

## RESEARCH COMMUNICATION

# Agreement Between Birthplace and Self-reported Ethnicity in a Population-based Mammography Service

Chris D Bajdik\*, MC Barroetavena, SR Saroa, T Gregory Hislop

### Abstract

**Background:** Ethnicity is associated with genetic, environmental, lifestyle and social constructs. Difficult to define using a single variable, but strongly predictive of health outcomes and useful for planning healthcare services, it is often lacking in administrative databases, necessitating the use of a surrogate measure. A potential surrogate for ethnicity is birthplace. Our aim was to measure the agreement between birthplace and ethnicity among six major ethnic groups as recorded at the population-based mammography service for British Columbia, Canada (BC). **Methods:** We used records from the most-recent visits of women attending the Screening Mammography Program of British Columbia to cross-tabulate women's birthplaces and self-reported ethnicities, and separately considered results for the time periods 1990-1999 and 2000-2006. In general, we combined countries according to the system adopted by the United Nations, and defined ethnic groups that correspond to the nation groups. The analysis considered birthplaces and corresponding ethnicities for South Asia, East/Southeast Asia, North Europe, South Europe, East Europe, West Europe and all other nations combined. We used the kappa statistic to measure the concordance between self-reported ethnicity and birthplace. **Results:** Except for the "Other" category, the most-common birthplace was East/Southeast Asia and the most-common ethnicity was East/Southeast Asian. The agreement between birthplace and self-reported ethnicity was poor overall, as evidenced by kappa scores of 0.22 in both 1990-1999 and 2000-2006. There was substantial agreement between ethnicity and birthplace for South Asians, excellent agreement for East/Southeast Asians, but poor agreement for Europeans. **Conclusion:** Birthplace can be used as a surrogate for ethnicity amongst people with South Asian and East/Southeast Asian ethnicity in BC.

**Key Words:** Ethnicity - birthplace - agreement - administrative data

*Asian Pacific J Cancer Prev*, 9, 511-514

### Introduction

Ethnicity is associated with genetic, environmental, lifestyle and social constructs. Each ethnic group includes people who vary according to their 'culture', religion, education, occupational class, economic activity, residential area and migration history. For some, ethnicity will be a fundamental part of how they interact with others and see themselves. For others, ethnicity will have little influence. Canadian researchers have used birthplace, surname, ethnicity and other measures to study health outcomes, behaviours and services in ethnic subgroups of the population (Sheth et al, 1999; Wang et al, 2000; Satia et al, 2001; Maxwell et al, 2001; Taylor et al, 2002; Hislop et al, 2002; Hislop et al, 2003; Thompson et al, 2003; Hislop et al, 2004; Hislop et al, 2007; Oliffe et al, 2007; O'Loughlin et al, 2007; Whitley and Kirmayer, 2008). A recent forum on cancer care services recommended that more attention be given to serving the needs of special populations defined by culture and ethnicity, and that collecting information about important determinants of health within cancer databases is essential

(Barroentavena, 2008). Ethnicity is not stored in many healthcare databases or disease registries (Aspinall, 2006) Birthplace alone may be a poor proxy for some ethnic groups as some countries are quite ethnically heterogeneous (Aspinall, 2006). It will also miss non-migrants and result in the undercounting of an ethnic group. There have been limited analyses concerning ethnicity in administrative data, but they are needed in order to promote ethnic equality, monitor policies and ensure public access to information and services.

In this paper, we examine the agreement between birthplace and self-reported ethnicity for six major ethnic groups using administrative data obtained from a large population-based screening program in British Columbia, Canada.

### Materials and Methods

This study was approved by the Research Ethics Board at the BC Cancer Agency. We requested data from the Screening Mammography Program of British Columbia (SMPBC) regarding the birthplace and ethnicity of all

women who visited SMPBC clinics since 1990. British Columbia (BC) is the westernmost province of Canada with an area of 94,780 hectares. It has a population of approximately 4 million people with diverse ethnic backgrounds. The SMPBC began in 1988 and now comprises 37 screening centres that serve more than 100 communities throughout the province. Upon each visit to the SMPBC, women are asked to report several demographic factors including their birthplace and ethnicity.

The SMPBC database is structured so that records correspond to individual clinic visits; SMPBC records do not correspond to individual patients. Accordingly, we used records for only a woman’s most-recent visit during this period. We did not use data from multiple visits because data are assumed to be independent in the statistical analysis. We excluded data from women who have not visited the SMPBC since 1990 because the categories of self-reported ethnicity were different. This implies that women who have attended the SMPBC, but whose last visit was prior to 1990, were excluded altogether. We also excluded reports from women who did not report ethnicity or birthplace. In fact, many records in our analysis are those of women who were born in Canada.

Between 1990 and 2006, self-reported ethnicity was coded by the SMPBC as one of 10 categories: South Asian, East/Southeast Asian, English, French, North European, South European, East European, West European, Black, Aboriginal Peoples or Other. The SMPBC records these particular categories because they are the most common ethnicities reported in the BC population. We defined countries that correspond to these ethnic categories using the definitions provided in Table 1. In general, we combined ethnic groups according to the system adopted for geographic regions by the United Nations (<http://unstats.un.org/unsd/methods/m49/m49regin.htm> accessed August 5, 2008). Women were asked to report a single ethnicity, and the first value was usually coded if someone provided multiple responses. Our analyses excluded data from women reporting the ethnicity Black and Aboriginal Peoples because those responses do not correspond to any single birthplace. In addition, we included the ethnicity response English within the Northern European group, and the ethnicity response French within the Western European group.

We used the kappa statistic to measure the concordance between self-reported ethnicity and birthplace. Kappa measures the agreement between two variables of which neither is considered a “gold standard” and adjusts for agreement due to chance. Kappa takes values between 0 and 1. Values between 0.61 and 0.80 suggest substantial agreement, whereas values greater than 0.80 suggest excellent agreement (Landis and Koch, 1977). An approximate 95% confidence interval for kappa was calculated as  $\pm 1.96$  standard errors.

We were interested in whether there was a temporal change in the agreement between birthplace and self-reported ethnicity. Accordingly, we performed the analysis and report results for the periods 1990-1999 and 2000-2006 separately.

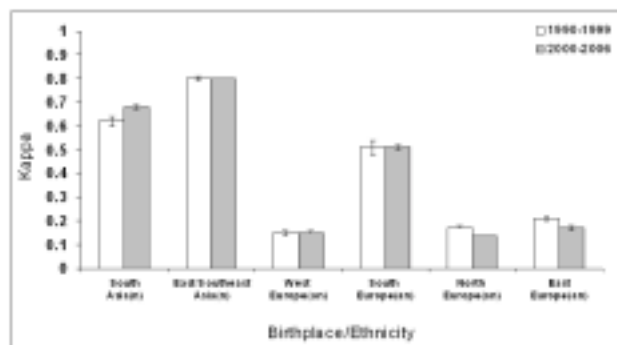
**Table 1. Categories of Ethnicity and the Corresponding Countries as Reported by the United Nations.** (<http://unstats.un.org/unsd/methods/m49/m49regin.htm> accessed on August 5, 2008)

Ethnicity	Corresponding Countries
South Asian	Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka
East/Southeast Asian	China, Hong Kong, Macao, North and South Korea, Japan, Mongolia, Brunei, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor, Viet Nam
West European	Austria, Belgium, France, Germany, Lichtenstein, Luxembourg, Monaco, Netherlands, Switzerland
South European	Albania, Andorra, Bosnia, Herzegovina, Croatia, Gibraltar, Greece, Holy See, Italy, Malta, Montenegro, Portugal, San Marino, Serbia, Slovenia, Spain, Macedonia
North European	Aland Islands, Channel Islands, Denmark, Estonia, Faeroe Islands, Finland, Guernsey, Iceland, Ireland, Isle of Man, Jersey, Latvia, Lithuania, Norway, Svalbard and Jan Mayen Islands, Sweden, United Kingdom
East European	Belarus, Bulgaria, Czech Republic, Hungary, Poland, Moldova, Romania, Russia, Slovakia, Ukraine

**Results**

The final dataset contained records from 271,575 women. Regarding the proportion of birthplaces, the largest increase from 1990-1999 to 2000-2006 was for women born in South Asia and the largest decrease was for women born in North Europe. Regarding the proportion of women’s reported ethnicity, the largest increase from 1990-1999 to 2000-2006 was for women of South Asian ethnicity and largest decrease was for women of “Other” ethnicity. (The “Other” category combines all ethnicity responses that were not South Asian, East/Southeast Asian or European.)

A cross-tabulation of the birthplace and self-reported ethnicity categories is shown in Table 2. Except for “Other”, the most common birthplace was East/Southeast



**Figure 1. The kappa Statistic and Approximate 95% Confidence Interval for Each Birthplace/ethnicity Category Compared with all other Categories Combined**

**Table 2. Cross-tabulation of Birthplace and Self-reported Ethnicity amongst Women attending the Screening Mammography Program of British Columbia (SMPBC) during 1990-1999 and 2000-2006**

Ethnicity	Birthplace							Total
	S Asia	E/SE Asia	W Europe	S Europe	N Europe	E Europe	Other	
1990-1999								
S Asian	1,054	281	3	9	56	14	166	1,583
E/SE Asian	302	5,196	22	27	93	26	274	5,940
W European	1	10	702	10	92	26	24	865
S European	2	8	61	395	19	24	70	579
N European	10	7	62	4	4,307	28	96	4,514
E European	0	12	98	4	24	431	33	602
Other	358	1,103	5,985	507	19,870	2,730	3,417	33,970
Total	1,727	6,617	6,933	956	24,461	3,279	4,080	48,053
Kappa = 0.22								
2000-2006								
S Asian	7,572	1,270	22	50	170	102	1,369	10,555
E/SE Asian	1,635	25,564	93	147	375	133	1,644	29,591
W European	2	17	3,052	49	354	111	69	3,654
S European	11	18	236	2,239	109	122	215	2,950
N European	49	22	211	23	15,653	139	202	16,299
E European	0	30	284	15	43	1,820	67	2,259
Other	1,991	5,348	28,289	3,143	93,233	14,863	1,347	158,214
Total	11,260	32,269	32,187	5,666	109,937	17,290	14,913	223,522
Kappa = 0.22								

Asia and the most-common ethnicity was East/Southeast Asian. The agreement between birthplace and self-reported ethnicity was fairly poor overall, as evidenced by kappa scores of about 0.22 in both time periods. To measure the agreement for individual ethnic groups, we calculated kappa separately for each group versus all of the others combined, as shown in Figure 1. Those results indicate substantial agreement between ethnicity and birthplace for South Asians in both time periods. The same results indicate excellent agreement for East/Southeast Asians in both time periods. The agreement was generally low for the different European groups.

**Discussion**

The agreement between birthplace and self-reported ethnicity was poor overall, but substantial for South Asians and excellent for East/Southeast Asians. The agreement did not change very much between the time periods 1990-1999 and 2000-2006. We believe that birthplace can be used as a surrogate for ethnicity with regards South Asian and East/Southeast Asian ethnic sub-populations in BC. This is useful for research because birthplace is easier to define than ethnicity, and more-often available in computer databases.

The extent of findings in our study is dependent on the data available to us. Many women attended the SMPBC more than once during the 1990-1999 and 2000-2006 periods, but our analysis only used data from a woman’s most-recent visit. Thus, the analysis was not influenced by the number of times a woman attended the SMPBC, and similar results for the time periods 1990-1999 and 2000-2006 cannot be attributed to data for a woman being included in the analyses for both periods. We considered the periods 1990-1999 and 2000-2006

separately because we were interested in whether the results would be different. Our choice of time intervals was arbitrary, and other choices might depend on government immigration policies or world events. A woman’s reported ethnicity also might have been influenced by the questionnaire’s terminology or format (Gordon and Bell, 1993). Women were allowed to report only one ethnicity in the SMPBC questionnaire. Some women used “Other” to report multiple ethnic groups, however only the first listed response was recorded in the database. The effect of this is likely to be small in our analysis, and further reduced because we considered ethnic categories and not individual ethnicities. Many women did not report any ethnicity other than Canadian. This probably indicates something about self-reported information regarding ethnicity, but we cannot interpret responses in the database. In our analysis of the correspondence between birthplace and self-reported ethnicity, data from non-responders were excluded. A more-general issue is whether birthplace or self-reported ethnicity can be considered a “gold standard” with which the other variable can be assessed. We don’t think that either variable definitely predicts someone’s health, so we analyzed the agreement between variables.

Any categorization scheme may mask the original values. We grouped nations to show overall trends and provide analytic stability that is not possible when small groups are analyzed individually. However, caution must be used when interpreting the results of grouped responses and the underlying variables. We chose a categorization scheme based on that adopted by the United Nations because it is an accepted one. We recognize that, despite its broad use, the UN categorization is somewhat arbitrary.

Finally, readers are reminded that other factors limit our ability to generalize from these findings. The ethnicity

and birthplace of women attending the SMPBC might not correspond to that of the BC general population. This would not affect the agreement between these variables in women, unless women attending the SMPBC reported ethnicity and birthplace unlike women in the general population. Breast cancer risk is known to differ among nations, and women might differentially participate in mammography according to the risk associated with their country of origin. It is not obvious that our findings apply to males, but we have no reason to believe this is untrue. Further, it is not obvious that our findings can be generalized to populations outside of British Columbia.

Finally, lack of comprehensive information about ethnicity in administrative datasets limits efforts to explore health disparities and improve the coverage of programs for ethnic groups (Aspinall, 2006).

## Acknowledgements

CDB was supported by a Scholar Award from the Michael Smith Foundation for Health Research during the performance of this research. We thank Christina Chu at the SMPBC for providing a computerized file of medical records. We thank the journal's reviewers for their comments on an earlier version of the paper.

## References

- Aspinall PJ (2006). Secondary analysis of administrative, routine, and research data sources. In: Nazroo, J.Y. (Ed.), *Health and Social Research in Multiethnic Societies*. Routledge, New York, NY, pp. 165-95.
- Barroentavena MC (2008). Proceedings and Recommendations from a National Forum on Cancer Care for All Canadians – Improving Access and Minimizing Disparities for Vulnerable Populations. <http://www.bccancer.ca/RES/ResearchPrograms/SBR>
- Gordon CC, Bell NA (1993). Problems of racial and ethnic self-identification and classification. *NAPA Bulletin*, **13**, 34-47.
- Hislop TG, Teh C, Lai A, Labo T, Taylor VM (2002). Cervical cancer screening in Chinese BC women. *BC Med J*, **42**, 456-60.
- Hislop TG, Inrig KM, Bajdik CD, et al (2003). Health care services and pap testing behaviour for Chinese women in British Columbia. *J Immigrant Health*, **5**, 143-52.
- Hislop TG, Teh C, Lai A, et al (2004). Pap screening and knowledge of risk factors for cervical cancer in Chinese Women in British Columbia, Canada. *Ethnicity & Health*, **9**, 267-81.
- Hislop TG, Teh C, Low A, et al (2007). Predisposing, reinforcing and enabling factors associated with hepatitis B testing in Chinese Canadians in British Columbia. *Asian Pac J Cancer Prev*, **8**, 39-44.
- Landis RJ, Koch GG (1977). The measurement of observer agreement for categorical data. *Biometrics*, **33**, 159.
- Maxwell CJ, Bancej CM, Snider J (2001). Predictors of mammography use among Canadian women age 50-69: findings from the 1996/97 National Population Health Survey. *CMAJ*, **164**, 329-334
- Oliffe J, Thorne S, Hislop TG, Armstrong E (2007). "Truth telling" and cultural assumptions in an era of informed consent. *Community Health*, **30**, 5-15.
- O'Loughlin J, Maximova K, Tan Y, Gray-Donald K (2007). Lifestyle risk factors for chronic disease across family origin among adults in multiethnic, low-income, urban neighborhoods. *Ethn Dis*, **17**, 657-63.
- Satia JA, Patterson RE, Kristal AR, Hislop TG, Pineda M (2001). A household inventory for North American Chinese. *Public Health Nutr*, **4**, 241-7.
- Sheth T, Nair C, Nargundkar M, Armand S, Yusuf S (1999). Cardiovascular and cancer mortality among Canadians of European, south Asian and Chinese origin from 1979 to 1993: an analysis of 1.2 million deaths. *CMAJ*, **161**, 132-8.
- Taylor VM, Hislop TG, Jackson JC, et al (2002). A randomized control trial of interventions to promote cervical cancer screening among Chinese women in North America. *J Natl Cancer Inst*, **94**, 670-7.
- Thompson MJ, Taylor VM, Yasui Y, et al (2003). Hepatitis B knowledge and practices among Chinese Canadian women in Vancouver, British Columbia. *Can J Public Health*, **94**, 281-6.
- Wang PP, Elsbett-Koeppen R, Geng G, Badley EM (2000). Arthritis prevalence from place of birth: findings from the 1994 Canadian National Population Health Survey. *Am J Epidemiol*, **152**, 442-5.
- Whitley R, Kirmayer LJ (2008). Perceived stigmatisation of young mothers: An exploratory study of psychological and social experience. *Soc Sci Med*, **66**, 339-48.