Five-Year Outcomes of Routine FFR Use in Clinical Practice: Data From ASAN PCI Registry

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ASAN PCI Registry

- **The ASAN PCI registry** (clinicaltrials.gov number NCT 0178859) is a prospective, single-center registry to assess the contemporary practice and outcomes of PCI in a tertiary, high-volume center in Korea.

- Between January 2008 and December 2011, a total of 5097 patients were enrolled.

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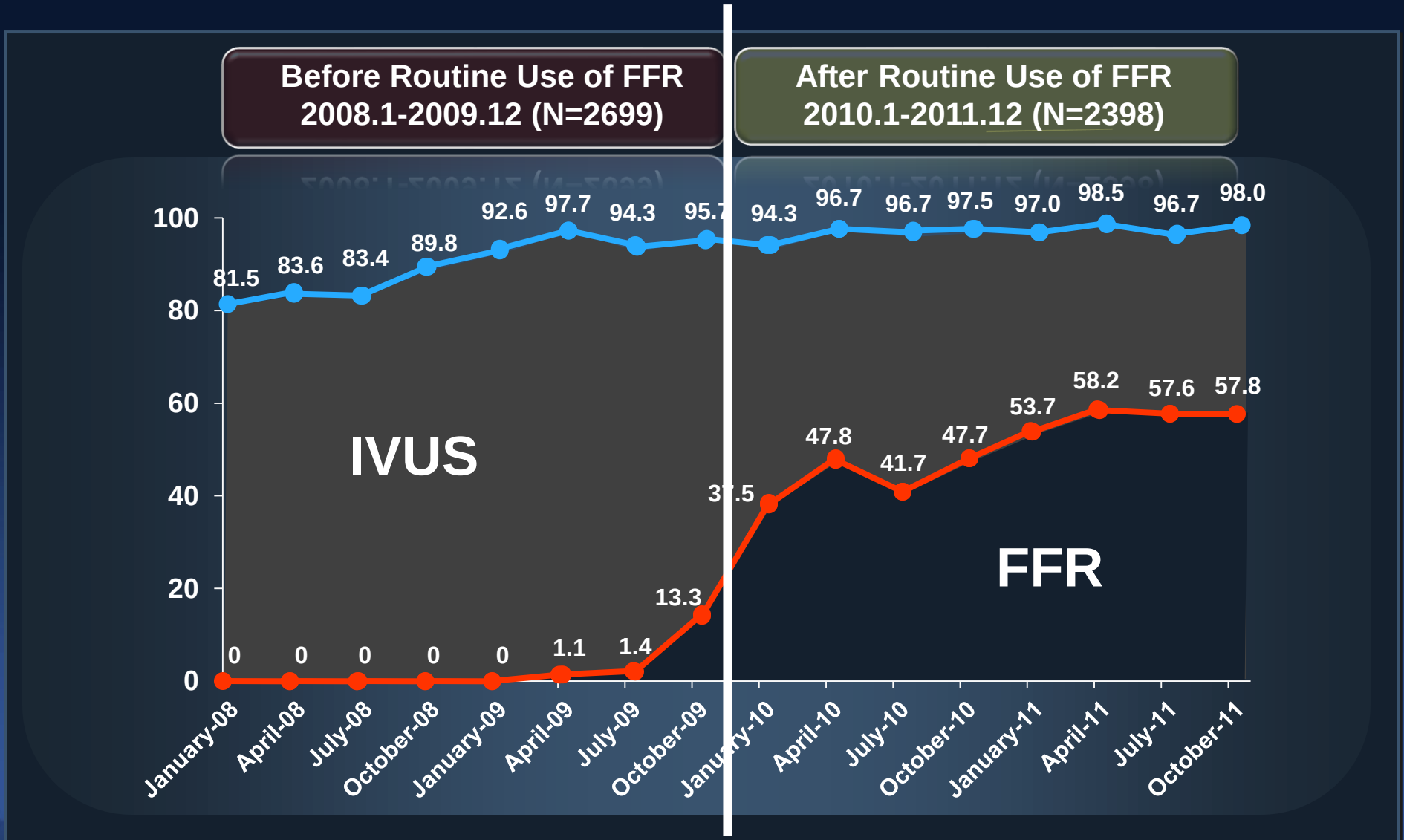
Rate of FFR and IVUS Use

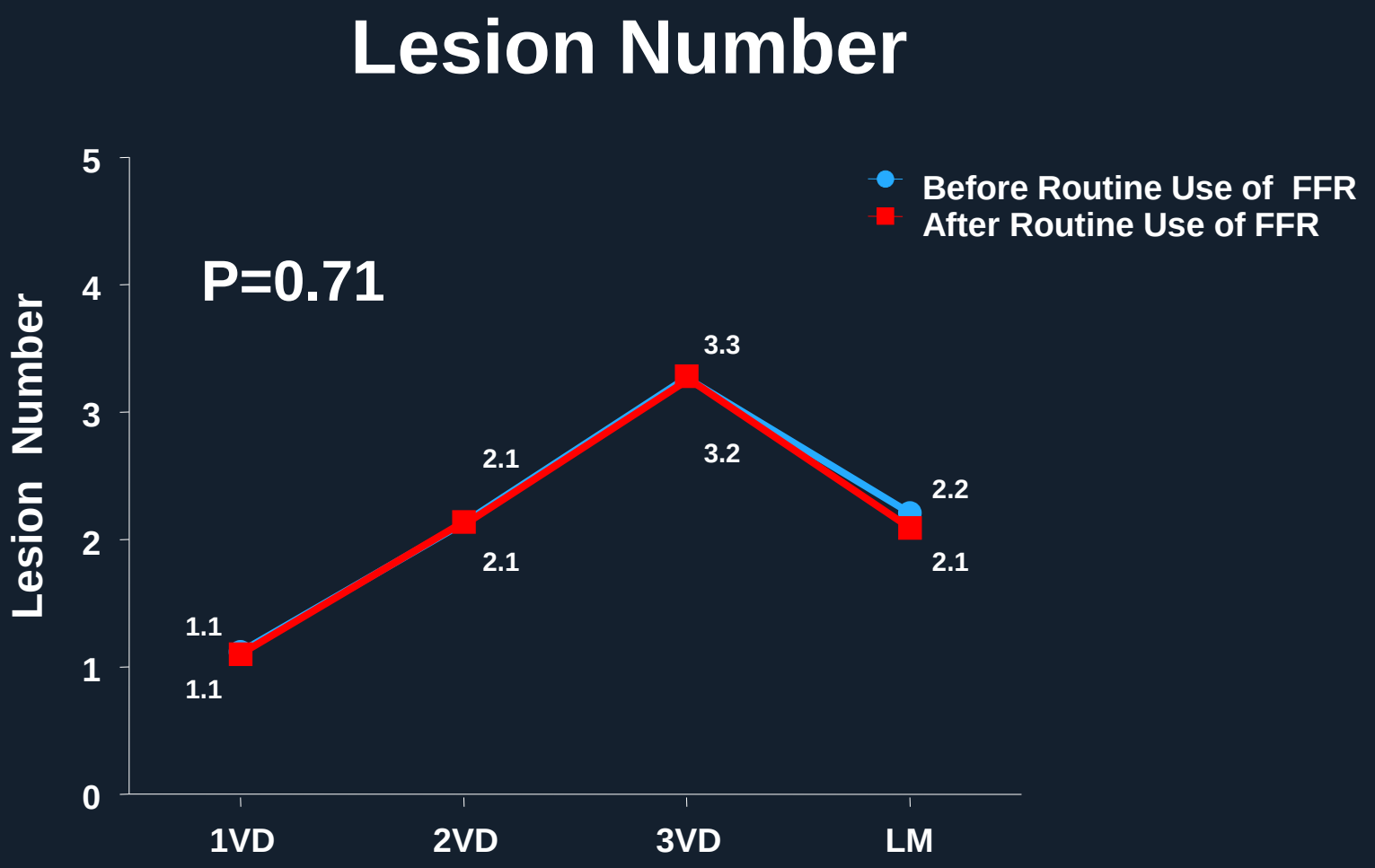


What is the Routine Use?

Reasons for FFR not measured Between 2010 and 2011

	N=1183 (%)
Tight stenosis (visual estimated DS>80%) or total occlusion	**1115 (94.3)**
Stenosis evaluated by non-invasive functional study	**225 (19.0)**
Unfavorable anatomy (e.g. severe calcified and/or tortuous vessel) Or unstable hemodynamics for FFR measurement	**75 (6.3)**
Stenosis supplying small myocardium	**47 (4.0)**
No-specific reason identified	**43 (3.6)**

Changes in PCI procedure



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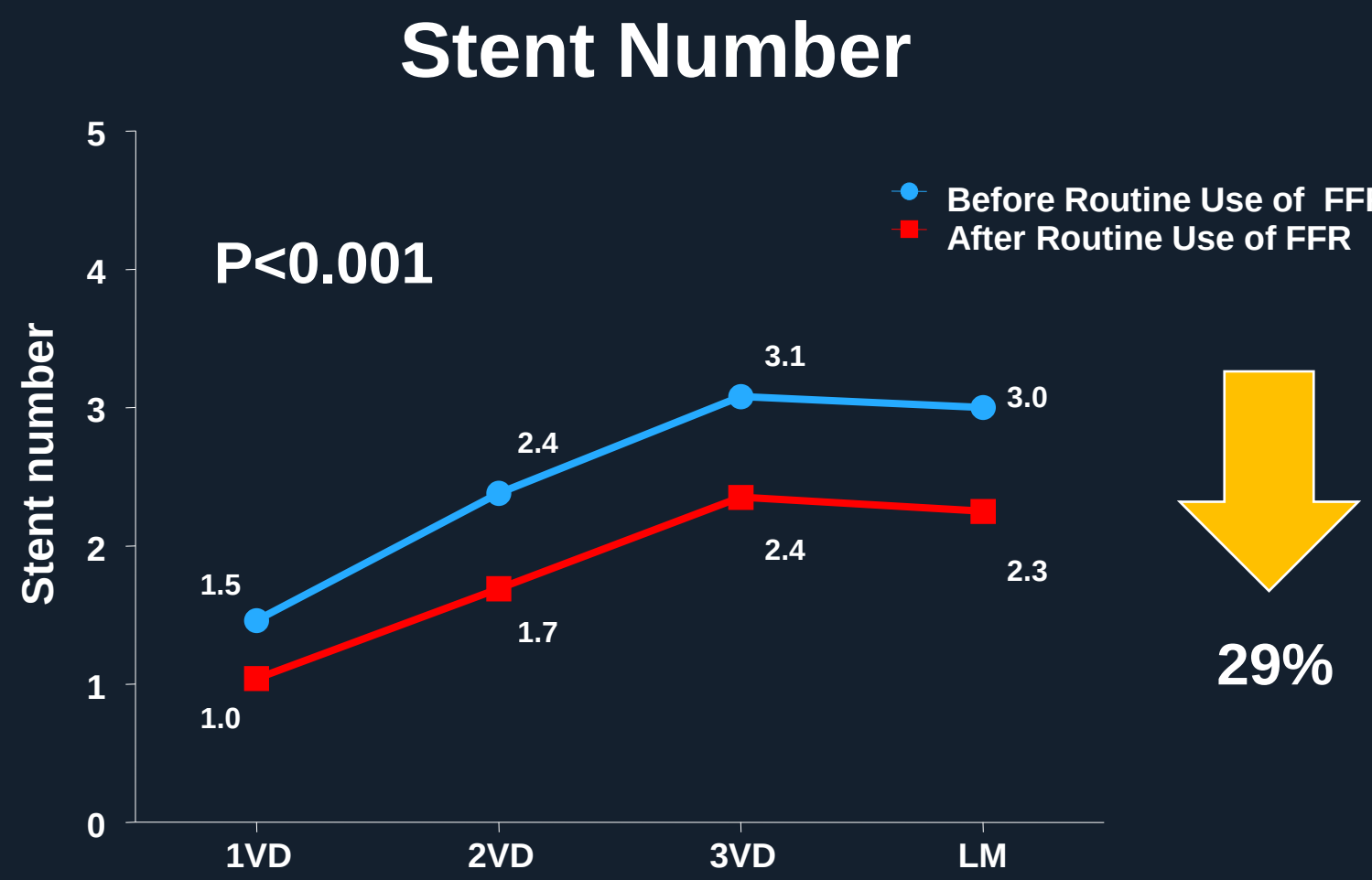

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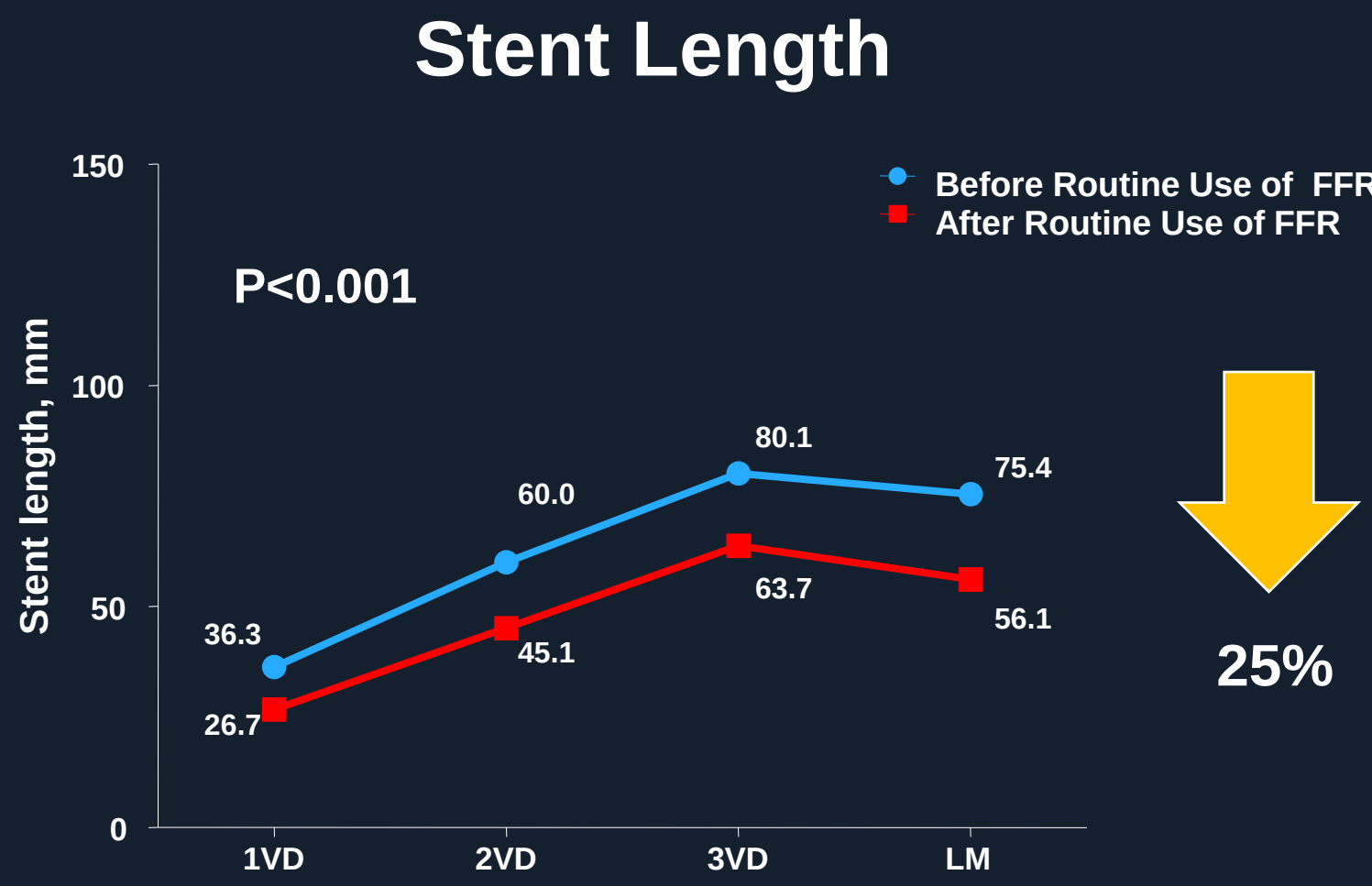
Changes in PCI procedure



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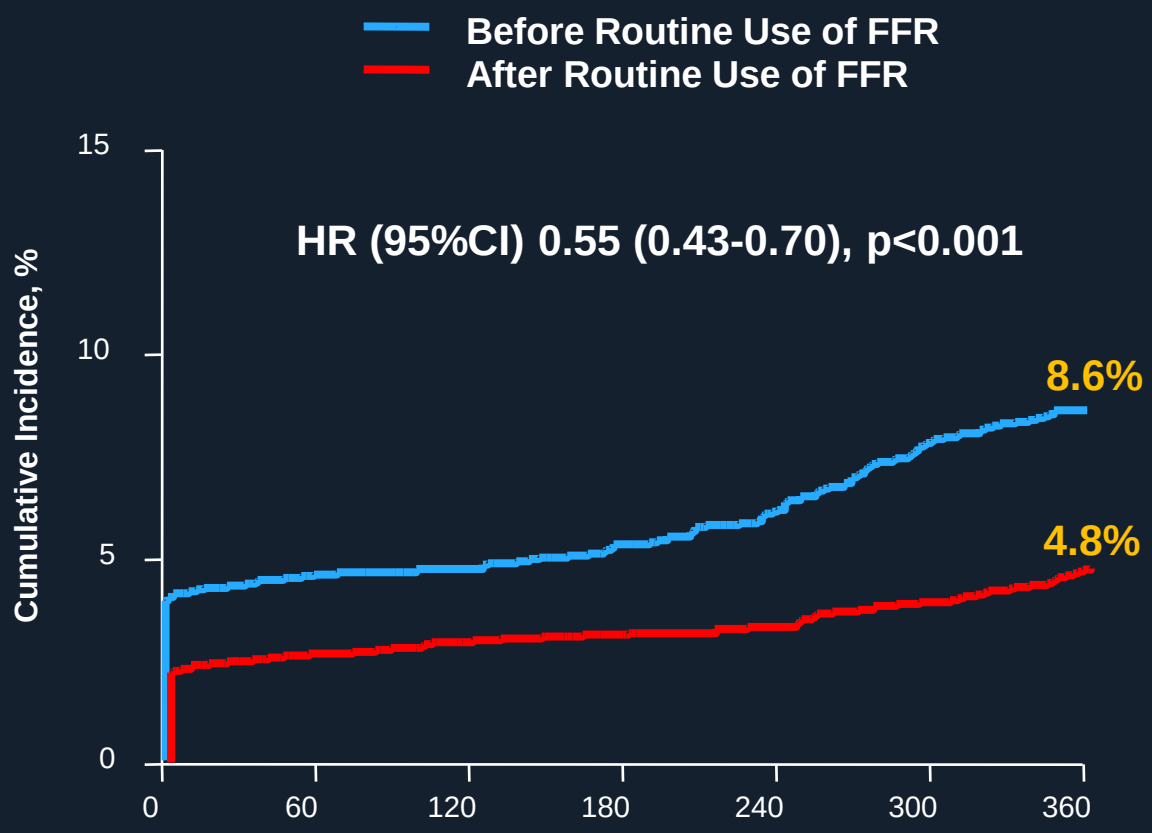
Primary End Point

(Death, MI, or Repeat Revascularization)



No. at Risk				
Before Routine Use	2178	2066	2011	1960
After Routine Use	2178	2092	2067	2037

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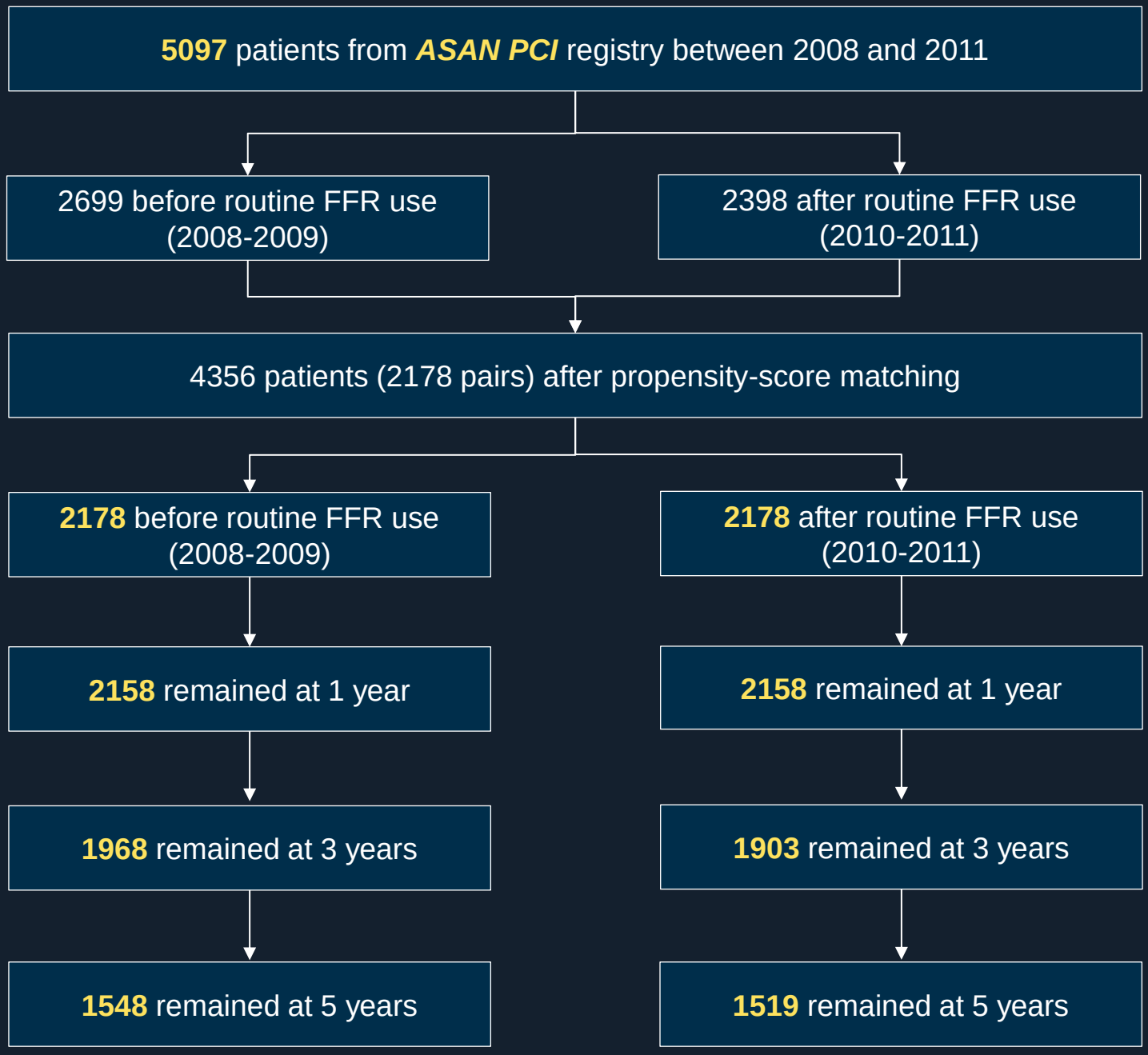
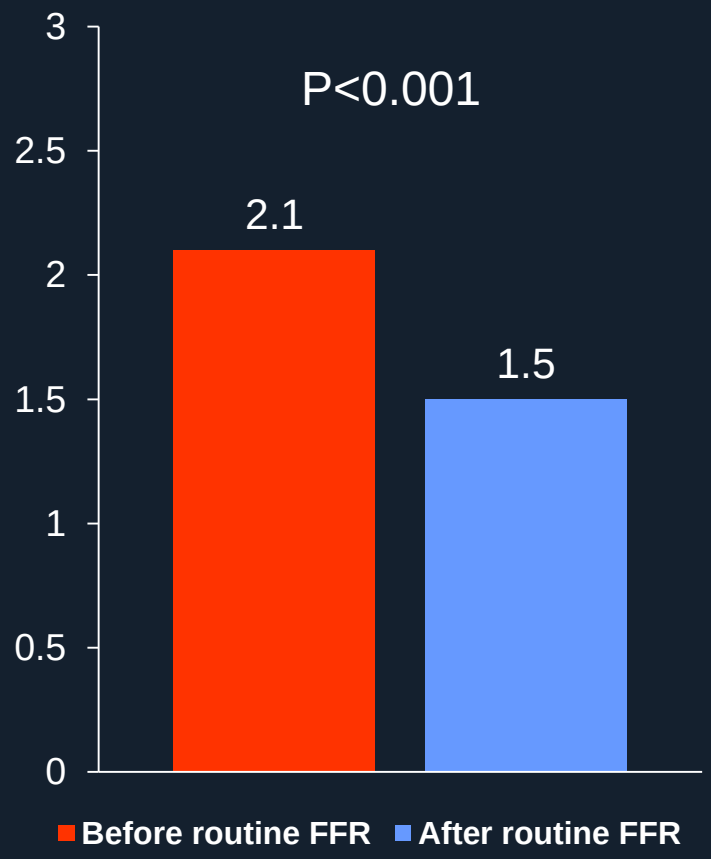
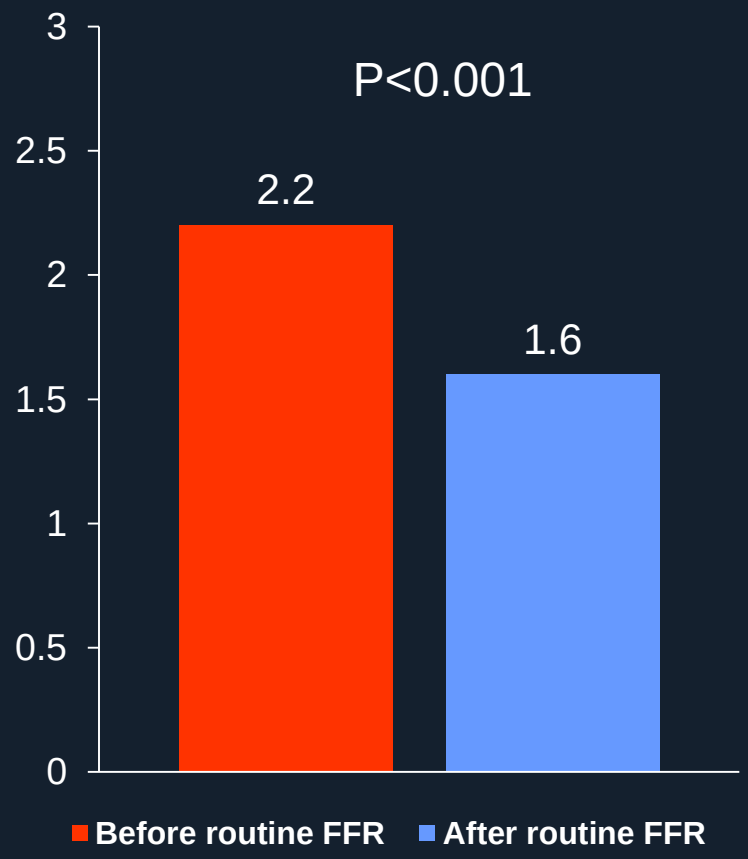

5097 patients from ASAN PCI registry between 2008 and 2011
2699 before routine FFR use (2008-2009)
2398 after routine FFR use (2010-2011)
4356 patients (2178 pairs) after propensity-score matching
2178 before routine FFR use (2008-2009)
2178 after routine FFR use (2010-2011)
2158 remained at 1 year
2158 remained at 1 year
1968 remained at 3 years
1903 remained at 3 years
1548 remained at 5 years
1519 remained at 5 years

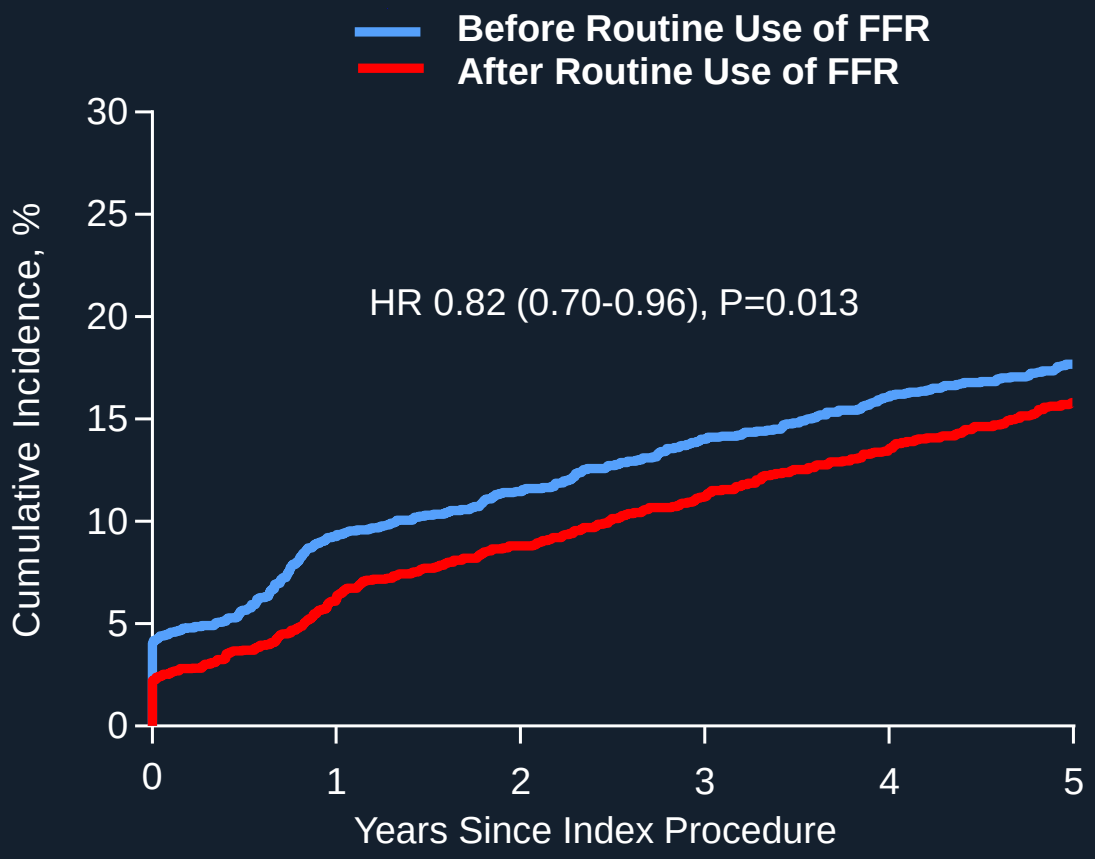
Number of Stent Per Patient





Primary End Point

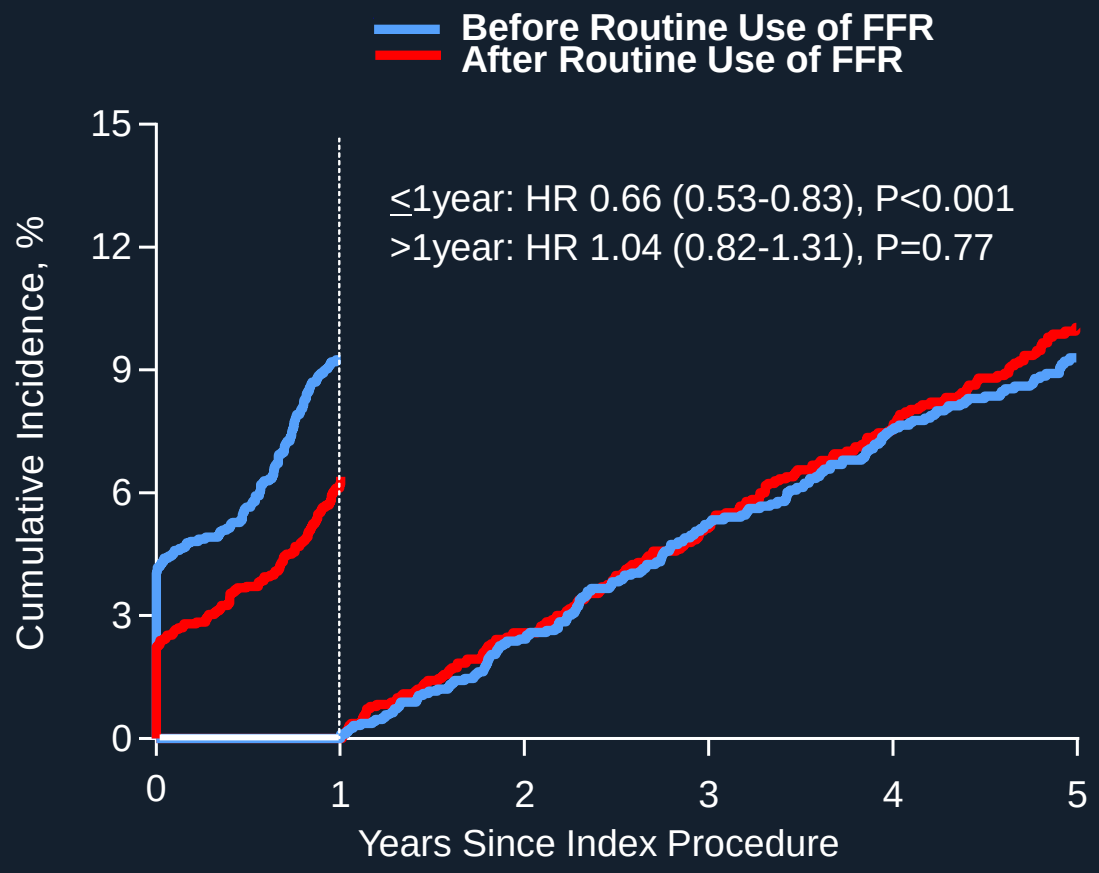
(Death, MI, or Repeat Revascularization)



No. at Risk						
Before Routine Use	2178	1965	1827	1735	1596	940
After Routine Use	2178	2035	1826	1722	1606	966

Primary End Point

(Death, MI, or Repeat Revascularization)



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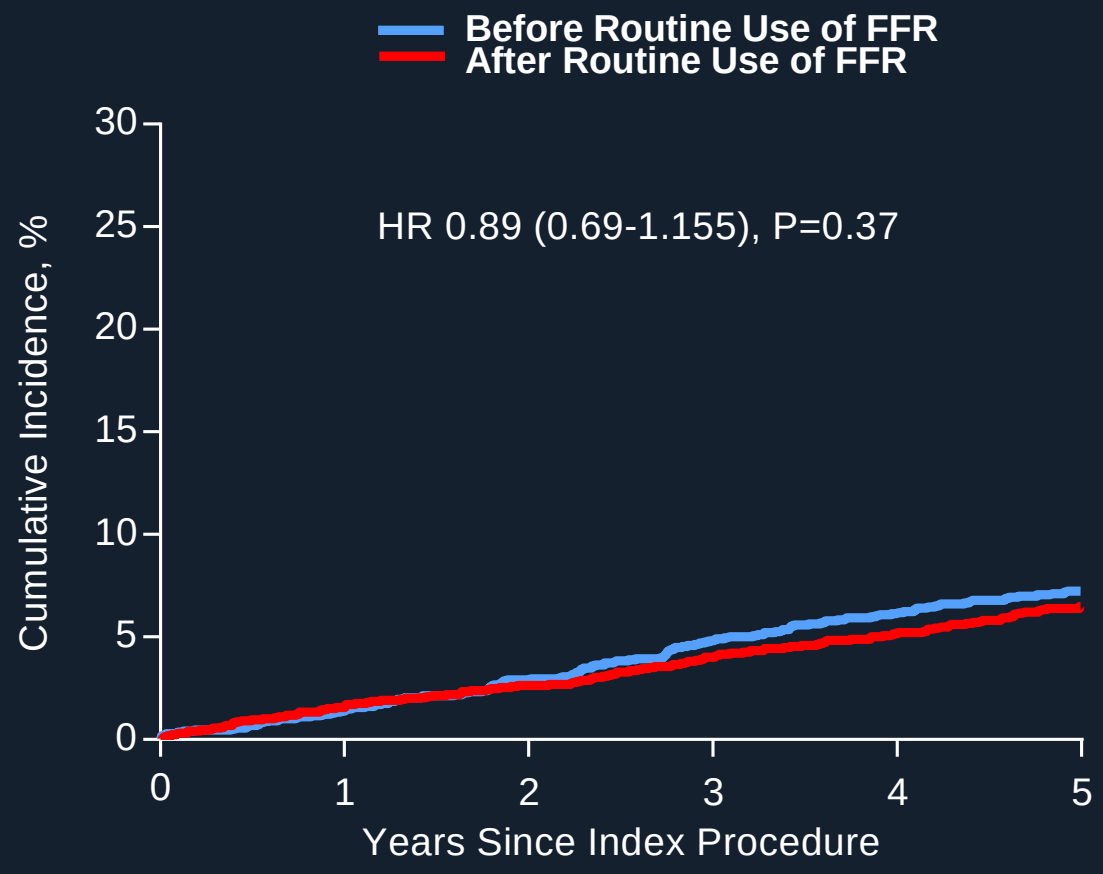
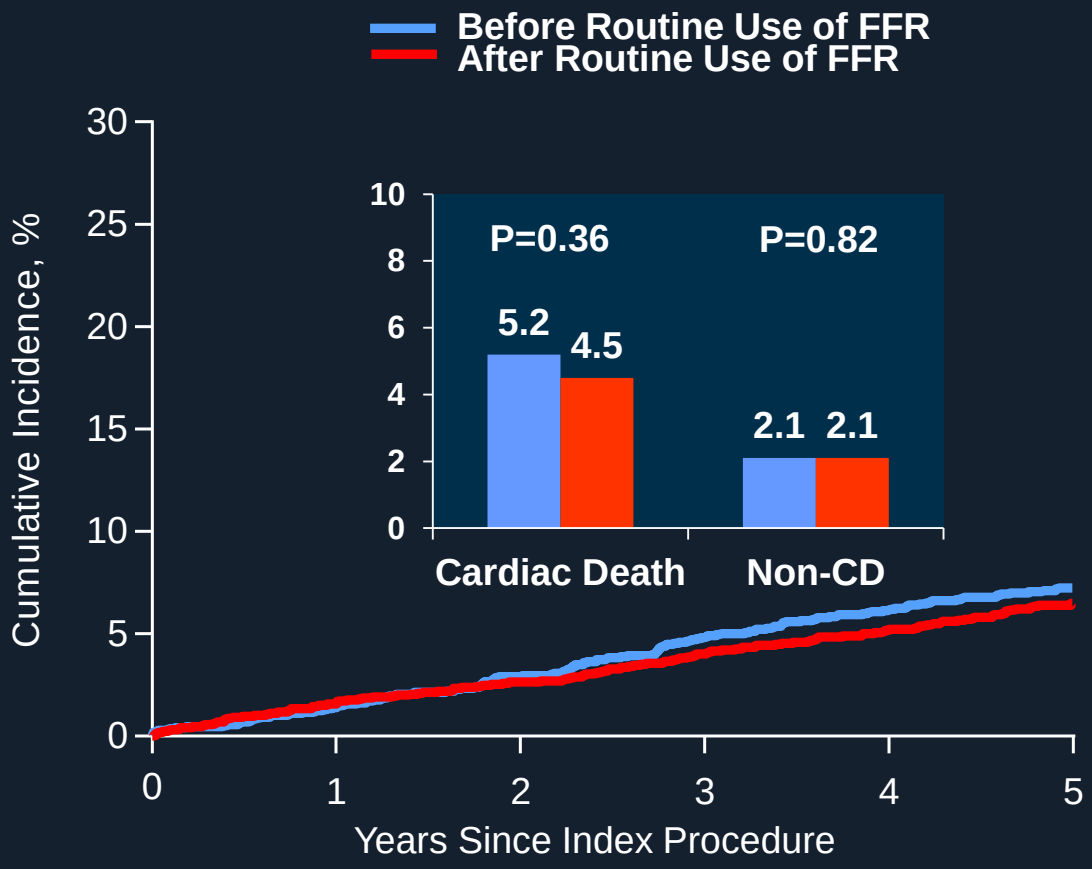
Death



No. at Risk						
Before Routine Use	2178	2136	2006	1922	1787	1077
After Routine Use	2178	2135	1953	1862	1761	1089

Death



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Before Routine Use	2178	2136	2006	1922	1787	1077
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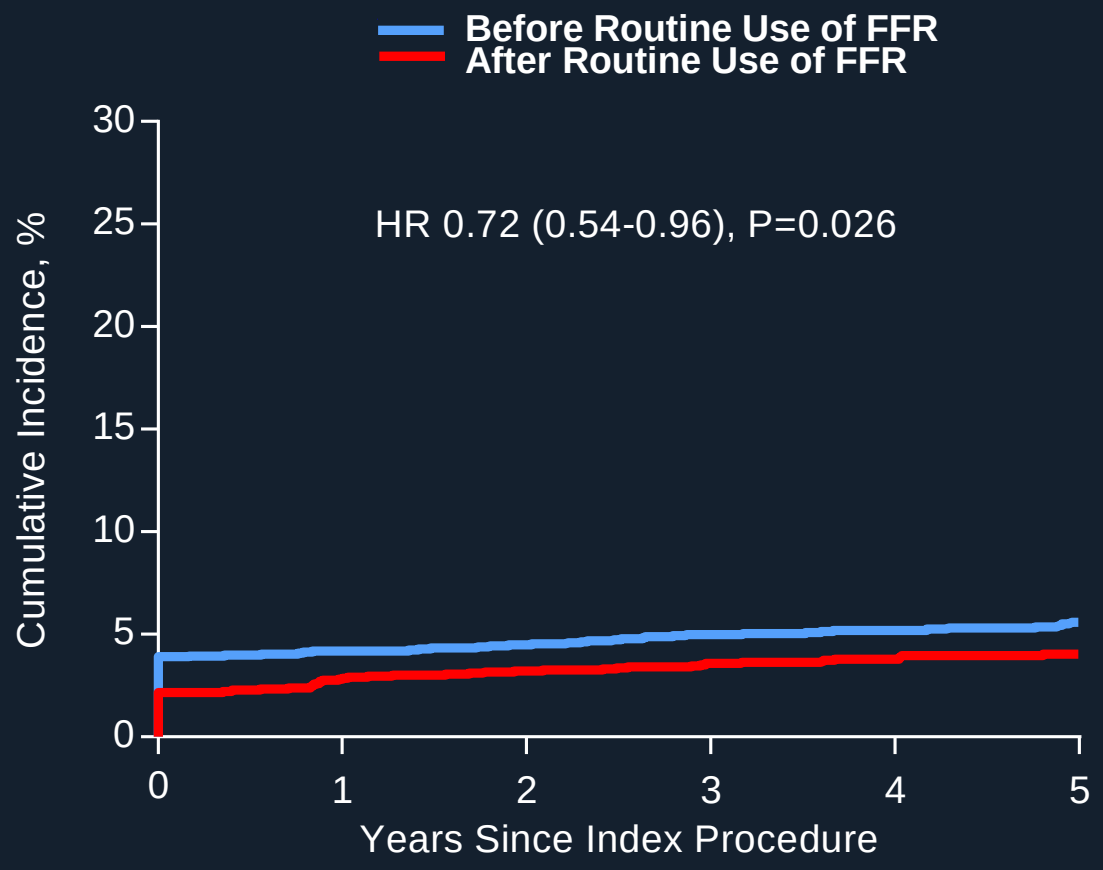
Myocardial Infarction



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Before Routine Use	2178	2045	1916	1828	1699	1014
After Routine Use	2178	2078	1893	1804	1705	1046

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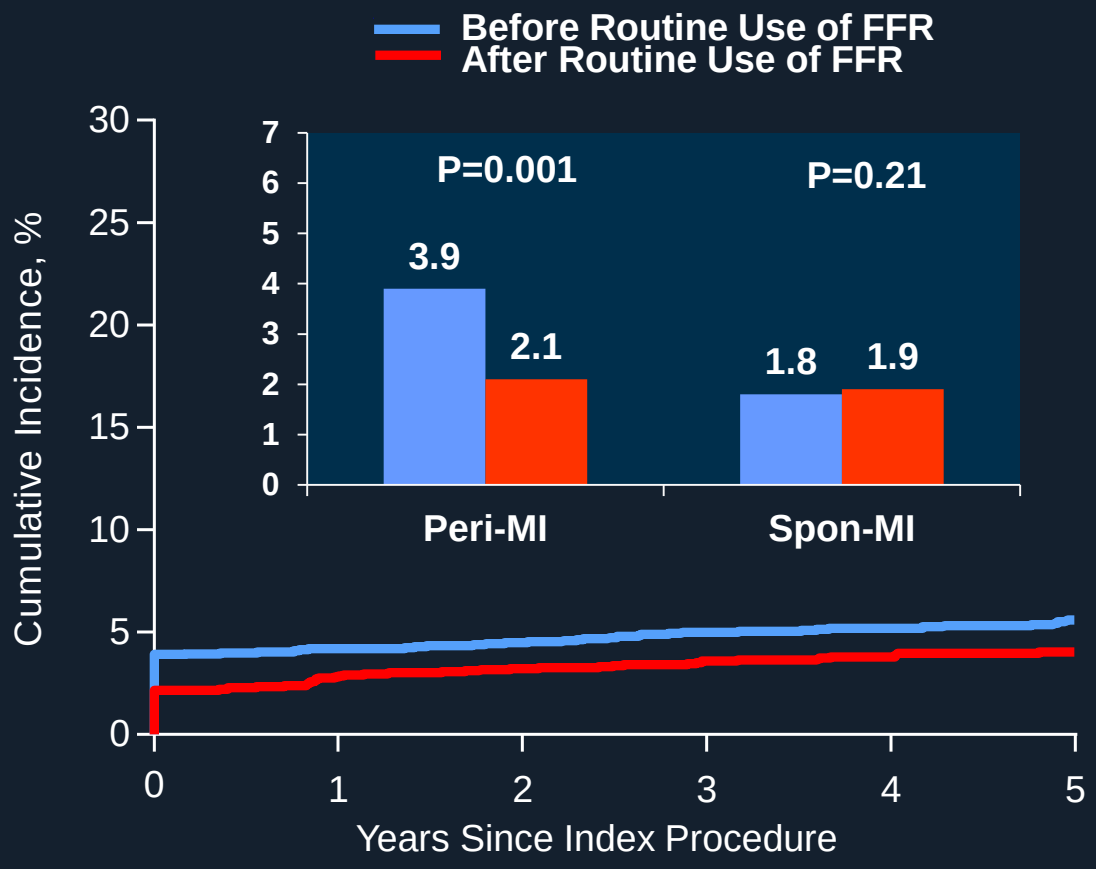

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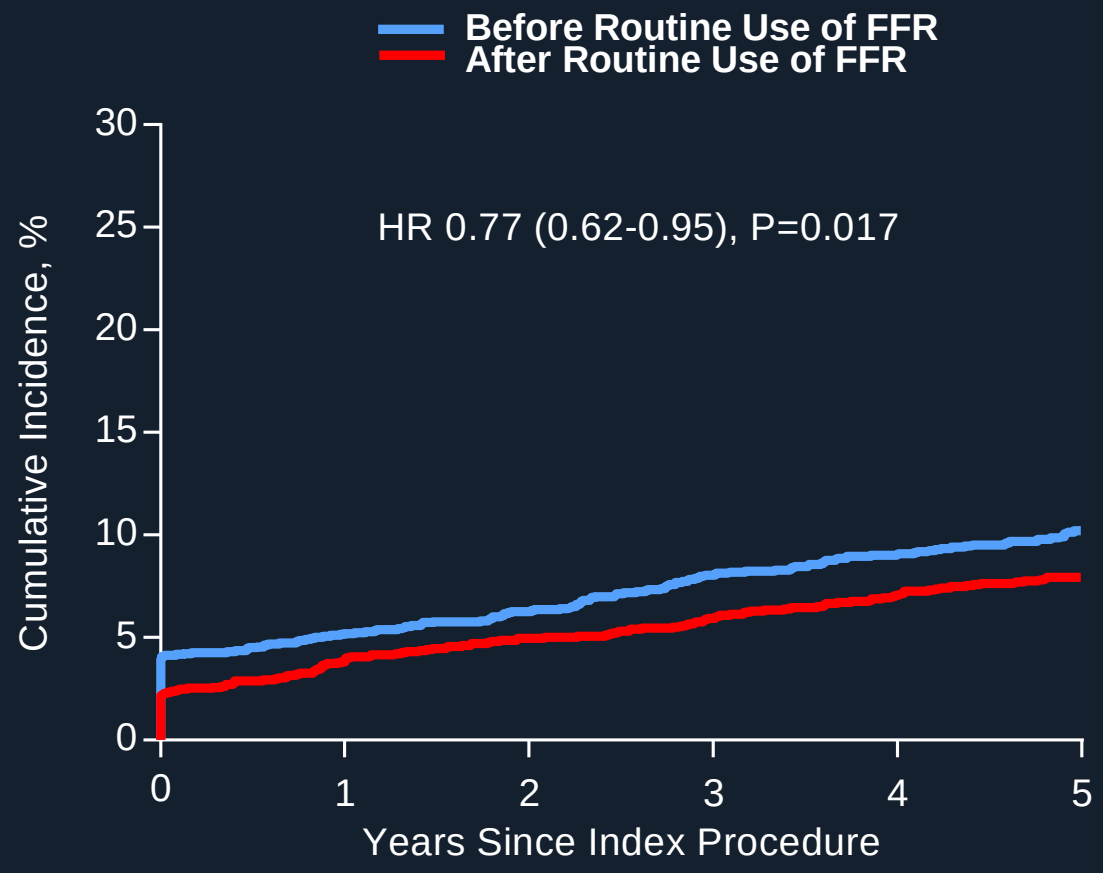
Cardiac Death or MI



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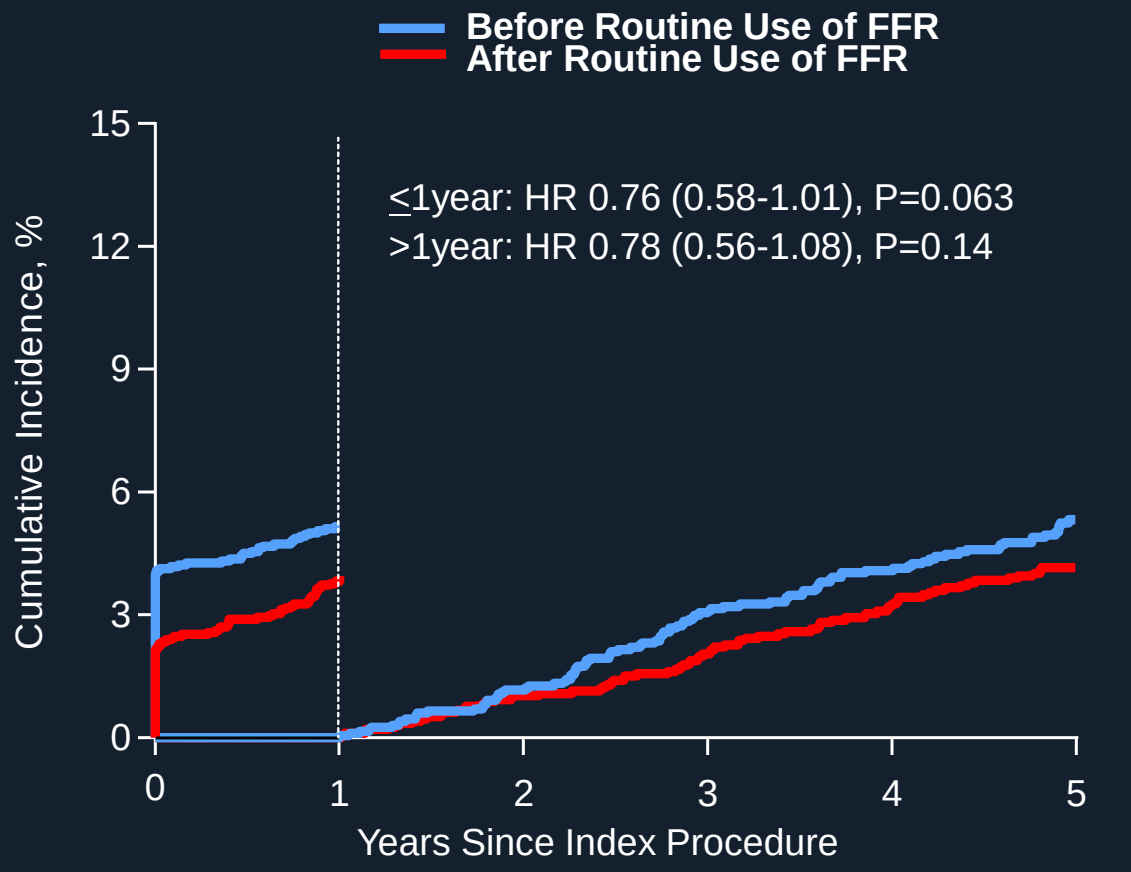

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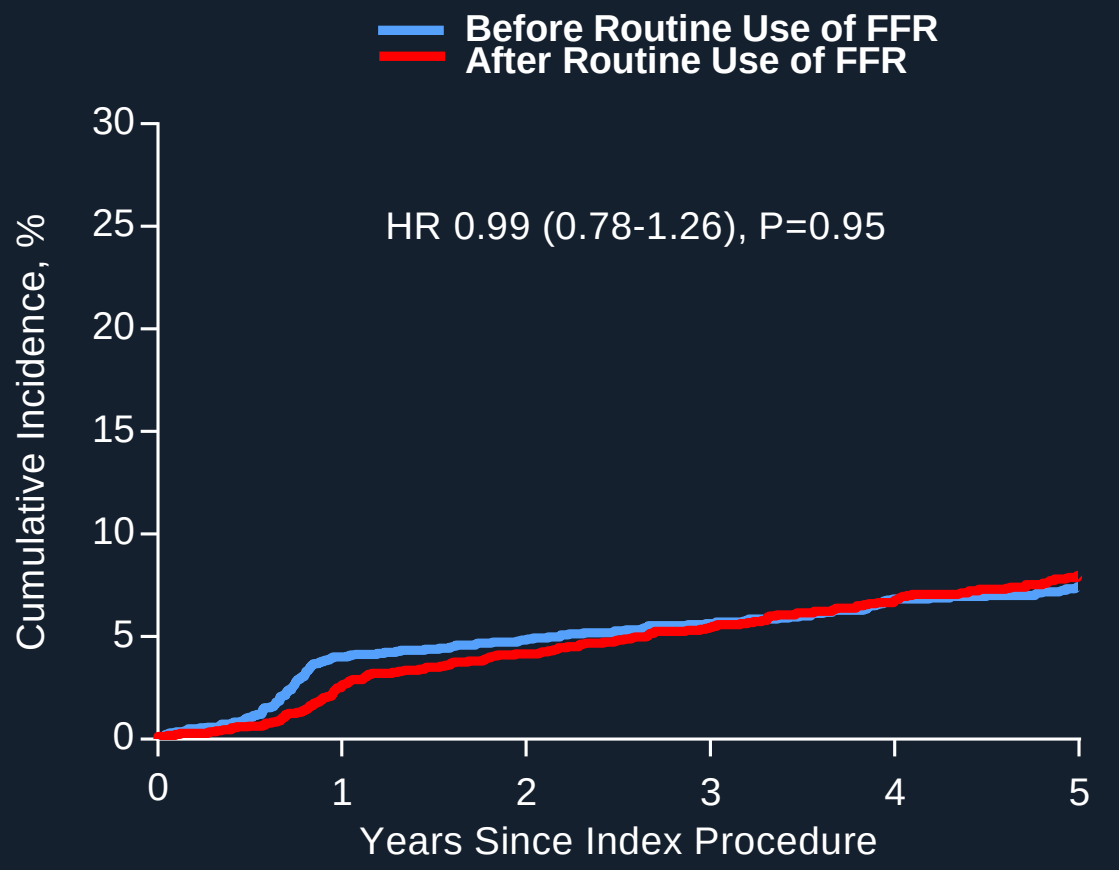
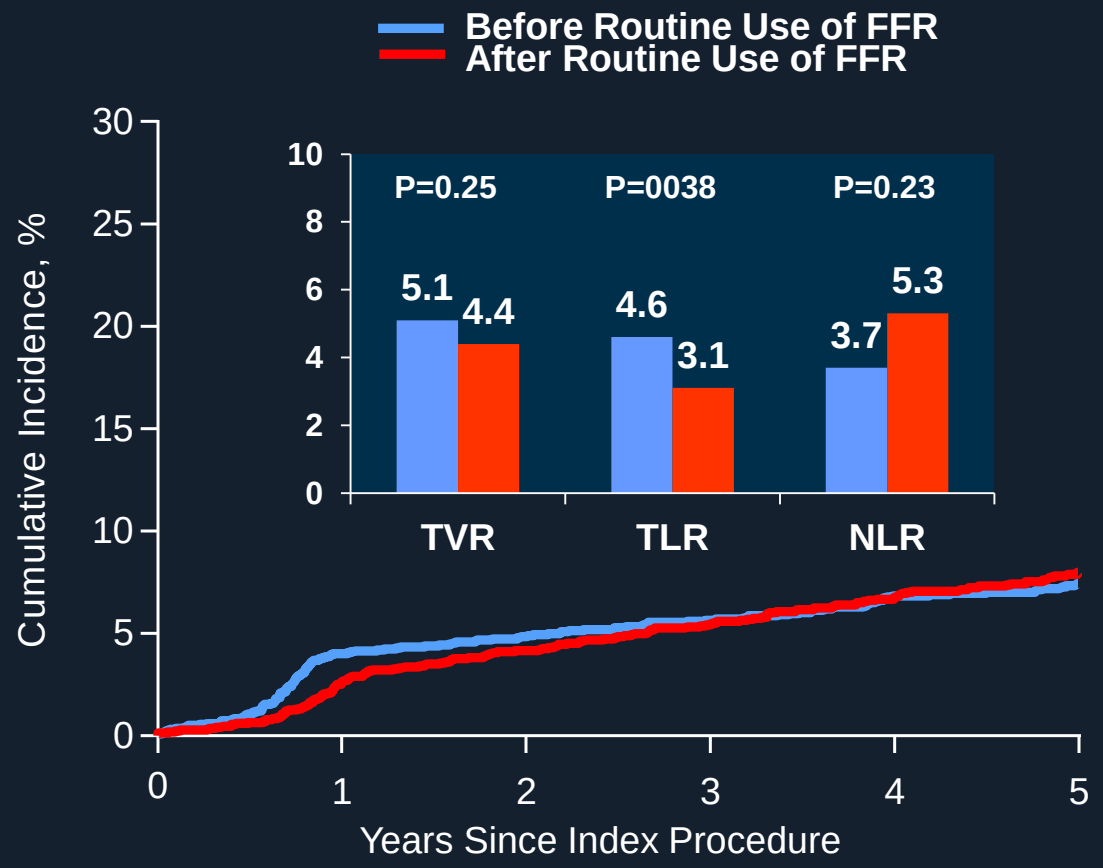
Repeat Revascularization



No. at Risk						
Before Routine Use	2178	2050	1908	1814	1665	986
After Routine Use	2178	2083	1871	1764	1646	994

Repeat Revascularization



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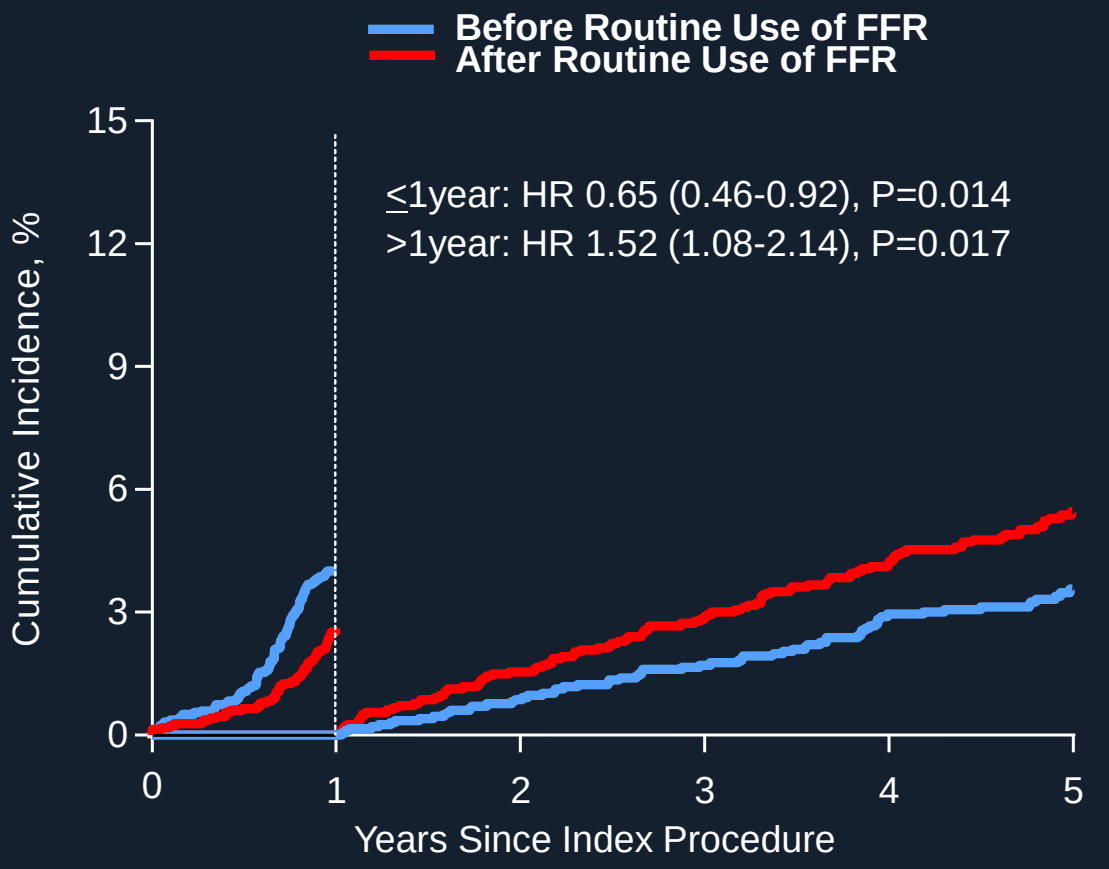
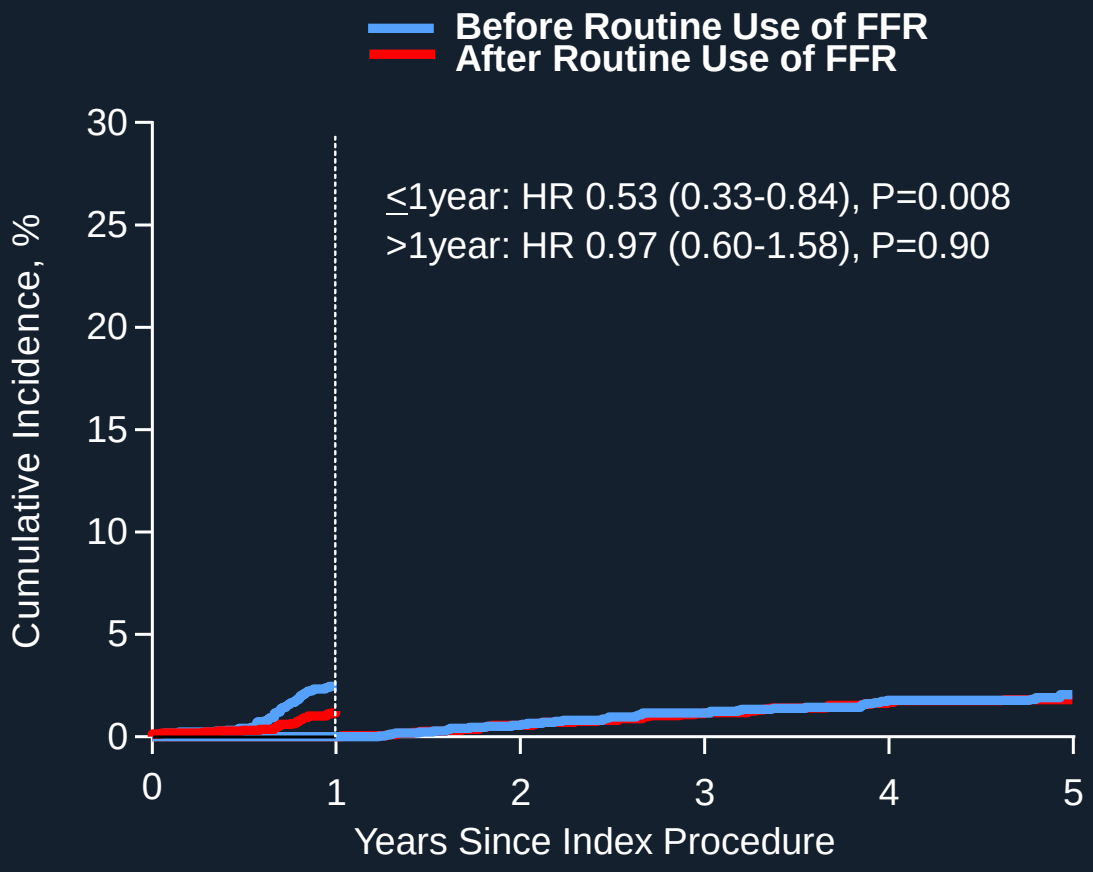
Repeat Revascularization



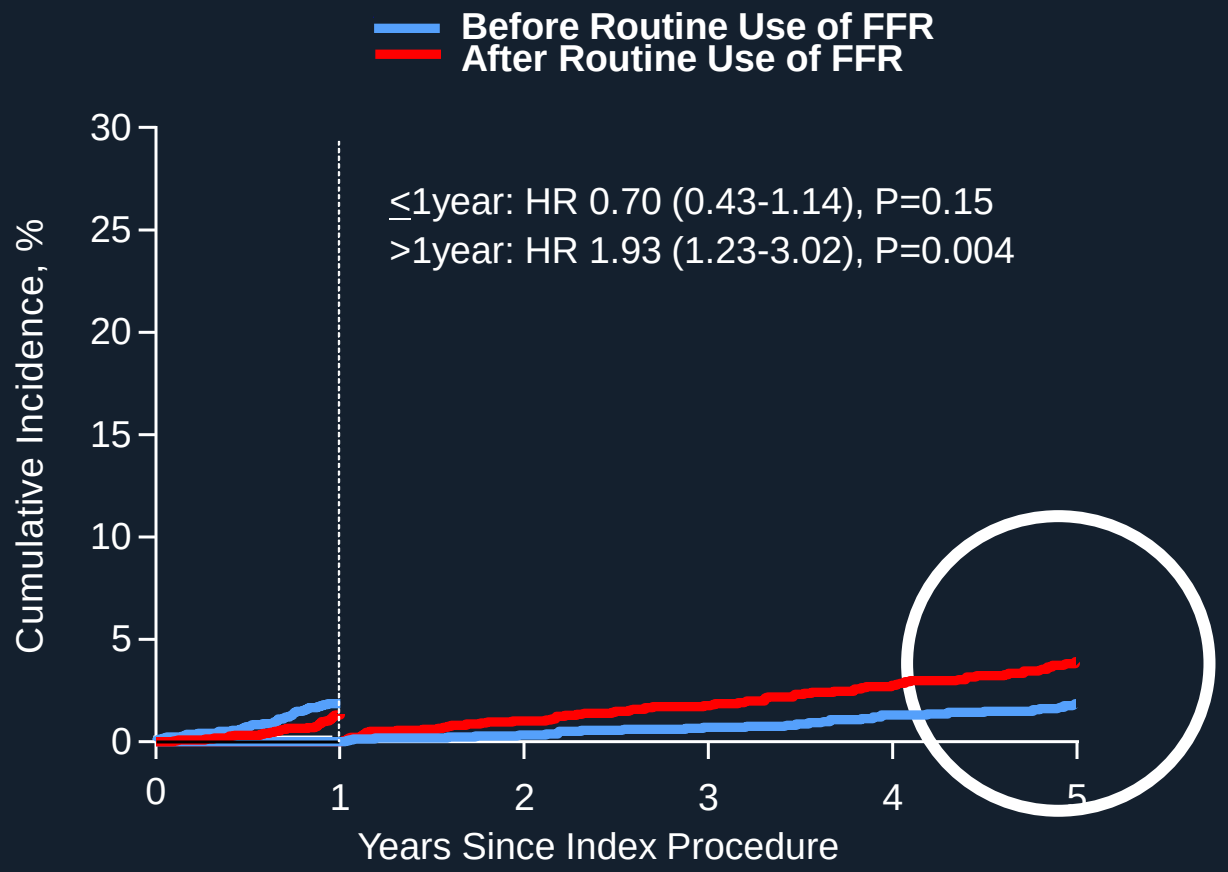
No. at Risk						
Before Routine Use	2178	2050	1908	1814	1665	986
After Routine Use	2178	2083	1871	1764	1646	994

Target Lesion Revascularization



No. at Risk						
Before Routine Use	2178	2083	1946	1852	1708	1020
After Routine Use	2178	2110	1917	1821	1715	1055

New Lesion Revascularization



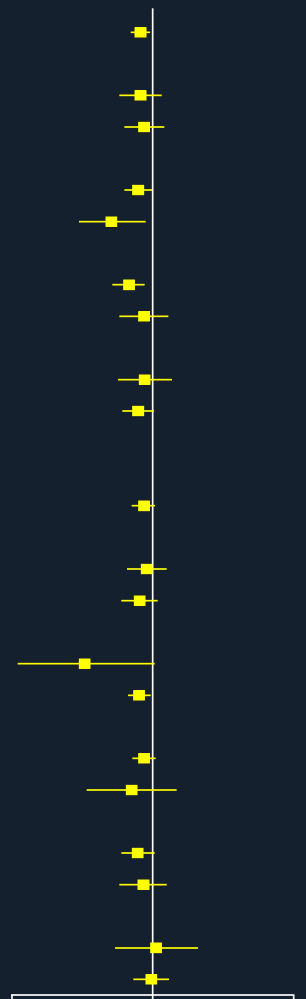
No. at Risk

Before Routine Use	2178	2096	1962	1875	1735	1035
After Routine Use	2178	2108	1906	1803	1689	1024

Propensity Score Matched Population

Subgroup Analysis

Subgroup	5 Year Event Rate (%) of Primary Endpoints: Before Routine Use (N=2178)	5 Year Event Rate (%) of Primary Endpoints: After Routine Use (N=2178)	Hazard Ratio (95% CI)	P value	Interaction P value
Overall	17.7	15.8	0.82 (0.70-0.96)	0.013	
Age					0.79
≥65 yo (N=1917)	21.7	19.8	0.82 (0.58-1.16)	0.26	
<65 yo (N=2439)	14.5	12.7	0.87 (0.63-1.21)	0.41	
Sex					0.66
Male (N=3159)	17.7	15.7	0.79 (0.63-0.99)	0.038	
Female (N=1197)	17.8	16.2	0.51 (0.30-0.89)	0.018	
Presentation					0.15
sAP (N=2805)	16.4	13.2	0.68 (0.52-0.88)	0.003	
ACS (N=1551)	20.0	20.5	0.87 (0.58-1.29)	0.48	
Diabetes					0.65
Yes (N=1410)	22.9	20.5	0.88 (0.57-1.37)	0.58	
No (N=2946)	15.2	13.6	0.79 (0.61-1.02)	0.07	
Ejection fraction					0.59
≤40% (N=154)	30.5	29.8	NA	NA	
>40% (N=3840)	16.8	15.8	0.87 (0.72-1.04)	0.13	
Bifurcation					0.63
Yes (N=1951)	20.2	17.4	0.91 (0.66-1.26)	0.56	
No (N=2405)	15.7	14.6	0.81 (0.60-1.09)	0.17	
Left main disease					0.36
Yes (N=485)	25.1	25.2	0.33 (0.11-1.03)	0.057	
No (N=3871)	16.8	14.6	0.81 (0.67-0.97)	0.025	
Long (>20mm) lesion					0.43
Yes (N=3490)	19.1	16.9	0.87 (0.72-1.05)	0.15	
No (N=866)	12.1	11.4	0.71 (0.34-1.48)	0.36	
Multivessel disease					0.63
Yes (N=2311)	22.7	19.4	0.78 (0.60-1.03)	0.083	
No (N=2045)	11.7	12.0	0.86 (0.58-1.26)	0.43	
Type of DES					0.84
Early DES (N=1589)	18.0	17.0	1.06 (0.54-2.10)	0.86	
New DES (N=2351)	17.3	15.9	0.98 (0.73-1.31)	0.88	



Conclusion

- In this large, prospective, real-world registry, we demonstrated that early benefit of FFR-guided PCI was maintained over the long-term.
- At 5 years, the cohort after routine FFR use was associated with a significantly lower risk of major adverse cardiac events compared with those before routine FFR use. In addition, the rate of cardiac death and myocardial infarction was significantly lower after routine FFR use.
- This benefit was achieved with 26% reduction in overall stent use.

Conclusion

- Although the long-term risk of any repeated revascularization was similar between the two periods, the temporal pattern was significantly different.
- An early increased risk of target lesion revascularization was observed in the cohort before routine FFR use, which was offset by a late increased risk of new lesion revascularization in the cohort after routine FFR use.
- Further studies regarding the identification of high risk deferred lesions would be necessary.