Supplementary Appendix

Differential Clinical Outcomes Between Angiographic Complete versus Incomplete Coronary Revascularization, According to the Presence of Chronic Kidney Disease in The Drug-Eluting Stent Era

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Supplementary Table 1. Baseline Characteristics According to Complete Revascularization and Chronic Kidney Disease, After Adjustment with Using Stabilized Inverse Probability of Treatment Weight

	CKD group (929 patients)				Non-CKD group (2295 patients)			
	IR (N=736)	CR (N=193)	P value	SMD (%)	IR (N=1648)	CR (N=647)	P value	SMD (%)
Demographics								
Age, yrs	68.7 ± 9.6	67.8 ± 9.4	0.397	-8.4	62.1 ± 10.5	61.6 ± 10.5	0.674	-2.3
Male	65.0 %	67.0 %	0.698	4.1	77.8 %	76.6 %	0.614	-2.9
Coexisting condition								
Diabetes mellitus	22.0 %	22.4 %	0.924	1.0	19.8 %	20.0 %	0.934	0.5
Hypertension	76.6 %	77.6 %	0.827	2.2	55.1 %	53.9 %	0.672	-2.4
Dyslipidemia	28.6 %	28.8 %	0.962	0.5	29.1 %	28.5 %	0.829	-1.2
Peripheral vascular disease	4.5 %	4.2 %	0.881	-1.3	1.2 %	0.7 %	0.346	-4.8
Renal function								
Creatinine, mg/dl	2.1 ± 2.0	2.2 ± 2.1	0.559	5.7	0.9 ± 0.2	0.9 ± 0.2	0.987	-0.1
eGFR, ml/min/1.73m^2	42.0 ± 16.2	41.6 ± 17.4	0.749	-3.5	81.0 ± 16.6	81.1 ± 20.2	0.869	0.9
CKD stage*			0.766	11.0			NA	NA
Mild	56.7 %	56.4 %			NA	NA		
Moderate	20.9 %	17.5 %			NA	NA		
Severe	18.5 %	22.1 %			NA	NA		
ESRD	3.9 %	4.0 %			NA	NA		
Cardiac risk factors								
Current smoker	13.5 %	12.7 %	0.817	-2.5	20.5 %	21.8 %	0.557	3.2
Previous CVA	10.1 %	9.2 %	0.759	-3.1	4.1 %	3.7 %	0.684	-2.0
Previous MI	26.3 %	28.7 %	0.627	5.6	20.7 %	20.2 %	0.835	-1.2
Previous PCI	16.9 %	16.0 %	0.835	-2.2	11.8 %	11.3 %	0.777	-1.6
LVEF†, %	56.3 ± 13.4	55.1 ± 14.4	0.966	-0.5	60.1 ± 10.7	60.4 ± 10.4	0.890	0.9
Clinical diagnosis			0.499	11.6			0.957	1.7
AMI	28.2 %	33.5 %			23.1 %	23.8 %		
Unstable angina	17.7 %	15.8 %			19.6 %	19.1 %		
Stable angina	54.1 %	50.7 %			57.3 %	57.1 %		
Complexity of CAD								
SYNTAX score < 12	25.7 %	26.2 %	0.902	1.0	30.0 %	30.4 %	86.3	0.9
Treatment of CAD								
Left main coronary artery	7.5 %	7.5 %	0.997	0.1	8.3 %	8.7 %	0.773	1.4

At least 1 bifurcation lesion	23.1 %	21.0 %	0.571	-5.1	28.2 %	28.7 %	0.837	1.1
At least 1 ostial lesion	10.0 %	10.0 %	0.990	0.1	12.5 %	12.6 %	0.933	0.4
At least 1 CTO lesion	14.0 %	17.7 %	0.355	10.2	17.2 %	17.8 %	0.787	1.5
At least 1 type B2/C lesion	66.4 %	68.0 %	0.750	3.4	67.8 %	68.7 %	0.736	1.9
Type of inserted stent‡			0.879	5.0			0.886	2.8
1st generation stent only	60.2%	59.6%			44.9	46.0		
2nd generation stent only	34.3%	35.9%			50.7	49.3		
Other	5.5%	4.6%			4.4	4.7		

Values are mean ± SD or n/N% adjusted by stabilized IPTW (inverse probability of treatment weight) using entire variables in supplementary table 1.

* CKD was divided into 4 stages using MDRD (Modification of Diet in Renal Disease) study equation; mild ($45 \leq eGFR < 60$); moderate ($30 \leq eGFR < 45$); severe ($eGFR < 30$, not on dialysis); ESRD: on dialysis.

† Echocardiographic data were available in 2863 patients (88.8%).

‡ Type of inserted stent included 1st generation (paclitaxel-eluting stent, sirolimus-eluting stent), 2nd generation (everolimus-eluting stent, zotarolimus-eluting stent, biolimus-eluting stent) and other (simultaneous use of 1st generation stent, 2nd generation stent or bare-metal stent).

AMI=acute myocardial infarction; CAD=coronary artery disease; CKD=chronic kidney disease; CR=complete revascularization; CTO=chronic total occlusion; CVA=cerebrovascular accident; eGFR=estimated glomerular filtration rate; ESRD=end stage renal disease; IR=incomplete revascularization; MI=myocardial infarction; NA, not applicable; LVEF=left ventricular ejection fraction; PCI=percutaneous coronary intervention; SMD=standardized mean difference.

Supplementary Table 2. Details of Nonfatal Target-Vessel Myocardial Infarction at 3 Years According to Complete Revascularization and Chronic Kidney Disease.

Non-CKD group	**Total patients (N=2295)**	**CR (N=647)**	**IR (N=1648)**	**P value**
Nonfatal target vessel MI	25 (1.1%)	8 (1.3%)	17 (1.1%)	0.620
Stented segment	17 (0.8%)	5 (0.9%)	12(0.8%)	0.846
Denovo segment	8 (0.3%)	3 (0.5%)	5 (0.3%)	0.540
Unclassified	0	0	0	NA
CKD group	**Total patients (N=929)**	**CR (N=193)**	**IR (N=736)**	
Nonfatal target vessel MI	17 (2.0%)	7 (4.2%)	10 (1.4%)	0.018
Stented segment	12 (1.4%)	6 (3.2%)	6 (1.0%)	0.020
Denovo segment	2 (0.3%)	0	2 (0.3%)	0.914
Unclassified	3 (0.3%)	1 (0.9%)	2 (0.2%)	0.376

Values are n/N%. The cumulative incidence of clinical outcomes are presented as Kaplan-Meier estimates at 3 years with IPTW adjusted sample, and p values are presented with Log-rank test.

CKD=chronic kidney disease; CR=complete revascularization; IR=incomplete revascularization; MI=myocardial infarction; NA, not applicable.

Supplementary Table 3. Clinical Outcomes At 3 Years, According to Completeness of Revascularization in Patients with eGFR < 45 ml/min/1.73 $m^{2.}$

	Total patients (N=403)	CR (N=84)	IR (N=319)	Unadjusted HR	Adjusted HR*	P value
POCO	171 (43.3%)	48 (57.8%)	123 (39.5%)	1.67 (1.20-2.33)	1.57 (1.11-2.22)	0.010
All-cause death	122 (31.2%)	38 (45.9%)	84 (27.3%)	1.84 (1.26-2.70)	1.61 (1.09-2.38)	0.017
Nonfatal MI	17 (5.0%)	6 (9.6%)	11 (3.9%)	2.60 (0.97-7.00)	3.49 (1.20-10.16)	0.022
Any revascularization	58 (17.0%)	15 (21.5%)	43 (15.8%)	1.49 (0.83-2.63)	1.62 (0.88-2.98)	0.124
SOCO	96 (26.0%)	26 (35.5%)	70 (23.8%)	1.54 (0.98-2.41)	1.38 (0.87-2.18)	0.174
Cardiac death	69 (18.8%)	19 (25.6%)	50 (17.2%)	1.48 (0.87-2.49)	1.18 (0.69-2.03)	0.540
Nonfatal target vessel MI	14 (4.2%)	6 (9.6%)	8 (2.9%)	3.43 (1.20-9.79)	4.65 (1.48-14.60)	0.008
TLR	21 (6.1%)	5 (7.7%)	16 (5.7%)	2.13 (0.85-5.34)	1.63 (0.58-4.55)	0.350

Values are n/N% or hazard ratio (95% confidential interval). The cumulative incidence of clinical outcomes are presented as Kaplan-Meier estimates at 3 years with IPTW adjusted sample. The p values are for adjusted HR and 95% confidence interval.

* Adjusted HR was calculated by additional multivariate Cox regression analyses with clinically relevant covariates including age, sex, hypertension, diabetes mellitus, type of inserted stent, and clinical diagnosis.

CKD=chronic kidney disease; CR=complete revascularization; eGFR=estimated glomerular filtration rate; HR=hazard ratio; IR=incomplete revascularization; MI=myocardial infarction; POCO=patient-oriented composite outcome; SOCO=stent-oriented composite outcome; TLR=target lesion revascularization.

Supplementary Table 4. Clinical Outcomes At 3 Years, According to Completeness of Revascularization in Patients with Chronic Kidney Disease and Treated Using Only 2nd Generation Drug-Eluting Stents.

	Total patients (N=321)	CR (N=69)	IR (N=252)	Unadjusted HR	Adjusted HR*	P value
POCO	87 (27.0%)	20 (29.0%)	67 (26.5%)	1.11 (0.67-1.83)	1.07 (0.64-1.77)	0.800
All-cause death	57 (17.8%)	16 (23.2%)	41 (16.4%)	1.45 (0.81-2.60)	1.30 (0.73-2.34)	0.377
Nonfatal MI	6 (2.1%)	2 (3.9%)	4 (1.6%)	2.49 (0.47-13.27)	2.96 (0.52-16.73)	0.220
Any revascularization	30 (10.4%)	4 (6.2%)	26 (11.5%)	0.51 (0.17-1.53)	0.52 (0.17-1.58)	0.250
SOCO	42 (13.5%)	10 (15.2%)	32 (13.1%)	1.19 (0.58-2.43)	1.14 (0.55-2.33)	0.729
Cardiac death	31 (10.1%)	6 (9.3%)	25 (10.3%)	0.93 (0.39-2.24)	0.85 (0.35-2.05)	0.712
Nonfatal target vessel MI	5 (1.8%)	2 (3.9%)	3 (1.2%)	3.3 (0.56-19.62)	3.34 (0.55-20.33)	0.190
TLR	7 (2.2%)	2 (3.4%)	5 (3.2%)	1.08 (0.17-6.96)	1.16 (0.17-7.66)	0.880

Values are n/N% or hazard ratio (95% confidential interval). The cumulative incidence of clinical outcome are presented as Kaplan-Meier estimates at 3 years with IPTW adjusted sample. The p values are for adjusted HR and 95% confidence interval.

* Adjusted HR was calculated by additional multivariate Cox regression analyses with clinically relevant covariates including age, sex, hypertension, diabetes mellitus, type of inserted stent and clinical diagnosis.

CKD=chronic kidney disease; CR=complete revascularization; eGFR=estimated glomerular filtration rate; HR=hazard ratio; IR=incomplete revascularization; MI=myocardial infarction; POCO=patient-oriented composite outcome; SOCO=stent-oriented composite outcome; TLR=target lesion revascularization.

Supplementary Figure Legends

Supplementary Figure 1. Clinical Outcomes According to Completeness of Revascularization in Patients with eGFR (ml/min/1.73m^2) < 45.

Among the patients with more advanced CKD, defined as eGFR (ml/min/1.73 m^2) < 45, the significant hazard of angiographic CR was similar to the total CKD population. (A) Patient-oriented composite outcomes in more advanced CKD, and (B) stent-oriented composite outcomes in more advanced CKD. Multivariate adjusted hazard ratio (HR) with 95% confidence intervals (95% CI) and p values are presented.

CKD=chronic kidney disease; CR=complete revascularization; IR=incomplete revascularization.

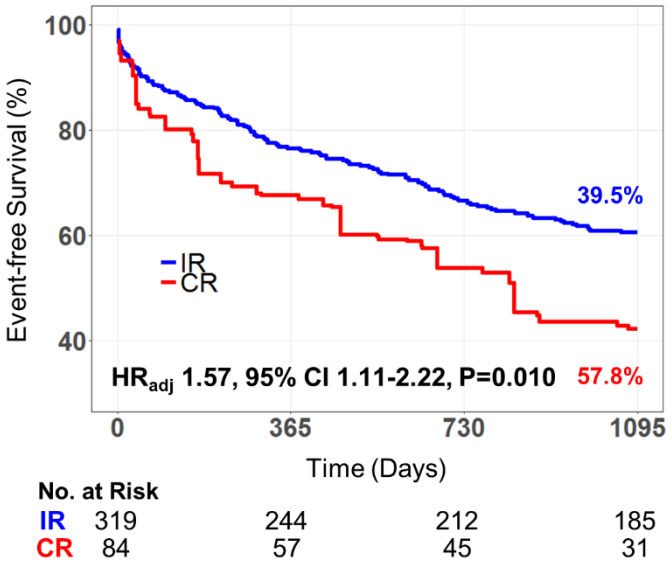
Supplementary Figure 2. According to Completeness of Revascularization in Patients with Chronic Kidney Disease and Treated Using Only 2nd Generation Drug-Eluting Stents.

The sensitivity analysis among patients who were revascularized using only 2nd generation drug-eluting stent showed similar trends with the original one, however, statistical significance was not reached. (A) Patient-oriented composite outcomes in CKD, and (B) stent-oriented composite outcomes in CKD. Multivariate adjusted hazard ratio (HR) with 95% confidence intervals (CI) and p values are presented.

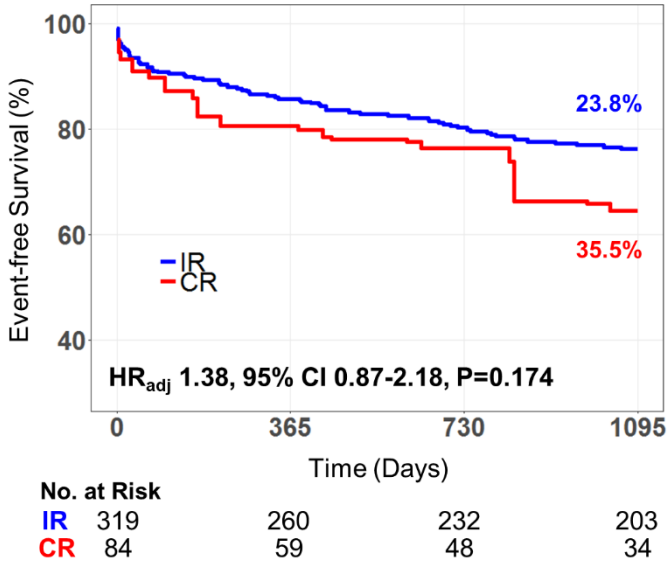
CKD=chronic kidney disease; CR=complete revascularization; IR=incomplete revascularization.

Supplementary Figure 1. Clinical Outcomes According to Completeness of Revascularization In Patients with eGFR (ml/min/1.73m^2) < 45.

(A) Patient-Oriented Composite Outcomes in CKD

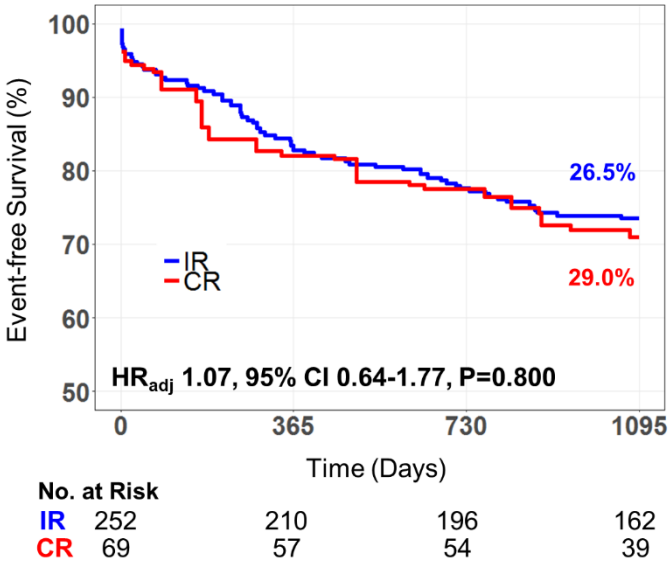


(B) Stent-Oriented Composite Outcomes in CKD



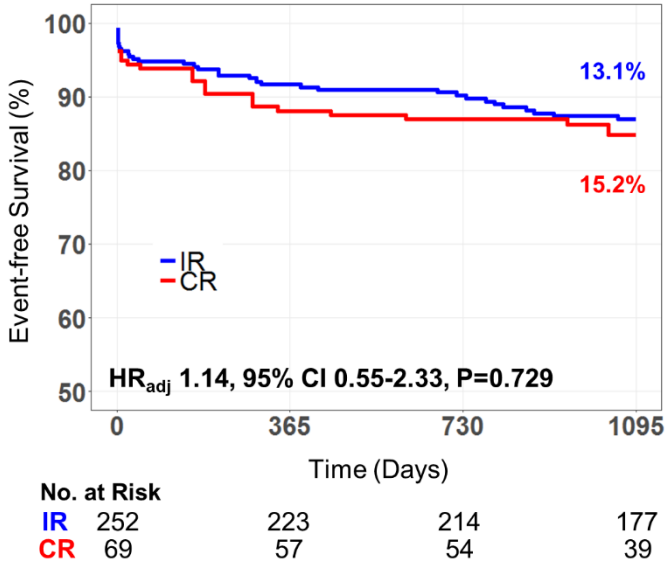
Supplementary Figure 2. Clinical Outcomes According to Completeness of Revascularization in Patients with Chronic Kidney Disease and Treated Using Only 2nd Generation Drug-eluting Stents.

(A) Patient-Oriented Composite Outcomes in CKD



No. at Risk				
IR	252	210	196	162
CR	69	57	54	39

(B) Stent-Oriented Composite Outcomes in CKD



No. at Risk				
IR	252	223	214	177
CR	69	57	54	39