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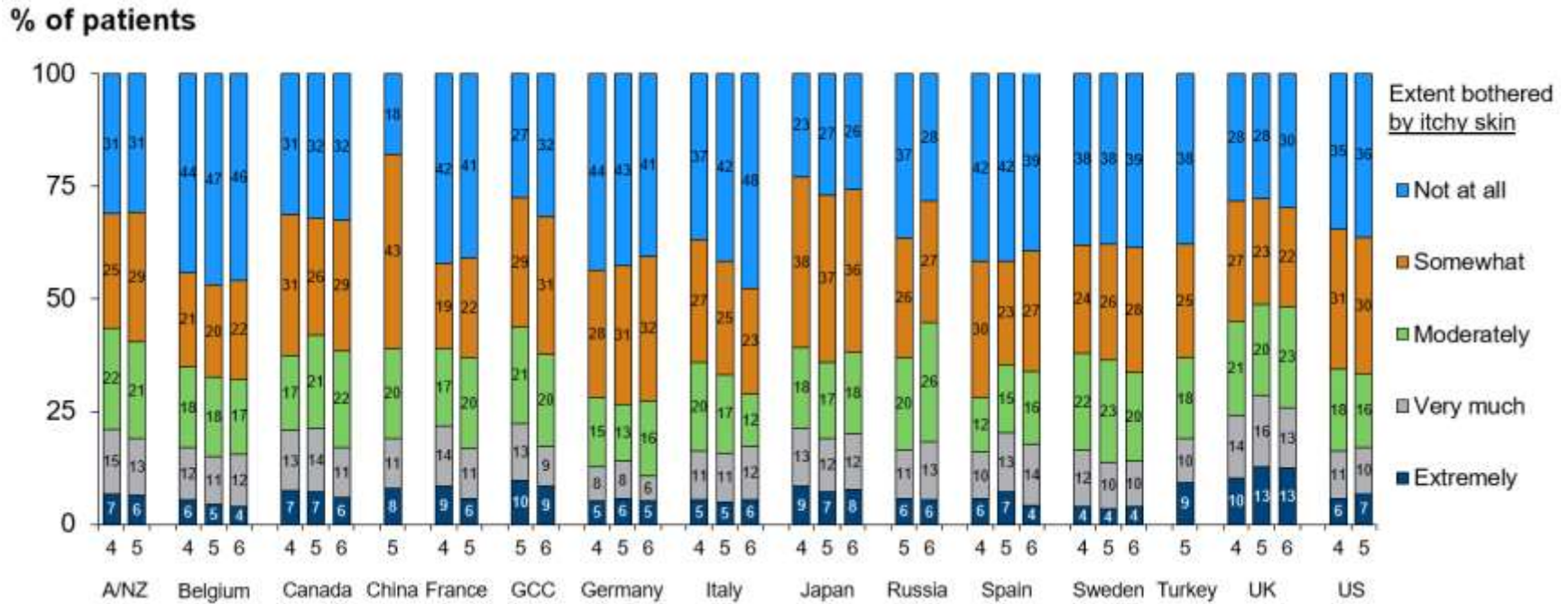
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Figure S1

Self-reported pruritus, by DOPPS phase and country



DOPPS 4: 2009-2011; DOPPS 5: 2012-2015; DOPPS 6: 2015-2018; A/NZ=Australia/New Zealand; GCC=Gulf Cooperation Council countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates); UK=United Kingdom; US=United States.

Table S1a

Listing of specific causes of death classified as cardiovascular or infection-related

N events	Primary cause of death
Cardiovascular-related (N=1402)	
509	Cardiac Arrest, Cause Unknown
280	Myocardial Infarction, Acute
142	Congestive Heart Failure
102	Cerebro-Vascular Accident Including Intracranial Hemorrhage
89	Cardiac Arrhythmia
57	Stroke - ischemic
47	Atherosclerotic Heart Disease
47	Mesenteric Infarction/Ischemic Bowel
35	Cardiomyopathy
26	Pulmonary Edema Due To Exogenous Fluid
25	Ischemic Brain Damage/Anoxic Encephalopathy
21	Valvular Heart Disease
16	Hyperkalemia
5	Pericarditis, Incl. Cardiac Tamponade
1	Hypokalemia
Infection-related (N=536)	
197	Pulmonary Infection (pneumonia, influenza)
165	Septicemia, Other
74	Septicemia, Due To Peripheral Vascular Disease, Gangrene
35	Infection, Other
33	Septicemia, Due To Vascular Access
15	Abdominal Infection (peritonitis, perforated bowel, etc.)
11	Cardiac Infection (endocarditis)
6	Genito-urinary infection (urinary tract infection, etc.)

Number of events will sum to the total because patients can have a maximum of 1 primary cause of death

Table S1b

Listing of specific hospitalization diagnosis and procedure codes classified as cardiovascular, infection, skin-related, or mental status change/confusion

N events	Diagnosis or Procedure code
Cardiovascular-related (N=3060)	
991	Procedure: Other Cardiac/Cardiovascular
619	Procedure: Cardiac catheterization
538	Diagnosis: Angina
470	Diagnosis: Other Cardiac/Cardiovascular
347	Diagnosis: Chest pain, MI ruled out
333	Diagnosis: Congestive heart failure
302	Diagnosis: Atrial fibrillation
269	Diagnosis: Other arrhythmia
261	Diagnosis: Hypertension
254	Diagnosis: Acute myocardial infarction (MI)
247	Diagnosis: Hypotension
148	Procedure: Coronary angioplasty
104	Procedure: Pacemaker placed
83	Diagnosis: Cardiac arrest/sudden death
66	Procedure: Coronary bypass graft (CABG)
55	Diagnosis: Cardiomyopathy
44	Procedure: Cardioversion
37	Diagnosis: Pericarditis &/or tamponade
20	Procedure: AICD (defibrillator) placement
8	Procedure: Pericardial procedure
Infection-related (N=2215)	
1503	Procedure: Antibiotic Therapy
501	Diagnosis: Septicemia
482	Diagnosis: Pneumonia
343	Diagnosis: Fever or chills, source unknown
247	Procedure: Other Infectious Diseases
231	Diagnosis: Other Infectious Diseases
165	Diagnosis: Wound Infection
142	Diagnosis: Urinary Tract Infection
111	Diagnosis: Cellulitis/soft tissue infection
106	Diagnosis: Abscess
93	Procedure: Abscess Drainage
82	Diagnosis: Viral infection
60	Diagnosis: Osteomyelitis
27	Diagnosis: Endocarditis
15	Diagnosis: Fungal infection

7 Diagnosis: Meningitis

Skin-related (N=245)

132 Diagnosis: Other - Skin

94 Diagnosis: Cellulitis/Skin infection

33 Diagnosis: Rash

Mental status change / confusion (N=249)

249 Diagnosis: Mental status change/confusion

Number of events will exceed the total because patients may have more than 1 diagnosis/procedure code associated with the hospitalization

Table S2

Patient characteristics for included vs. excluded patients

Patient characteristic	Included	Excluded
N patients	23264	11430
Case-mix		
Age (years)	63.8 ± 14.5	64.6 ± 15.6
Sex (% male)	14321 (62%)	6978 (61%)
Vintage (years)	2.6 (0.8, 6.2)	1.4 (0.2, 4.6)
Post-dialysis weight (kg)	70 ± 19	72 ± 20
Treatments		
IDWL (% of body weight)	3.0 ± 1.4	2.7 ± 1.4
Single pool Kt/V	1.48 ± 0.32	1.47 ± 0.34
< 3 HD sessions/week (%)	987 (4%)	509 (5%)
Catheter use (%)	4279 (20%)	1504 (33%)
Hemodiafiltration (%)	3752 (16%)	1660 (15%)
ESA use (%)	19282 (86%)	7988 (80%)
ESA dose (1000 units/wk)	7.5 (4.0, 12.0)	8.8 (5.0, 14.0)
Laboratory values		
Hemoglobin (g/dL)	11.1 ± 1.4	10.8 ± 1.5
Serum Albumin (g/dL)	3.70 ± 0.48	3.59 ± 0.56
Serum Creatinine (mg/dL)	8.7 ± 3.0	7.7 ± 3.0
CRP (mg/L)	4.0 (1.1, 9.7)	5.0 (2.0, 14.1)
Serum Phosphorus (mg/dL)	5.2 ± 1.6	5.1 ± 1.6
PTH (pg/mL)	215 (110, 390)	237 (126, 426)
Serum Calcium (mg/dL)	8.9 ± 0.8	8.8 ± 0.8
Comorbid conditions (%)		
Coronary artery disease	7652 (33%)	4195 (37%)
Heart failure	4621 (20%)	2771 (25%)
Cerebrovascular disease	3252 (14%)	1839 (16%)
Other cardiovascular disease	6106 (26%)	3303 (29%)
Cancer (non-skin)	3116 (14%)	1537 (14%)
Diabetes	9346 (41%)	5164 (46%)
Gastrointestinal bleeding	913 (4%)	518 (5%)
Hypertension	19807 (86%)	9840 (88%)
Lung disease	2527 (11%)	1526 (14%)
Neurologic disease	1909 (8%)	1659 (15%)
Dementia	200 (1%)	302 (3%)
Non-dementia	1707 (7%)	1357 (12%)
Psychiatric disorder	3035 (13%)	1903 (17%)
Peripheral vascular disease	5244 (23%)	3110 (28%)
Recurrent cellulitis, gangrene	1665 (7%)	1059 (9%)

Hepatitis C	1173 (5%)	487 (4%)
Cirrhosis	357 (2%)	191 (2%)

Mean \pm standard deviation, median (interquartile range), or % shown. ESA dose shown among ESA users; IDWL=Intradialytic weight loss, expressed in terms of % body weight; Neurologic disease includes dementia, seizure disorder, cognitive impairment, and Parkinson's disease; Psychiatric disorder includes depression, bipolar disorder, schizophrenia/psychotic disorder, alcohol abuse within past 12 months, and other substance abuse within past 12 months.

Table S3

Pruritus and HR (95% CI) of all-cause mortality, by level of adjustment

	N (%) patients	Model 1 DOPPS phase, country	Model 2 + Age, sex, vintage	Model 3 + 15 comorbidities	Model 4 + Weight, Alb, Hgb, Phos, Catheter use
Self-reported extent bothered by itchy skin					
Not at all	7665 (33%)	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)
Somewhat	7009 (30%)	0.96 (0.88, 1.05)	0.97 (0.88, 1.06)	0.97 (0.88, 1.06)	0.99 (0.90, 1.08)
Moderately	4258 (18%)	1.20 (1.09, 1.32)	1.14 (1.03, 1.25)	1.11 (1.00, 1.22)	1.11 (1.00, 1.22)
Very much	2711 (12%)	1.22 (1.09, 1.36)	1.15 (1.03, 1.28)	1.04 (0.94, 1.17)	1.02 (0.91, 1.14)
Extremely	1621 (7%)	1.59 (1.41, 1.81)	1.54 (1.36, 1.75)	1.34 (1.18, 1.53)	1.24 (1.08, 1.41)

Cox regression models with expanding sets of covariate adjustment; Model 1 stratified by DOPPS phase and country; Model 2 additionally adjusted for demographics; Model 3 additionally adjusted for 15 comorbidities (listed in Table 1); Model 4 (primary model) additionally adjusted for post-dialysis body weight, serum albumin, hemoglobin, serum phosphorus, and catheter use.