Early Onset of Type II Diabetes Among Visible Minority and Immigrant Populations in Canada

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RESEARCH INTERESTS

❖Global/International Health

❖Population Health

❖Health Promotion

❖Applied Social Statistics

RESEARCH AGENDA

❖ **WHAT HAVE I BEEN RESEARCHING?**

➤ (A) The interconnections between population variables and sexual reproductive health outcomes;

➤ (B) Linkages between culture, gender, violence, youth and health outcomes;

➤ (C) Global non-communicable diseases and social change.

RESEARCH THEME A

SEXUAL REPRODUCTIVE HEALTH OF VULNERABLE AND MARGINALIZED POPULATIONS

HOUSING AND HEALTH NEEDS OF HIV+ PERSONS IN GHANA (Canada-Africa Research Exchange Grant funded by IDRC 2014-2016). Principal Investigator– Amount awarded=$55,496.

RESEARCH THEME B

VIOLENCE, CULTURE, YOUTH, GENDER & HEALTH OUTCOMES

VIOLENCE AND SEXUAL HEALTH

❖ **Marital violence against women in Ghana (funded by SSHRC Insight Development Grant 2013-2015). Principal Investigator– Amount awarded:$71,305**

➢ Project uses feminist and cultural epistemologies in understanding intimate partner violence.

➢ Socio-cultural underpinnings of intimate partner violence (IPV) in Ghana.

➢ The effects of IPV on women's sexual autonomy in limited resource countries.

VIOLENCE AND SEXUAL HEALH CONT.

➢Kinship and intimate partner violence in Ghana.

➢In Ghana, kinship determines how women are socialized, their access to power, wealth and custody of children.

➢Kin group affiliation and kinship dynamics have implications for IPV in Ghana.

FOLLOW-UP SSHRC STUDY

❖**Help-seeking behaviors of female victims of IPV (Funded by SSHRC Insight Grant 2016-2020). Principal Investigator– Amount awarded: $203, 378.**

➢Initial project showed the majority of victims of IPV did not seek help.

➢Currently, there is limited knowledge on the help-seeking behaviors of female victims of IPV in Ghana and sub-Saharan Africa.

FOLLOW-UP SSHRC STUDY CONT.

➢We need to understand why the majority of women do not report their experiences?

➢What avenues exist for women to report their experiences?

➢How different are those reporting from respondents who do not report their experiences?

➢If type and severity of violence influence whether and where women report their experiences?

RESEARCH THEME C

NON-COMMUNICABLE DISEASES AND GLOBAL SOCIAL CHANGE
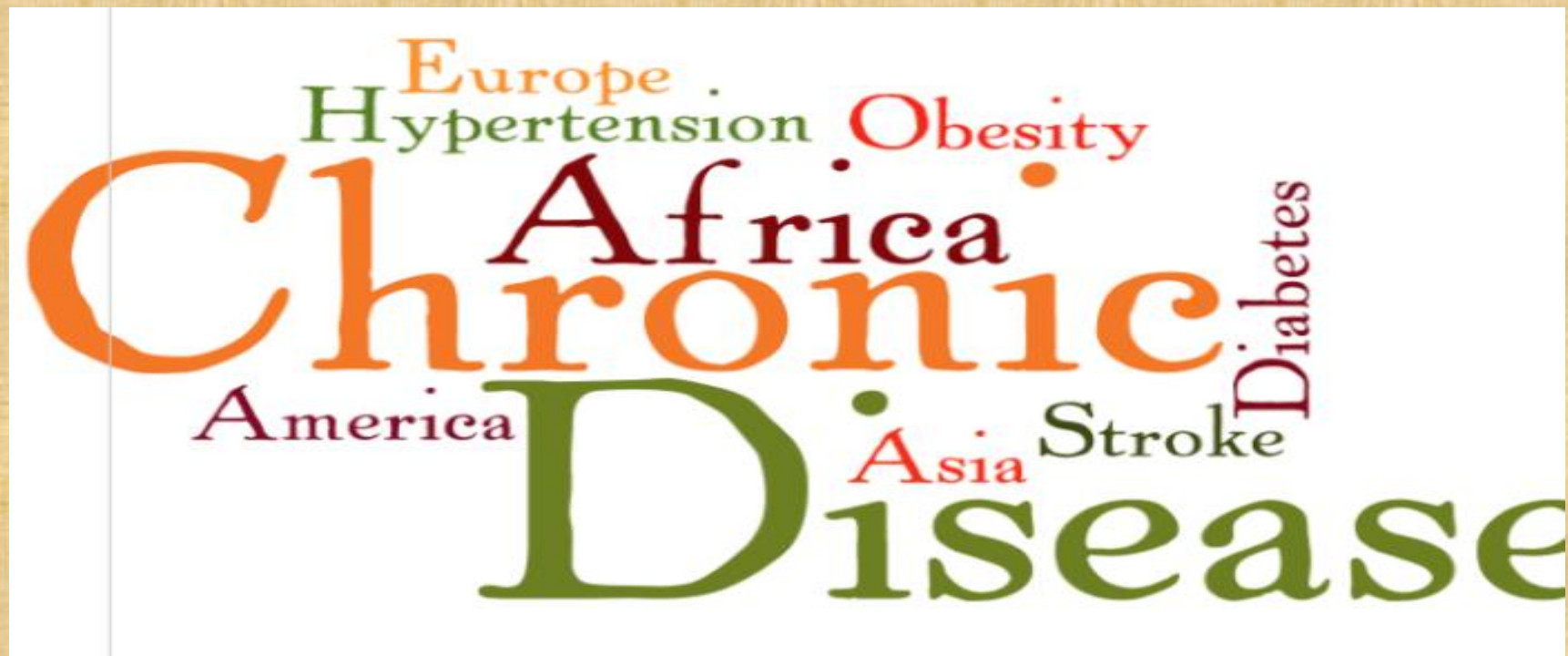
NON-COMMUNICABLE DISEASES

❖ **Non-communicable diseases and global social change (Funded by the Collaborative Applied Research in Economics): Principal Investigator– Amount awarded=$25,538.**

➢ Examining chronic diseases in the context of the changing socio-economic circumstances in Africa.

➢ Understanding chronic/non-communicable diseases among immigrant and visible minority populations in Canada.

➢ Using the CCHS to explore the timing of first onset of diabetes among visible minority and immigrant populations.

INTRODUCTION

➢Globally, 387 million people (constituting 8.3%) of the world's population live with Type II diabetes. Approximately 4.9 million died of the condition in 2014.

➢2.4 million Canadians (constituting 6.8% of population) live with diabetes. This is projected to increase to 3.7 million in 2018/19.

➢However, provincial/regional, gender and age differences exist. Note limited data exist on ethnic differences.

INTRODUCTION

❖ **Why bother about increasing prevalence?**

➢ Could have dire socio-economic and health consequences for Canada.

➢ Adults aged 20-29 years with diabetes made frequent visits to family doctors and had been hospitalized more than those without diabetes.

➢ Canada spent about $12.2 billion on the management and treatment of diabetes in 2010 (Canadian Diabetes Association).

EPIDEMIOLOGICAL TRANSITION

➢ Theory developed by Abdel Omran (1971) and later expanded by Olshansky and Ault (1986).

➢ Epidemiological and demographic shifts mainly as a result of changes in socio-economic development.

➢ Industrialized countries including Canada have completed transition.

➢ Chronic diseases are a reflection of changing age structure.

BACKGROUND

➢ Within this context, several researchers have attempted to understand the epidemiology of diabetes in Canada.

➢ The majority of this work examined risk factors and other important facets of diabetes (see Shah 2013; Lipscombe & Hux 2007; Tan & MacLean 1995; Liu et al. 2010).

➢ Not many have explored the timing and onset of diabetes and how this varies among various socio-economic and demographic groups in Canada.

➢ Specifically, limited information exists on the timing of the onset of diabetes among Canada's ethnic minority and immigrant populations.

BACKGROUND

❖ **Two major questions emerge: Why the focus on timing and ethnic/visible minorities?**

➢ Timing has medical/clinical implications; crucial for management of disease; consequences for health delivery and planning.

➢ Early onset associated with increased retinopathy risks, micro and macro-vascular complications, end-stage renal diseases and other cardiovascular diseases.

➢ Increased access to multidisciplinary specialist clinics including psychological, dietary and bariatric support.

BACKGROUND

❖ **Two major questions emerge: Why the focus on timing and ethnic/visible minorities?**

➢ Relationship between ethnicity and health is complex.

➢ Ethnicity affects health outcomes through genes in a way that is not completely understood.

➢ Past research identified some ethnic groups as susceptible to the risks of living with diabetes.

BACKGROUND

❖**Two major questions emerge: Why the focus on timing and ethnic/visible minorities?**

➢Genetic susceptibility combines with socio-cultural and environmental factors in affecting the risks of living with diabetes.

➢In this regard, some have referred to changes in diet, physical activity, stress levels etc. when immigrants transition to new host societies.

➢Intricately linked to these lifestyle and modifiable risk factors is the socio-economic characteristics of respondents.

BACKGROUND

❖ **Two major questions emerge: Why the focus on timing and ethnic/visible minorities?**

➤ In spite of higher SES, majority of visible minorities especially Blacks and South Asians have incomes lower than their educational and occupational background would merit.

➤ Economic disadvantage could translate into health disadvantages.

➤ We explore how modifiable risk factors including SES may confound relationship between ethnicity and time to first onset of diabetes.

METHODS

❖**Data**

➢2013 Canadian Community and Health Survey (CCHS).

➢Nationally representative cross-sectional survey of 65000 respondents age 12 years and above in the 110 health regions and 3 territories.

➢About 3% of the target sample were excluded from the CCHS (Aboriginals living on reserves, members of the Canadian Forces etc.).

➢Sample was restricted to all immigrants in Canada corresponding to to about 8,905 respondents (Male = 4,208, Females = 4,697).

METHODS

❖**Measures**

➤Dependent variable is the self-reported age at first diagnosis with diabetes.

➤This was after respondents were asked if they had been diagnosed with diabetes that lasted 6 months or more by a health professional.

➤Dropped respondents whose diabetes developed outside of Canada.

➤Also, dropped female respondents with gestational diabetes (1% of female sample).

METHODS

❖**Measures**

➢Focal predictor is ethnicity, a polytomous variable that asked respondents to self-identify with an ethnic group.

➢Explanatory variables are divided into three main blocks: *socio-economic* (education, occupation, household income); *lifestyle/modifiable risk factors* (physical activity, fruits and vegetables, BMI, smoking and drinking); co-morbidities (heart disease, hypertension and stroke).

➢Control variables: region of residence, marital status, time since immigration.

METHODS

❖**Data Analysis:**

➢Cox proportional hazards model was used as analytical strategy.

➢Event history technique used to model time until an event while adjusting for influential covariates.

➢Also called the proportional hazards model due to the proportional hazards assumption similar to the proportional odds assumption in Ordinal logit models.
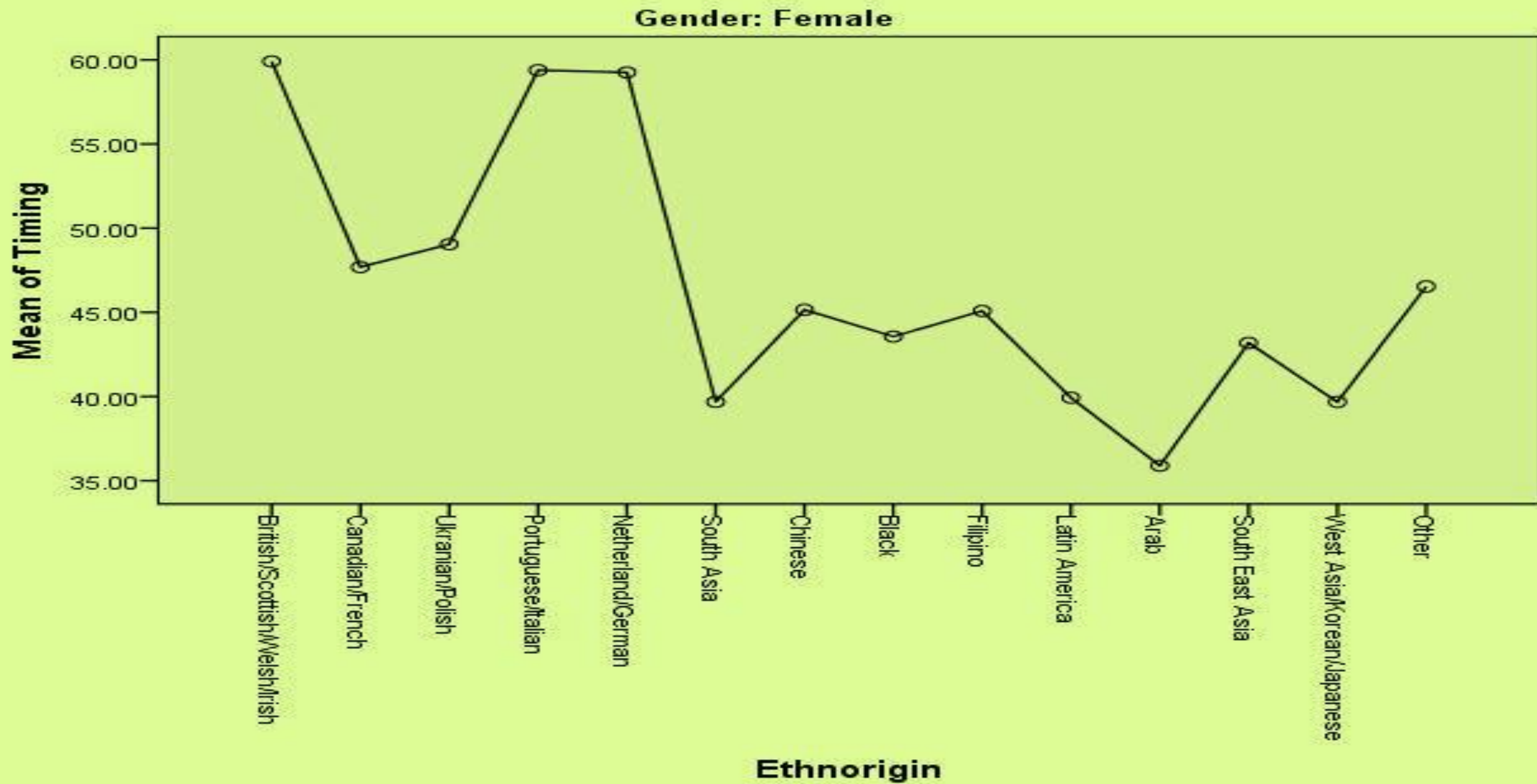
METHODS

❖**Data Analysis:**

❖Several reasons account for the choice of Cox model:

➢First, like other event history techniques it recognizes the fact that the event of interest is rarely observed in all respondents and allows for right censoring.

➢Uses the partial likelihood estimation procedure which in combination with Breslow's methods is efficient in dealing with ties in the data.

➢It is a semi-parametric model, meaning it is flexible and does not require that we specify the functional distribution underlying the data.

Gender: Female

RESULTS

Gender: Male

Mean of Timing vs Ethnorigin

British/Scottish/Welsh/Irish, Canadian/French, Ukranian/Polish, Portuguese/Italian, Netherland/German, South Asia, Chinese, Black, Filipino, Latin America, Arab, South East Asia, West Asia/Korean/Japanese, Other
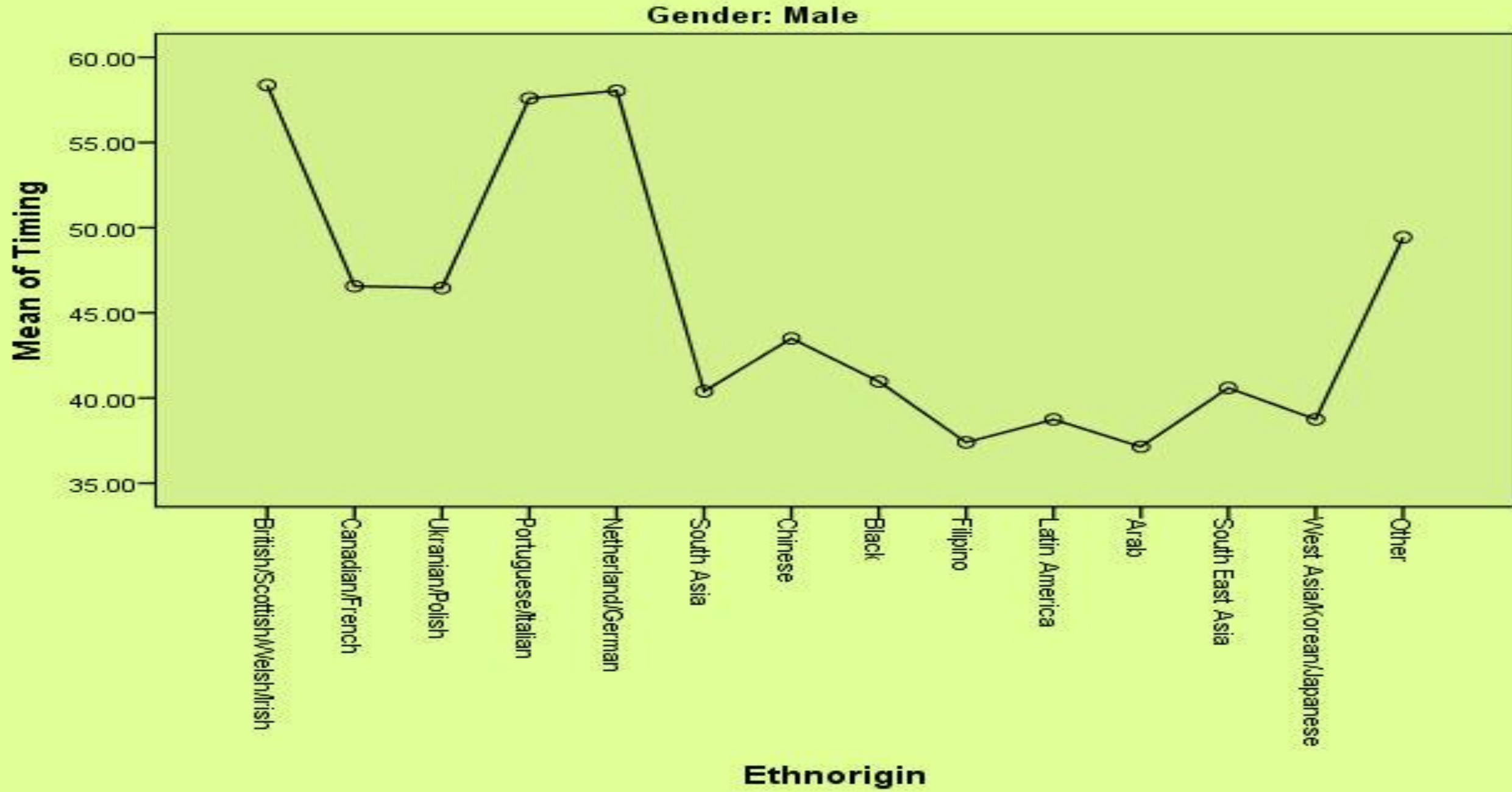
RESULTS

Table 2a: Unadjusted hazard ratios of selected independent variables by gender		
Ethnicity/cultural background	HR Male (N=4208)	HR Female (N=4697)
British/Welsh/Scottish/Irish (ref)	1.00	1.00
French	2.61 (.795)***	1.17 (.546)
Ukrainian/Polish	.716 (.323)	.680 (.294)
Portuguese/Italian	1.42 (.347)	1.53 (.384)
Netherlands/German	.993 (.271)	.919 (.254)
South Asia	2.33 (.529)***	3.08 (.743)***
Chinese	1.56 (.378)	1.31 (.330)
Black	4.03 (.962)***	2.73 (.722)***
Filipino	2.62 (.808)***	2.70 (.691)***
Latin America	1.62 (.602)	1.27 (.536)
Arab	3.35 (1.18)***	2.08 (1.04)
South East Asia	6.04 (1.68)***	.465 (.315)
Korea/Japanese	.195 (.212)	.512 (.374)
Other	1.11 (.252)	1.21 (.301)

Table 3: Adjusted hazard ratios for timing of first onset of diabetes among female immigrant and visible minority populations in Canada, 2013

Independent variables	Female			
Ethnicity/cultural background	Model 1	Model 2	Model 3	Model 4
British/Welsh/Scottish/Irish (ref)	1.00	1.00	1.00	1.00
French	.984 (.470)	1.03 (.492)	1.01 (.484)	.984 (.475)
Ukrainian/Polish	.641 (.279)	.608 (.265)	.617 (.269)	.511 (.224)
Portuguese/Italian	1.48 (.377)	1.31 (.335)	1.34 (.343)	1.03 (.268)
Netherlands/German	.929 (.258)	.887 (.247)	.919 (.256)	.854 (.239)
South Asia	3.16(.786)***	3.28(.829)***	3.09(.785)***	2.12(.573)***
Chinese	1.43 (.368)	1.53 (.395)	1.49 (.386)	1.46 (.406)
Black	2.58(.706)***	2.38(.658)***	2.09(.581)***	1.40 (.404)
Filipino	2.65(.686)***	2.38(.630)***	2.14(.579)***	1.64 (.470)
Latin America	1.27 (.542)	1.05 (.452)	.973 (.419)	.767 (.335)
Arab	1.97 (1.02)	2.18 (1.13)	2.02 (1.05)	1.54 (.814)
South East Asia	.457 (.311)	.459 (.313)	.424 (.290)	.399 (.276)
Korea/Japanese	.598 (.441)	.628 (.464)	.685 (.505)	.513 (.383)
Other	1.18 (.297)	1.17 (.295)	1.13 (.286)	.862 (.222)

Table 3: Adjusted hazard ratios for timing of first onset of diabetes among male immigrant and visible minority populations in Canada, 2013

Independent variables	Male			
Ethnicity/cultural background	Model 1	Model 2	Model 3	Model 4
British/Welsh/Scottish/Irish (ref)	1.00	1.00	1.00	1.00
French	1.79 (.582)	1.62 (.532)	1.64 (.538)	2.05 (.675)**
Ukrainian/Polish	.756 (.343)	.773 (.351)	.676 (.307)	.810 (.371)
Portuguese/Italian	1.28 (.323)	1.20 (.304)	1.07 (.272)	1.07 (.277)
Netherlands/German	.956 (.262)	.929 (.255)	.946 (.261)	.988 (.274)
South Asia	2.77(.645)***	2.59(.609)***	2.81(.665)***	3.93(.983)***
Chinese	1.97(.495)***	1.94(.488)***	1.85 (.471)**	2.27(.606)***
Black	3.61(.898)***	3.28(.828)***	2.88(.735)***	3.31(.875)***
Filipino	3.46(.989)***	3.79(.990)***	3.28(.992)***	4.01(.993)***
Latin America	1.39 (.524)	1.42 (.537)	1.58 (.604)	1.87 (.734)
Arab	3.46(.553)***	3.09(.552)***	3.02(.552)***	5.05(.558)***
South East Asia	5.40(.854)***	5.21(.852)***	5.43(.854)***	6.12(.859)***
Korea/Japanese	.223 (.243)	.194 (.212)	.197 (.216)	.243 (.267)
Other	1.05 (.244)	1.01 (.234)	.964 (.225)	1.14 (.270)

DISCUSSION & CONCLUSION

❖Several discussion points emerge from this study:

➢Clear gender differences are observed and must inform future analysis of the epidemiology of diabetes.

➢There are ethnic differences in the timing of the first onset of diabetes. Specific ethnic groups including Blacks, South Asians, Filipinos, Arabs, and South East Asians experienced earlier timing compared to the British/Caucasians.

➢Several theoretical pathways in explaining these differences, including genetic and family history reasons. However, our models make a strong case for **modifiable risk factors**.

DISCUSSION

❖ Several discussion points emerge from this study:

➢ Modifiable risk factors (Physical activity, nutrition, smoking, drinking etc.) were significantly associated with the timing of the first onset of diabetes.

➢ Most important is that modifiable risk factors worked differently for men and women belonging to different ethnicities.

➢ For black and Filipino women, the risks of developing diabetes earlier in the life course vanished completely after accounting for lifestyle/modifiable risks factors. For South Asians, there was significant attenuation in the risks of the onset of diabetes.

DISCUSSION

❖ Several discussion points emerge from this study:

➢ For some immigrant men (South East Asia, Arabs, Chinese, Filipinos etc.), their risks accentuated after accounting for lifestyle/modifiable risk factors.

➢ Finding is quite intriguing and clearly suggests a complex relationship between ethnicity and time to first onset of diabetes.

➢ Given its independent effect, it is clear that ethnicity is an important risk factor for men of specific ethnic groups. This risk is compounded with 'unhealthy lifestyles'.

Policy Implications

➢ It is important to increase education around diabetes among immigrant populations in Canada.

➢ Gender-specific interventions should target specific immigrant groups with increased risks of developing diabetes.

➢ Develop interventions that address diabetes earlier and in the first few years of immigrant settlement.

➢ Address broader contextual factors that might limit immigrants' ability to engage in health preventive behaviors.

Limitations

➢ Data are cross-sectional so we cannot draw causal connections between predictors and outcome variable. We are unable to establish order between predictors and onset of diabetes.

➢ Data are self-reported and subject to report and recall bias. This is especially do for our outcome variable.

➢ We focused on immigrants who developed diabetes in Canada, but it is possible that pre-migrations factors might have contributed to the development of this medical condition in Canada. We couldn't control for these pre-migration factors.

END OF SLIDES