

QUALITY OF BIRTHPLACE INFORMATION OBTAINED FROM DEATH CERTIFICATES FOR HISPANICS, ASIANS, AND PACIFIC ISLANDERS

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INTRODUCTION

Of the 28.4 million foreign-born persons living in the United States in 2000, more than 75% migrated from Latin America or Asia.¹⁻⁵ Studying disease patterns in these immigrant populations is increasingly important as it helps to identify vulnerable subpopulations at increased risk of disease, and to provide clues to disease etiology.⁶ Past research on immigrants examined health outcomes by nativity, using birthplace information recorded on death certificates.⁷⁻¹⁰ However, the validity of the results from these types of analyses is predicated on the accuracy of birthplace information, which may be based on a subjective assessment made by hospital or mortuary personnel, rather than on a statement by the next-of-kin. In a comparison of demographic data recorded on death certificates with self-reported data obtained from the National Longitudinal Mortality Study and the Current Population Survey, Sorlie et al demonstrated that agreement between death certificate data and self-reported birthplace data was high: 99.4% ($\kappa=.959$). However, as more than 90% of the study subjects were non-Hispanic White and US-born, it is difficult to interpret the findings for the groups for whom immigration is a health-impacting factor.¹¹

Hispanics and Asians/Pacific Islanders (API) are currently the most rapidly increasing population groups in the United States, due to recent immigration trends.¹⁻⁵ This pattern is particularly evident for California, in general, and the San Francisco Bay Area, in particular, where Hispanics and Asians comprise 23% and 20%, respectively, of the population.¹² To determine the utility of birthplace information from death

certificates for these groups, we quantified the extent of birthplace misclassification on death certificates, using self-reported birthplace as a standard in Hispanic and Asian cancer patients from the population-based cancer registry covering the Greater Bay Area of Northern California.

METHODS

We compared death certificate information about birthplace to self-reported birthplace data collected for 13 epidemiologic research studies based on enumerations of incident cancer patients provided by the Greater Bay Area Cancer Registry (GBACR), which identifies each new cancer diagnosis in a resident of the catchment area (the counties of San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, Santa Cruz, Monterey, and San Benito). Because the GBACR monitors individuals' vital status until death, patient records are updated annually with information (including vital status, and, for deceased patients, additional information on cause of death and other patient demographic factors) obtained from death certificate files; birthplace is not one of the characteristics by which patients are matched to vital statistics sources. With deaths reported to the registry as of early 1997, death certificate information was retained in separate fields from the original registry information, thus providing the opportunity to evaluate birthplace information obtained directly from the death certificate.

The interview research studies from which patients were drawn covered a broad spectrum of malignancies (Table 1), and included persons from various racial/ethnic groups. Many of the stud-

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Table 1. Characteristics of participating studies,* Greater Bay Area

Principal Investigator	Hispanics (self-report) N=51	Asians (self-report) N=85	Cancer Site(s)†	Diagnosis Year‡	Gender‡	Race/Ethnicity†	Age at Diagnosis‡	Response Rate‡	Proxy Interviews	Other Study Criteria
K. Kerlikowski§	3	0	breast	1983–94	female	all	all	79%	yes	ductal carcinoma in-situ treated by lumpectomy only
E. John ¹³	14	0	breast	1995–98	female	White, Black, Hispanic	35–79	86%	yes	English- or Spanish-speaking
M. Lee ¹⁴	5	2	breast	1990–92	female	White, Black, Hispanic, Chinese	<70	72%	yes	English-, Chinese-, or Spanish-speaking
J. Bloom ^{15,16}	1	0	breast	1994–95	female	White, Black, Hispanic, Filipino, Chinese	<50	56%	no	English-speaking; interviewed within 6 months of diagnosis
J. Bloom	1	3	breast	1995–97	female	White, Black, Hispanic, Filipino, Chinese	<50	58%	no	English-, Spanish-, or Cantonese-speaking; interviewed within 6 months of diagnosis
E. John & D. West ¹⁷	1	2	breast	1995–98	both	White, Black, Hispanic, Chinese, Japanese, Filipino	females (20–64); males (<80)	91%	yes	English-, Spanish-, or Chinese-speaking
S. Glaser ^{18–20}	1	1	Hodgkin's disease	1988–94	female	all	19–79	85%	no	English-speaking
P. Horn-Ross ^{21,22}	0	1	thyroid	1992–98	female	all	20–74	74%	no	English-, Spanish-, Tagalog-, Chinese-, or Vietnamese-speaking
P. Horn-Ross¶	4	0	endometrial	1996–99	female	White, Black, Hispanic	35–79	77%	no	English- or Spanish-speaking
A. Whittemore ^{23,24}	0	15	prostate	1987–91	male	White, Black, Chinese, or Japanese	<85	70%	yes	have at least 3 grandparents of same ethnicity
E. Holly ^{25–27}	10	6	non-Hodgkin's lymphoma	1988–92	both	all	21–74	57%	no	English- or Spanish-speaking
D. West ^{28–30}	10	1	in-situ or invasive breast, colon, prostate, lung, cervix	1990	both	White (regardless of Hispanic ethnicity)	20–89	76%	yes	English- or Spanish-speaking
D. West ³¹	1	54	all	1988–92	both	Vietnamese, Chinese, or Southeast Asian	20–84	48%	yes	English-, Vietnamese-, or Chinese-speaking

* After restricting to studies that included Asians and collected interview information on race/ethnicity and birthplace.

† Cancer site, diagnosis years, gender, race/ethnicity, and age at diagnosis are based on GBACR classifications.

‡ Among those eligible for interview.

§ Study of recurrent breast tumors in women with ductal carcinoma in-situ.

|| Study of quality of life among younger women with breast cancer.

¶ Phytoestrogens, physical activity, and endometrial cancer.

Table 2. Misclassification of birthplace in death certificate data among Hispanics and Asians, Greater Bay Area

Estimates of Misclassification (95% CI)/ Degree of Bias	Hispanic (N=51)	Asian (N=85)
Sensitivity for foreign-born*	100 (—)	100 (—)
Sensitivity for US-born†	96.3 (81.2–96.6)	93.3 (69.4–94.2)
Predictive value positive for foreign-born‡	96.0 (79.9–96.3)	98.6 (92.2–98.6)
Predictive value positive for US-born§	100 (—)	100 (—)
Relative bias for foreign-born	.042	.014
Relative bias for US-born¶	–.037	–.067

* Among those self-identifying as foreign-born, the percentage of persons who were classified as such.
 † Among those self-identifying as US-born, the percentage of persons who were classified as such.
 ‡ Among those classified as foreign-born, the percentage of persons who self-identified as such.
 § Among those classified as US-born, the percentage of persons who self-identified as such.
 || Amount by which the percent classified as being foreign-born differed from the percent self-identifying as such, as a percentage of the latter.
 ¶ Amount by which the percent classified as being US-born differed from the percent self-identifying as such, as a percentage of the latter.

ies conducted interviews in several languages. Subjects included in this analysis were Hispanics and Asians (based on self-report from interview), who were newly diagnosed with incident invasive or *in-situ* cancers of any site, reported to the cancer registry from 1973 to 2000, interviewed as part of the research studies, and who died between January 1997 and December 1999. Self-reported birthplace was obtained from the study interviews. Data from both self-reports and death certificates were available for 51 Hispanics and 85 Asians, among whom 56 self-identified as Chinese. No subjects had birthplace missing on their death certificates. Although there are approximately 900 cancer deaths on average among Hispanics and 1300 among Asians in the registry's counties annually, the small proportion of the total in this study reflects the fact that most of the interview studies did not include patients who were deceased.

RESULTS

Among Hispanics, 24 (47.1%) self-reported being foreign-born, and among Asians, 70 (82.4%) self-reported being

foreign-born. Table 2 shows the measures of death certificate birthplace misclassification by race/ethnicity. Only one Hispanic and one Asian (Chinese) subject were misclassified, resulting in relatively high predictive value positives and sensitivities (>90%). Both subjects whose birthplace was recorded in error self-reported as being US-born, but were misclassified as foreign-born. The relative bias measures indicate a consequent slight underestimate in the number of US-born Hispanics and Chinese using death certificate data.

DISCUSSION

Our findings of high accuracy of birthplace data recorded on death certificates for cancer patients are consistent with those of Sorlie et al.¹¹ Such accuracy is encouraging for subsequent research in Hispanics and Asians, 2 growing populations in the United States for whom immigration status may be relevant for studies of disease patterns. Our findings suggest that death certificate completion involves querying the next-of-kin for demographic information on the deceased, or acquiring

the information from other sources (eg, medical records). Since the completion of other sociodemographic items on the death certificate (eg, race/ethnicity, marital status, education, occupation, etc) requires assistance from a next-of-kin or someone familiar with the deceased, it is unlikely that individuals recording this information on death certificates would have simply guessed the patient's birthplace.

Our study is limited in having a small number of deceased Hispanics and Asians with available death certificate information, and in lacking self-reported data on specific country of birth. It is likely that our sample is not representative of all cancer patients, as patients participating in interview studies tend to be diagnosed with less aggressive disease, and, consequently, are less sick, than non-participants. In addition, as several of the research studies were limited to English-speaking participants, our sample may under-represent foreign-born Hispanics and Asians. We previously found that misclassification of birthplace in the cancer registry was more likely to occur among Asians and Hispanics who did not speak English (Gomez, unpublished results); however, this association is unlikely to apply to death certificate information on birthplace, given that the patient is deceased. If language barriers between the interviewer and the next-of-kin or informant are also associated with misclassification, birthplace misclassification may, in fact,

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be even higher among the general cancer registry population.

The birthplace information for Hispanic and Asian cancer patients appears to be complete and accurate, suggesting that research incorporating birthplace information based on death certificate data can be conducted reliably for these populations.

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Manuscript draft: Gomez, Glaser
Statistical expertise: Gomez
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