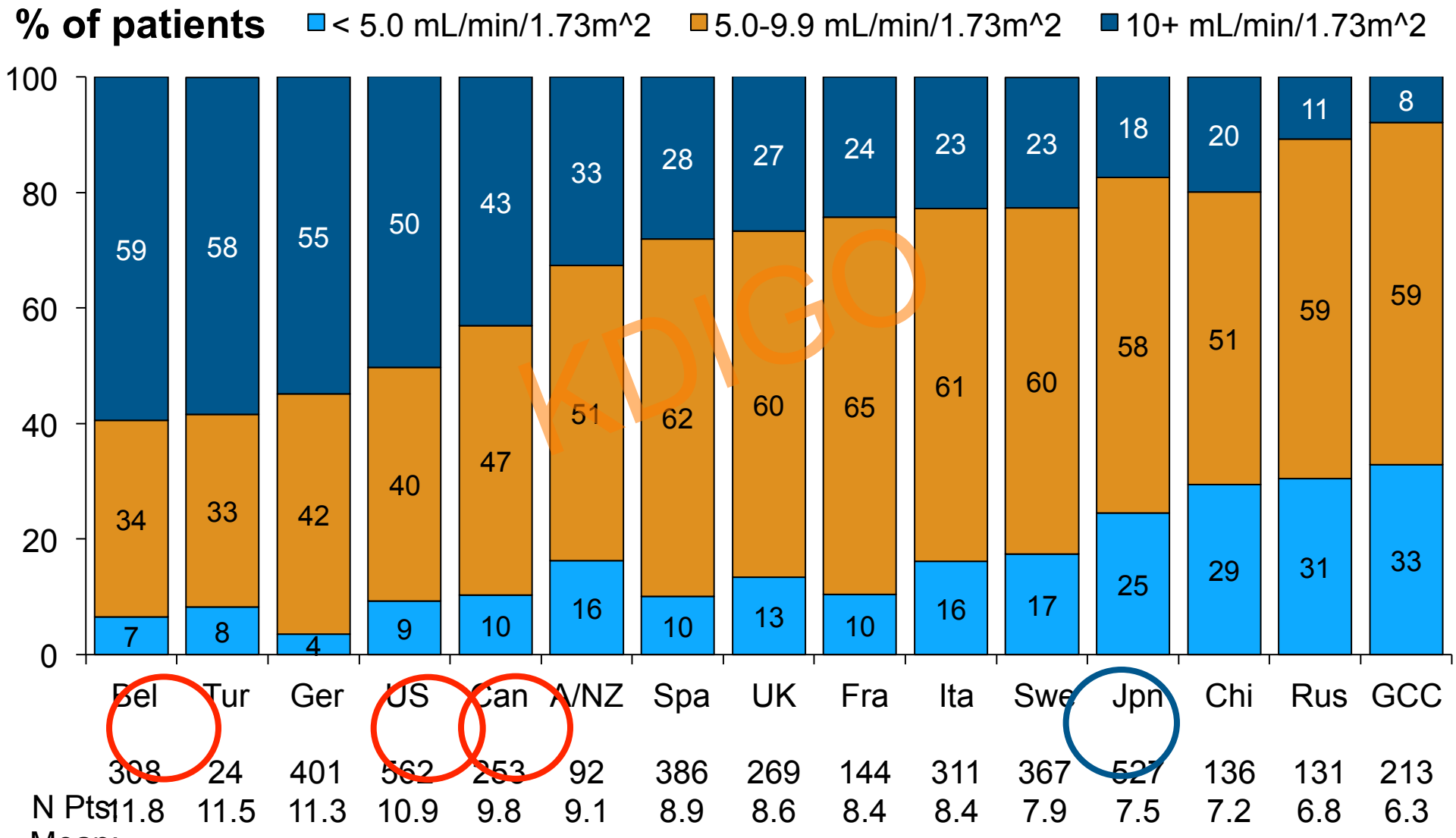
KDIGO

DOPPS

Adapted from Bieber et al. ASN abstract (2013)

eGFR at dialysis initiation

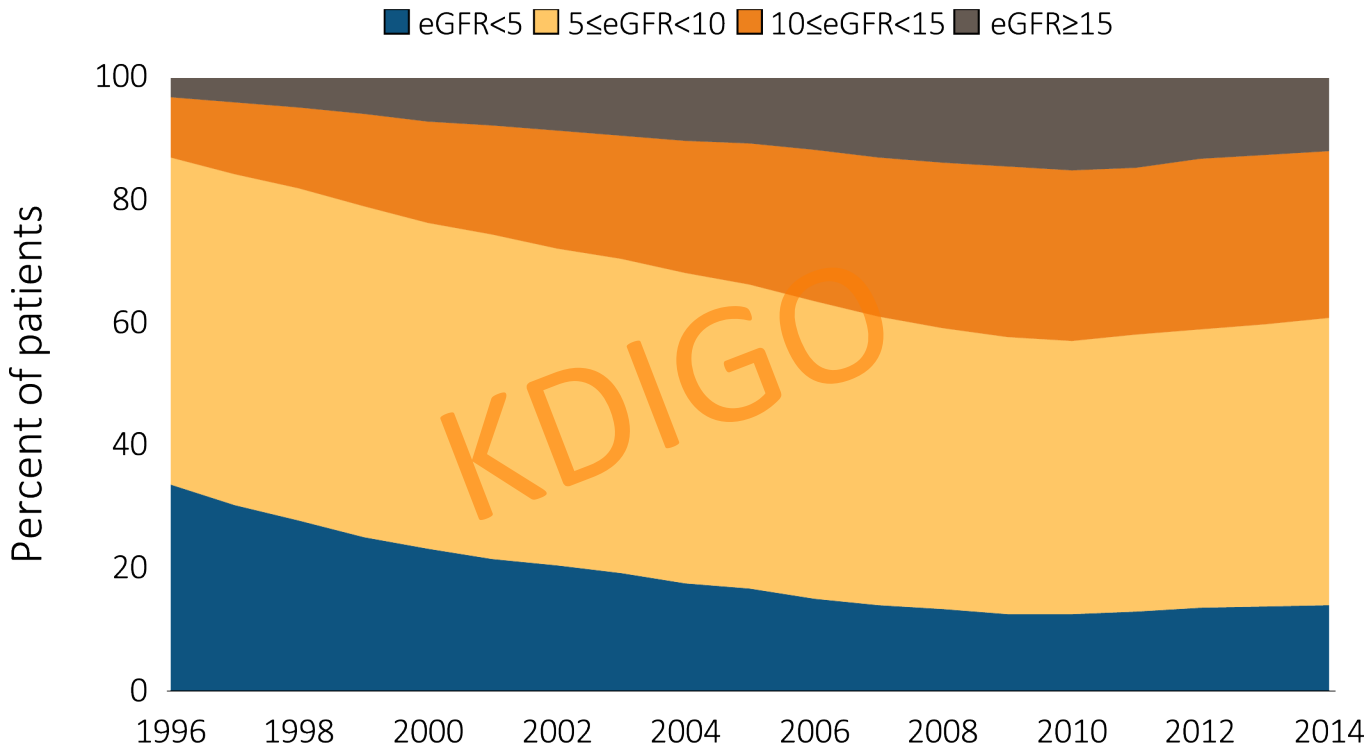
DOPPS 4.5 (2009-2015)



DOPPS

Adapted from Bieber et al. ASN abstract (2013)

Figure 1.22 Trends in the distribution (%) of eGFR (ml/min/1.73 m2) among incident ESRD patients, 1996-2014

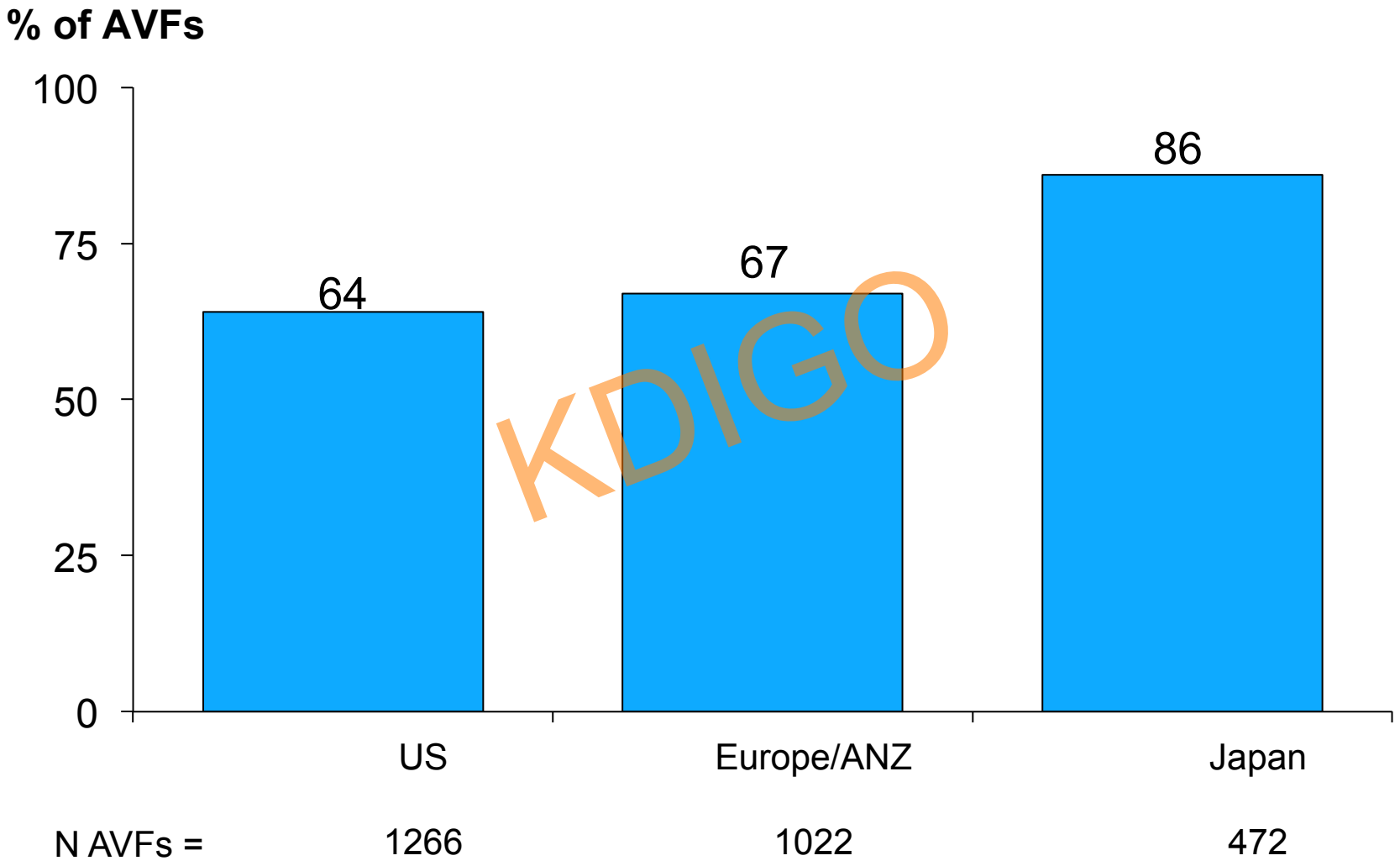


Data Source: Special analyses, USRDS ESRD Database. Population only includes incident cases with CMS form 2728. eGFR calculated using the CKD-EPI equation (CKD-EPI eGFR (ml/min/1.73 m2) for those aged ≥18 and the Schwartz equation for those aged <18. Abbreviations: CKD-EPI; chronic kidney disease epidemiology calculation; eGFR, estimated glomerular filtration rate; ESRD, end-stage renal disease.

Need (Imperative!) to Improve Practices During the Dialysis Transition Period

Vascular Access

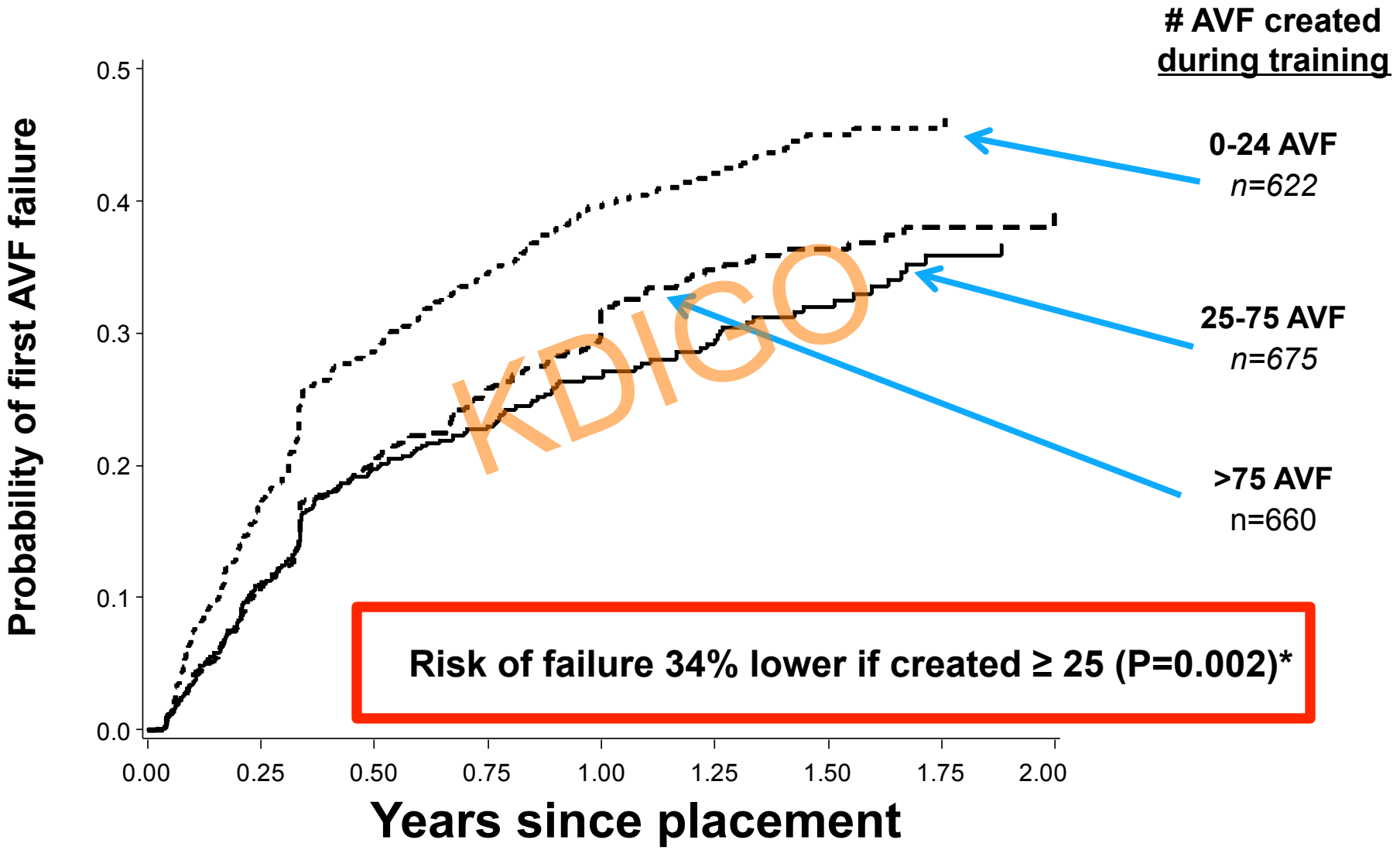
AVF maturation success*, by region



*AVF maturation success was defined as use ≥ 30 days
Restricted to AVFs created in DOPPS 4 and 5 (2009-2015) in US, Europe, Australia and New Zealand, and Japan

DOPPS

Time to Primary Fistula Failure by Number Created by Surgeon During Training



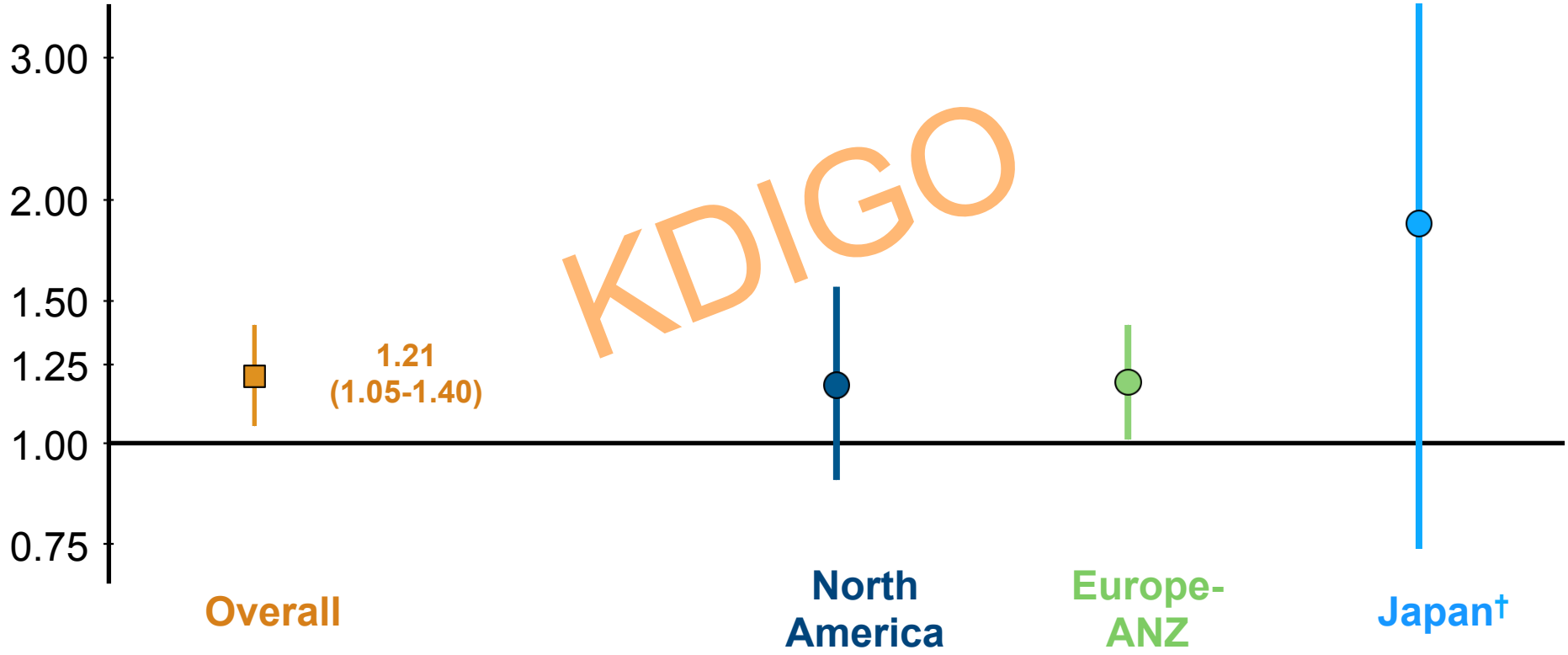
* Adjusted for age, sex, race, vintage, 14 comorbidities, prior catheter use, country

DOPPS

Goodkin et al. AJKD 2010;56:1032

Blood Flow Rate and Fistula Survival

HR of Final AVF Failure per 50 mL/min higher than the facility median BFR (95% CI)



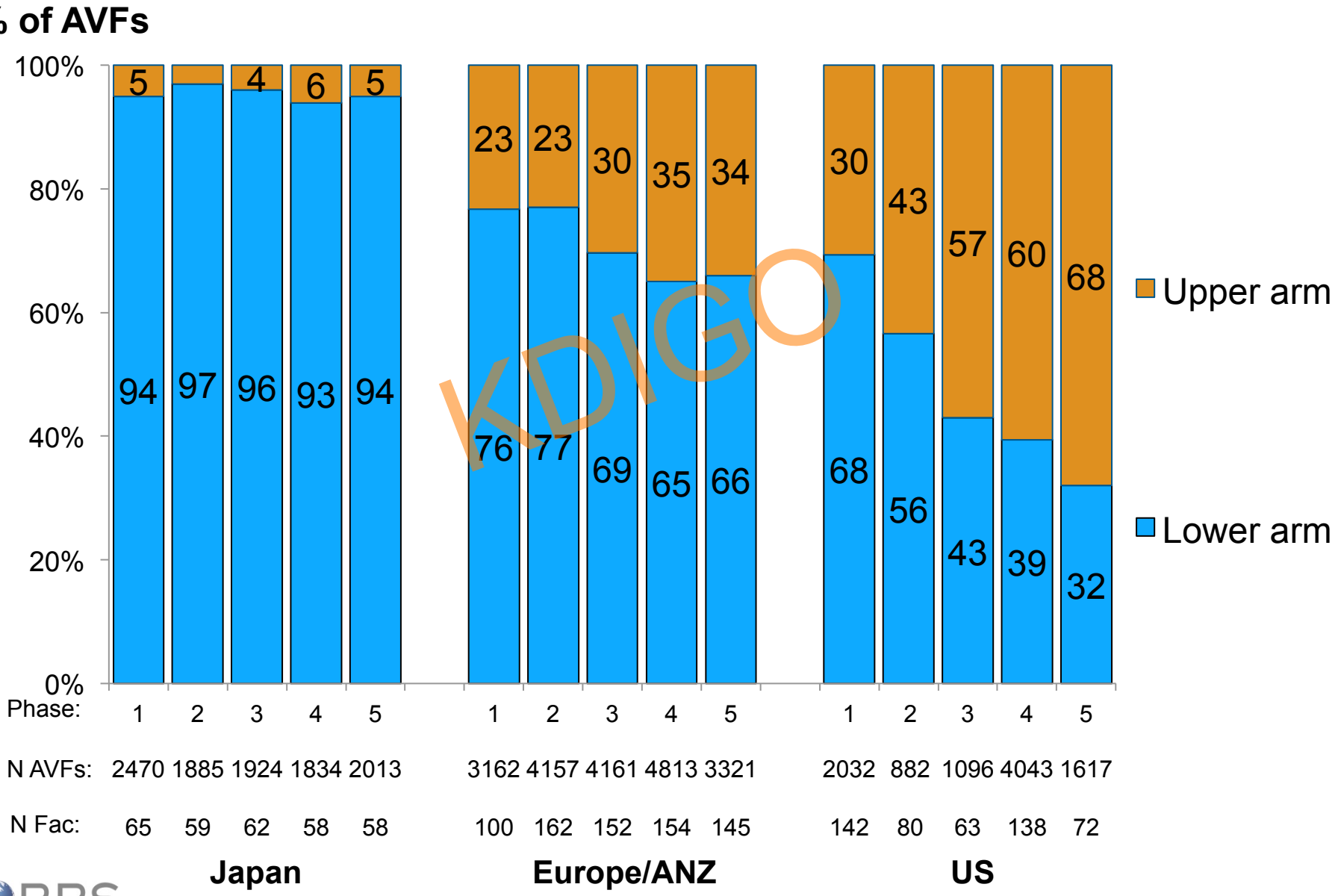
Adjusted for age, sex, black race, BMI, vintage, cardiac disease, cerebrovascular disease, PAD, lung disease, cancer, psychiatric disease, and recurrent cellulitis, prior catheter use, and fistula location. DOPPS 2 and 3. n=2,132 fistulas. † Only 14 failure events in Japan.

DOPPS

Asano et al, Nephron Clin Pract 2013;124:23-30

AV Fistula location, by region and phase

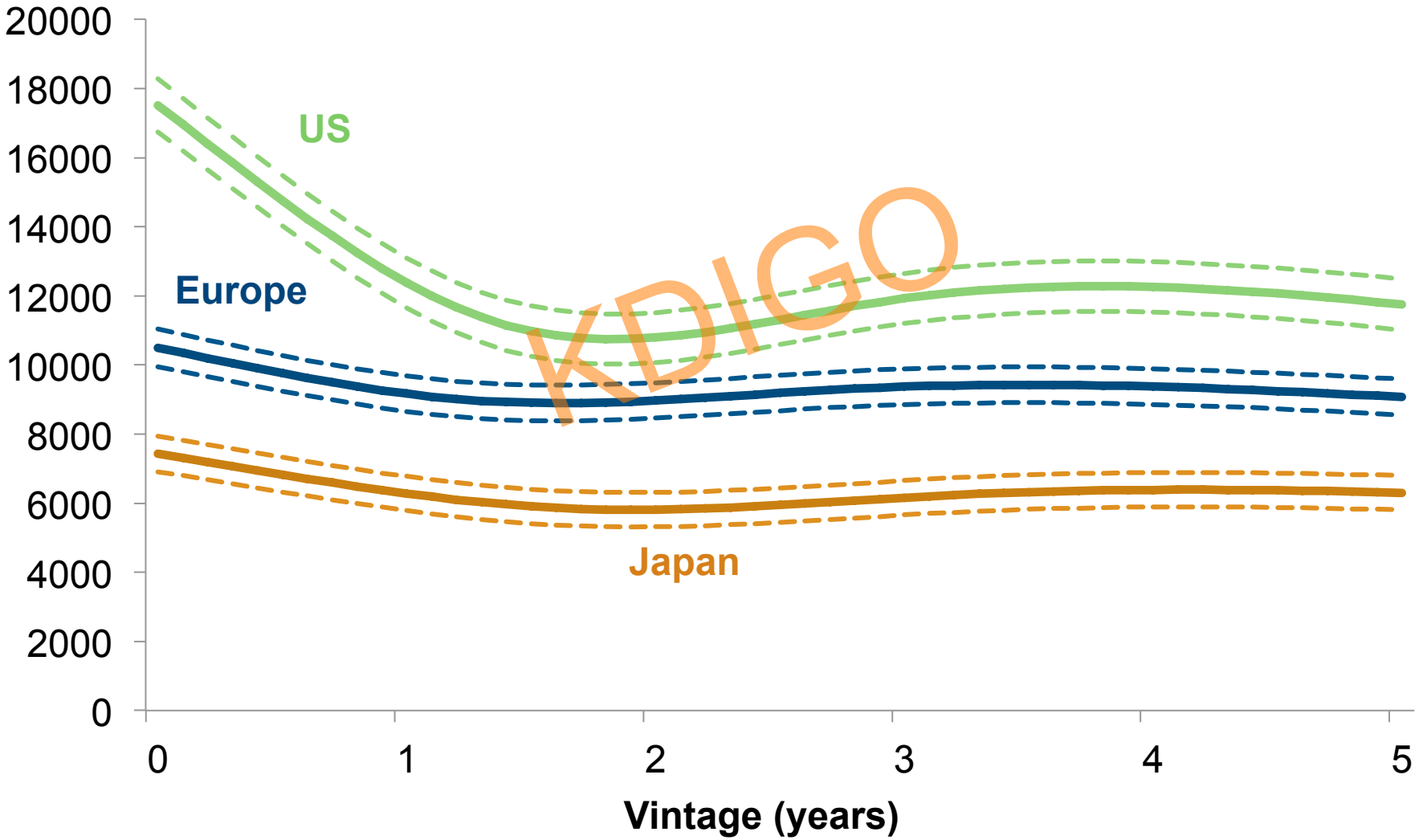
DOPPS 1-5 (1996-2015)



DOPPS

Regional difference in ESA dose by vintage

Mean weekly ESA dose (units/week), among those treated with ESAs



DOPPS 5 (2012-2015); restricted cubic spline with 4 knots used to model vintage in each region

DOPPS

Karaboyas et al, ASN oral abstract (2016)

DOPPS

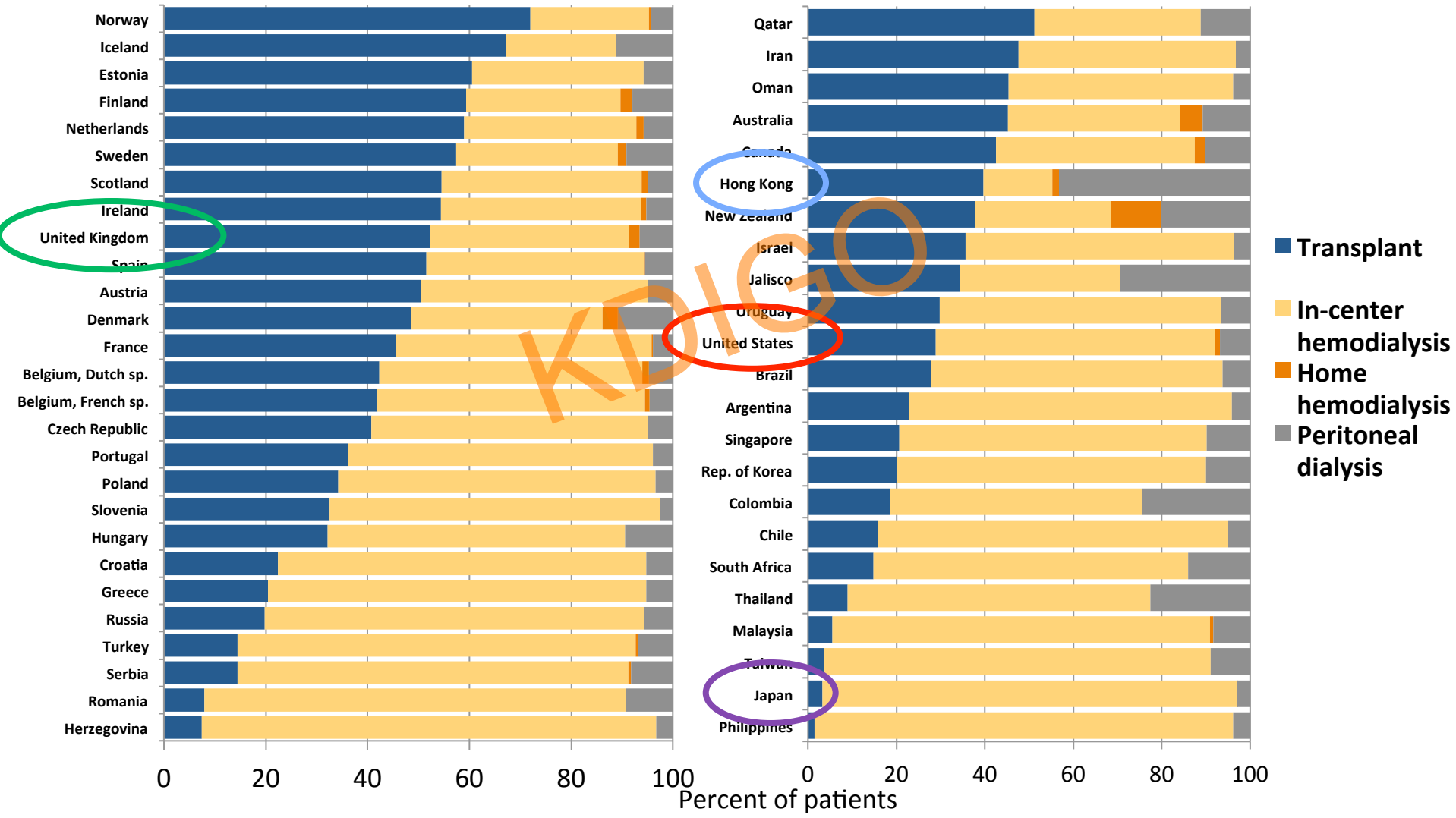
Dialysis Outcomes and Practice Patterns Study

KDIGO

Need to Prioritize Patient Choice:

Modality Selection & Withdrawal

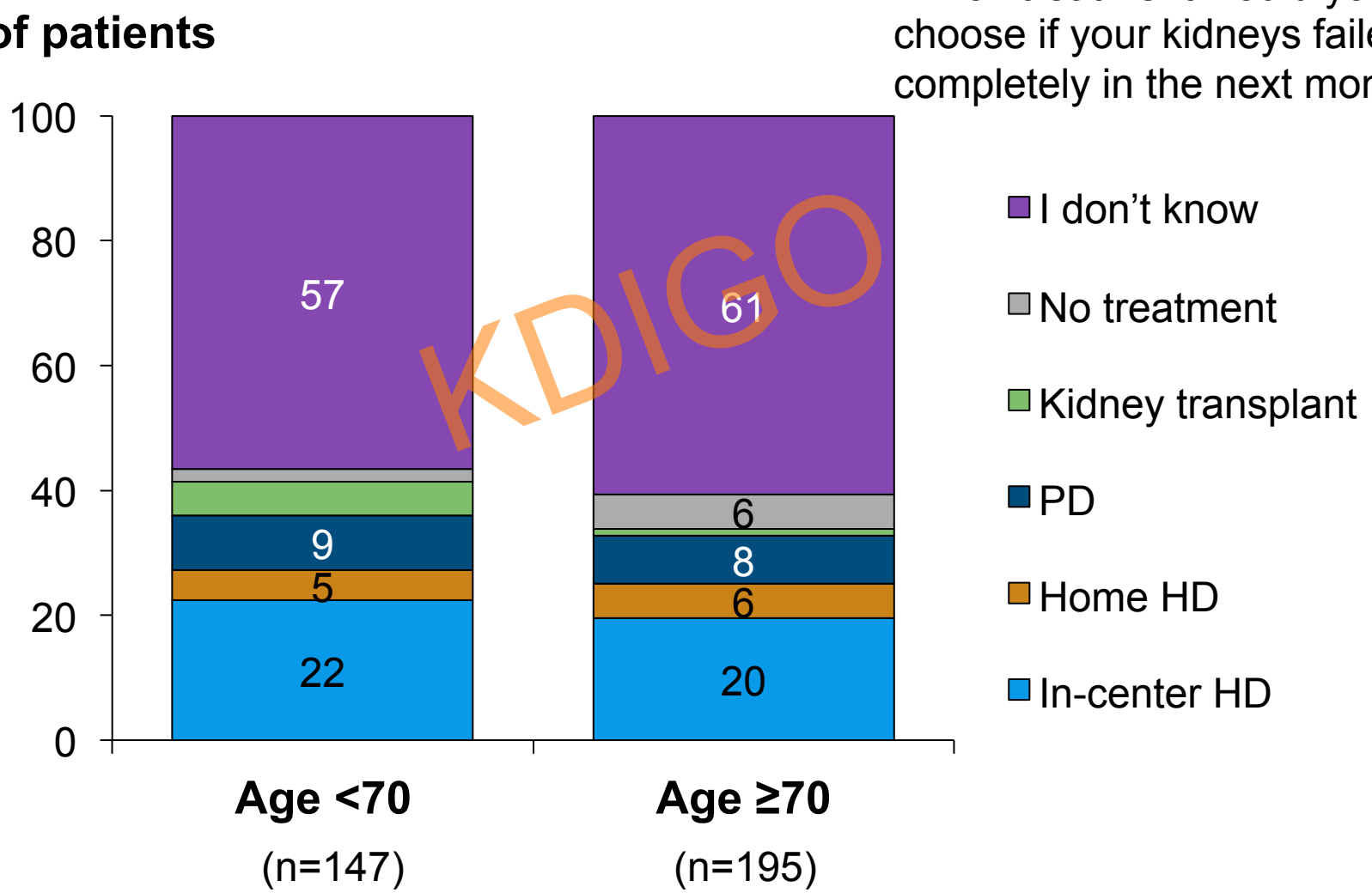
Renal replacement therapy modality use among prevalent ESKD patients, by country, in 2013



USRDS 2015 ADR, Vol. 2, Chapter 13 - International Comparisons

Education on treatment options for renal failure US CKDopps (2015)

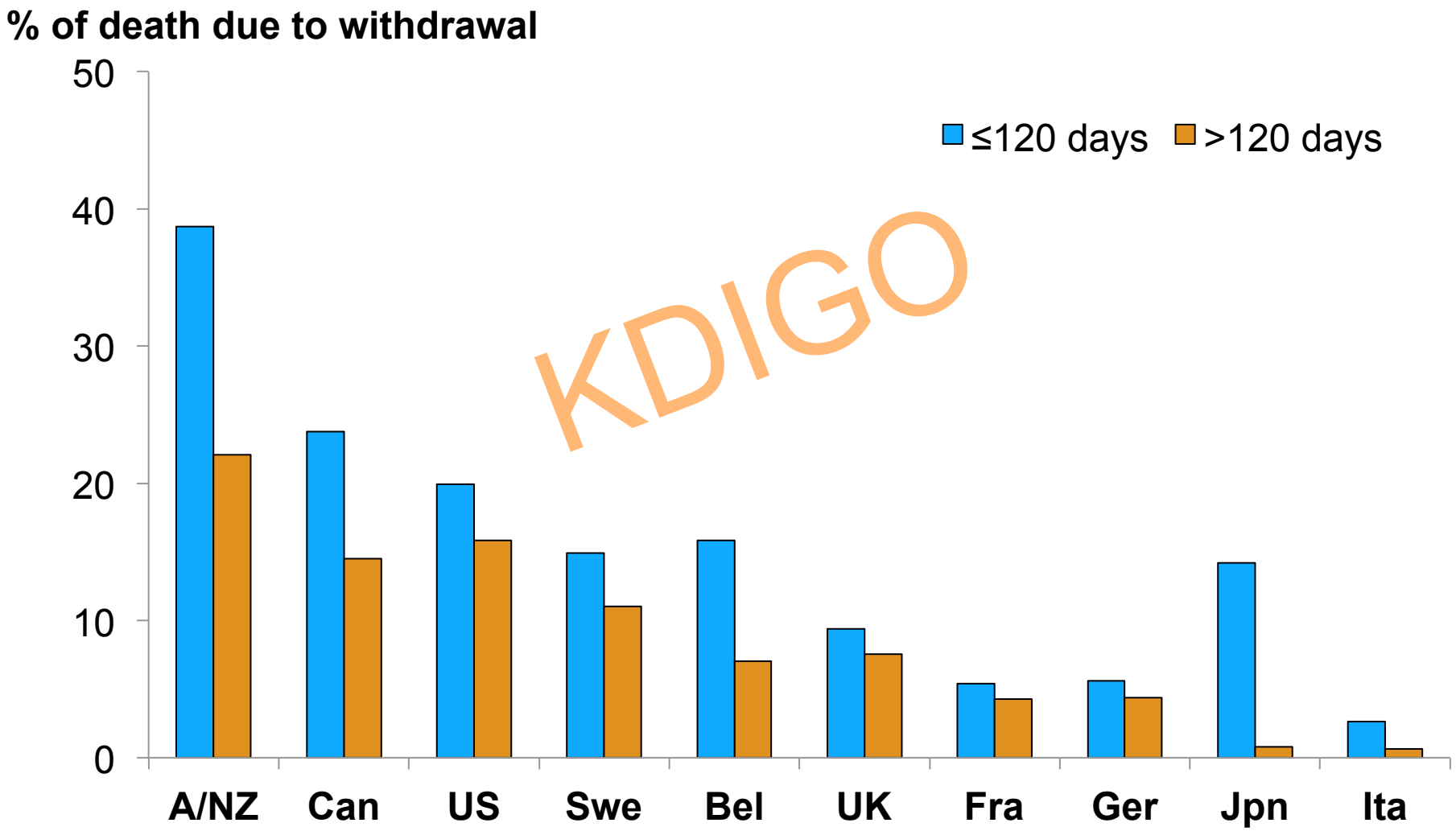
Which treatment would you choose if your kidneys failed completely in the next month?



Year 1 Patient Questionnaire data, among US patients with eGFR<30

CKDopps Patient Questionnaire; updated from Mariani et al (ASN 2015 abstract)

Proportion of Deaths due to Withdrawal from Dialysis by Dialysis Period and Country



Countries were ordered by percent of deaths due to withdrawal from dialysis

DOPPS

Robinson et al. *KI 85*(1):158-65, 2014

CKDOPPS

CHRONIC KIDNEY DISEASE OUTCOMES AND PRACTICE PATTERNS STUDY

KDIGO

CKDopps: Improving outcomes in advanced CKD and the transition to dialysis

Benedicte Stengel

on behalf of CKDopps and CKD-REIN Investigators

Inserm U1018, Univ Paris-Saclay
Centre for Research in Epidemiology and Population Health
Renal and Cardiovascular Epidemiology Team
Villejuif, France

CKDOPPS

CKD REIN
Préserver la santé rénale

Am J Kidney Dis. 2016 Sep;68(3):402-13

AJKD

Original Investigation

The CKD Outcomes and Practice Patterns Study (CKDopps): Rationale and Methods

Laura Mariani, MD, MS,[1,2] Bénédicte Stengel, MD, PhD,[3] Christian Combe, MD, PhD,[4,5] Ziad A. Massy, MD, PhD,[3,6] Helmut Reichel, MD,[7] Danilo Fliser, MD,[8] Roberto Pecoits-Filho, MD, PhD,[9] Antonio A. Lopes, MD, MPH, PhD,[10] Kunihiro Yamagata, MD, PhD,[11] Takashi Wada, MD, PhD,[12] Michelle M.Y. Wong, MD, MSc,[1] Elodie Speyer, PhD,[1] Friedrich K. Port, MD, MS,[1,2] Ronald L. Pisoni, PhD, MS,[1] and Bruce M. Robinson, MD, MS[1,2]

Background: Minimizing clinical complications in patients with advanced chronic kidney disease (CKD) and improving the transition to dialysis therapy and transplantation represents a challenge, requiring reliable evidence regarding the effects of CKD care on outcomes.

Study Design: The CKD Outcomes and Practice Patterns Study (CKDopps) is a new international prospective cohort study designed to describe and evaluate variation in nephrologist-led CKD practices.

CKDOPPS

CKD Rein
Préserver la santé rénale

CKDopps Country Updates

Country	Sites Recruited Target	Sites Recruited	Patient Enrollment Target	Patients Enrolled
Brazil	20	20	1,600	946
France (CKD-Rein)	40	40	3,200	3,034
Germany	30	32	1,800	1,810
Japan	30	30	2,400	1,043
United States	40	30	3,200	1,380
TOTAL	**160**	**152**	**12,200**	**8,213**

CKDOPPS

*derived from electronically transferred datasets

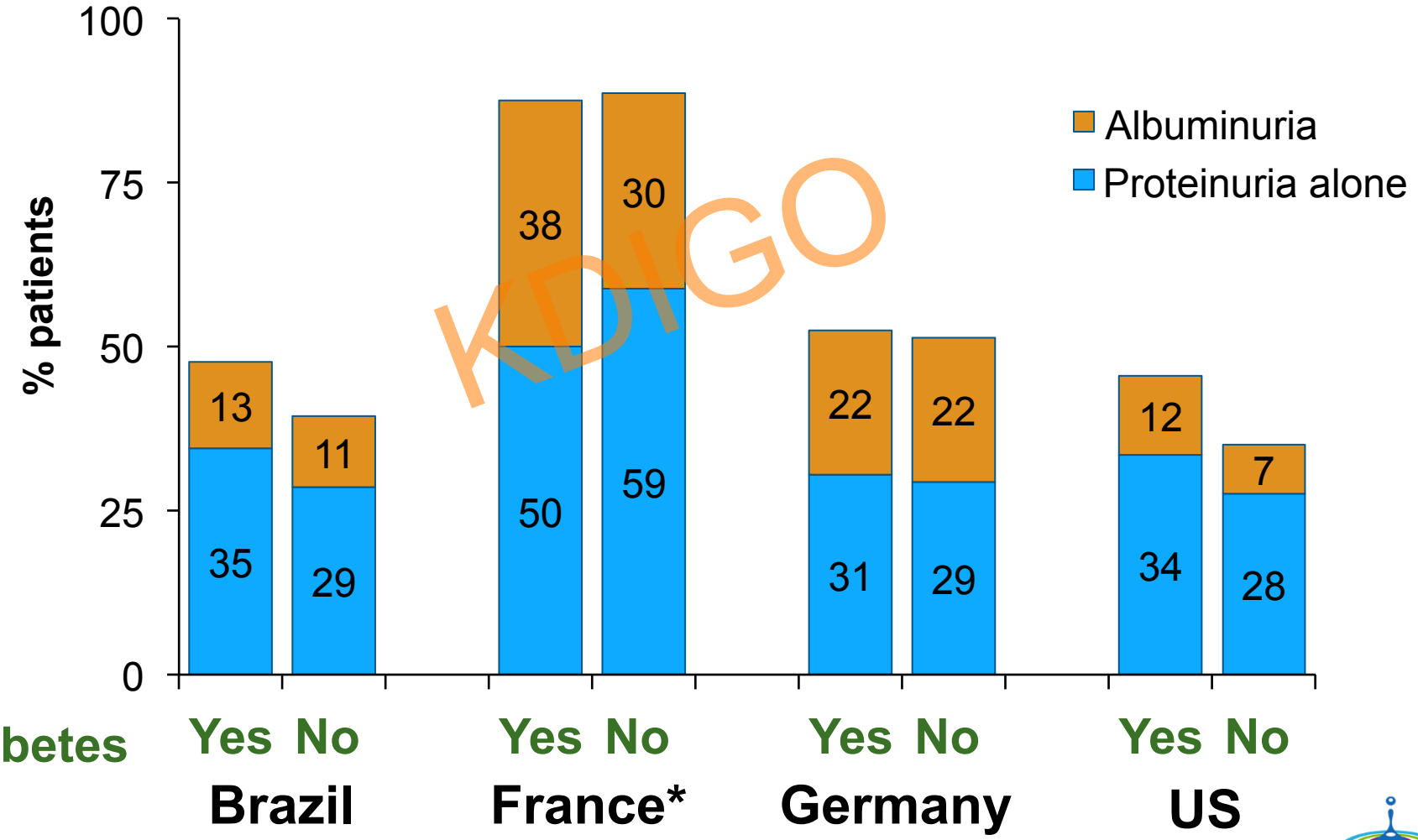
As of 11/1/2016

Baseline patient characteristics

	Brazil	France	Germany	US
Patients, N	774	3034	1810	1057
Median age, year	67	69	75	70
Women	48%	35%	43%	48%
Diabetes	47%	40%	42%	59%
Median years of diagnosed CKD	2.2	5.0	-	3.2
Mean eGFR, mL/min/1.73 m^2	25.7	33.8	27.6	26.7

Albuminuria or proteinuria monitoring by diabetes status

KDIGO 2.1.1 Assess albuminuria annually (Not Graded)

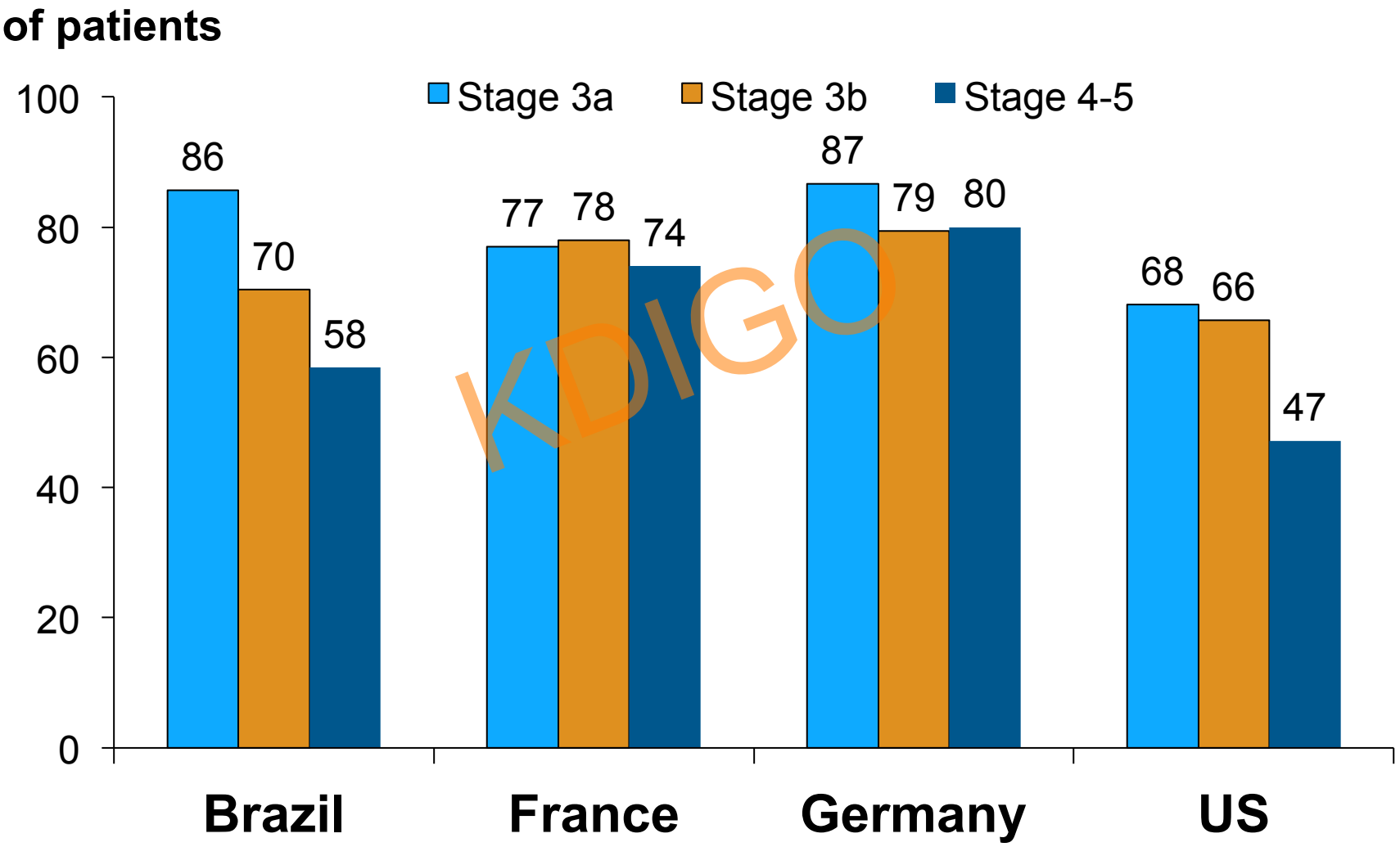


* requested lab per study protocol in France *vs* routine lab in other countries

CKDOPPS

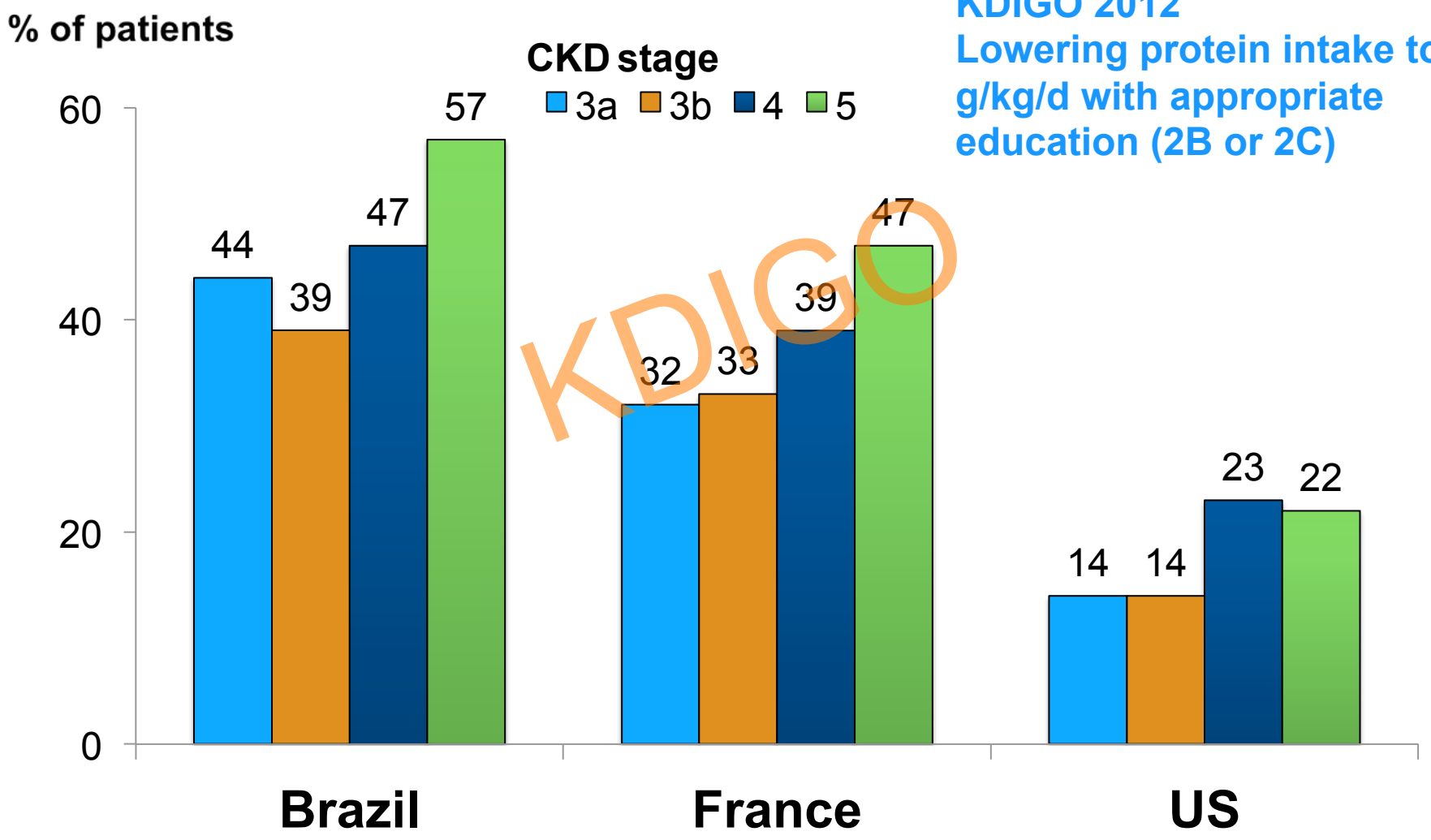
CKD REIN
Préserver la santé rénale

RASi use, by CKD stage



RASi : renin angiotensin system inhibitors, including ACEi, ARB and renin inhibitors

Patients reporting to have received advice to reduce protein intake



CKD PPS

CKD Rein
Préserver la santé rénale

Global Practice Patterns at Dialysis Start
Outline

- **Framing data:**
  - Age, mortality, practice variation
- **Need to improve practices:**
  - Vascular access
- **Need to prioritize patient choice:**
  - Modality selection & withdrawal
- **Preliminary CKDopps data:**
  - Poor performance against KDIGO

DIALYSIS OUTCOMES AND PRACTICE PATTERNS STUDY

KDIGO

Thank you