EU-Wide Cross-Sectional Observational Study of Lipid-Modifying Therapy Use in Secondary and Primary Care – the DA VINCI Study

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DA VINCI Sought to Determine Attainment of ESC/EAS LDL-C Goals In Clinical Practice Across Europe

- Recent studies of CAD patients in secondary healthcare settings have assessed the use of LLT and attainment of LDL-C goals as per the 2016 ESC/EAS dyslipidemia guidelines and have found that overall LDL-C goal attainment was low.[1]
- The 2019 ESC/EAS dyslipidemia guideline update recommends even lower LDL-C goals across all risk categories.[2]
- The attainment of these lower LDL-C goals in clinical practice and whether optimizing statin therapy alone is sufficient to achieve these lower goals have not been determined.[2]

Thus, the DA VINCI study sought to evaluate the implementation of both 2016 and 2019 ESC/EAS guideline LDL-C goal attainment for patients across Europe in primary and secondary healthcare settings as well as previously under-studied patient groups.[3]

CAD = Coronary Artery Disease; LLT = lipid lowering therapy; LDL-C = low density lipoprotein cholesterol

1. Kotseva K, et al. *Eur J Prev Cardiol.* 2019;26:824-835. 2. Mach F, et al. *Eur Heart J*. 2019; 21:111-188. 3. Ray, KK, et al. *Eur J Prev Cardiol*. 2020. [in press].

The 2019 ESC/EAS Dyslipidemia Guideline Update Recommends Even Lower LDL-C Goals Across All Risk Categories

	2016 LDL-C Goals[1]	2019 LDL-C Goals[2]
Low Risk	< 3.0 mmol/L (116 mg/dL)	
Moderate Risk	< 3.0 mmol/L (116 mg/dL)	< 2.6 mmol/L (100 mg/dL)
High Risk	50% reduction OR < 2.6 mmol/L (100mg/dL)	50% reduction AND < 1.8 mmol/L (70 mg/dL)
Very high risk	50% reduction OR < 1.8 mmol/L (70 mg/dL)	50% reduction AND < 1.4 mmol/L (55 mg/dL)
Second CV event within 2 years	NA	50% reduction AND < 1.0 mmol/L (40 mg/dL)

LDL-C = low density lipoprotein cholesterol

1. Catapano AL, et al. Eur Heart J 2016; 37:2999-3058. 2. Mach F, et al. Eur Heart J. 2019; 41:111-188.

DA VINCI: a Cross-Sectional, Observational Study Across 18 EU Countries and 128 sites

- Patients (N = 5,888) receiving LLT at primary (n = 3,000) and secondary (2,888) care clinics across 18 European countries were enrolled in this cross-sectional study.
- Patients were enrolled at a single visit between June 2017 and November 2018.
- The number of primary and secondary prevention patients enrolled at each site was capped to ensure an overall ratio of approximately 1:1.
- Sites includes primary care (26%) and secondary care (74%)
- Secondary care sites specializing in coronary, peripheral and cerebral (arterial) disease were included, and patients with these disease manifestations enrolled in an overall ratio of 1:2:2, respectively.

LLT = lipid lowering therapy; LDL-C = low density lipoprotein cholesterol

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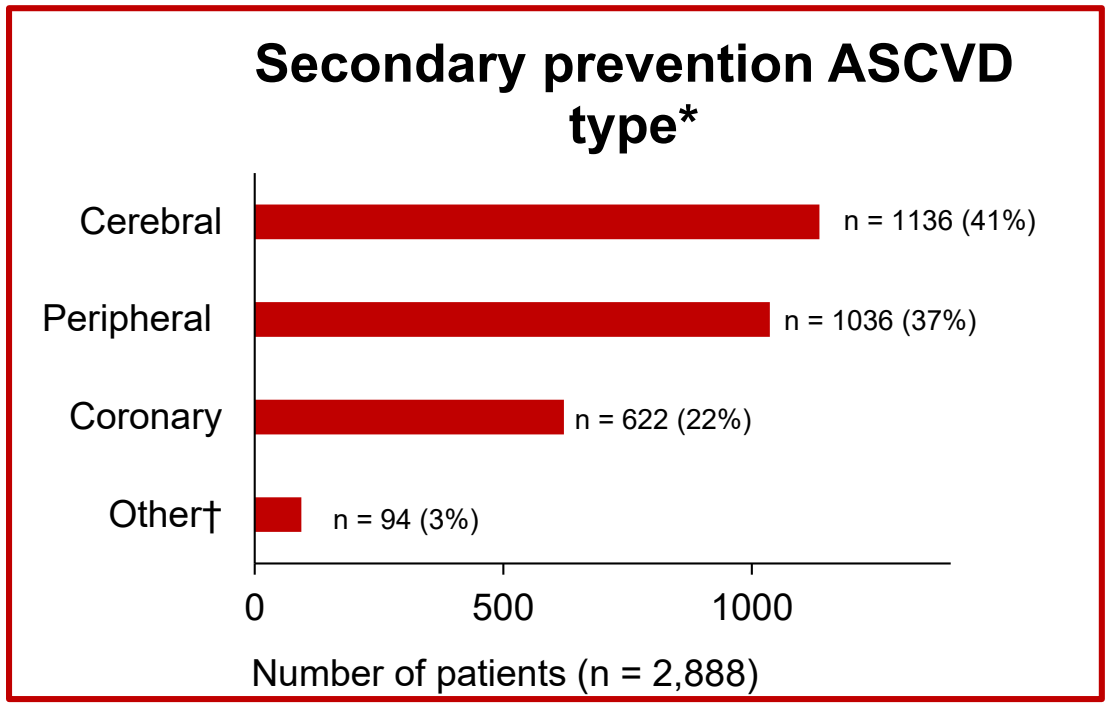
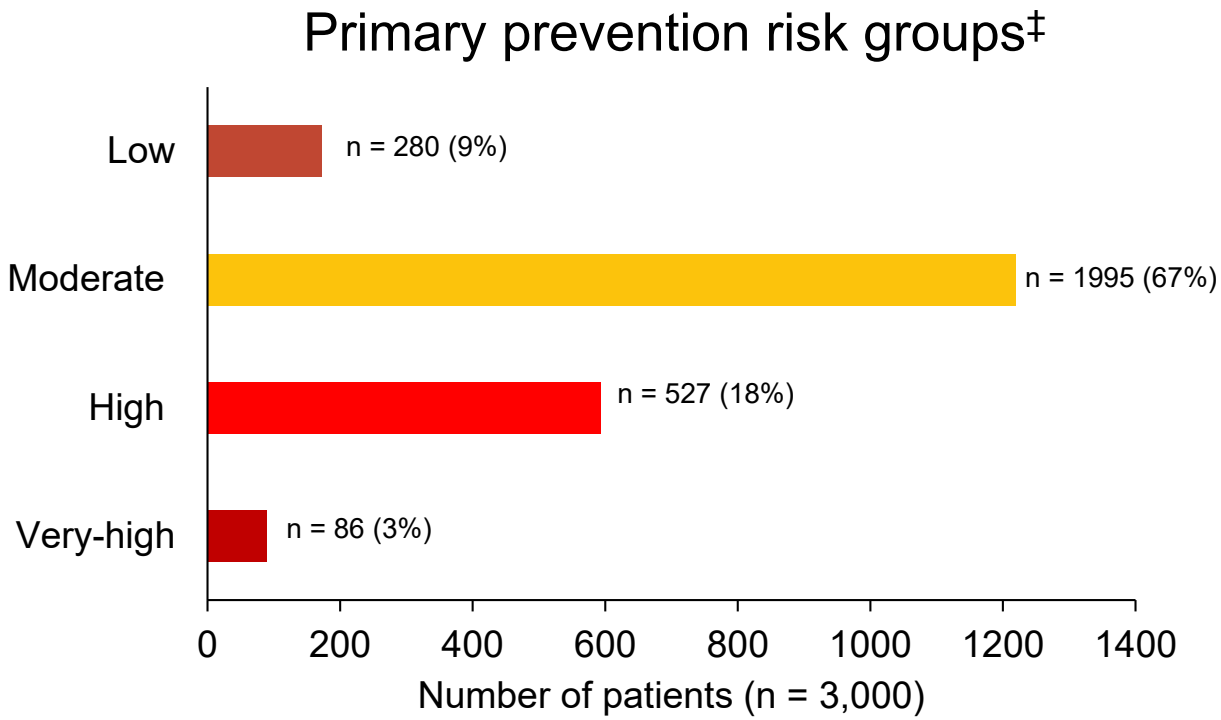
DA VINCI Enrolled Both Secondary Prevention and Primary Prevention Patients





*Very high risk, n = 2794 patients had established ASCVD at enrolment. †Patients had other evidence of atherosclerosis or other manifestation of vascular disease at enrolment. ‡n = 2888 patients considered PP at enrolment had data available to calculate SCORE.
ASCVD = atherosclerotic cardiovascular disease; PP = primary prevention; SCORE = Systematic COronary Risk Evaluation (Conroy et al, 2013).
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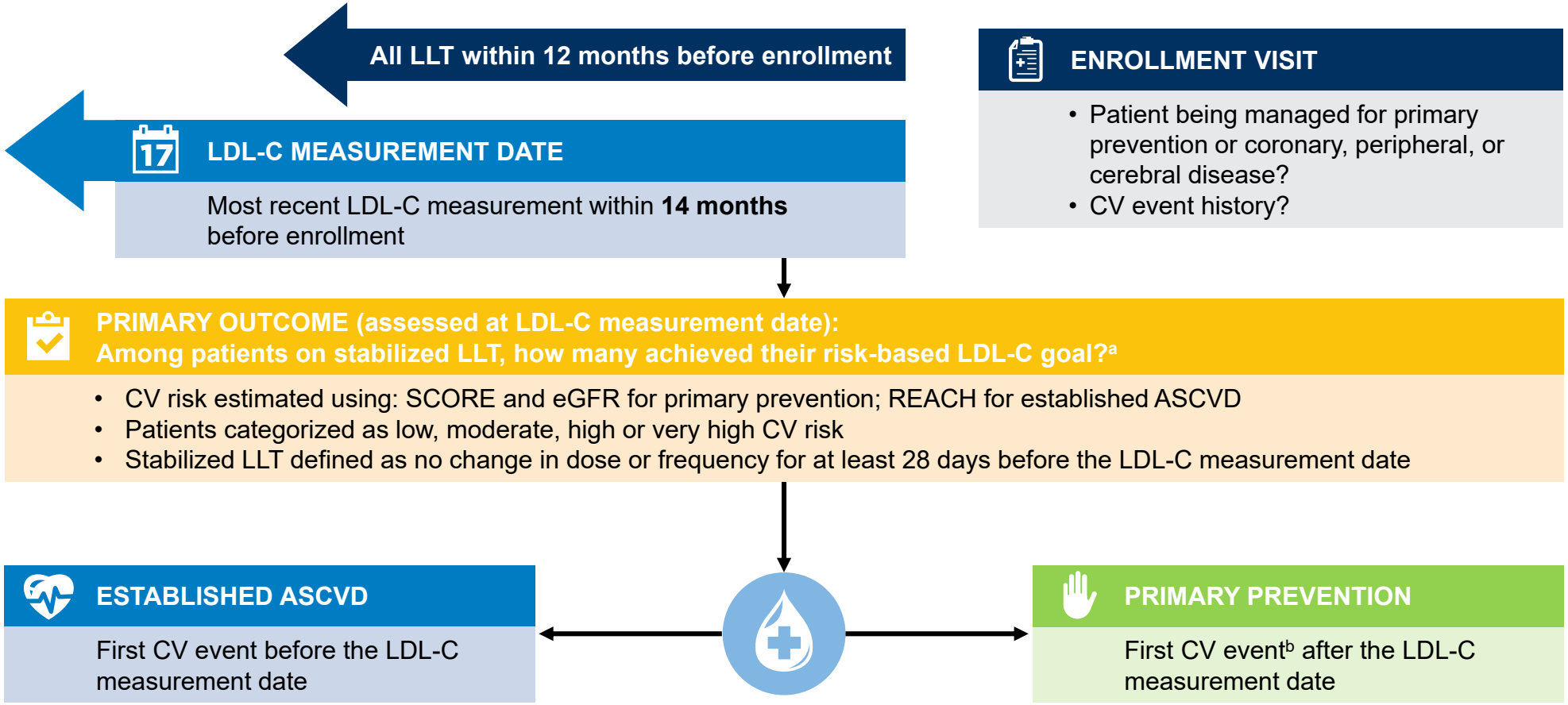
DA VINCI: Study Design Assessed Achievement of Risk-Based 2016 & 2019 ESC/EAS LDL-C Goal While Receiving Stabilized LLT



ASCVD = atherosclerotic cardiovascular disease events; CV = cardiovascular; eGFR = estimate glomerular filtrate; GFR = glomerular filtration rate; LDL-C = low density lipoprotein cholesterol; LLT = lipid-lowering therapy; PP = primary prevention; REACH = Reduction of Atherothrombosis for Continued Health; SCORE = Systematic Coronary Risk Evaluation.
Patients who were not stabilized on any LLT or had their LDL-C measurement taken before any LLT was initiated were not included in the assessment of the primary outcome. Includes patients enrolled as PP with no CV events.
[a]Patients enrolled as secondary prevention who were not being managed for peripheral, vascular or coronary disease and who had other evidence of atherosclerosis or other manifestations of vascular disease at enrollment. [b]Among patients considered as secondary prevention at the enrollment visit, 142 had their first cardiovascular event recorded after their most recent LDL-C measurement, hence they were analyzed as primary prevention patients for outcomes assessed at LDL-C measurement, such as goal attainment. For outcomes assessed at enrollment, these 142 patients were analyzed as secondary prevention.
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Baseline Demographics Were Well Balanced Between the Groups

			Secondary prevention patients by ASCVD status				
	Overall (*n* = 5888)	Primary prevention (*n* = 3000)	Established ASCVD total (*n* = 2794)	ASCVD-coronary (*n* = 622)	ASCVD-peripheral (*n* = 1036)	ASCVD-cerebral (*n* = 1136)	Other vascular secondary prevention[a] (*n* = 94)
Female, *n* (%)	2475 (42)	1502 (50)	939 (34)	149 (24)	323 (31)	467 (41)	34 (36)
Age, years, mean (SD)	65 (12)	63 (13)	68 (10)	67 (10)	69 (9)	67 (11)	70 (10)
Ethnicity, white, *n* (%)	5435 (92)	2829 (94)	2523 (90)	550 (88)	937 (90)	1036 (91)	83 (88)
Systolic blood pressure (mmHg), mean (SD)	135 (17)	134 (16)	135 (18)	133 (18)	136 (19)	136 (17.4)	137 (23)
Diastolic blood pressure (mmHg), mean (SD)	78 (11)	79 (10)	77 (11)	77 (11)	76 (11)	78 (11)	77 (13)
BMI, median (Q1, Q3)	28 (25, 32)	28 (25, 32)	28 (25, 31)	28 (25, 31)	28 (25, 31)	28 (25, 31)	28 (25, 31)
Smoking history, *n* (%)							
Non-smoker	2854 (49)	1732 (58)	1089 (39)	277 (45)	242 (23)	570 (50)	33 (35)
Ex-smoker	2059 (35)	851 (28)	1166 (42)	267 (43)	508 (49)	391 (34)	42 (45)
Light-smoker	313 (5)	140 (5)	167 (6)	26 (4)	76 (7)	65 (6)	6 (6)
Moderate smoker	391 (7)	161 (5)	220 (8)	30 (5)	126 (12)	64 (6)	10 (11)
Heavy smoker	253 (4)	106 (4)	144 (5)	19 (3)	84 (8)	41 (4)	3 (3)
Missing	18 (< 1)	10 (< 1)	8 (< 1)	3 (< 1)	0 (0)	5 (< 1)	0 (0)

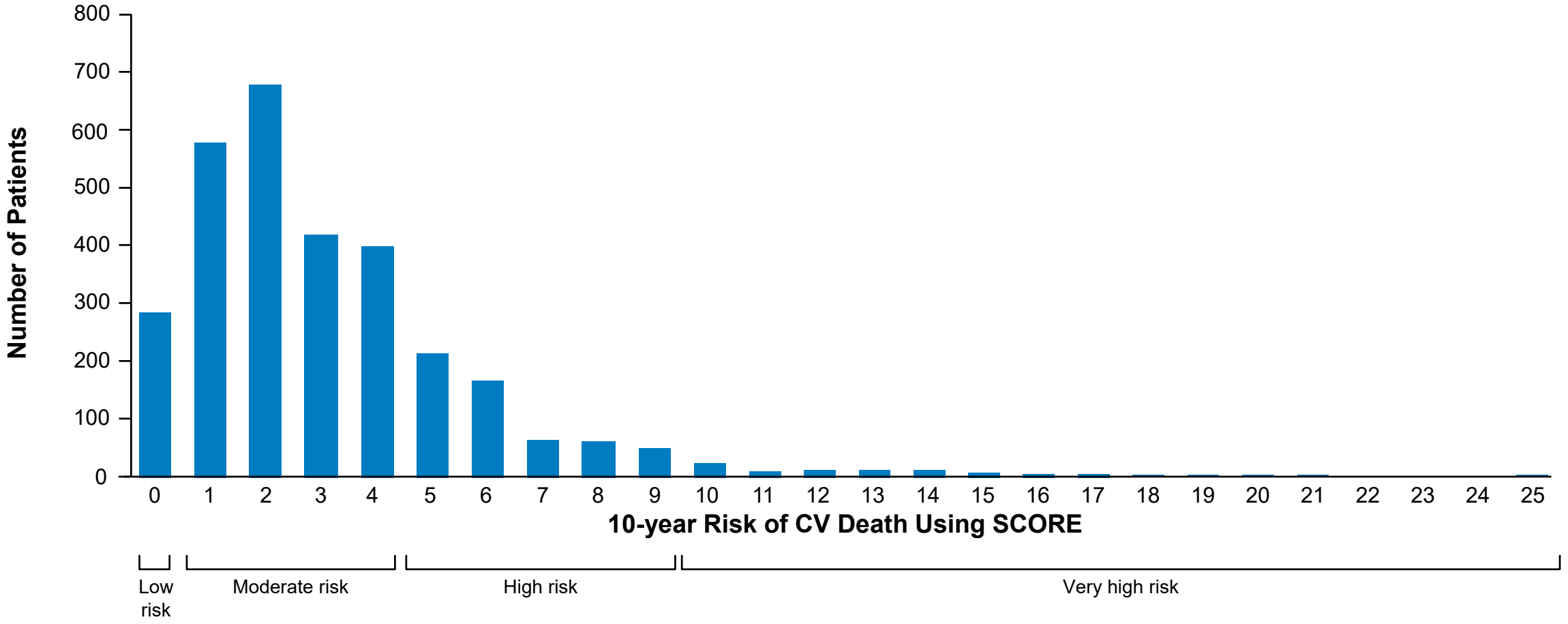
ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; SD = standard deviation.
[a]Patients with other evidence of atherosclerosis or other manifestation of vascular disease at enrollment.
Ray, KK, et al. *Eur J Prev Cardiol*. 2020. [in press].

Those Managed for PAD were More Likely to Have a Prior History of Vascular Disease

			Secondary prevention patients by ASCVD status				
	Overall (*n* = 5888)	Primary prevention (*n* = 3000)	Established ASCVD total (*n* = 2794)	ASCVD-coronary (*n* = 622)	ASCVD-peripheral (*n* = 1036)	ASCVD-cerebral (*n* = 1136)	Other vascular secondary prevention[a] (*n* = 94)
Hypertension, *n* (%)	4138 (70)	1976 (66)	2090 (75)	455 (73)	809 (78)	826 (73)	72 (77)
Diabetes, *n* (%)	2293 (39)	1169 (39)	1082 (39)	238 (38)	473 (46)	371 (33)	42 (45)
Chronic kidney disease ≥ grade 3, *n* (%)	432 (7)	179 (6)	242 (9)	46 (7)	124 (12)	72 (6)	11 (12)
Familial hypercholesterolaemia	284 (5)	284 (10)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Vascular bed involvement, *n* (%)							
Coronary	1007 (17)	0 (0)	985 (35)	618 (99)	271 (26)	96 (9)	22 (23)
Cerebral	1296 (22)	0 (0)	1277 (46)	31 (5)	122 (12)	1124 (99)	19 (20)
Peripheral	1125 (19)	0 (0)	1069 (38)	24 (4)	1014 (98)	31 (3)	56 (60)

ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; SD = standard deviation.
[a]Patients with other evidence of atherosclerosis or other manifestation of vascular disease at enrollment.
Ray, KK, et al. *Eur J Prev Cardiol*. 2020. [in press].

The Majority of Primary Prevention Patients[a] were Low-Moderate Risk



Using SCORE to calculate the estimated 10-year risk of CV death, 67% of primary prevention patients were low-moderate risk, 29% were high risk and 4% were very-high risk

CV = cardiovascular; GFR = glomerular filtration rate; LDL-C = low density lipoprotein cholesterol; LLT = lipid-lowering therapy; SCORE = Systematic Coronary Risk Evaluation.

[a]Data shown are for all patients considered primary prevention at LDL-C measurement (n = 3142); of these, 2073 were on stabilized LLT at LDL-C measurement and had data available to calculate SCORE and GFR risk.

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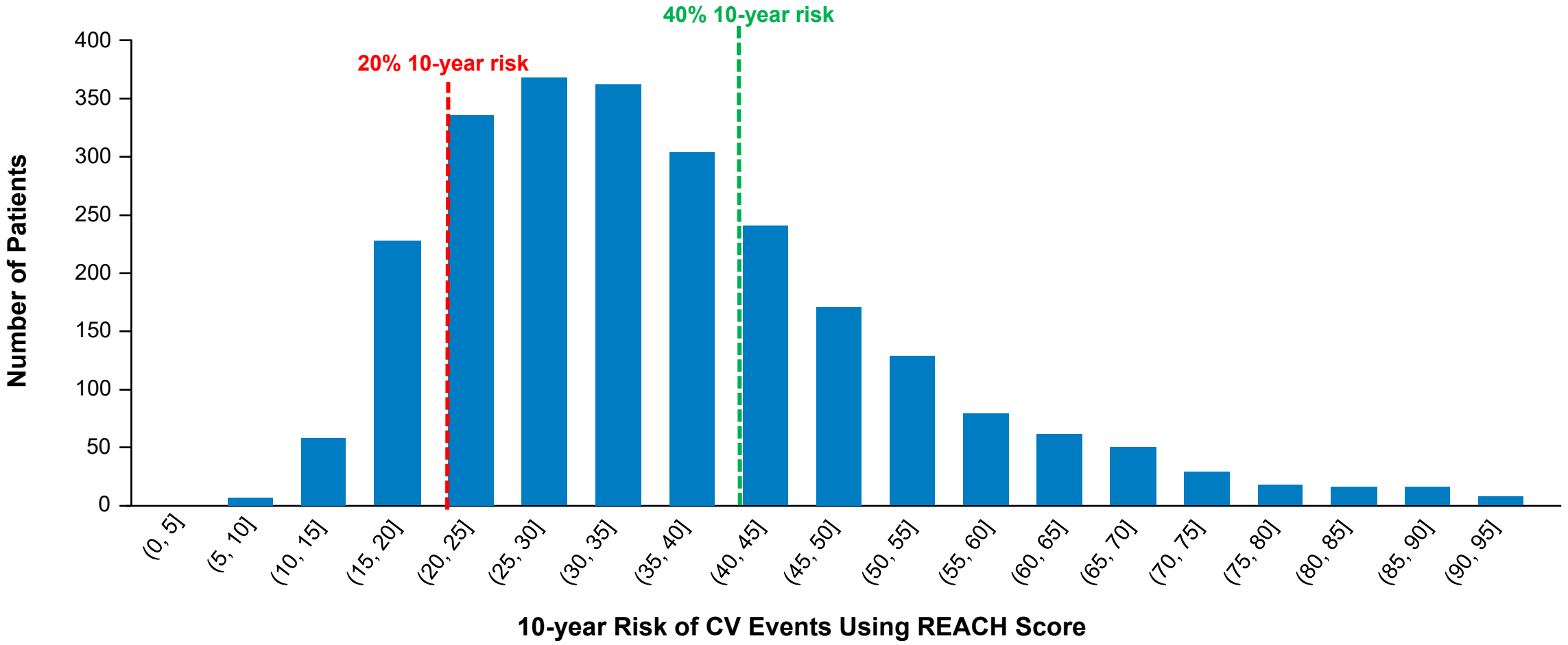
In the Established ASCVD[a] Group, 82% of Patients had Predicted 10-year Risk Greater than 20% and 31% had Predicted 10-year Risk Greater than 40%



ASCVD = atherosclerotic cardiovascular disease; CV = cardiovascular; LDL-C = low density lipoprotein cholesterol; LLT = lipid-lowering therapy; REACH = Reduction of Atherothrombosis for Continued Health.

[a]Data shown are for all patients considered having established ASCVD at LDL-C measurement (n = 2659); of these, 2039 were on stabilized LLT at LDL-C measurement.

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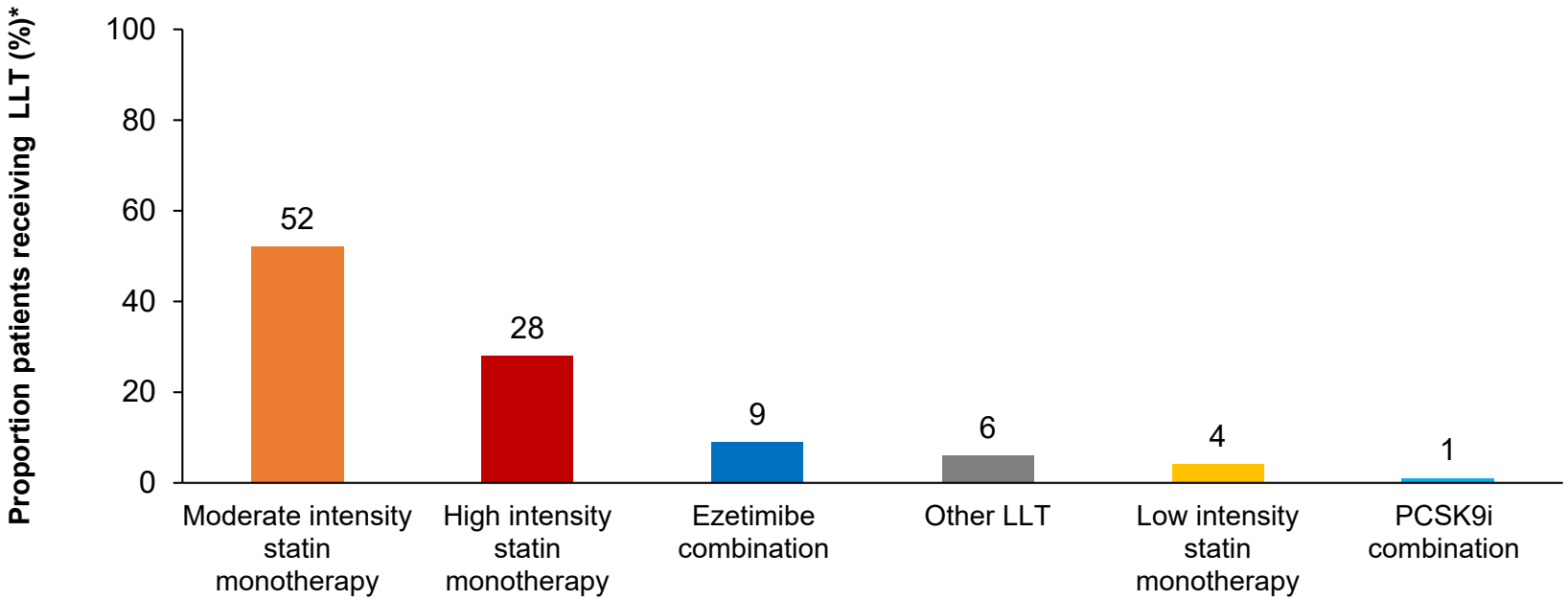
Overall, Moderate-Intensity Statin Monotherapy was the Most Frequently Used LLT Regimen



Only 28% of patients were receiving high intensity statin monotherapy
Few patients (9%) were receiving ezetimibe combo
Even fewer patients (1%) received PCSK9i combo

*Stabilised LLT at time of LDL-C measurement. combo, combination
LDL-C = low-density lipoprotein cholesterol; LLT = lipid lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
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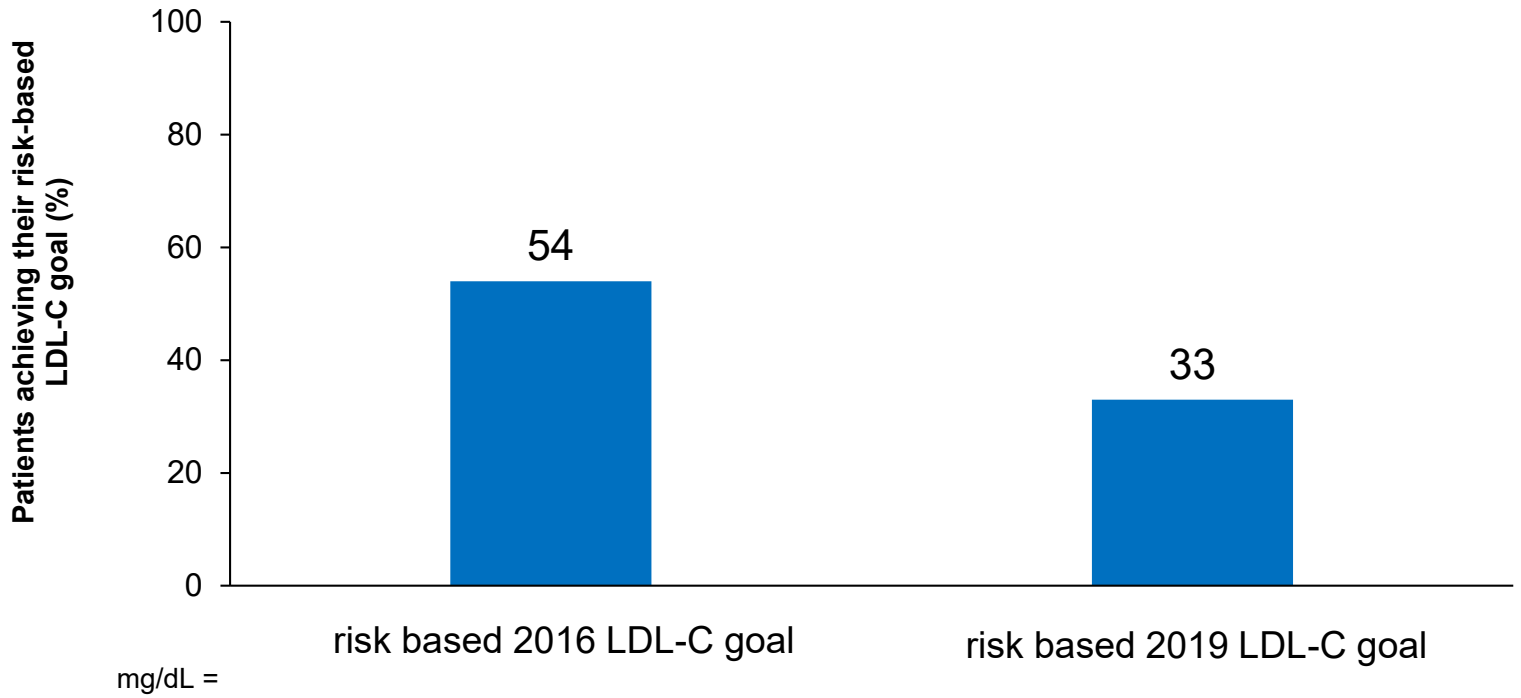
Overall, Goal Achievement of 2016 & 2019 ESC/EAS LDL-C Recommendations was Low



Overall, fewer patients attained their risk based 2019 LDL-C goals in comparison to their risk based 2016 goals (33% vs 54%) with a lower likelihood of goal attainment with increasing risk (i.e. lower LDL-C goal)

*Stabilised LLT at time of LDL-C measurement. combo, combination
LDL-C = low-density lipoprotein cholesterol
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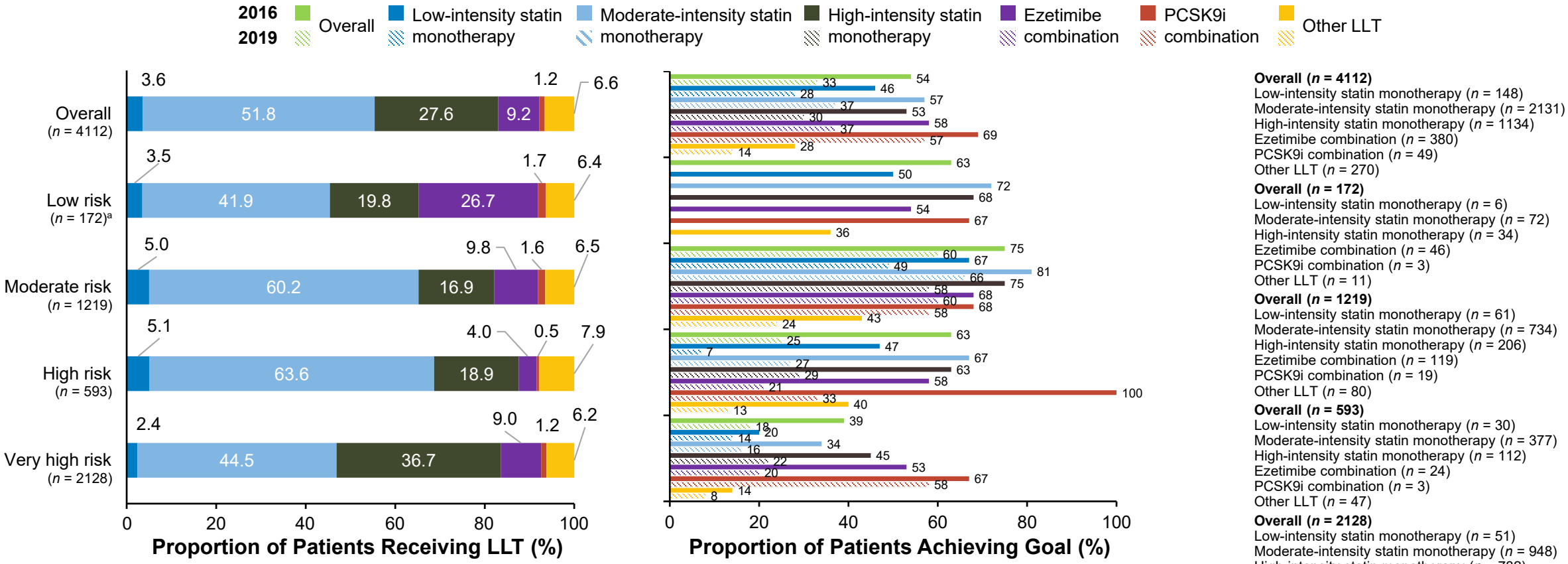
Only 18% of Very-High Risk Patients Achieved LDL-C Goals of < 1.4 mmol/L (< 55 mg/dL)



Among very-high risk patients receiving statin monotherapy, goal attainment was 14%, 16% and 22% in those receiving low-, moderate- and high-intensity statins. Overall, 37% of patients receiving ezetimibe combination therapy and 57% receiving PCSK9 inhibitor combination therapy achieved their risk-based LDL-C goal.

Overall (*n* = 4112)
Low-intensity statin monotherapy (*n* = 148)
Moderate-intensity statin monotherapy (*n* = 2131)
High-intensity statin monotherapy (*n* = 1134)
Ezetimibe combination (*n* = 380)
PCSK9i combination (*n* = 49)
Other LLT (*n* = 270)

Overall (*n* = 172)
Low-intensity statin monotherapy (*n* = 6)
Moderate-intensity statin monotherapy (*n* = 72)
High-intensity statin monotherapy (*n* = 34)
Ezetimibe combination (*n* = 46)
PCSK9i combination (*n* = 3)
Other LLT (*n* = 11)

Overall (*n* = 1219)
Low-intensity statin monotherapy (*n* = 61)
Moderate-intensity statin monotherapy (*n* = 734)
High-intensity statin monotherapy (*n* = 206)
Ezetimibe combination (*n* = 119)
PCSK9i combination (*n* = 19)
Other LLT (*n* = 80)

Overall (*n* = 593)
Low-intensity statin monotherapy (*n* = 30)
Moderate-intensity statin monotherapy (*n* = 377)
High-intensity statin monotherapy (*n* = 112)
Ezetimibe combination (*n* = 24)
PCSK9i combination (*n* = 3)
Other LLT (*n* = 47)

Overall (*n* = 2128)
Low-intensity statin monotherapy (*n* = 51)
Moderate-intensity statin monotherapy (*n* = 948)
High-intensity statin monotherapy (*n* = 782)
Ezetimibe combination (*n* = 191)
PCSK9i combination (*n* = 24)
Other LLT (*n* = 132)

2016/2019 risk-based LDL-C targets:
Low risk: 2016/2019, < 3.0 mmol/L (< 116 mg/dL);
Moderate risk: 2016, < 3.0 mmol/L (< 116 mg/dL); 2019, < 2.6 mmol/L (< 101 mg/dL); High risk: 2016, < 2.6 mmol/L (< 100 mg/dL); 2019, < 1.8 mmol/L (< 70 mg/dL); Very high risk: 2016, < 1.8 mmol/L (< 70 mg/dL); 2019, < 1.4 mmol/L (< 55 mg/dL)

ASCVD = atherosclerotic cardiovascular disease; CV = cardiovascular; EAS = European Atherosclerosis Society; ESC = European Society of Cardiology; LDL-C = low-density lipoprotein cholesterol; LLT = lipid-lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
[a]Goal attainment for low risk is the same for 2016 and 2019 (< 3.0 mmol/L [< 116 mg/dL]) so only one bar is displayed. *N* is the number of patients in the category with non-missing LDL-C goal data. Patients enrolled as secondary prevention whose first ASCVD event occurred after the date LDL-C levels were stabilised are included in the primary prevention group. Among patients enrolled as secondary prevention, 142 had their first CV event recorded after their most recent LDL-C measurement, hence they were analysed as primary prevention patients for outcomes assessed at LDL-C measurement, such as goal attainment. For outcomes assessed at enrollment, these 142 patients were analysed as secondary prevention. Kausik RK, et al. *Eur J Prev Cardiol.* 2020. [in press].

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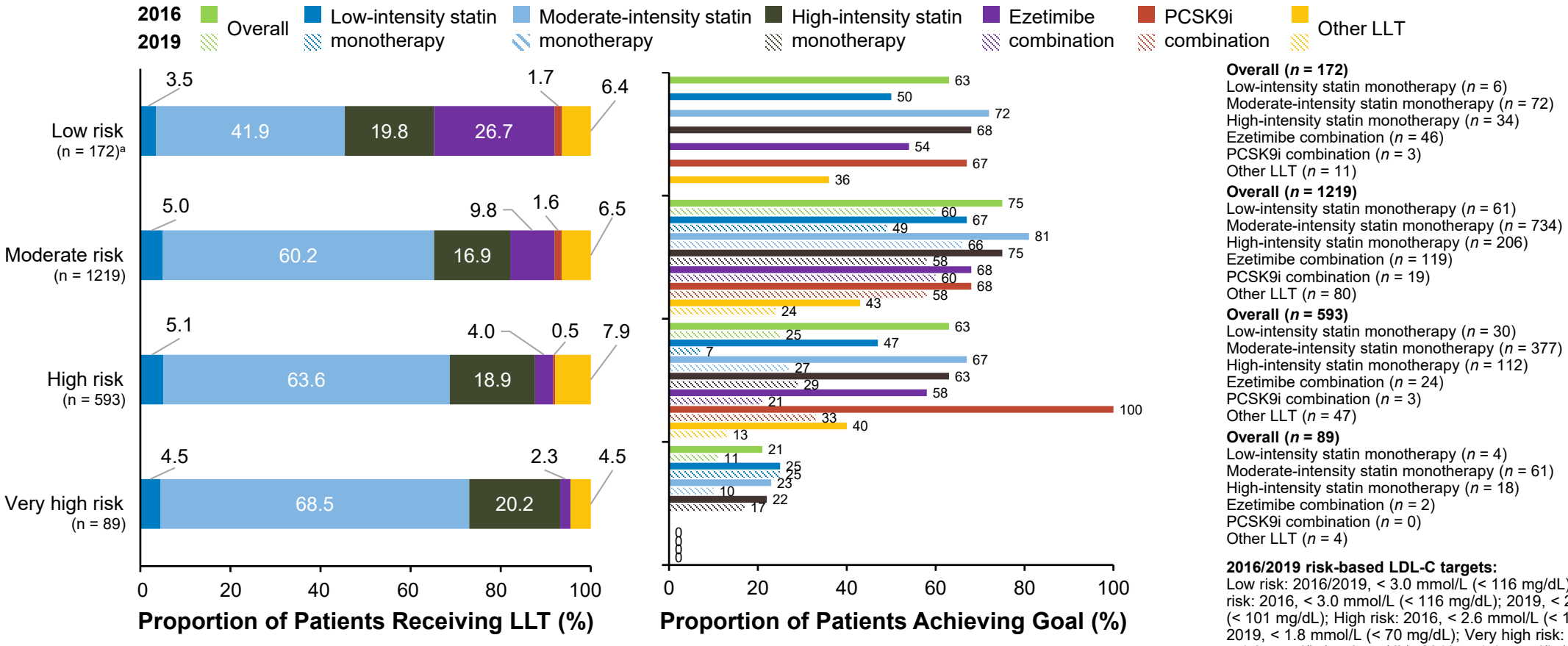
In the Primary Prevention Group, the 2016 ESC/EAS LDL-C Goal of < 3.0 mmol/L (< 116 mg/dL) was Achieved in 75% of Patients Compared to 60% Attainment of the 2019 LDL-C Goal of < 2.6 mmol/L (< 100 mg/dL)



Overall (*n* = 172)
Low-intensity statin monotherapy (*n* = 6)
Moderate-intensity statin monotherapy (*n* = 72)
High-intensity statin monotherapy (*n* = 34)
Ezetimibe combination (*n* = 46)
PCSK9i combination (*n* = 3)
Other LLT (*n* = 11)

Overall (*n* = 1219)
Low-intensity statin monotherapy (*n* = 61)
Moderate-intensity statin monotherapy (*n* = 734)
High-intensity statin monotherapy (*n* = 206)
Ezetimibe combination (*n* = 119)
PCSK9i combination (*n* = 19)
Other LLT (*n* = 80)

Overall (*n* = 593)
Low-intensity statin monotherapy (*n* = 30)
Moderate-intensity statin monotherapy (*n* = 377)
High-intensity statin monotherapy (*n* = 112)
Ezetimibe combination (*n* = 24)
PCSK9i combination (*n* = 3)
Other LLT (*n* = 47)

Overall (*n* = 89)
Low-intensity statin monotherapy (*n* = 4)
Moderate-intensity statin monotherapy (*n* = 61)
High-intensity statin monotherapy (*n* = 18)
Ezetimibe combination (*n* = 2)
PCSK9i combination (*n* = 0)
Other LLT (*n* = 4)

2016/2019 risk-based LDL-C targets:
Low risk: 2016/2019, < 3.0 mmol/L (< 116 mg/dL); Moderate risk: 2016, < 3.0 mmol/L (< 116 mg/dL); 2019, < 2.6 mmol/L (< 101 mg/dL); High risk: 2016, < 2.6 mmol/L (< 100 mg/dL); 2019, < 1.8 mmol/L (< 70 mg/dL); Very high risk: 2016, < 1.8 mmol/L (< 70 mg/dL); 2019, < 1.4 mmol/L (< 55 mg/dL)

Among individuals at high and very-high risk, 2016 vs 2019 goal attainment was 25% vs 63% and 11% vs 21%.
Among those receiving combination therapy with ezetimibe or PCSK9 inhibitors, 2019 ESC/EAS goal attainment in high risk patients was 21% and 33%.

ASCVD = atherosclerotic cardiovascular disease; CV = cardiovascular; LDL-C = low-density lipoprotein cholesterol; LLT = lipid-lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
[a]Goal attainment for low risk is the same for 2016 and 2019 (< 3.0 mmol/L [< 116 mg/dL]) so only one bar is displayed. *N* is the number of patients in the category with non-missing LDL-C goal data. Patients enrolled as secondary prevention whose first ASCVD event occurred after the date LDL-C levels were stabilised are included in the primary prevention group. Among patients enrolled as secondary prevention, 142 had their first CV event recorded after their most recent LDL-C measurement, hence they were analysed as primary prevention patients for outcomes assessed at LDL-C measurement, such as goal attainment. For outcomes assessed at enrollment, these 142 patients were analysed as secondary prevention.
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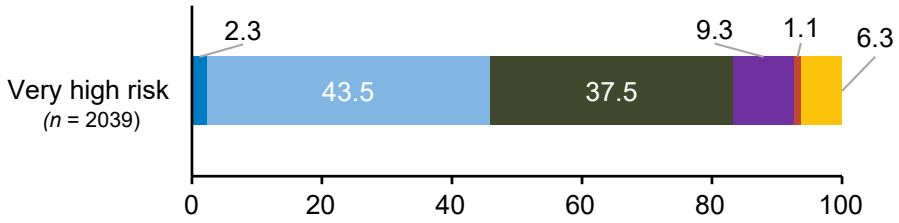
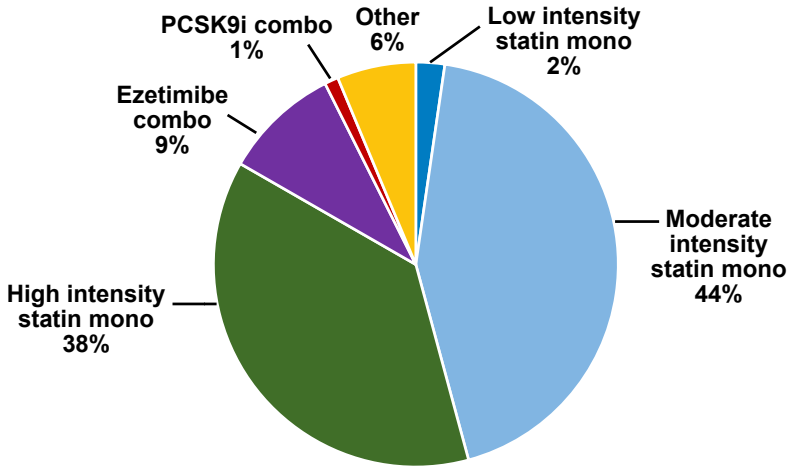
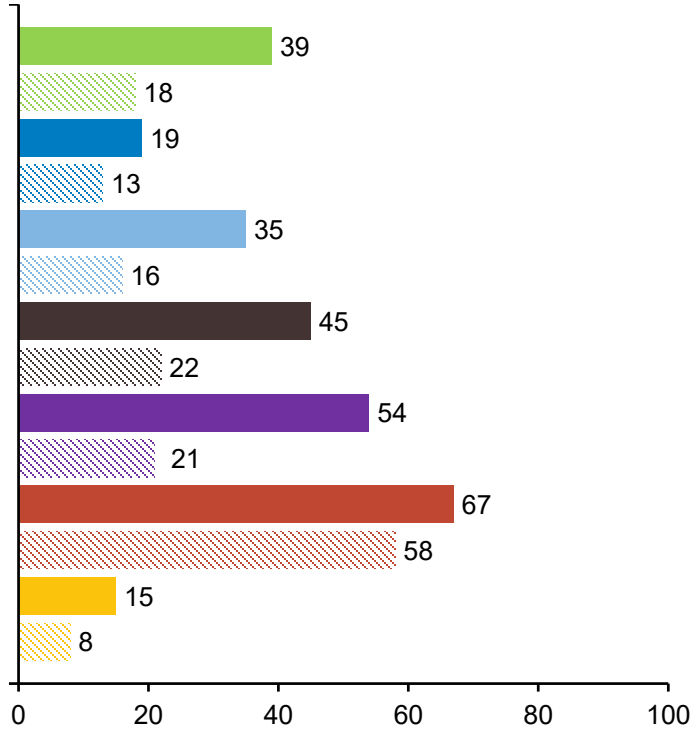
In Very High Risk Patients with Established ASCVD, Goal Attainment was More Likely Seen in those Receiving Combination Therapy

Proportion of Patients Receiving LLT (%)





Proportion of Patients Achieving Goal (%)

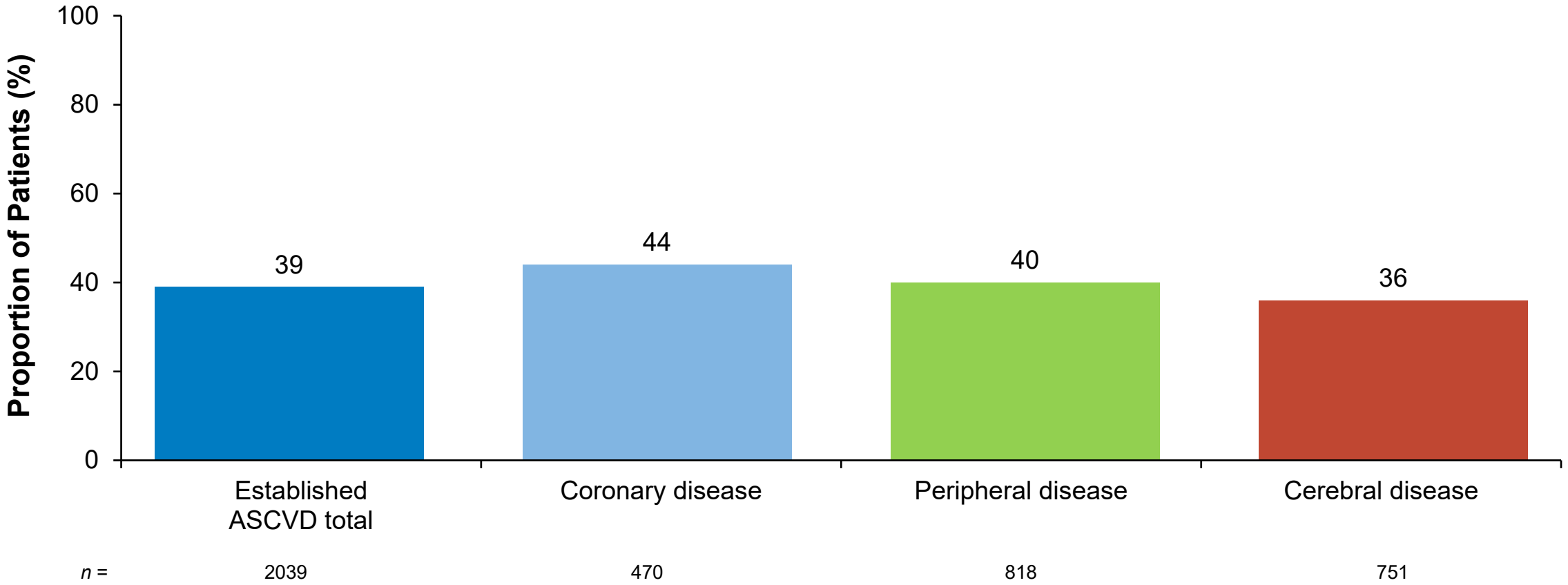


Overall (*n* = 2039)
Low-intensity statin monotherapy (*n* = 47)
Moderate-intensity statin monotherapy (*n* = 887)
High-intensity statin monotherapy (*n* = 764)
Ezetimibe combination (*n* = 189)
PCSK9i combination (*n* = 24)
Other LLT (*n* = 128)

2016/2019 risk-based LDL-C targets:
Low risk: 2016/2019, < 3.0 mmol/L (< 116 mg/dL); Moderate risk: 2016, < 3.0 mmol/L (< 116 mg/dL); 2019, < 2.6 mmol/L (< 101 mg/dL); High risk: 2016, < 2.6 mmol/L (< 100 mg/dL); 2019, < 1.8 mmol/L (< 70 mg/dL); Very high risk: 2016, < 1.8 mmol/L (< 70 mg/dL); 2019, < 1.4 mmol/L (< 55 mg/dL)

ASCVD = atherosclerotic cardiovascular disease; CV = cardiovascular; LDL-C = low-density lipoprotein cholesterol; LLT = lipid-lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
N is the number of patients in the category with non-missing LDL-C goal data. Patients enrolled as secondary prevention whose first ASCVD event occurred after the date LDL-C levels were stabilised are included in the primary prevention group. Among patients enrolled as secondary prevention, 142 had their first CV event recorded after their most recent LDL-C measurement, hence they were analysed as primary prevention patients for outcomes assessed at LDL-C measurement, such as goal attainment. For outcomes assessed at enrollment, these 142 patients were analysed as secondary prevention.
Ray, KK et al. *Eur J Prev Cardiol*. 2020. [in press].

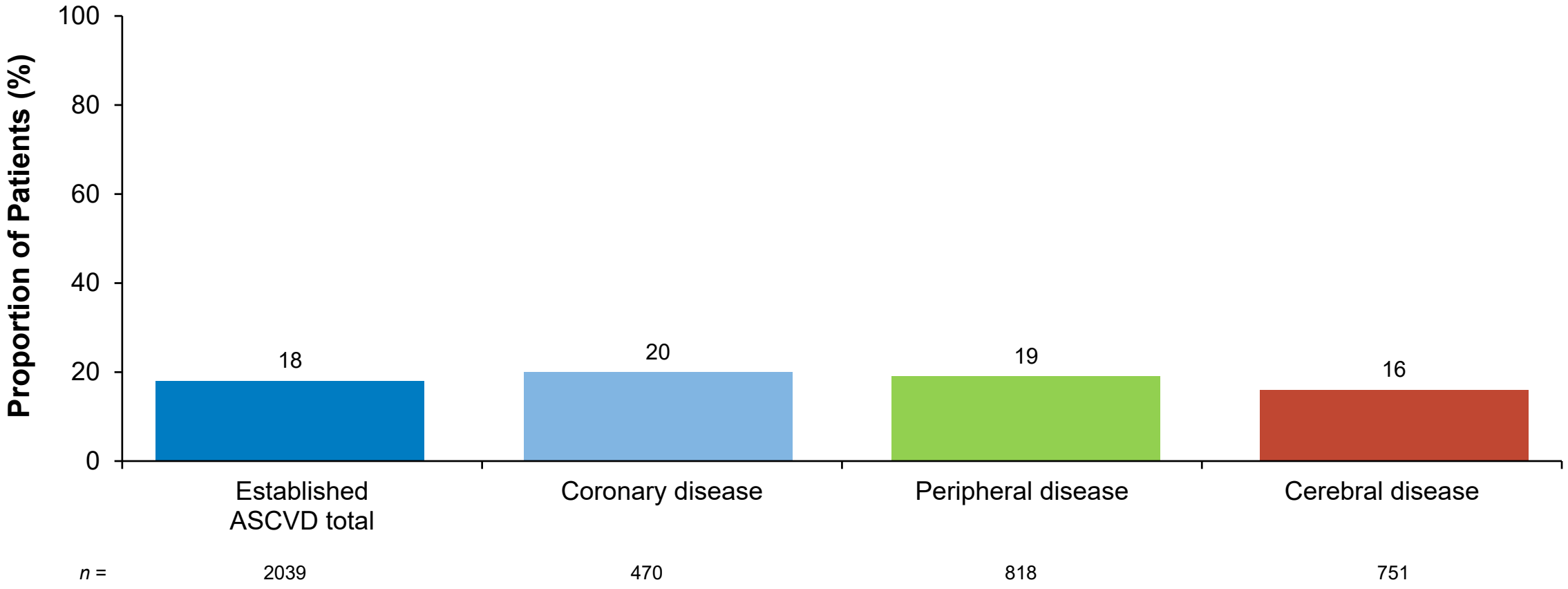
Among Patients with Established ASCVD, 39% Achieved the 2016 ESC/EAS Very-High Risk Goal of LDL-C < 1.8 mmol/L (< 70 mg/dL)



ASCVD = atherosclerotic cardiovascular disease; EAS = European Atherosclerosis Society; ESC = European Society of Cardiology; LDL-C = low-density lipoprotein cholesterol.

Ray KK, et al. *Eur J Prev Cardiol*. 2020. Suppl. [in press].

Among Patients with Established ASCVD, 18% Achieved the 2019 ESC/EAS Very-High Risk Goal of LDL-C < 1.4 mmol/L (< 55 mg/dL)



In very high risk patients, 2019 goal attainment was approximately half that of 2016 (18% vs 39%).

ASCVD = atherosclerotic cardiovascular disease; EAS = European Atherosclerosis Society; ESC = European Society of Cardiology; LDL-C = low-density lipoprotein cholesterol.

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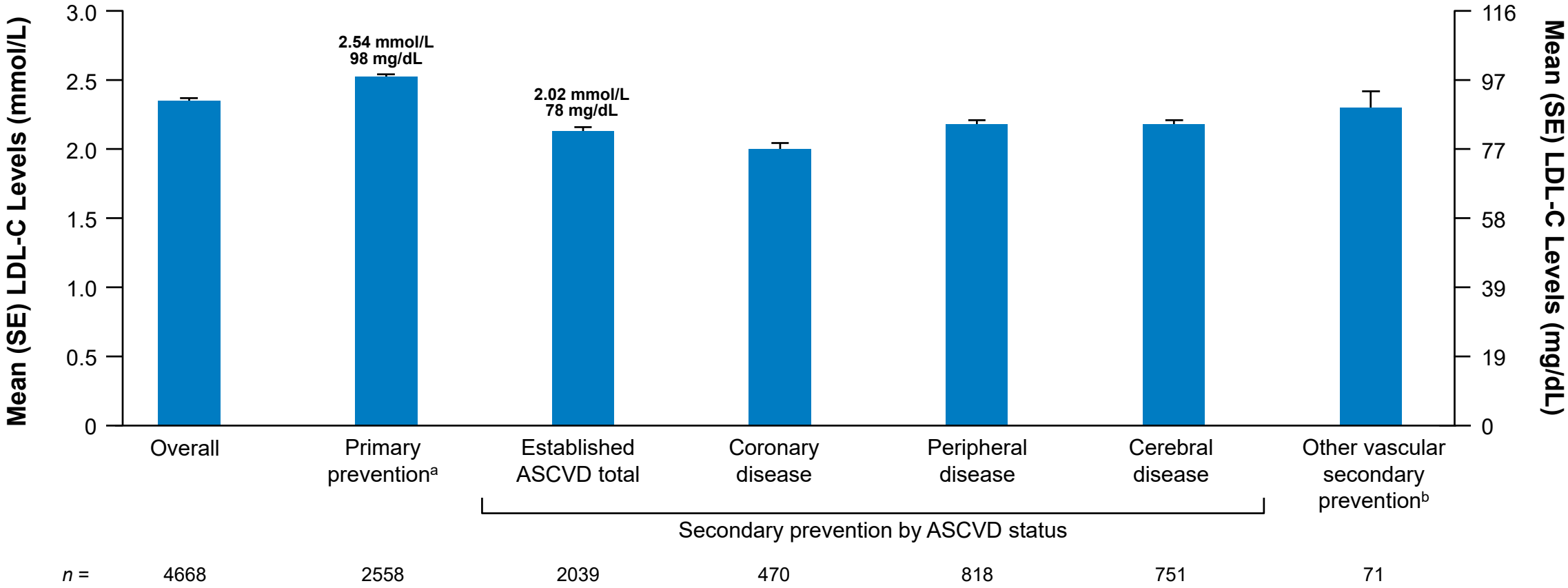
Even Among Patients Receiving Stabilized LLT at the Time of LDL-C Measurement, LDL-C Levels Remained Above 2.0 mmol/L (77 mg/dL)



ASCVD = atherosclerotic cardiovascular disease; LDL-C = low-density lipoprotein cholesterol; LLT = lipid-lowering therapy; SE = standard error.
n = the number of patients in the category on stabilized LLT and with non-missing LDL-C goal data.
[a]Primary prevention: at LDL-C measurement, 142 patients enrolled as secondary prevention, whose first ASCVD event occurred after the date LDL-C levels were stabilized, are included in the primary prevention group. [b]Patients with other evidence of atherosclerosis or other manifestation of vascular disease at enrollment.
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Summary

- The DA VINCI study demonstrated that in Europe gaps persist between ESC/EAS guidelines and clinical practice for lipid management.
  - Only 54% of patients achieved their 2016 risk-based LDL-C goal and 33% of patients achieved their 2019 risk-based LDL-C goal.
  - In addition, overall, only 18% of very-high risk patients achieved the 2019 ESC/EAS LDL-C Goal of <1.4 mmol/L (<55 mg/dL)
- Goal attainment was higher among individuals at lower CV risk and lower among those at higher risk.
- Moderate intensity statin monotherapy was the most frequently used LLT across all risk groups, including patients at high risk.
- In addition, use of combination therapies (i.e. ezetimibe & PCSK9i) in patients at very high risk was very low, which may be attributed to the timing of recruitment as most of the countries may not have had access to PCKS9i yet.
- Even with optimized statin use, the prevalent gap between guideline recommended LDL-C goals and their implementation in clinical care will require greater utilization of non-statin LLT in combination with statins for patients at highest risk.
- Moreover, DA VINCI established that implementation of 2019 guidelines will require a practice change, especially among very high risk patients with a LDL-C goal of < 1.4 mmol/L (<55 mg/dL).

LDL-C = low-density lipoprotein cholesterol; LLT = lipid lowering therapy; PCSK9i = proprotein convertase subtilisin-kexin type 9

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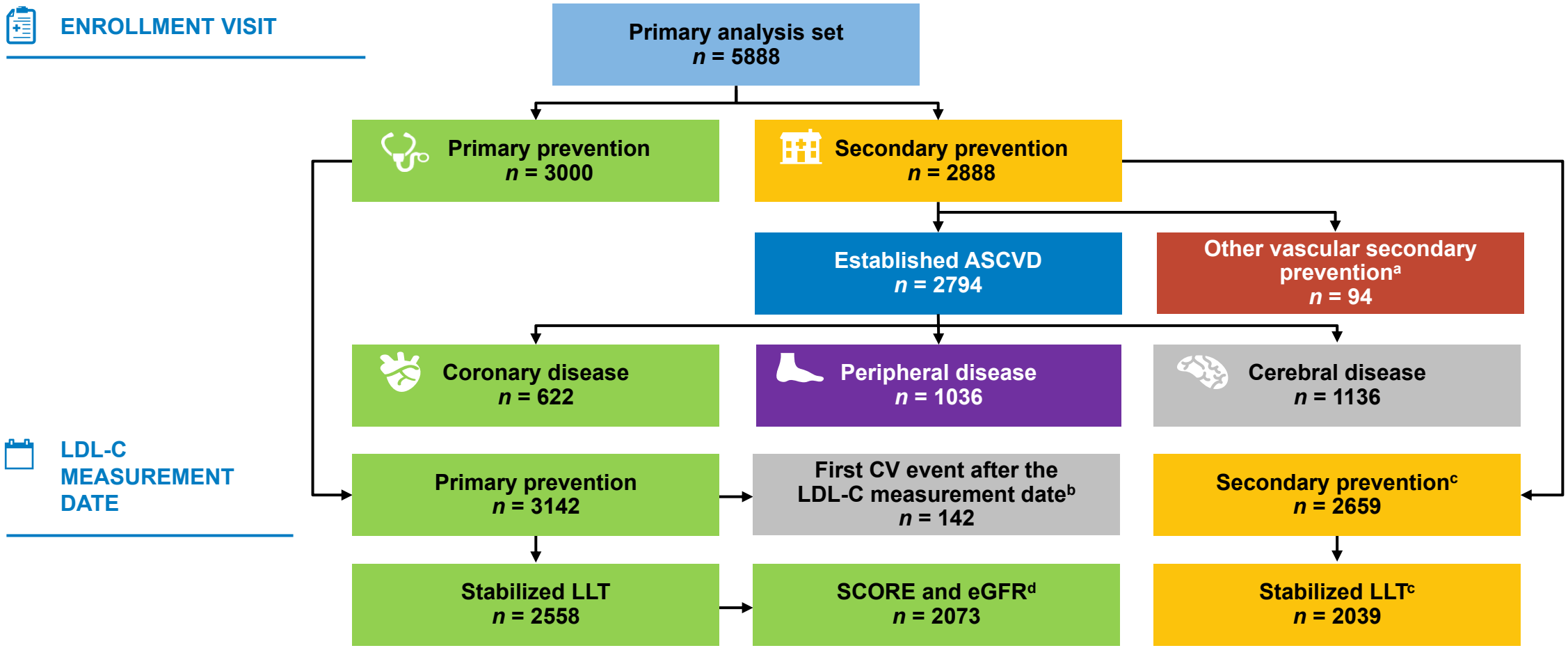
Back-Up

Patient Disposition



ASCVD = atherosclerotic cardiovascular disease; CV = cardiovascular; GFR = glomerular filtration rate; LDL-C = low density lipoprotein cholesterol; LLT = lipid-lowering therapy; n = number of patients; REACH = Reduction of Atherothrombosis for Continued Health; SCORE = Systematic Coronary Risk Evaluation; SP = secondary prevention.
[a]Patients enrolled as secondary prevention who were not being managed for peripheral, vascular or coronary disease and who had other evidence of atherosclerosis or other manifestations of vascular disease at enrollment. [b]Among patients considered as secondary prevention at the enrollment visit, 142 had their first cardiovascular event recorded after their most recent LDL-C measurement, hence they were analysed as primary prevention patients for outcomes assessed at LDL-C measurement, such as goal attainment. For outcomes assessed at enrolment, these 142 patients were analyzed as secondary prevention. [c]2073 were on stabilised LLT at LDL-C measurement and had data available to calculate SCORE and GFR risk. [d]2659 were on stabilized LLT in the established ASCVD group at LDL-C measurement and had data available to calculate REACH score, of these 2039 were on stabilized LLT at LDL-C measurement.
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Lipid-Lowering Therapy at Enrollment

Lipid lowering therapy[a]	Overall (*N* = 5888)	Primary prevention (*N* = 3000)	Secondary prevention patients by ASCVD status				Other vascular secondary prevention (*N* = 94)
			Established ASCVD total (*N* = 2794)	ASCVD-coronary (*N* = 622)	ASCVD-peripheral (*N* = 1306)	ASCVD-cerebral (*N* = 1136)	
Any statin, n (%)	5554 (94)	2818 (94)	2644 (95)	602 (97)	968 (93)	1074 (95)	92 (98)
Low-intensity statin	226 (4)	157 (5)	66 (2)	12 (2)	27 (3)	27 (2)	3 (3)
Moderate-intensity statin	3164 (54)	1880 (63)	1229 (44)	225 (36)	497 (48)	507 (45)	55 (59)
High-intensity statin	2028 (34)	700 (23)	1297 (46)	349 (56)	421 (41)	527 (46)	31 (33)
Unknown intensity statin	136 (2)	81 (3)	52 (2)	16 (3)	23 (2)	13 (1)	3 (3)
Any ezetimibe, n (%)	667 (11)	356 (12)	304 (11)	102 (16)	113 (11)	89 (8)	7 (7)
Any PCSK9i, n (%)	81 (1)	48 (2)	32 (1)	6 (1)	15 (1)	11 (1)	1 (1)
Fibrates, n (%)	248 (4)	167 (6)	78 (2)	10 (2)	42 (4)	26 (2)	3 (3)
Fish oils	43 (1)	30 (1)	13 (1)	3 (1)	6 (1)	4 (<1)	0 (0)
Low-intensity statin monotherapy, n (%)	194 (3)	137 (5)	54 (2)	9 (1)	23 (2)	22 (2)	3 (3)
Moderate-intensity statin monotherapy, n (%)	2966 (50)	1764 (59)	1148 (41)	192 (31)	467 (45)	489 (43)	54 (57)
High-intensity statin monotherapy, n (%)	1787 (30)	586 (20)	1173 (42)	306 (49)	384 (37)	483 (43)	28 (30)
Ezetimibe combination, n (%)	516 (9)	271 (9)	238 (9)	90 (15)	81 (8)	67 (6)	7 (7)
PCSK9i combination	64 (1)	39 (1)	25 (1)	3 (1)	13 (1)	9 (1)	0 (0)
Other LLT	361 (6)	203 (7)	156 (6)	22 (4)	68 (7)	66 (6)	2 (2)

ASCVD = atherosclerotic cardiovascular disease; LLT = lipid lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
[a]Use of any LLT at the time of enrollment or any LLT prescribed in the 12 months before enrollment.
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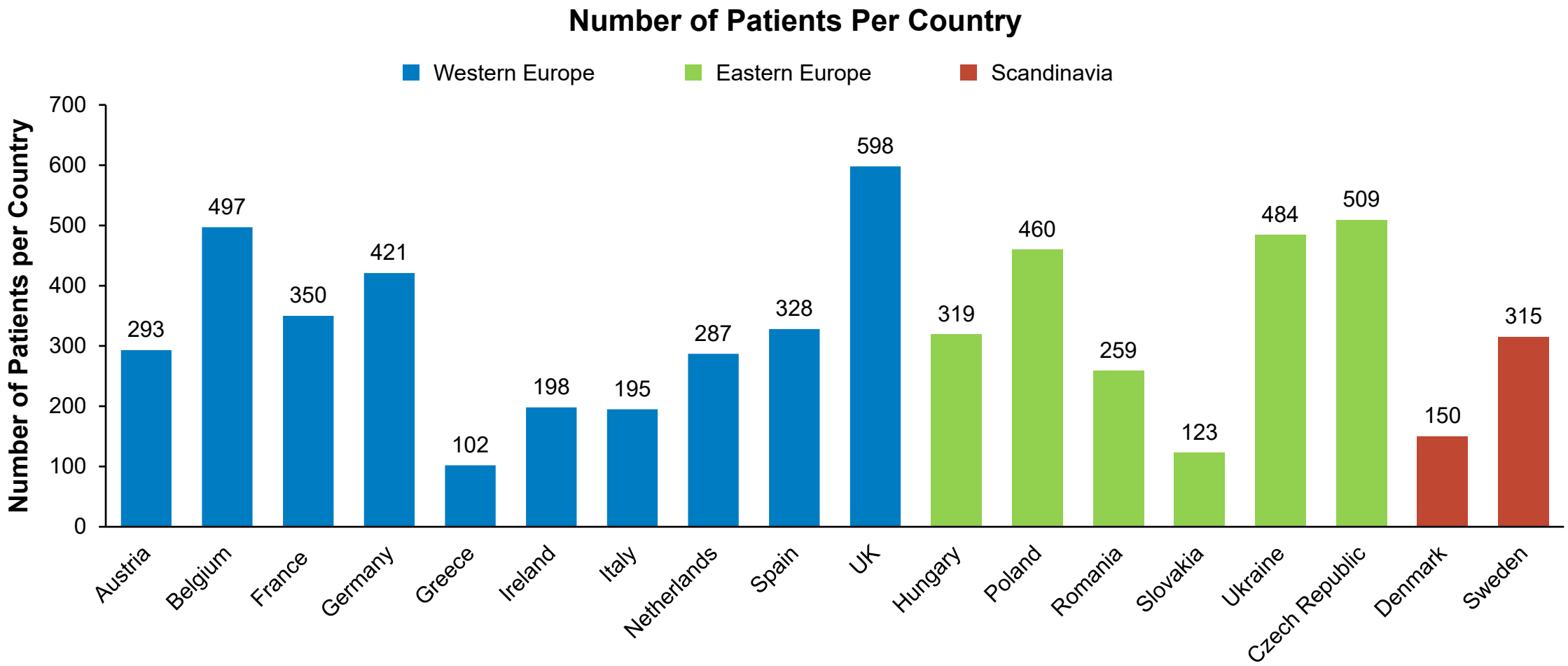
Stabilized LLT at LDL-C Measurement

Lipid lowering therapy[a]	Overall (*N* = 4112)	Primary prevention[b] (*N* = 2073)	Secondary prevention patients by ASCVD status			
			Established ASCVD total (*N* = 2039)	ASCVD-coronary (*N* = 470)	ASCVD-peripheral (*N* = 818)	ASCVD-cerebral (*N* = 751)
Any statin, n (%)	3856 (94)	1944 (94)	1912 (94)	455 (97)	758 (93)	699 (93)
Low-intensity statin	171 (4)	114 (6)	57 (3)	12 (3)	22 (3)	23 (3)
Moderate-intensity statin	2279 (55)	1327 (64)	952 (47)	190 (40)	396 (48)	366 (49)
High-intensity statin	1306 (32)	448 (22)	858 (42)	240 (51)	320 (39)	298 (40)
Unknown intensity statin	100 (2)	55 (3)	45 (2)	13 (3)	20 (2)	12 (2)
Any ezetimibe, n (%)	491 (12)	249 (12)	242 (12)	81 (17)	92 (11)	69 (9)
Any PCSK9i, n (%)	59 (1)	29 (1)	30 (2)	5 (1)	15 (2)	10 (1)
Fibrates, n (%)	181 (4)	114 (6)	67 (3)	9 (2)	34 (4)	24 (3)
Fish oils	36 (1)	23 (1)	13 (1)	3 (1)	6 (1)	4 (1)
Low-intensity statin monotherapy, n (%)	148 (4)	101 (5)	47 (2)	9 (2)	19 (2)	19 (3)
Moderate-intensity statin monotherapy, n (%)	2131 (52)	1244 (60)	887 (44)	164 (35)	372 (46)	351 (47)
High-intensity statin monotherapy, n (%)	1134 (28)	370 (18)	764 (38)	205 (44)	292 (36)	267 (36)
Ezetimibe combination, n (%)	380 (9)	191 (9)	189 (9)	72 (15)	67 (8)	50 (7)
PCSK9i combination	49 (1)	25 (1)	24 (1)	2 (< 1)	13 (2)	9 (1)
Other LLT	270 (7)	142 (7)	128 (6)	18 (4)	55 (7)	55 (7)

ASCVD = atherosclerotic cardiovascular disease; LLT = lipid lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
n = number of subjects receiving stabilised LLT at LDL-C measurement and with target LDL-C data.
[a]Stabilised LLT at LDL-C measurement. [b]142 patients who were enrolled as secondary prevention were defined as primary prevention at the time of LDL-C measurement.
Ray KK, et al. *Eur J Prev Cardiol*. 2020. Suppl. [in press].

Enrollment by Country



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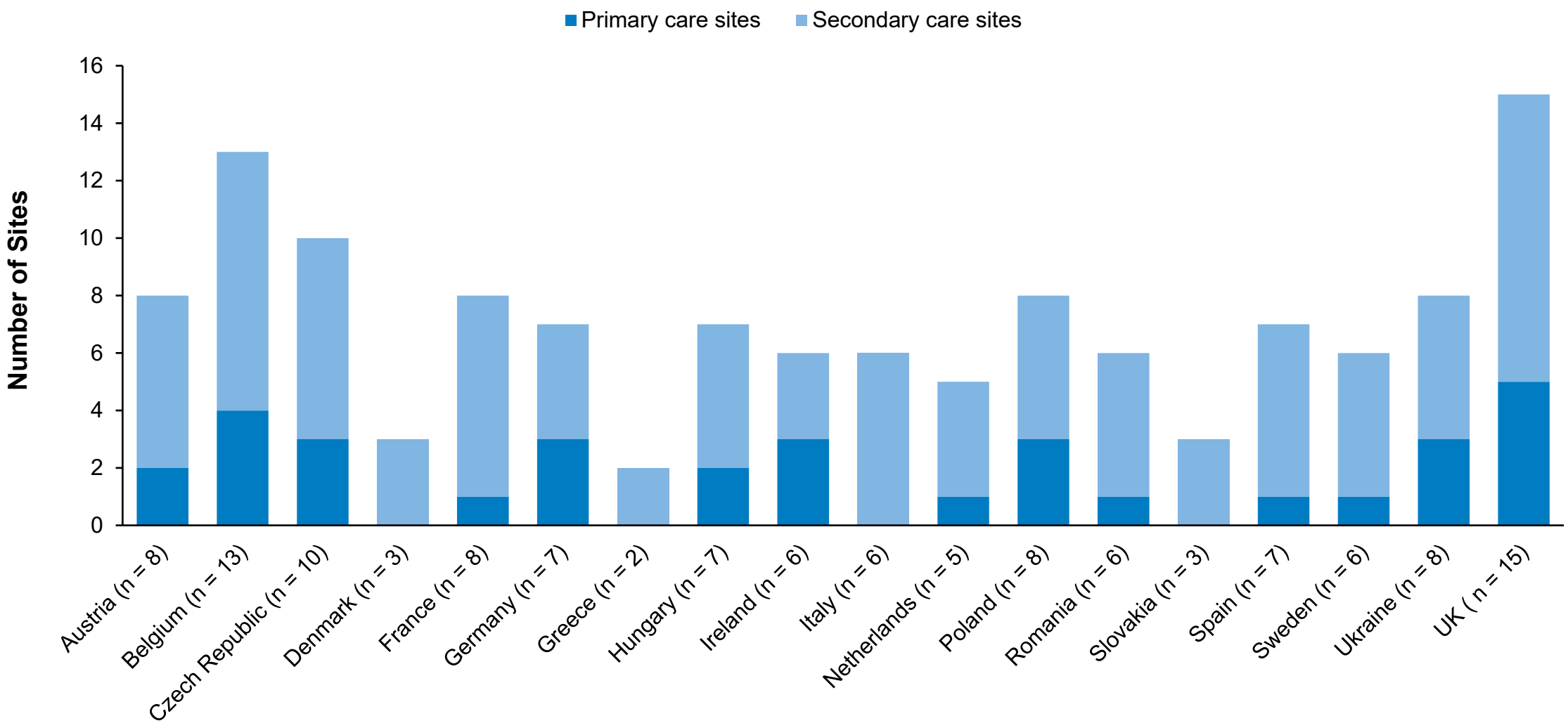
The Number of Sites per Country by Primary and Secondary Care Sites



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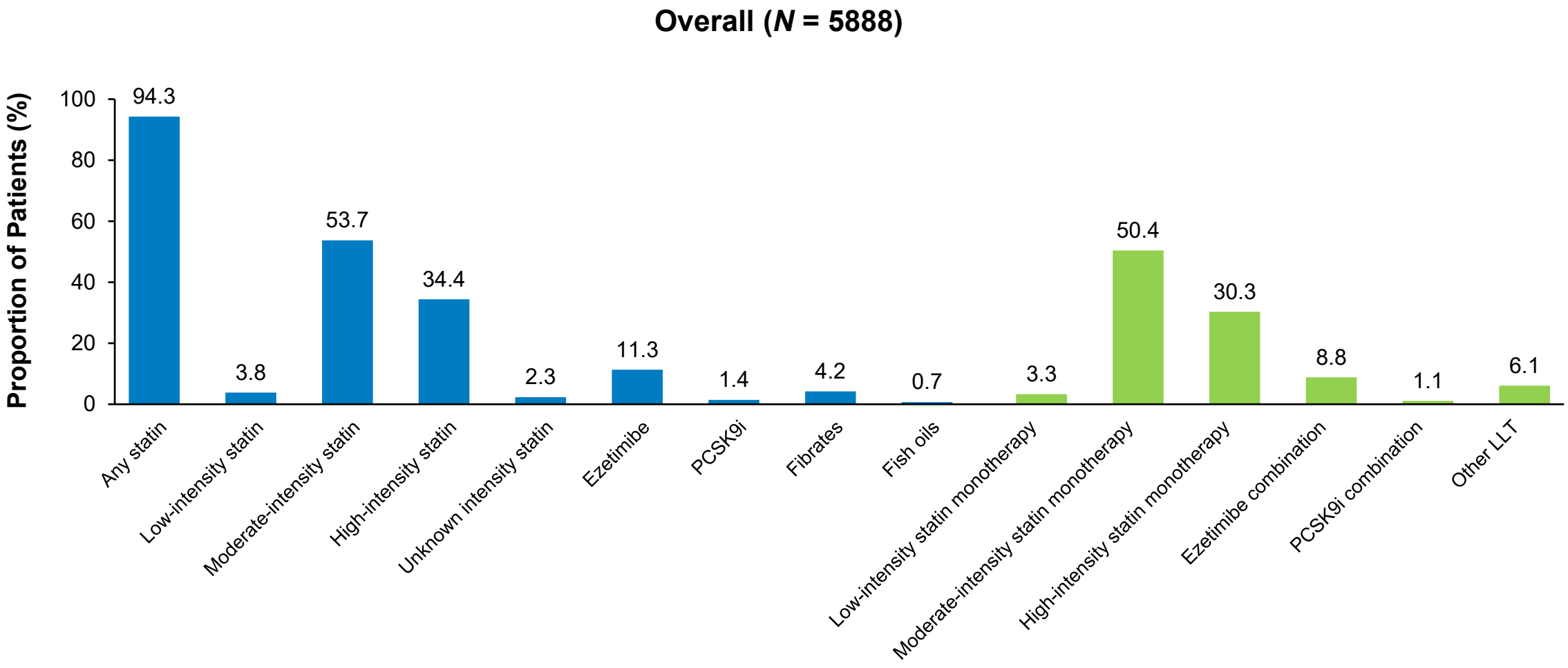
Lipid-lowering Therapy at Enrollment



Statin intensity defined per the American College of Cardiology/American Heart Association definition.
LLT = lipid-lowering therapy; PCSK9i = proprotein convertase subtilisin/kexin type 9 inhibitor.
Other vascular secondary prevention: Patients not in the primary prevention group who did not fulfil the criteria for secondary prevention, or who had no documented cardiovascular event. Definitions of LLT categories are described in Supplementary Table S2.
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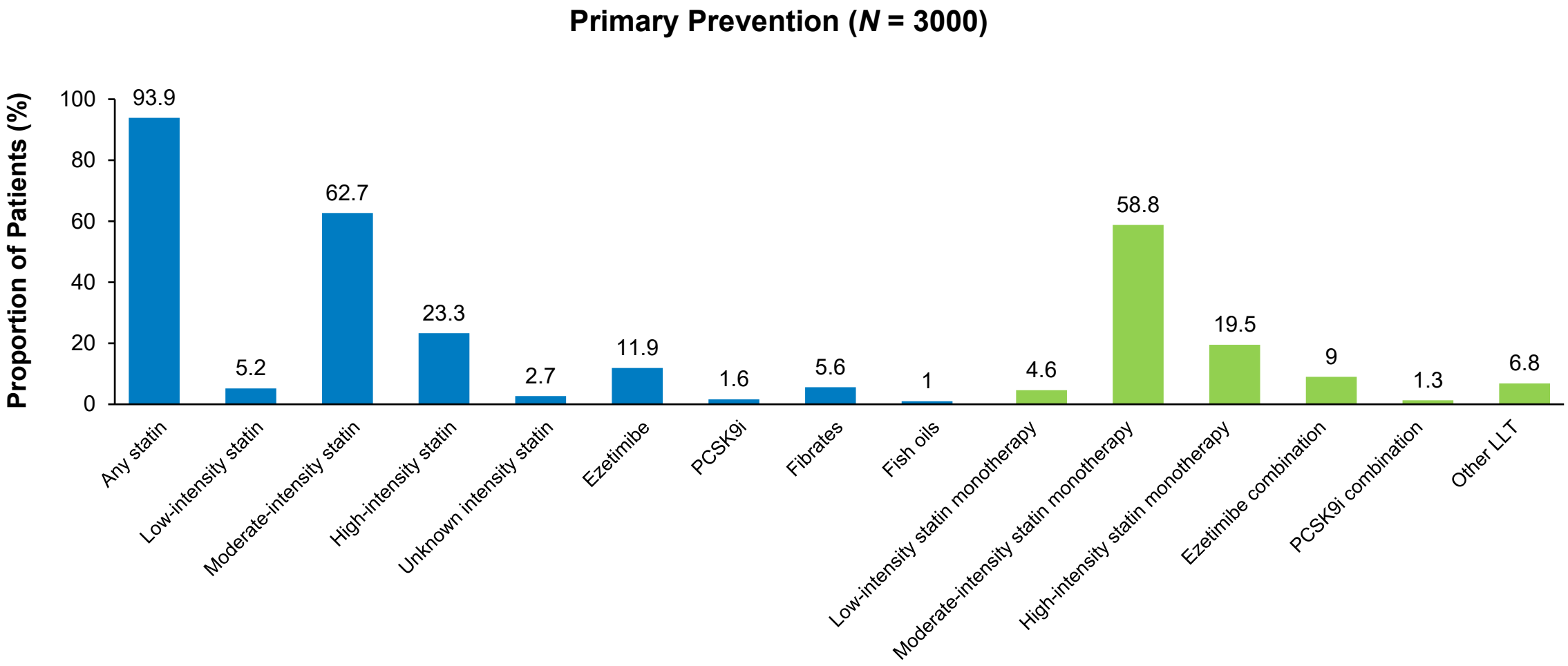

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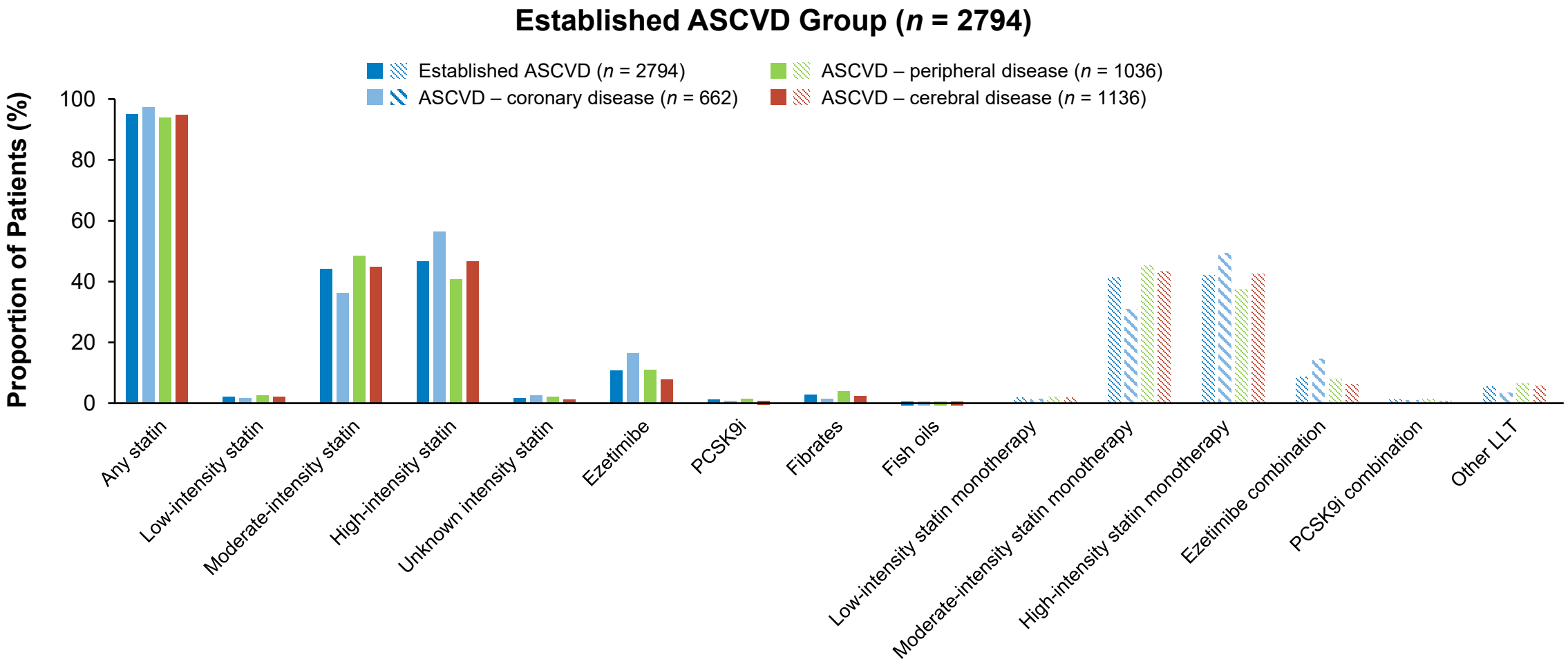

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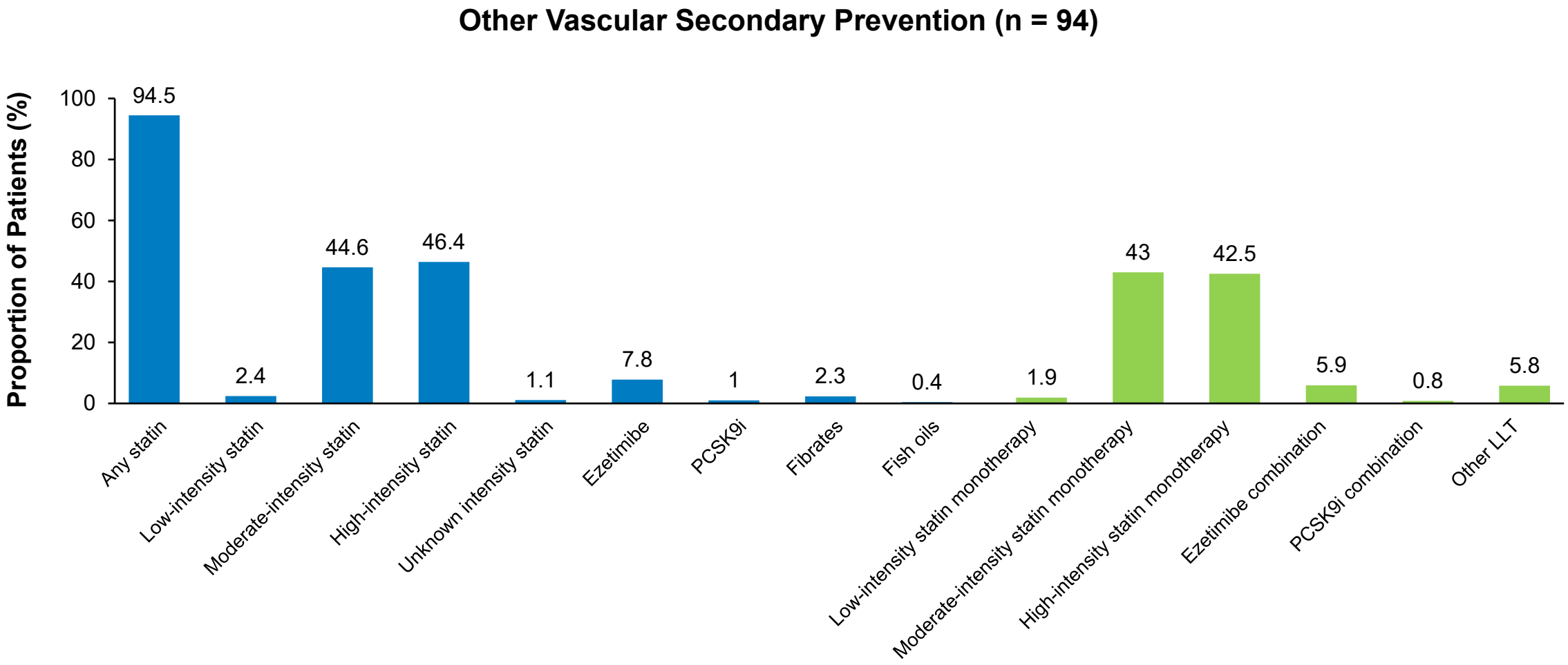

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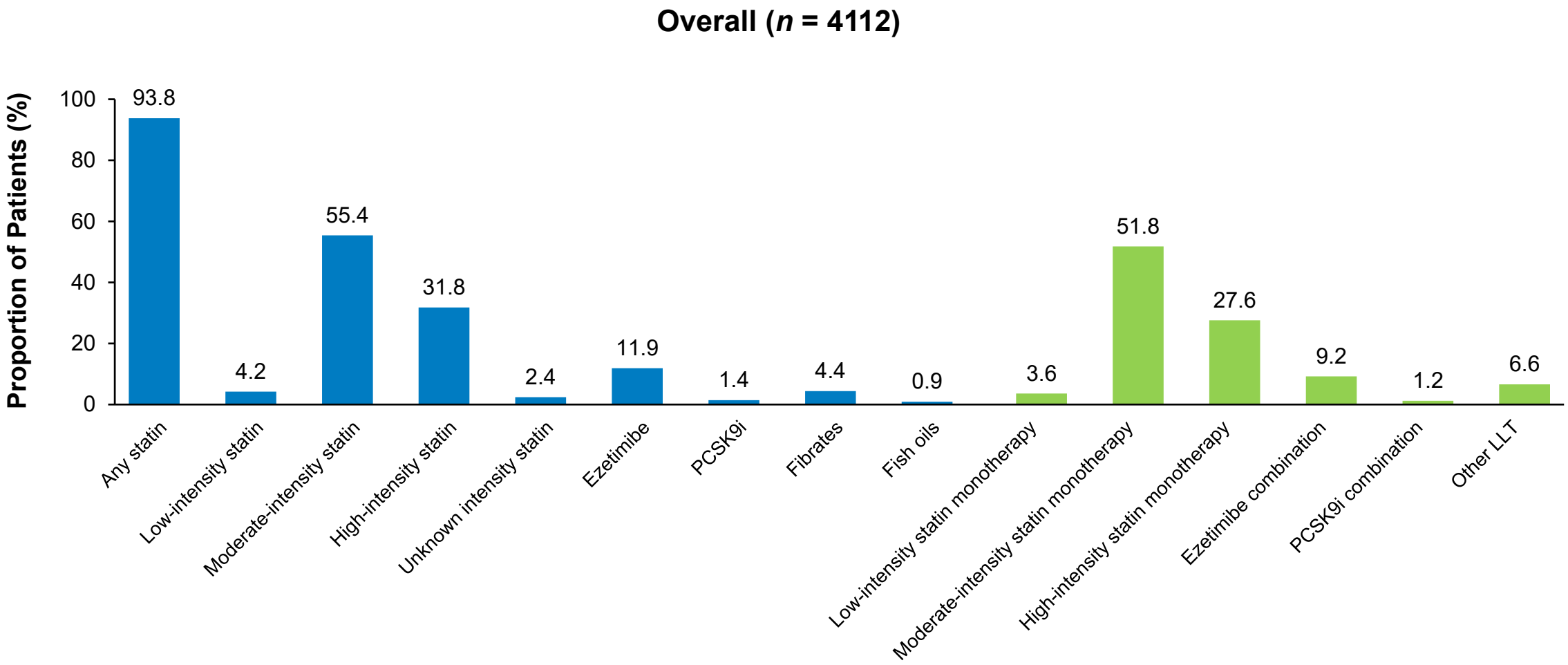
Lipid-lowering Therapy at LDL-C Measurement



Statin intensity defined per the American College of Cardiology/American Heart Association definition.
LDL-C = Low-density lipoprotein cholesterol; LLT = lipid-lowering therapy; PCSK9i = Proprotein convertase subtilisin/kexin type 9 inhibitor. Other vascular secondary prevention: Patients not in the primary prevention group who did not fulfil the criteria for secondary prevention, or who had no documented cardiovascular event. Definitions of LLT categories are described in Supplementary Table S2.
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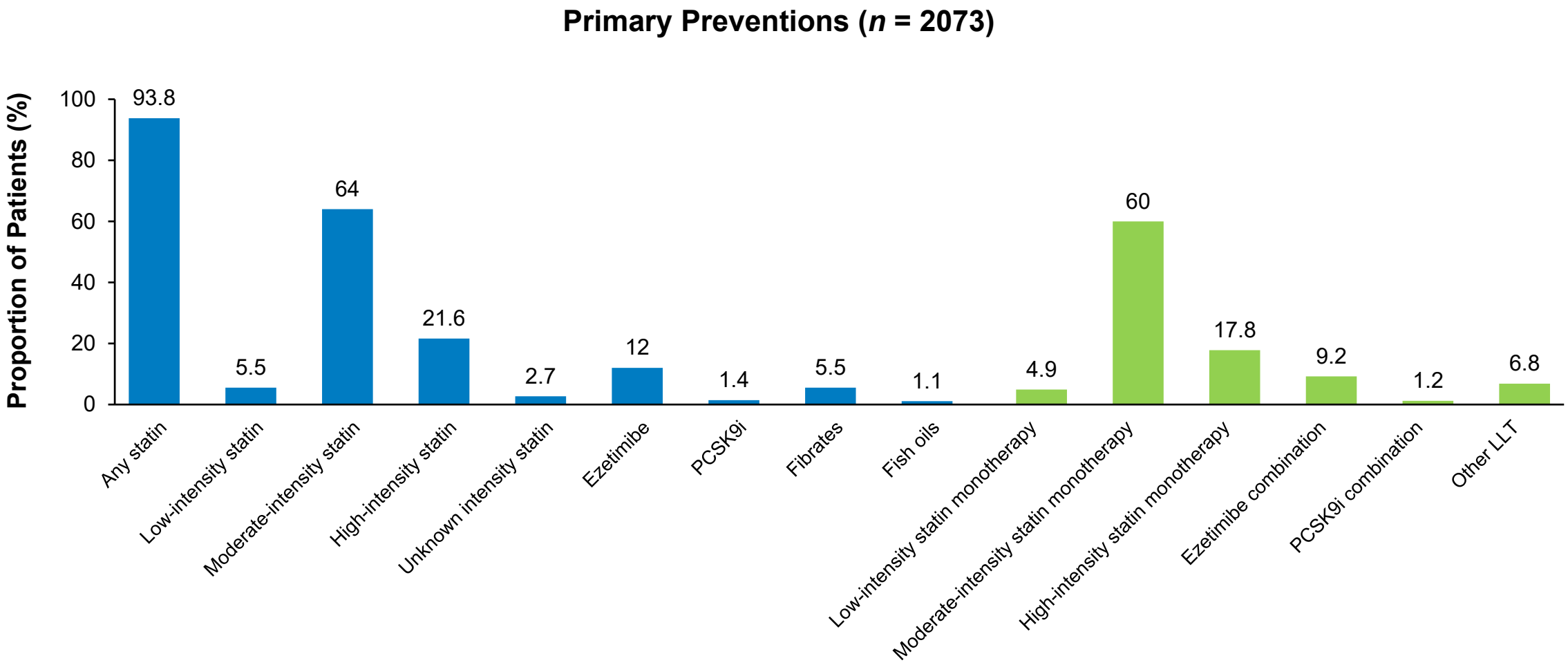
Lipid-lowering Therapy at LDL-C Measurement



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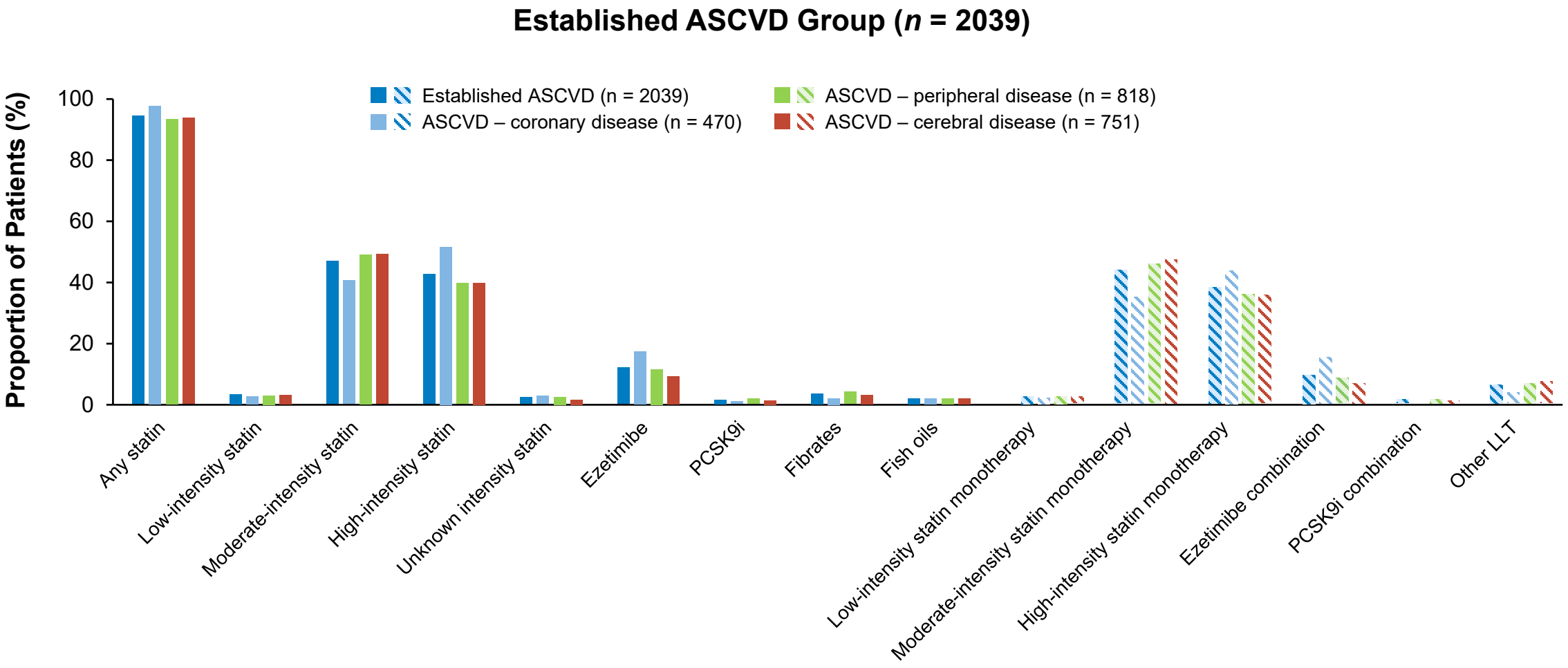

Statin intensity defined per the American College of Cardiology/American Heart Association definition.
ASCVD = Atherosclerotic cardiovascular disease; LDL-C = Low-density lipoprotein cholesterol; LLT = lipid-lowering therapy; PCSK9i = Proprotein convertase subtilisin/kexin type 9 inhibitor. Other vascular secondary prevention: Patients not in the primary prevention group who did not fulfil the criteria for secondary prevention, or who had no documented cardiovascular event. Definitions of LLT categories are described in Supplementary Table S2.
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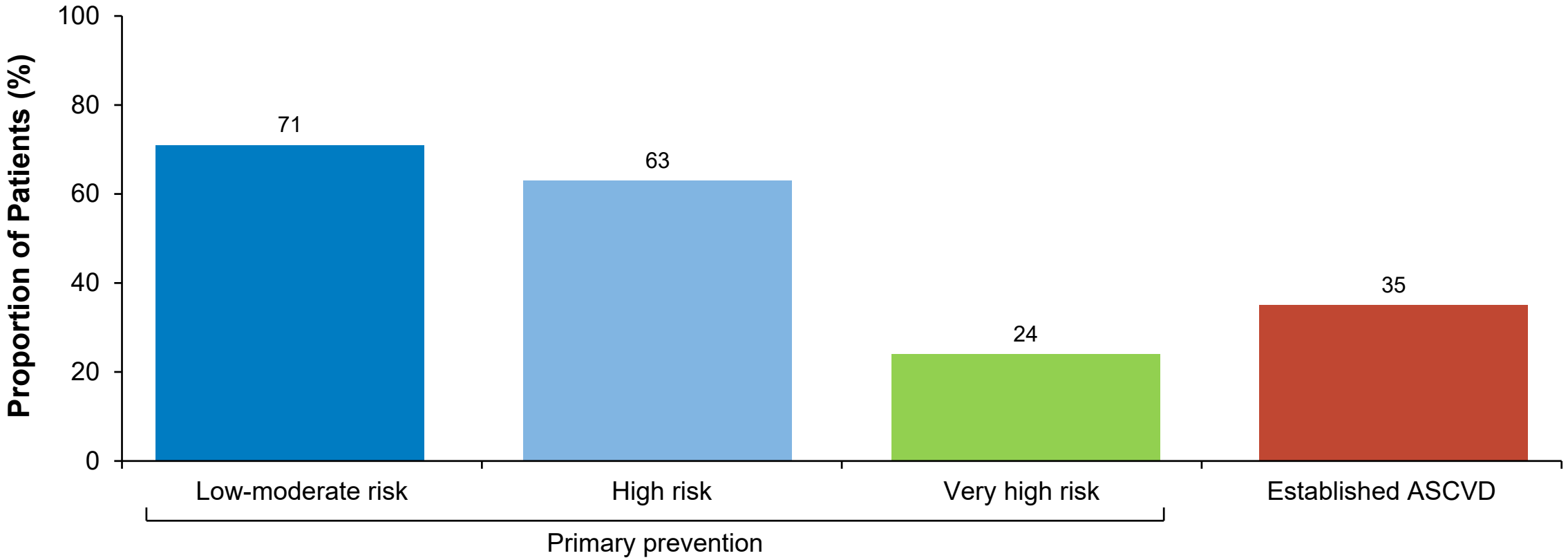
Overall ESC/EAS 2016 LDL-C Goal Attainment by Primary Care Sites



ASCVD = atherosclerotic cardiovascular disease; EAS = European Atherosclerosis Society; ESC = European Society of Cardiology; LDL-C = low-density lipoprotein cholesterol; LLT = lipid-lowering therapy.
n = number of patients enrolled at primary care sites or secondary care sites receiving stabilised LLT and with target LDL-C goal data.
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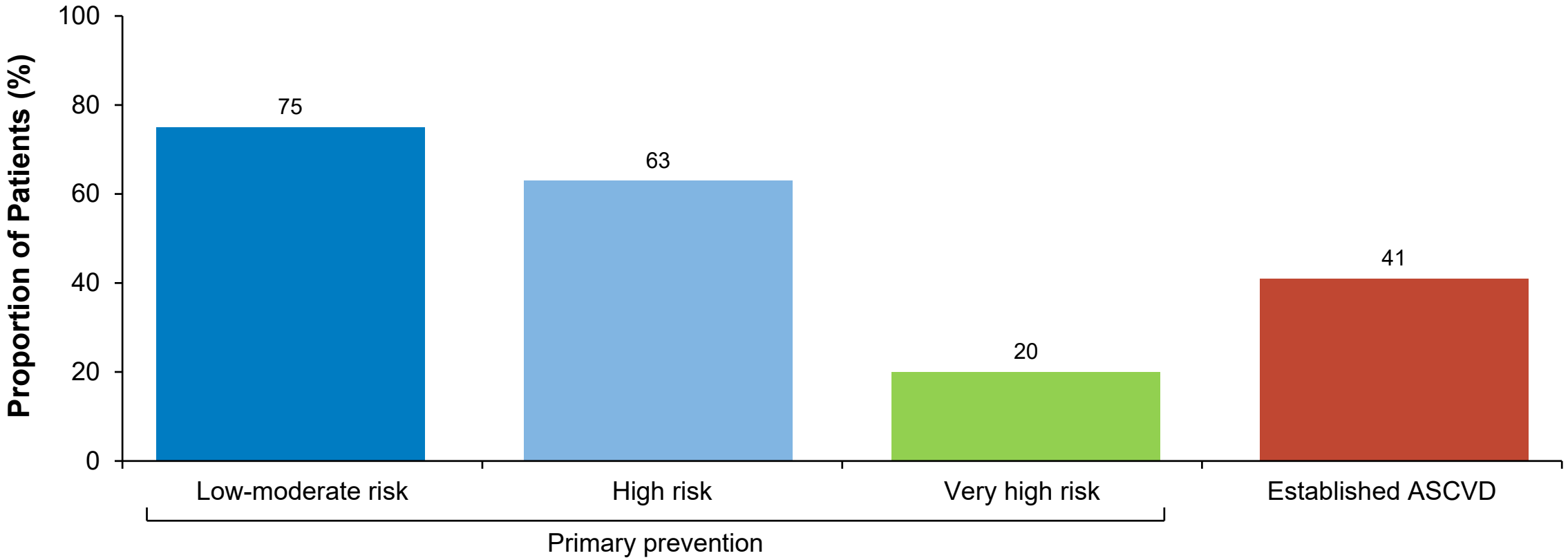
Overall ESC/EAS 2016 LDL-C Goal Attainment by Secondary Care Sites



	Low-moderate risk	High risk	Very high risk	Established ASCVD
mmol/L =	< 3.0	< 2.6	< 1.8	
mg/dL =	< 116	< 100	< 70	
n =	835	364	60	1513

ASCVD = atherosclerotic cardiovascular disease; EAS = European Atherosclerosis Society; ESC = European Society of Cardiology; LDL-C = low-density lipoprotein cholesterol; LLT = lipid-lowering therapy.
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