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# THE PREVALENCE OF STATIN PRESCRIPTION FOR PRIMARY PREVENTION OF ARTERIOSCLEROTIC CARDIOVASCULAR DISEASE AMONG PATIENTS WITH TYPE 2 DIABETES IN QATAR

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## Introduction

Noncommunicable diseases (NCDs) like diabetes, heart disease, cancer, and chronic respiratory diseases are major causes of morbidity and mortality, and present has a huge burden to the healthcare systems worldwide. Diabetes is the most prevalent of all NCDs (1). Qatar has one of the highest prevalence rates for diabetes in the world (2). Atherosclerotic cardiovascular disease (ASCVD), like myocardial infarction (MI) and ischemic stroke, are the leading cause of mortality among patients with diabetes and are responsible for nearly 50% of deaths among patients with diabetes in Qatar (3). ASCVD are preventable when risk factors are properly addressed. Treating with statins is one of the most effective ASCVD primary prevention strategies for patients with diabetes (4,5). Yet despite evidence of the effectiveness of statins and their safety for primary prevention of ASCVDs in patients with diabetes, statin prescription remains suboptimal worldwide, especially in primary care settings which is where most of the medical management of diabetes occurs (6). Moreover, studies have reported differently on the effect of patient's characterises on statin prescription (7-19). Little is known about the prevalence of statin prescription for primary prevention of ASCVD among diabetics in primary care settings in Qatar.

## Objectives

This study aimed to quantify the prevalence of statin prescription for primary prevention of ASCVD among patients with type 2 diabetes (T2dm) in primary care settings, and to describe the attributes of patients who are prescribed statins.

## Methods

A retrospective analysis of electronic medical records (EMR) of patients with T2dm 40-75 years of age, treated in any of the 27 health centers operated by Primary Healthcare Corporation (PHCC) during calendar year 2019. A multivariable logistic regression model was used to estimate the odds of being prescribed statins and to adjust for confounding variables.

## Results

Of 23,934 patients with complete data, 57% were males and 31.9% were Qatari nationals. Average age for participants was 54.8 ± 8.25 years. About 66 % (95% CI, 65.5-66.7%) of the patients were prescribed statins at least once during year 2019 which despite being low, does not fall short of reported rates worldwide (7-19) (Figure 1).
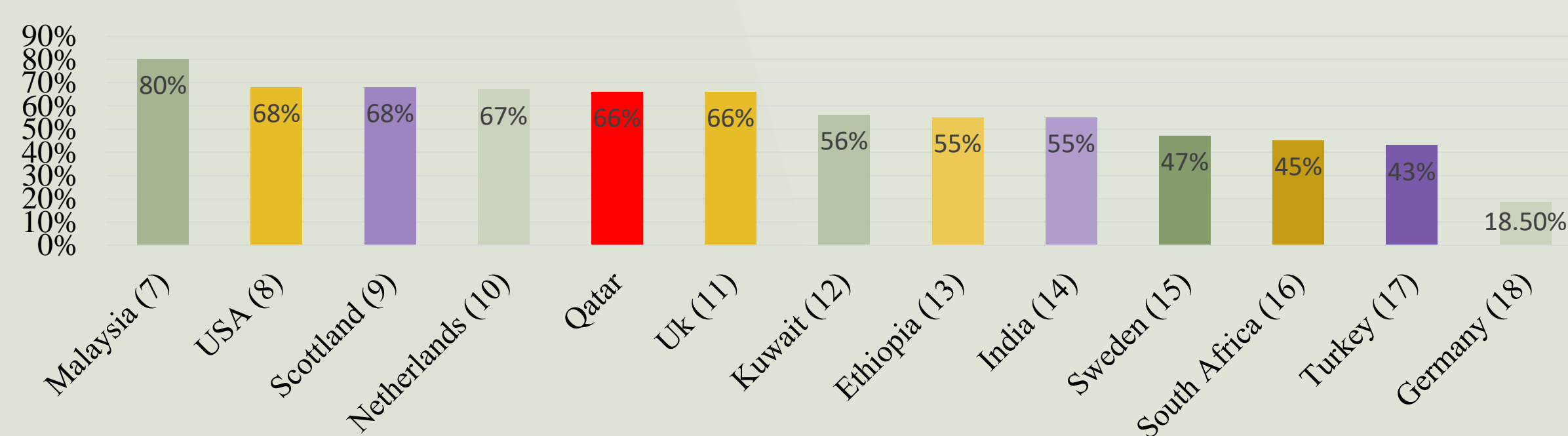


Figure 1: Statin prescription prevalence by country

Patients who were prescribed statins were older by a mean of 2.68 years (P<0.000), slightly leaner (mean BMI difference -0.26 kg/m$^2$ [95% CI: -0.12-- -0.45]) and had a median difference of one more visit and one more NCD pill compared to those not receiving statins (P <0.000). Males and non-Qatari patients had about 6% and 3% higher rates of statin prescription compared to females and Qatari patients respectively (P<0.000). Patients with reported history of smoking had higher rates of statin prescription compared to non-smoking patients. Former smokers had higher rates of statin prescription compared to either current smokers or non-smokers. An associated diagnosis of hypertension or neuropathy increased the rates of statin prescription by 20.5% and 8.7% respectively (P <0.000). Statin prescription rate was 9% higher in patients co-prescribed other non-statin lipid lowering therapy (P <0.000) but was 1% lower in patients co-prescribed an anti-platelet medication, although the latter was not statistically significant (P =0.21) Non-Qatari men had the highest rate of statin prescription while non-Qatari women had the lowest rate. The rate of statin prescription for Qatari men and women were nearly equal (p for difference 0.37) and were both very close to rates of non-Qatari women ( p for difference 0.18) (Figure 2).
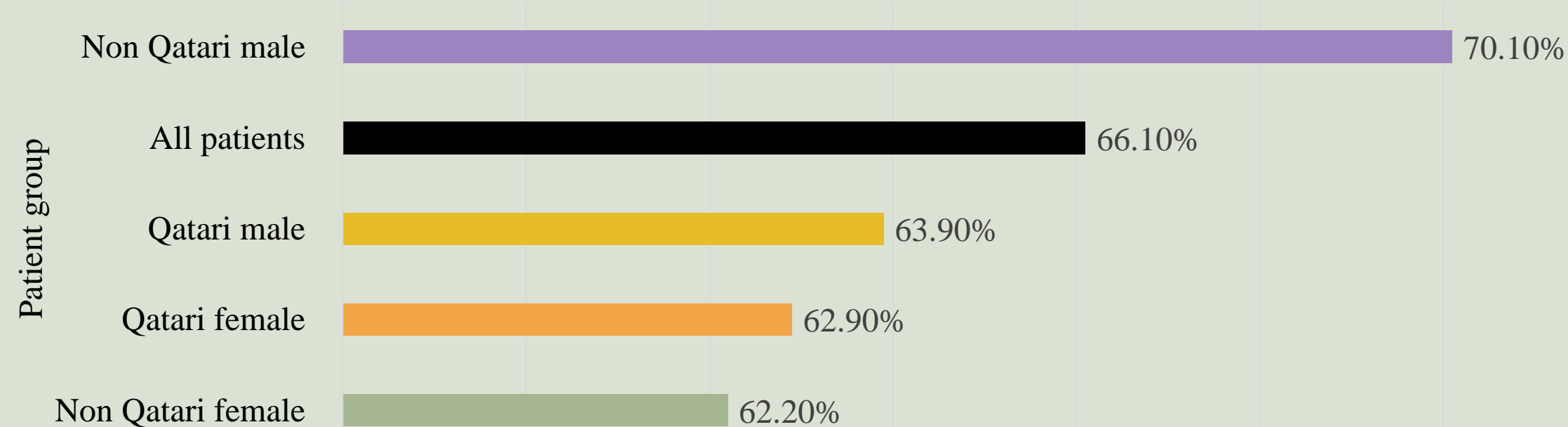


Figure 2: Proportion of statin prescription by study population subgroup

In a multivariable model analysis and after controlling for other covariates in the model, statin prescription was positively associated with being a male (adjusted odds ratio (aOR): 1.2, [95% CI: 1.12-1.28]), history of smoking, i.e. former smoker (aOR 1.16 [95% CI: 1.03-1.29]), current smoker (aOR 1.11 [95% CI: 1.01-1.22 ]), hypertension (aOR 1.51 [95% CI: 1.41-1.61]), being prescribed other non-statin lipids lowering medications (aOR 1.44 [95% CI: 1.27-1.63]), increased age (aOR 1.03/year [95% CI: 1.026-1.034]), increasing daily pill burden (aOR 1.23/pill [95% CI: 1.21-1.25]), increasing number of daily medication injections (aOR 1.29/injection [95% CI: 1.23-1.35]), and frequent visits to GP clinic (aOR 1.22/visit [95% CI: 1.19-1.24]). Statin prescription was negatively associated with having a history of diabetic neuropathy (aOR 0.87 [95% CI: 0.75-1.0]), increasing BMI (aOR 0.996/unit [95% CI: 0.9892-1.00]), being Qatari (aOR 0.87 [95% CI: 0.81-0.93]) and being prescribed an anti-platelet (aOR 0.96/unit [95% CI: 0.89-1.03]) (Figure 3).
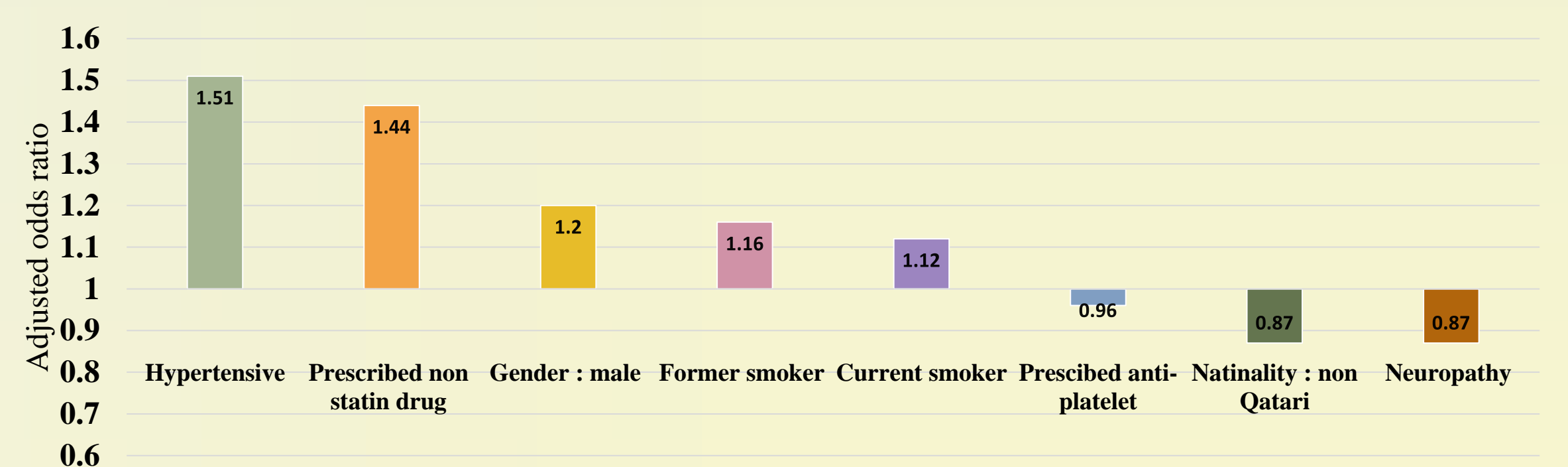


Figure 3: Adjusted odds ratio for statin prescription by covariate

Sensitivity analysis confirmed robustness of our findings as direction of association between statin prescription and other covariates was not changed after restricting analysis to patients followed for > 2 years, patients with > 2 visits,women only or Qatari patients only. In post hoc analysis significant positive 1$^{st}$ order interaction was found between being a male and higher BMI. On the other hand, significant negative 1$^{st}$ order interaction was found between being male and diagnosis of hypertension or being Qatari, this could in part explain the lower odds seen in females and Qatari population.
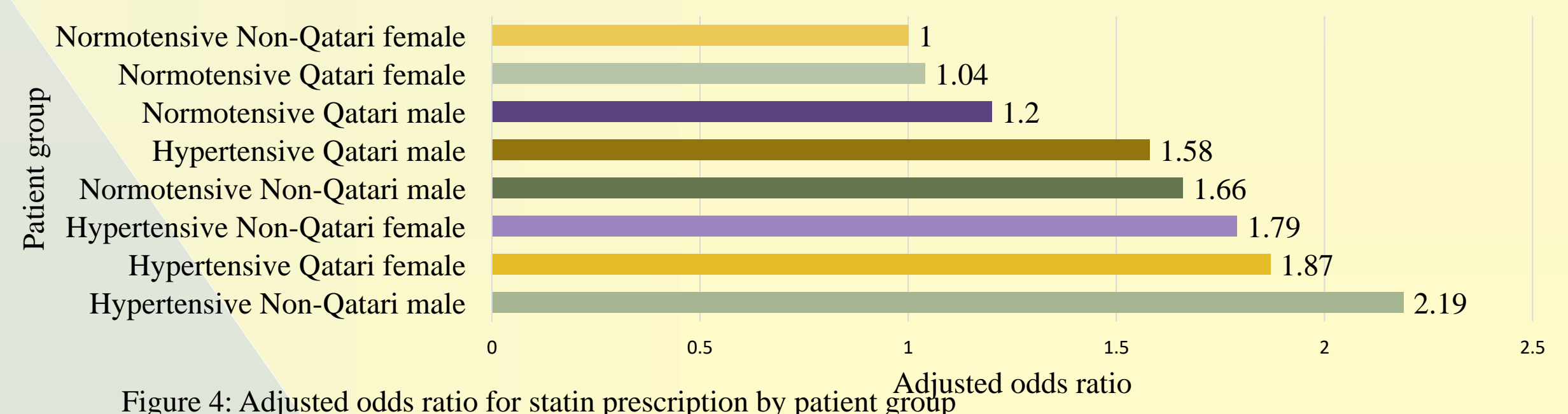


Figure 4: Adjusted odds ratio for statin prescription by patient group

## Conclusion

Statin prescription for the primary prevention of ASCVD in T2dm patients is suboptimal in primary care settings in Qatar. Patient attributes associated with statin prescription are mostly concordant with current literature. However, odds of statin prescription were lower in patients who are at higher risk of ASCVD like women and Qatari patients. The low rates in this study should be addressed in the context of the complexity of the statin prescription process which involves the patient, physician, guidance, and system factors. Further studies exploring each of these aspects are needed to develop strategies to improve the prescription of statins.

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