PREVALENCE OF CKD 4+

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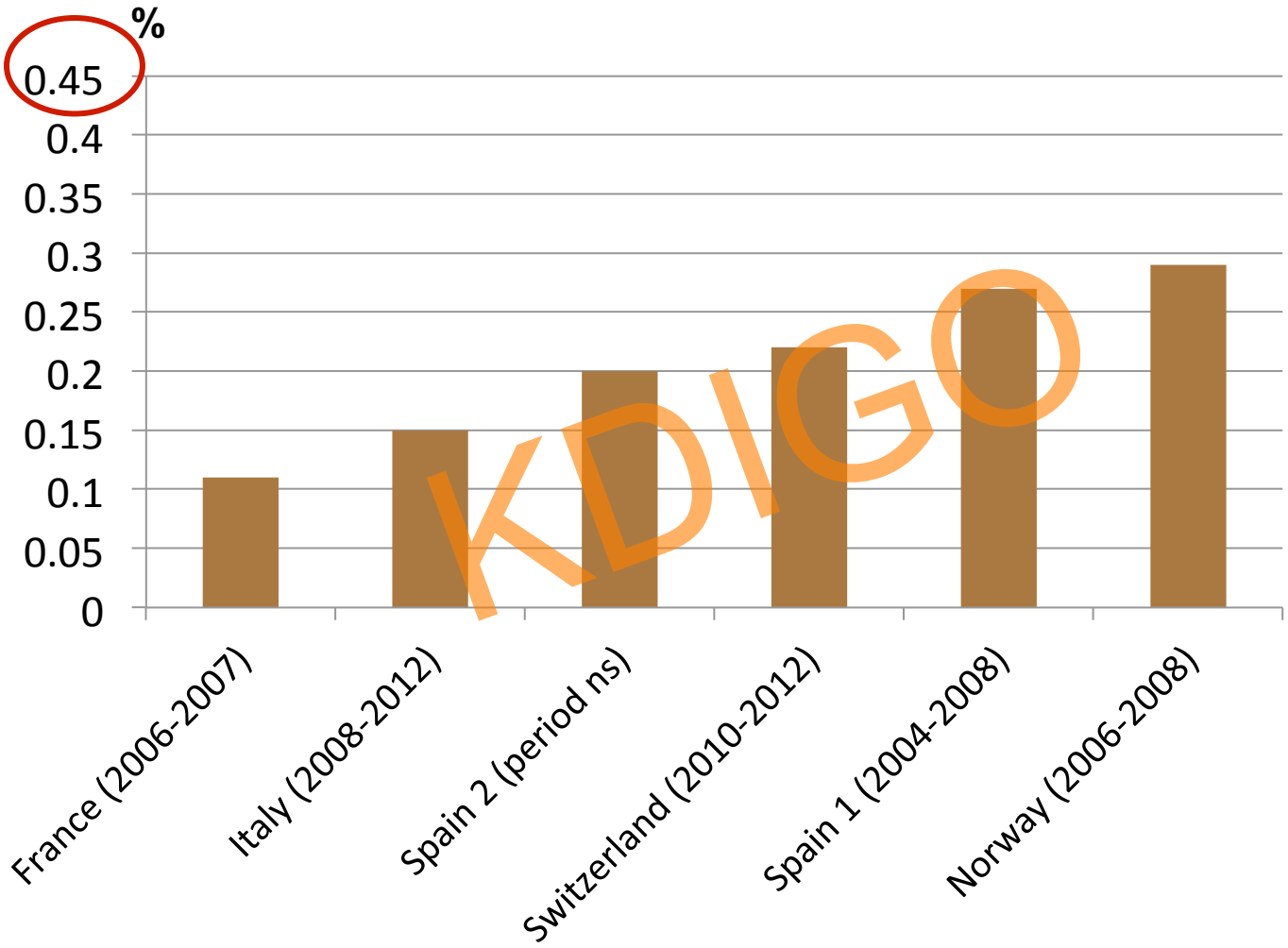
Disclosure of Interests

- No relevant disclosures

Outline

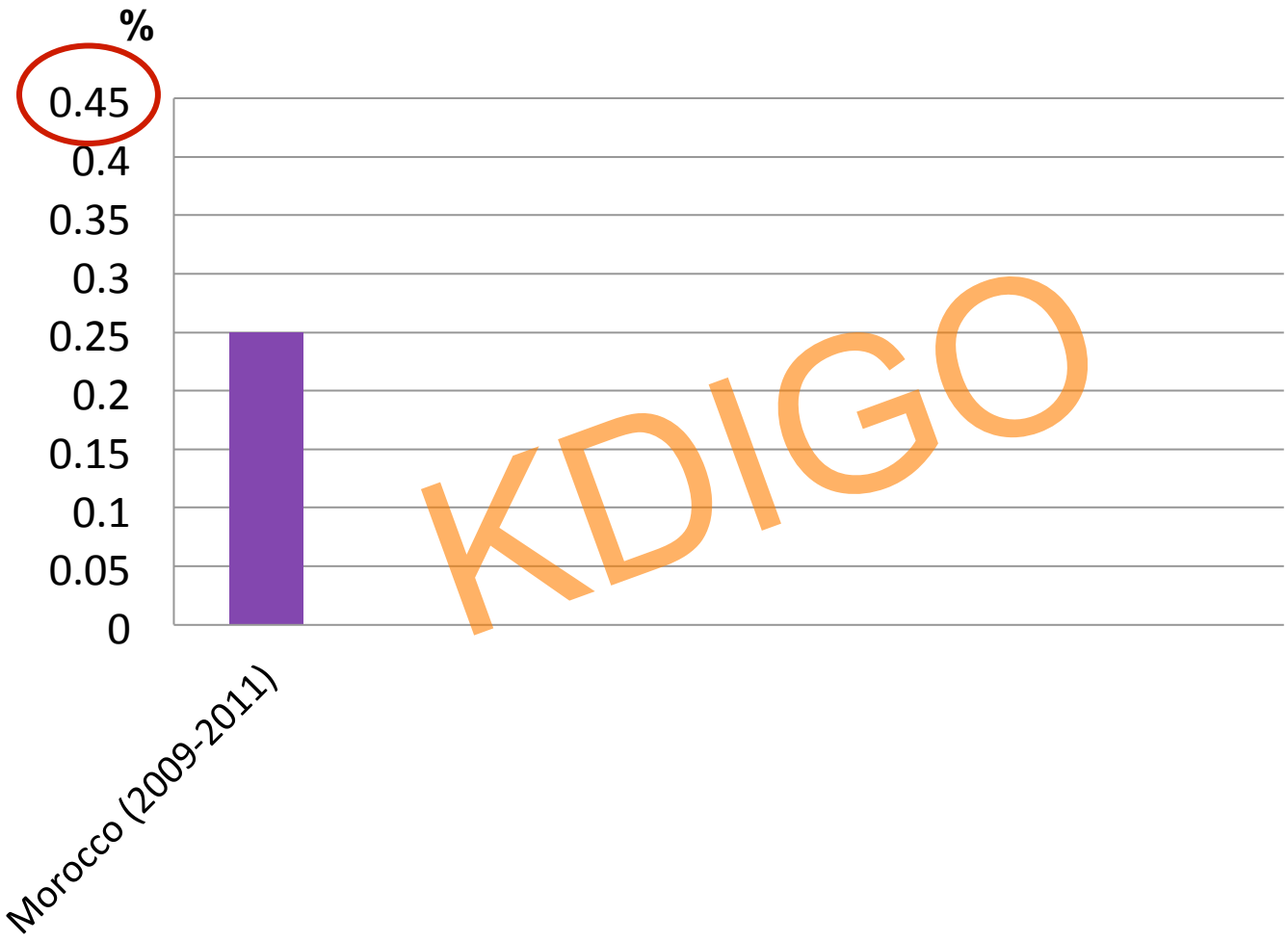
- Stage 4 Prevalence
  - Percent of general population (crude)
  - By continent and country
- Stage 5 *on RRT* Prevalence
  - Stage 5 *not on RRT* - not reported
  - Per million population (crude)
  - By continent and country
- Time trends
- Limitations

Stage 4 Europe



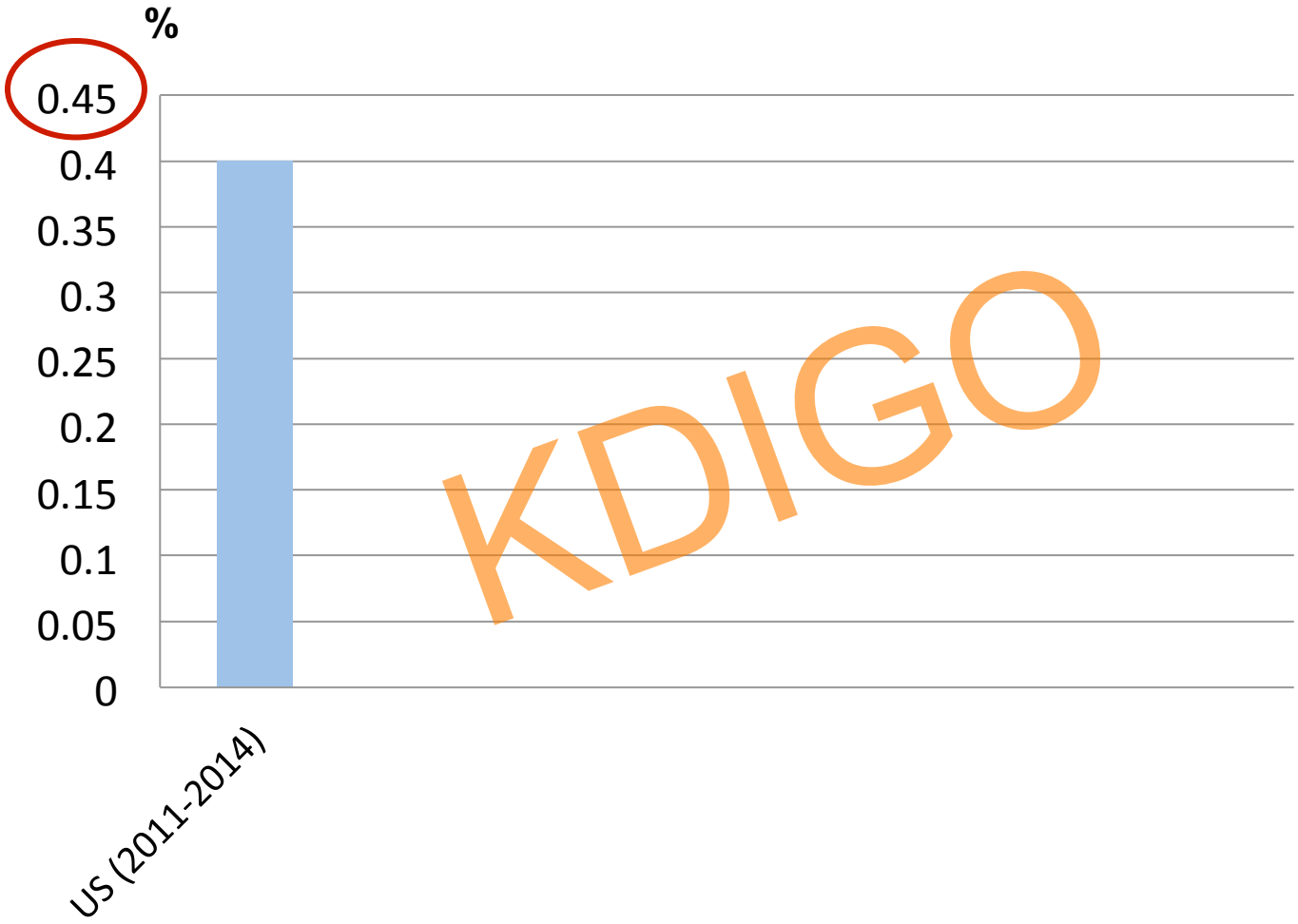
SOURCES: Bongard V. Ann Cardiol Angeiol 2012; De Nicola L. NDT 2015; Robles NR. J Nephrol 2013; Forni Ogna V. Swiss medical weekly 2016; Otero A. Nefrologia 2010; Hallan S. Kidney Int 2016

Stage 4 Africa



SOURCES: Benghanem Garbi M. Kidney Int 2016

Stage 4 Americas



SOURCES: USRDS Annual Report 2016

Stage 4 Asia / Oceania

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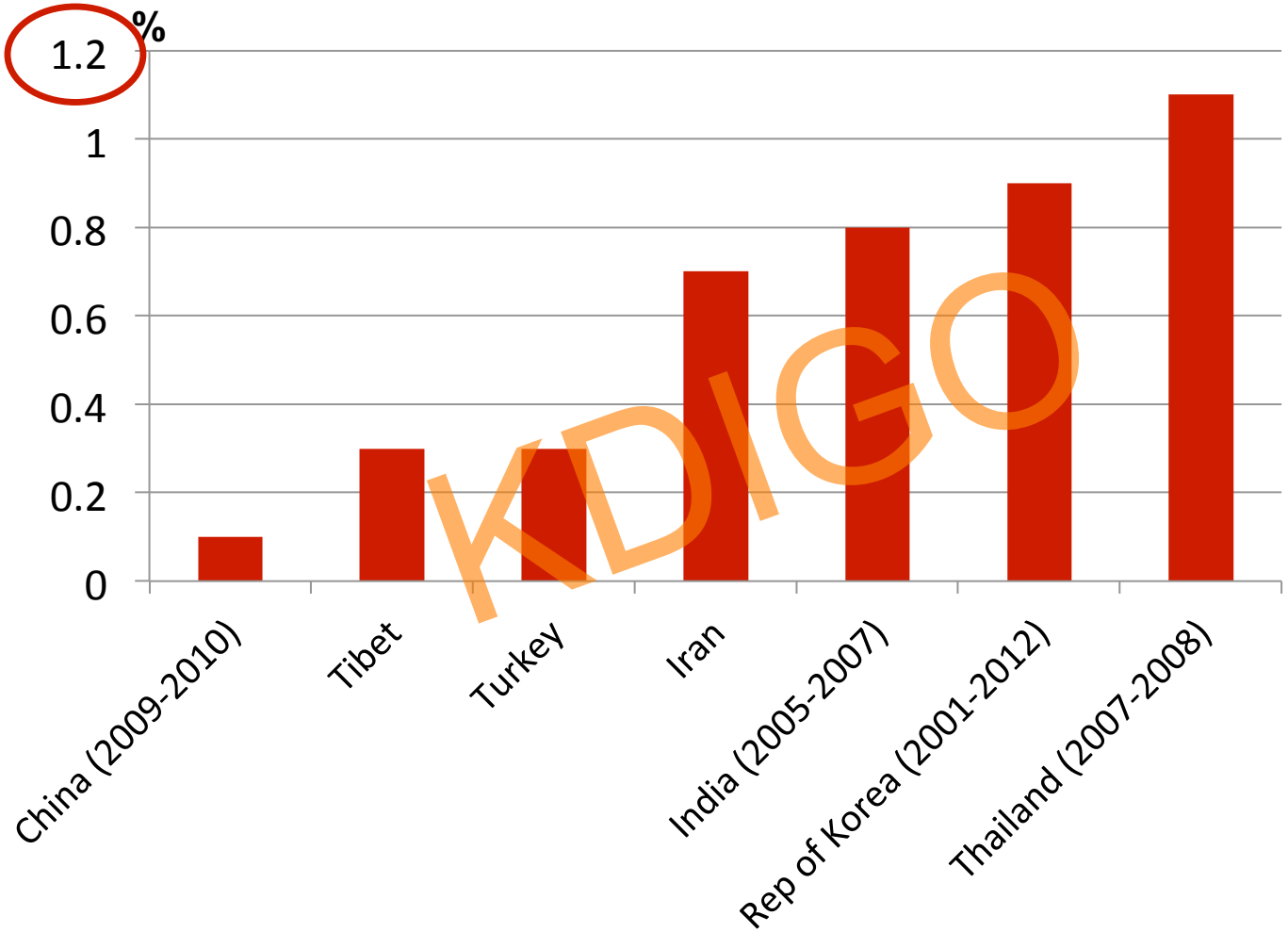
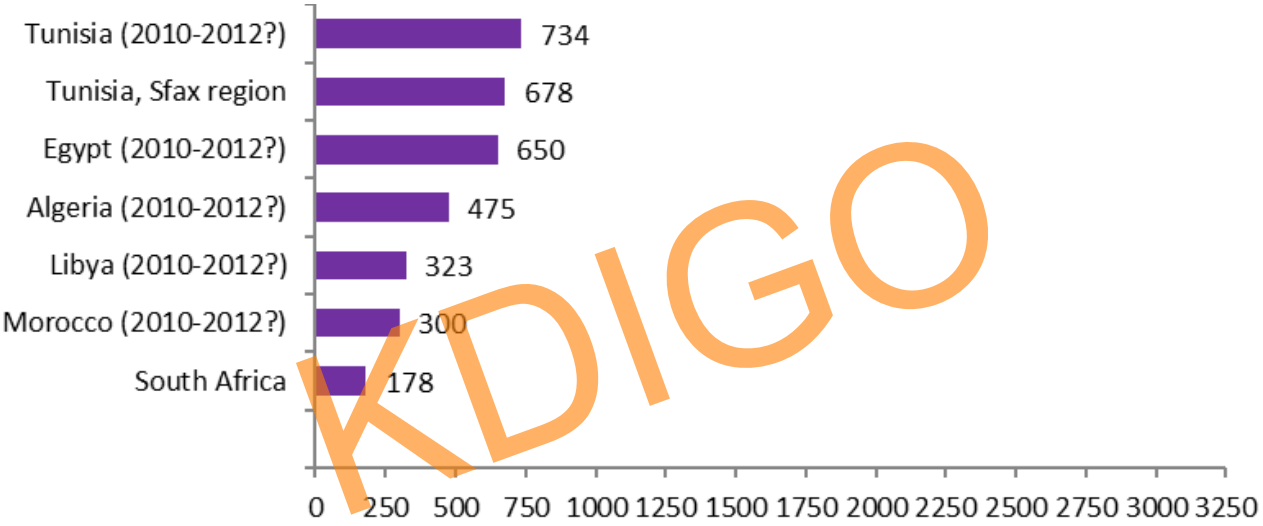


SOURCES: Zhang L. Lancet 2012; Chen W. NDT 2011; Suleymanlar G. NDT 2011; Hosseinpanah F. BMC Public Health 2009; Singh AK. BMC Nephrol 2013; Ji E. KJIM 2015; Ingsathit A. NDT 2010

Stage 5 on RRT
Africa

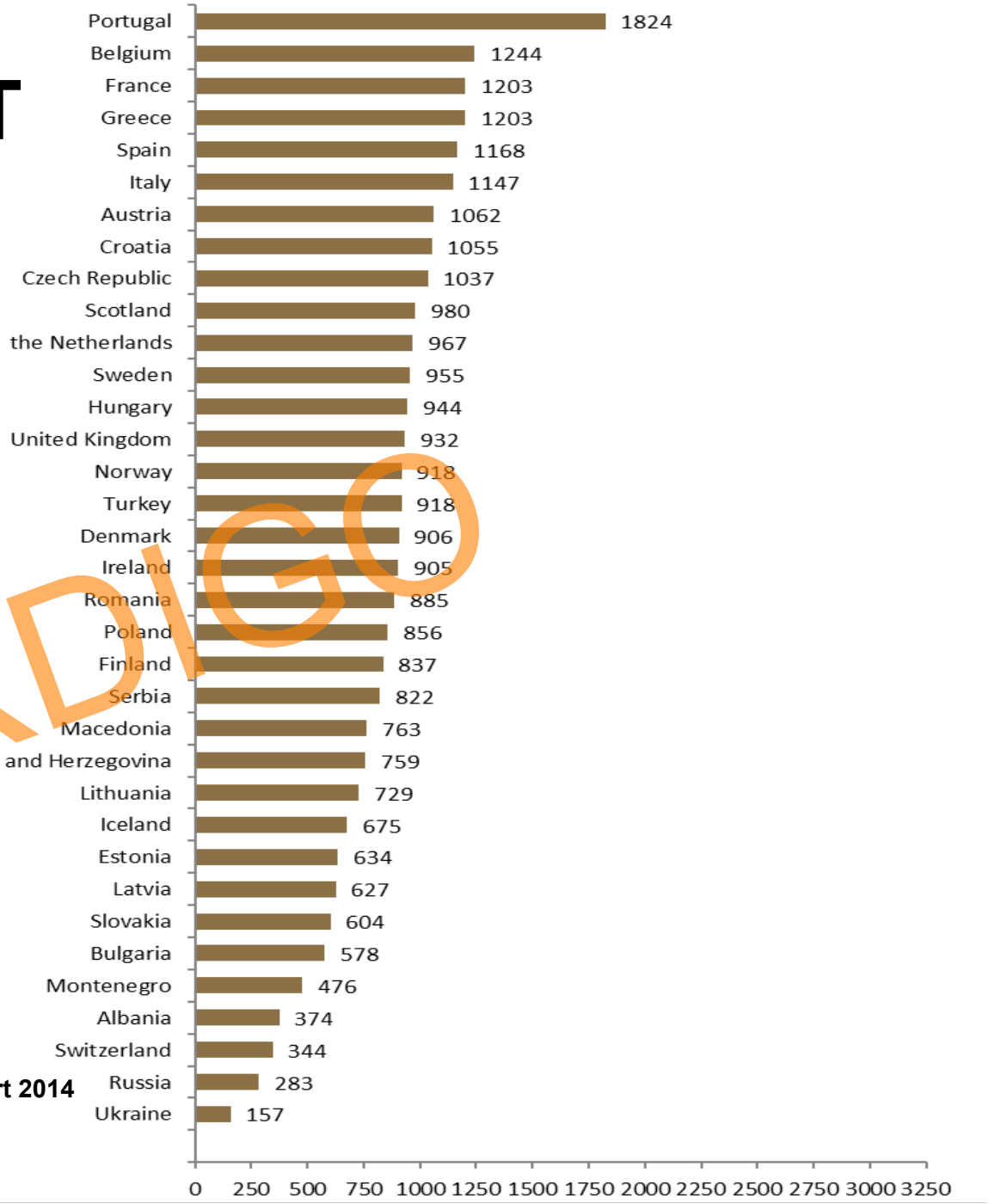


Unadjusted prevalence in 2014 (pmp)

SOURCES: ERA-EDTA Registry Annual Report 2014; USRDS Annual Report 2016; Barsoum R. Kidney Int Suppl 2013

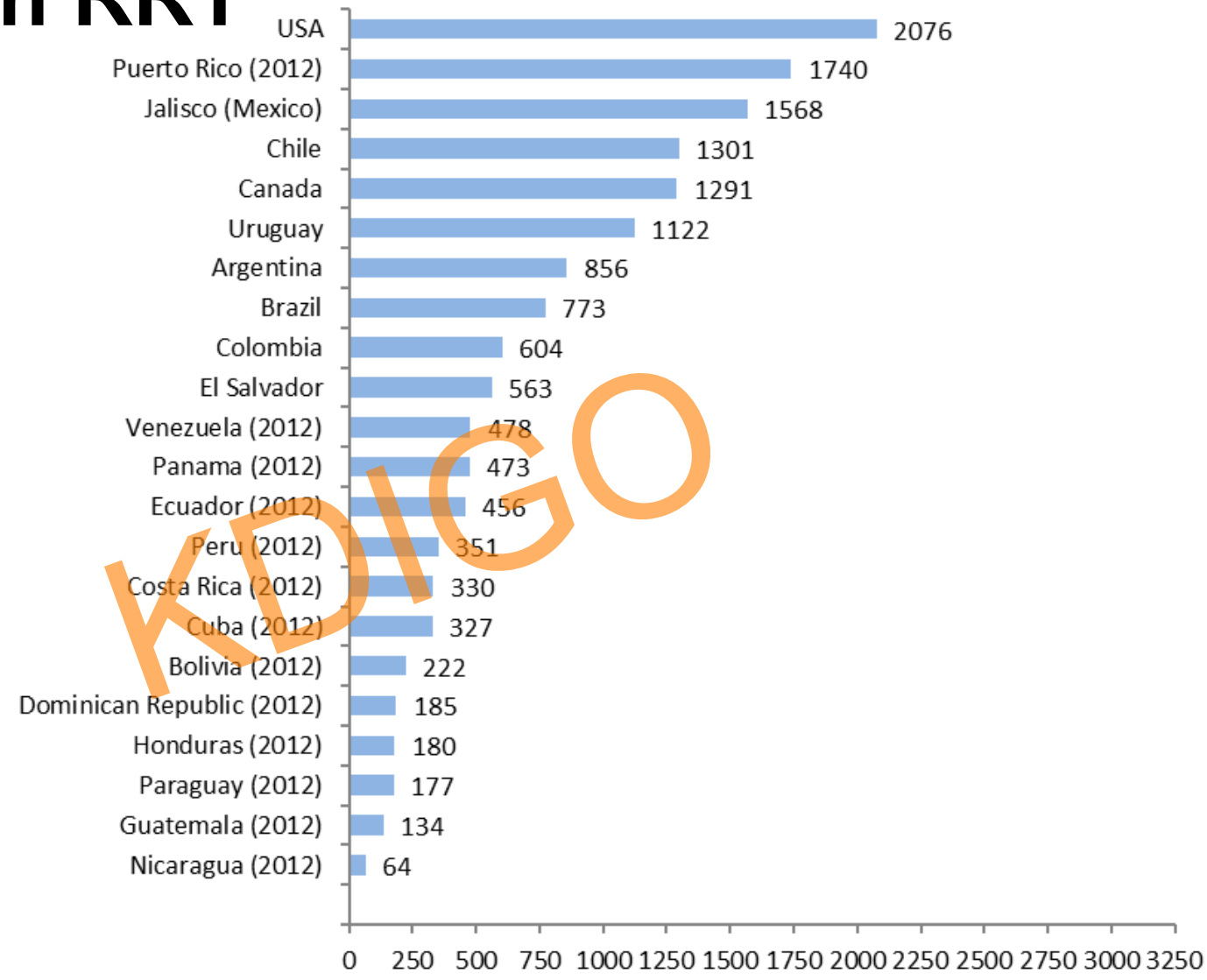
Stage 5 on RRT Europe

Unadjusted prevalence in 2014 (pmp)



SOURCES: ERA-EDTA Registry Annual Report 2014

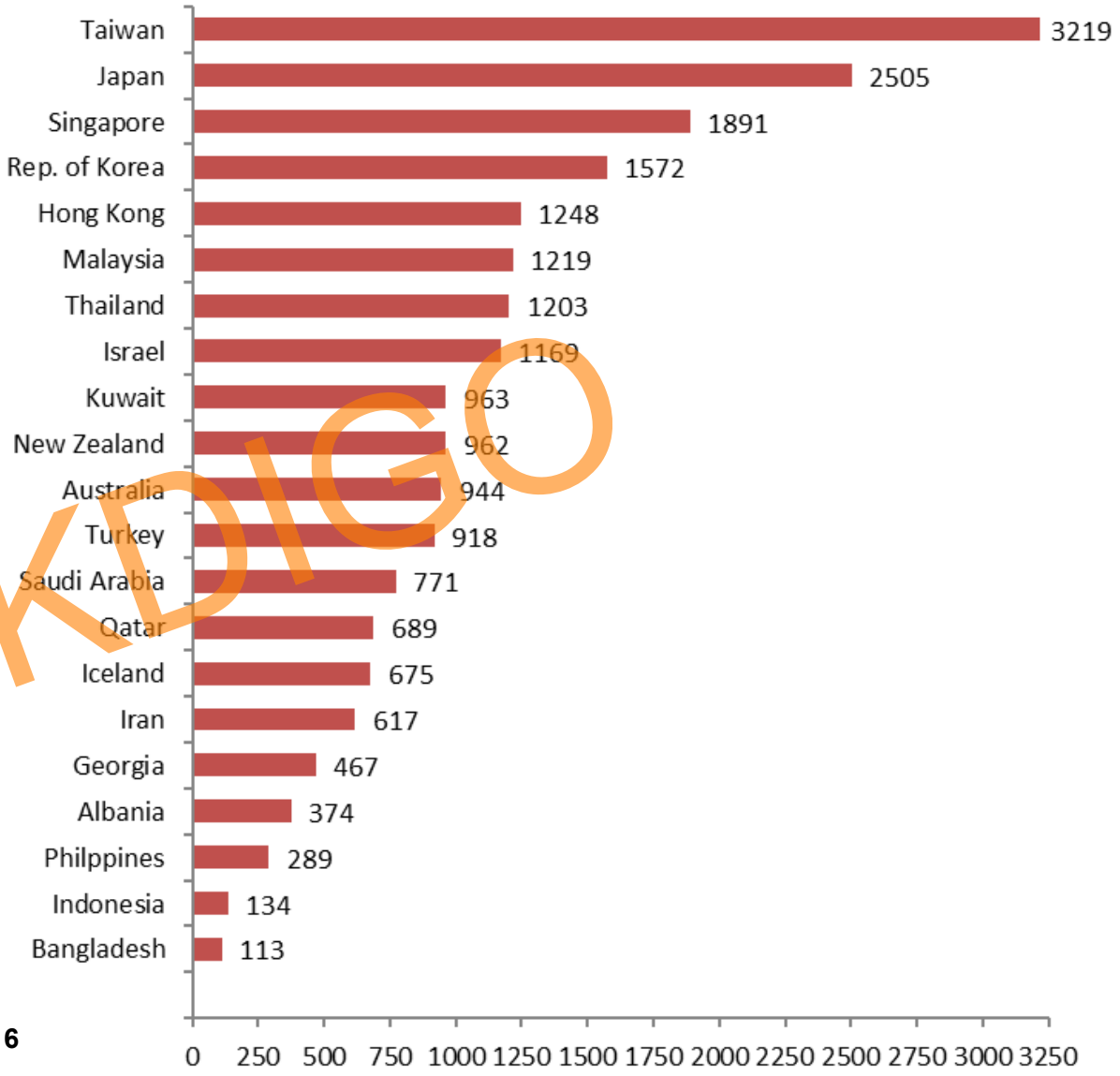
Stage 5 on RRT Americas



Unadjusted prevalence in 2014 (pmp)

SOURCES: USRDS Annual Report 2016; Rosa-Diez G. Clin Nephrol 2016

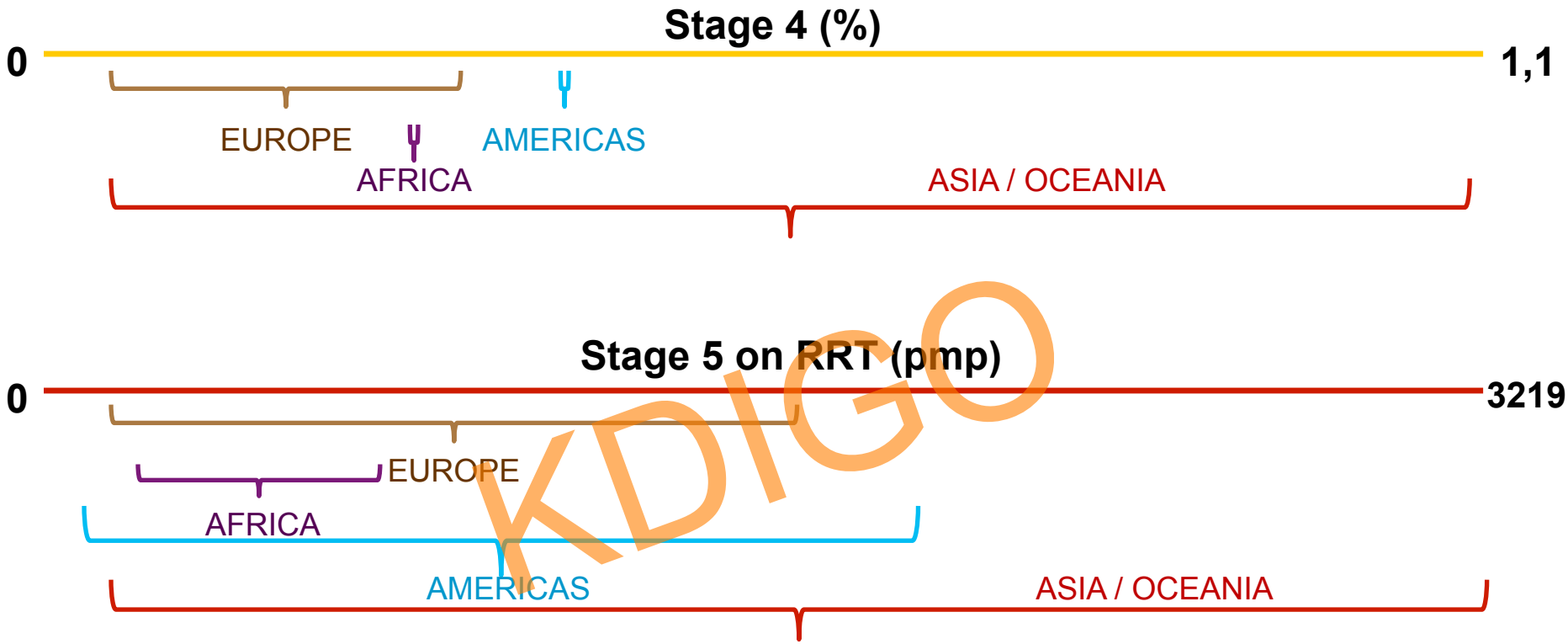
Stage 5 on RRT
Asia / Oceania



Unadjusted prevalence in 2014 (pmp)

SOURCES: USRDS Annual Report 2016

Data suggest



	Stage 4 (%)	Stage 5 on RRT (pmp)
Europe	0.11 – 0.29	157 - 1824
Africa	0.25	178 - 734
Americas	0.40	64 - 2076
Asia & Oceania	0.1 – 1.1	113 - 3219

Trends in CKD prevalence

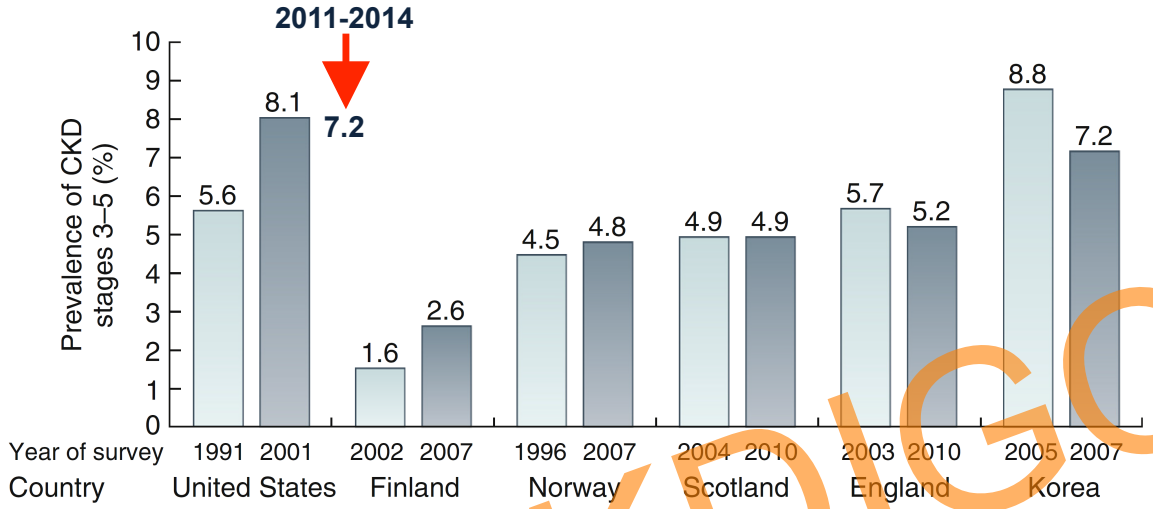
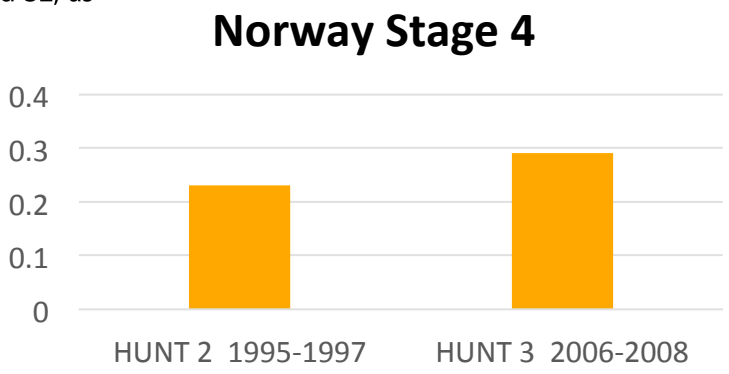
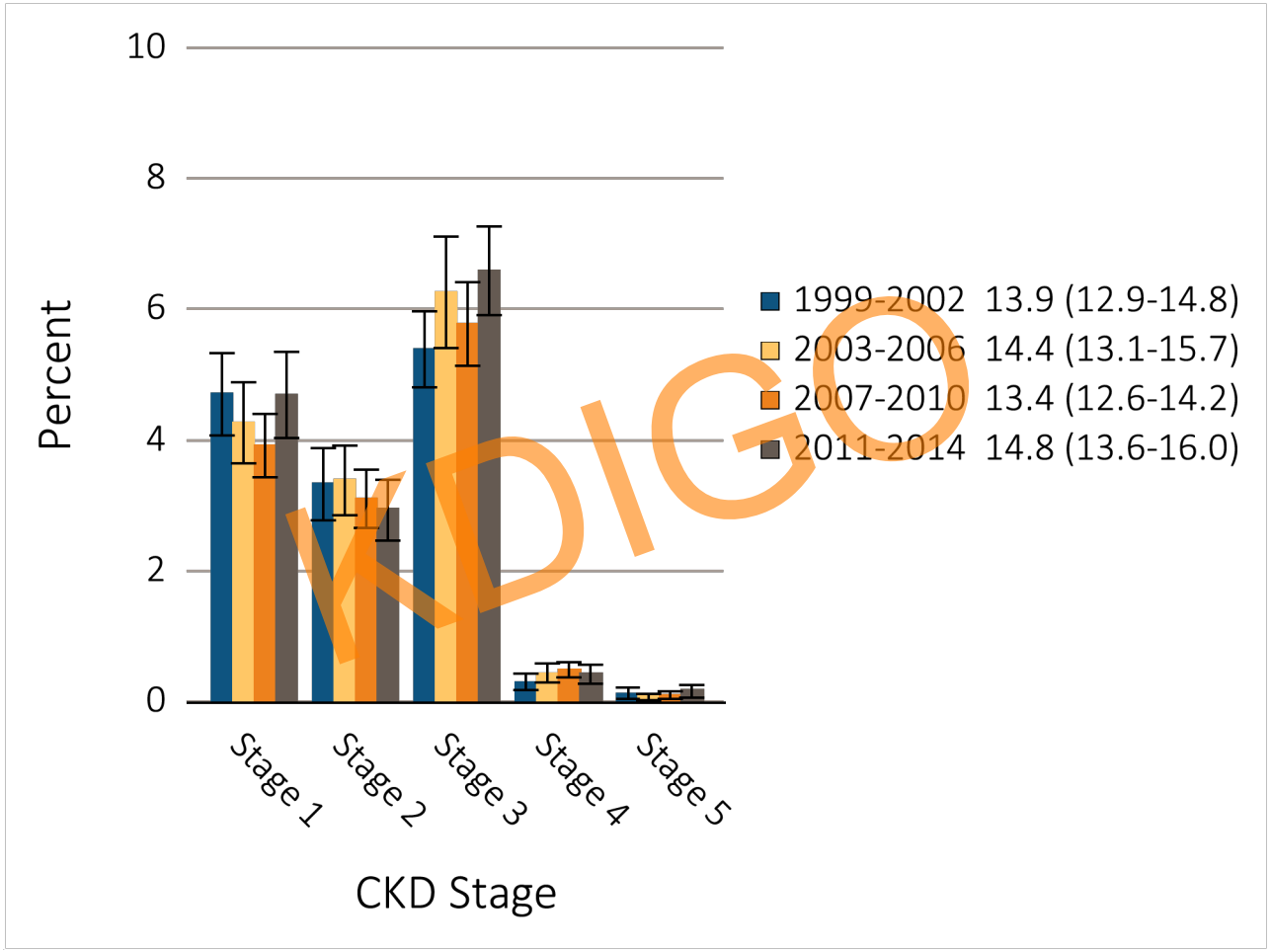


Figure 1 | National surveys reporting trends over time of the prevalence of chronic kidney disease (CKD) stages 3 through 5. Data are from references 4, 12, 15, 16, and 32, as cited by Hallan *et al.*[3]



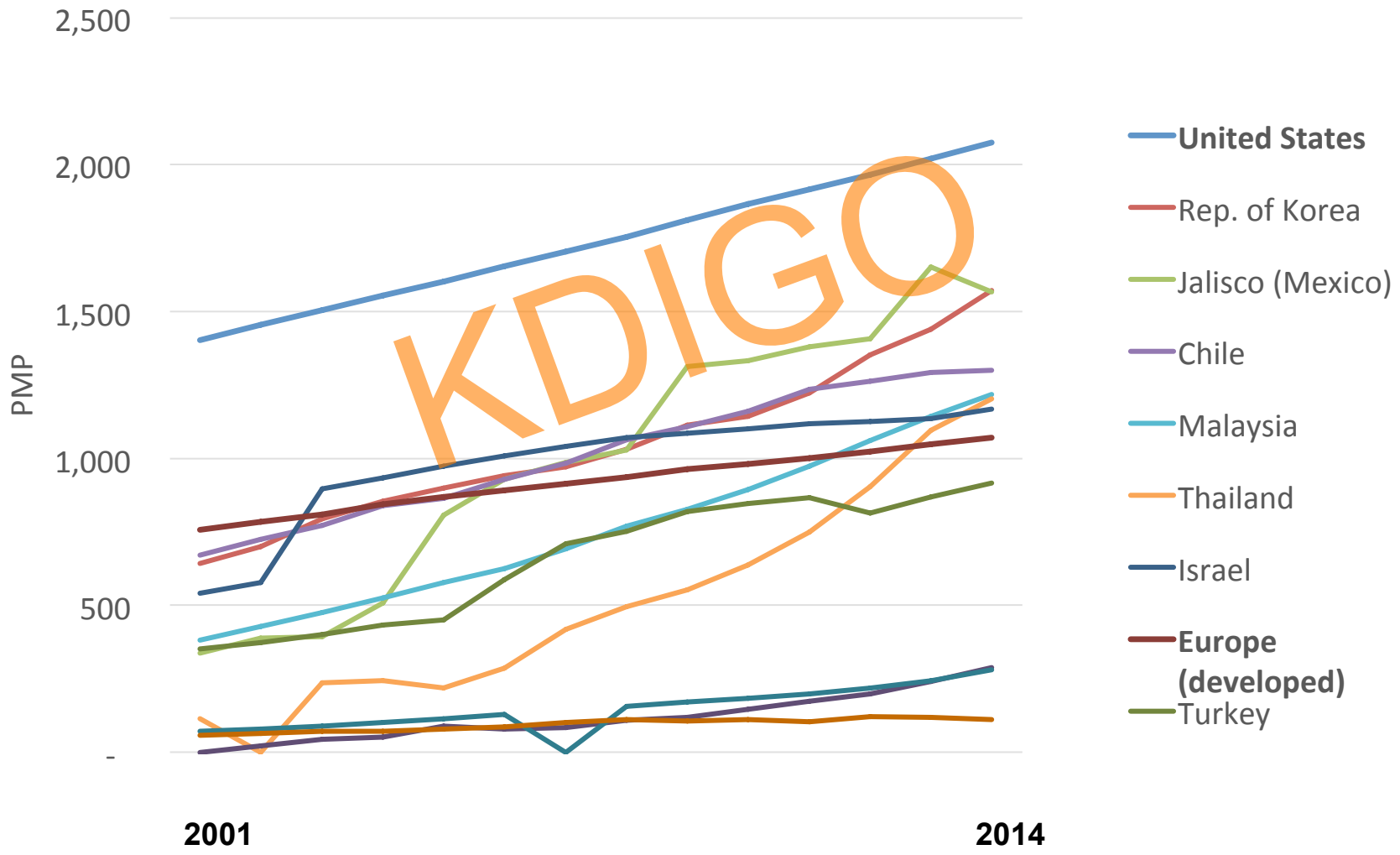
SOURCES: De Nicola L. Kidney Int 2016; Hallan S. Kidney Int 2016; USRDS Annual Report 2016

Figure 1.1 Prevalence of CKD by stage among NHANES participants, 1999-2014



Data Source: National Health and Nutrition Examination Survey (NHANES), 1999-2002, 2003-2006, 2007-2010 & 2011–2014 participants aged 20 & older. Whisker lines indicate 95% confidence intervals. Abbreviations: CKD, chronic kidney disease.

Ten countries with highest % rise in RRT prevalence 2001-2014 plus US and Europe (developed countries)



Limitations

STAGE 5 Prevalence

- Stage 5 on RRT relatively straightforward
  - Reflects access to RRT – not ESRD disease burden
- Stage 5 *not on RRT,* however, is not being reported by registries
- Even in large general population based study samples numbers of Stage 5 CKD are low – CIs often lacking
- This makes it virtually impossible to report ESRD burden

Limitations

STAGE 4 Prevalence

- Problems
  - Sampling (not all population based, low response rates)
  - Use of different age ranges / categories
  - Even in large general population based study samples numbers of Stage 4 CKD are low – CIs often lacking

Table 1: Description of the method of general population sample selection per study. (Part 1)

First author, (ref)	Study	Country	Time period	N	Age range	Sample frame	Sample design	Response
Aumann, (17)	SHIP	Germany	2001-06	2830	25-88	ns	multistage sampling	69%
Bongard, (18)	MONA LISA	France	2006-07	4727	35-75	electoral rolls	age and sex stratified	ns
Browne, (19)	SLAN	Ireland	2007	1098	45+	other (Geo-directory)	multi-stage random sample: by area & region	66%
Capuano, (20)	VIP	Italy	1998-99 2008-09	2400	25-74	electoral rolls	age and sex stratified	ns
Christensson, (21)	GAS	Sweden	2001-04	2815	60-93	census	stratified, age, sex & urban/rural location	60%
Chudek, (22)	PolSenior	Poland	2007-11	3793	65+	ns*	ns*	32%
Cirillo, (23)	Gubbio Pop.	Italy	ns	4574	18-95	ns*	ns*	ns
Codreanu, (24)	**	Moldova	2006-07	973	18-77	ns	ns	ns
De Nicola, (25)	CARHES	Italy	2008	4077	35-79	electoral rolls	age and sex stratified	45%
Delanaye, (26)		Belgium	2008-09	1992	45-75	ns	voluntary nature	ns
Donfrancesco,(27)	MATISS	Italy	1993-96	2924	20-79	random sample	age and sex stratified	60%
Formiga, (28)	Octabaix	Spain	2009	328	85	ns*		ns
Fraser, (29)	HSE	England	2009-10	5799	16+	random 2 stage sample		ns*
Gambaro, (30)	INCIPE	Italy	2006	3629	40+	GP list	random sample	62%

N= Number of subjects with creatinine measurement, ns= not specified. Gubbio Pop.=Gubbio population Study. *authors refer to previous publication.**Early Detection and Intervention Program for Chronic Renal and Cardiovascular Disease in Rep Moldova.

Limitations

STAGE 4 Prevalence

- Problems
  - Sampling (not all population based, low response rates)
  - Use of different age ranges / categories
  - Even in large general population based study samples numbers of Stage 4 CKD are low – CIs often lacking
  - Different types of eGFR formulas used
  - Different creatinine measurement methods
  - General population studies are not using the chronicity criterion to diagnose CKD

This makes many studies unsuitable for assessment of CKD prevalence and/or for international comparison.

Room for improvement

1. Quality assessment for studies examining the prevalence of CKD

***Panel:* Quality assessment criteria for studies examining the prevalence of chronic kidney disease**

High quality

For studies of the highest quality, assessors should answer yes to the following ten questions

1 *Subject sampling and precision*

- A Are the included people representative of the general population? (Comment: if people were included on the basis of hospital records, insurance claims, or health-care facilities then they should not be considered representative of the general population.)
- B People are not included or excluded on the basis of specific risk factors. (Comment: high risk people such as those with diabetes, HIV, or hypertension should not be sought out specifically for inclusion or exclusion.)
- C Is the sample size adequate to address the question of prevalence in the studied population?

2 *Sampling technique*

- A Were the people recruited at random? (Comment: methods should address the issue of enrolling consecutive participants, people likely to have the disease or at high risk, and convenience sampling)

Stanifer JW.
The epidemiology of CKD in sub-Saharan Africa
Lancet Global Health 2014

2. Towards Reporting Standards for studies reporting prevalence of CKD