

# Prevalence of Chronic Kidney Disease (CKD) in Non-Diabetic Middle-Aged Adults: Insight from the Primary cARe AuDIt of Global risk Management (PARADIGM) Study

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## BACKGROUND

- The PARADIGM study is an observational registry, the primary objective of which is to evaluate primary care physician assessment of global cardiovascular (CV) risk in healthy individuals
- In 2009/2010, primary care physician investigators from 105 sites across Canada prospectively enrolled 3015 healthy middle-aged adults in PARADIGM to assess the prevalence of CV risk factors and trends in CV risk assessment using traditional biochemical and novel inflammatory and structural biomarkers of atherosclerosis
- Presence of chronic kidney disease (CKD) alone increases the risk of coronary heart disease (CHD) and is also associated with adverse outcomes in those with prior cardiovascular disease
- We assessed the characteristics of non-diabetic middle-aged adults with CKD (eGFR < 60 ml/min/1.73 m<sup>2</sup>) in the PARADIGM study

## METHODS

- The PARADIGM study enrolled 3015 generally healthy, middle-aged patients in an observational registry
  - Subjects with diabetes or vascular disease were excluded, as were subjects receiving lipid-lowering therapy
  - PARADIGM represents a pure primary prevention cohort
- Inclusion Criteria**
- Men ≥ 40y, women ≥ 50y
  - Absence of known high Framingham Risk Score
  - Absence of known type 1 or type 2 diabetes
  - Absence of lipid lowering treatment (current or past)
  - No previous history of atherosclerosis (angina, TIA, myocardial infarction, stroke, peripheral arterial disease)
  - Willingness to give informed consent

## PARADIGM STUDY OBJECTIVES

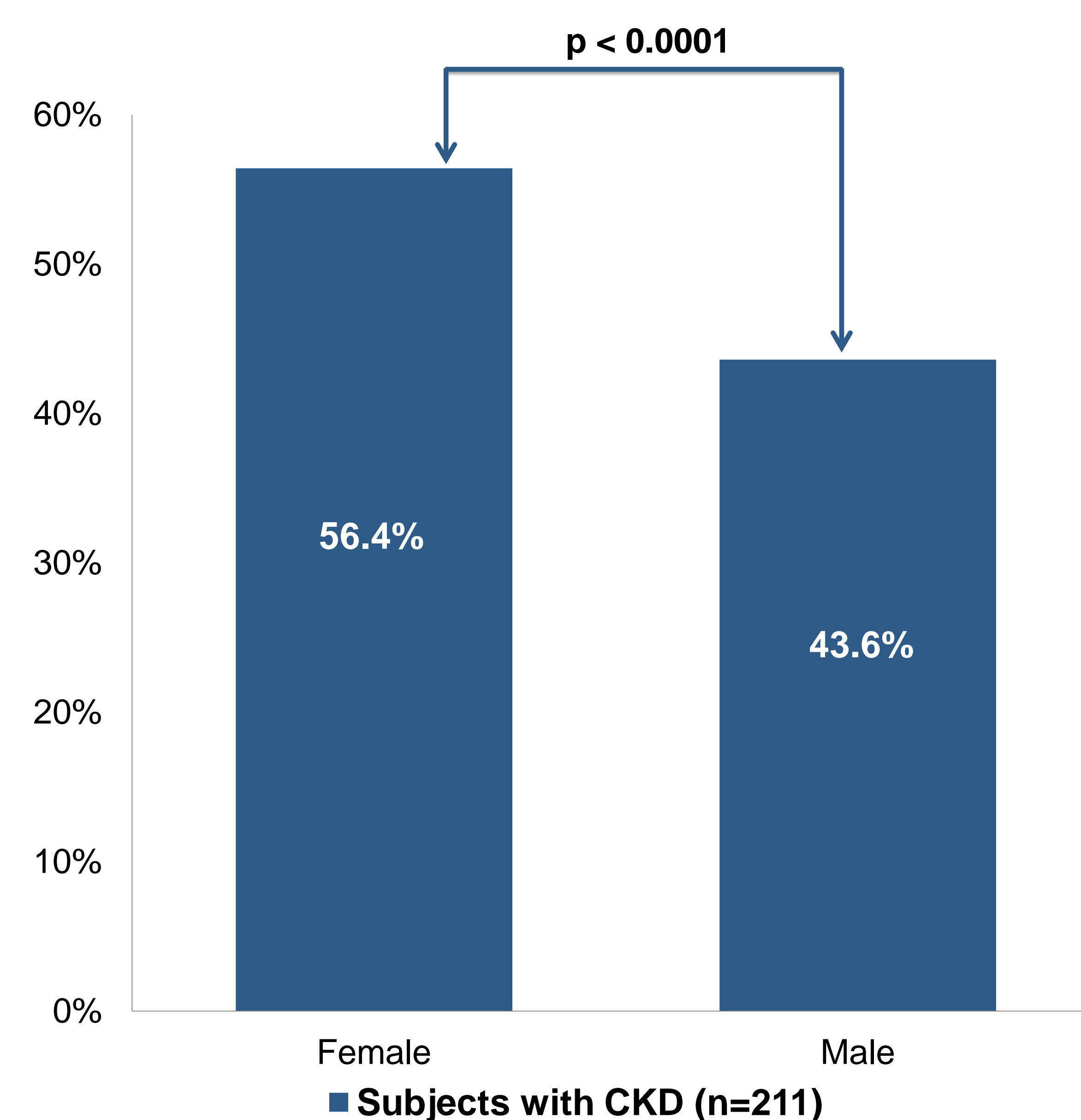
- To evaluate primary care physician assessment of global cardiovascular risk in healthy individuals
- To assess characteristics of non-diabetic middle-aged adults with CKD
- To evaluate the risk category of subjects with CKD based on the total CV Framingham Risk Score.

## RESULTS

Table 1: Prevalence of CKD in the PARADIGM cohort

Total # of subjects in PARADIGM	3014
Subjects with CKD	211 (7%)
Subjects without CKD	2803 (93%)

Figure 1: CKD prevalence by gender in the PARADIGM cohort



## RESULTS

Table 2. Clinical variables

Variable (% (n) or mean ± SD)	CKD - Yes (n=211)	CKD - No (n=2803)	p-value
Age ± SD†	63.1 ± 9.5	55.8y ± 8.1	p<0.000001
Female	119 (56.4%)	1122 (40%)	p<0.00001
Hypertension	87 (41.2%)	829 (29.6%)	p<0.01
Smoking Hx* (P/C)**	86 (40.8%)	959 (34.2%)	p=ns
Family Hx CVD***	43 (20.4%)	689 (24.6%)	p=ns
BMI****(kg/m <sup>2</sup> )	28 ± 5.1	27.8 ± 5.2	p=ns
WC <sup>1</sup> (cm)	95.4 ± 12.9	94.8 ± 13.7	p=ns

† Standard deviation  
\* Hx (history)  
\*\* P/C (past or current smoker)  
\*\*\* CVD (cardiovascular disease)  
\*\*\*\* BMI (body mass index)  
<sup>1</sup> WC (waist circumference)

Table 3. Lab results

Variable (% (n) or mean ± SD)	CKD - Yes (n=211)	CKD - No (n=2803)	p-value
TC*(mmol/L)	5.7 ± 1.1	5.6 ± 1.0	p=ns
LDL**(mmol/L)	3.6 ± 1.0	3.6 ± 0.8	p=ns
HDL*** (mmol/L)	1.4 ± 0.4	1.4 ± 0.4	p=ns
TG****(mmol/L)	1.6 ± 1.1	1.6 ± 1.0	p=ns
Fasting glucose (mmol/L)	5.4 ± 0.6	5.4 ± 0.7	p=ns
hsCRP (mg/L)	4.1 ± 5.8	2.9 ± 4.1	p<0.01
Serum Creatinine(μmol/L)	105.8 ± 18.7	78.1 ± 14.1	p<0.000001
eGFR <sup>1</sup> (ml/min/1.73m <sup>2</sup> )	53 ± 6.0	83 ± 13	p<0.000001
U_MACR <sup>2</sup> (mg/mmol creatinine)	3.6 ± 12.4	1.4 ± 3.7	p<0.05

\* TC (total cholesterol)  
\*\* LDL (low density lipoprotein)  
\*\*\* HDL (high density lipoprotein)  
\*\*\*\* TG (triglycerides)  
<sup>1</sup> Estimated glomerular filtration rate  
<sup>2</sup> U\_MACR (Urinary micro albumin/creatinine ratio)

## RESULTS

Table 4. Categories of Risk by Total Cardiovascular Framingham Risk Score (FRS)

Variable % (n)	CKD - Yes (n=211)	CKD - No (n=2803)	p-value
FRS-Score	19.4%	14.4%	p<0.0001
Low FRS	66 (31.3%)	1248 (44.5%)	p<0.01
Intermediate FRS	68 (32.2%)	953 (40%)	p<ns
High FRS	77 (36.5%)	601 (21.4%)	p<0.0001

## SUMMARY AND CLINICAL IMPLICATIONS

- Approximately 7% of otherwise healthy middle-aged Canadians have CKD
- The prevalence of CKD was significantly higher in women although only 18.5% of women with CKD have high FRS compared to 59.8% of men (p < 0.000001)
- In this non-diabetic cohort, hypertension was the main modifiable factor correlated with CKD. Lipids were not correlated
- A greater proportion of subjects with CKD have a high FRS, supporting the need for lipid-lowering therapy in this population

## CONFLICTS OF INTEREST

The authors report no conflicts of interest to disclose