Breast cancer survival in South Asian women in England and Wales

Sabya Farooq, Michel P Coleman


Study objectives: To estimate ethnic and socioeconomic differences in breast cancer incidence and survival between South Asians and non-South Asians in England and Wales, and to provide a baseline for surveillance of cancer survival in South Asians, the largest ethnic minority.


Methods/design: Ethnic group was ascribed by a computer algorithm on the basis of the name. Incidence rates were derived from 1991 census population denominators for each ethnic group. One and five year relative survival rates were estimated by age, quintile of material deprivation, and ethnic group, using national mortality rates to estimate expected survival.

Main results: Age standardised incidence was 29% lower among South Asian women (40.5 per 100 000 per year) than among all other women (57.4 per 100 000). Five year age standardised relative survival was 70.3% (95%CI 65.2 to 75.4) for South Asian women and 66.7% (66.4 to 67.0) for other women. For both ethnic groups, survival was 8%–9% higher for women in the most affluent group than those in the most deprived group. In each deprivation category, however, survival was 3%–8% higher for South Asian women than other women.

Conclusions: This national study confirms that breast cancer incidence is substantially lower in South Asians than other women in England and Wales. It also provides some evidence that South Asian women diagnosed up to 1990 had higher breast cancer survival than other women in England and Wales, both overall and in each category of deprivation.
Breast cancer survival in South Asian women

depression category; they were included only in overall estimates of survival.

**Analysis**
South Asian ethnicity was defined, irrespective of birthplace, as an ethnic origin in peoples indigenous to India, Pakistan, or Bangladesh. SANGRA was used to identify South Asian women by matching their names to libraries that contained 9917 first names and 9422 surnames recognised as typically belonging to South Asians. A 1% systematic sample of records not identified as South Asian was examined to check for false negatives.

Incidence rates were derived using 1991 national census populations for each ethnic group as denominators. Of the 25 707 284 women of all ages, 710 601 (2.8%) were of Indian, Pakistani, or Bangladeshi origin. Relative survival rates were estimated at one and five years since diagnosis, with an algorithm developed in Stata software (Stata Corporation, College Station, TX, 1997), using the method of Estève et al. The official life table, based on all cause mortality in all ethnic groups, was used to adjust for background mortality. The period 1990–92 was central to the period 1986–93 covered by the study. Life tables for specific material deprivation and ethnic group: England and Wales, women diagnosed 1986–1990.

Relative survival rates were standardised for age using the direct method. Standard weights for the age groups 15–39, 40–49, 50–59, 60–69, 70–79, and 80–99 years were given by the age distribution of all women with breast cancer included in survival analyses for England and Wales for the period 1986–90.

**RESULTS**
Among 115 712 women diagnosed during 1986–90, 1010 (0.9%) were identified as being of South Asian origin. Visual inspection showed that all these women had at least one South Asian name. Two South Asian names, missed by inspection, were identified among the 1157 records inspected to check for false negatives. This would suggest that 0.1%–0.2% of women with breast cancer who were identified as non-South Asian might actually be South Asian.

South Asian women were much younger than other women with breast cancer (table 1), with a mean age at diagnosis of 51.8 years (compared with 62.8 years for non-South Asians), and 16% (compared with 5%) aged under 40 at diagnosis. Crude annual incidence rates were 42.8 per 100 000 among South Asian women and 111.2 for other women. Incidence was lower for South Asians in every age group: the world standardised incidence rate for South Asians (40.5 per 100 000) was 29% lower than for other women (57.4).

In South Asian women, five year survival was highest for those aged 60–69 years at diagnosis (74.2%), while for non-South Asian women the highest survival was seen for women aged 40–49 (73.3%). Overall (all ages) survival was some 3% higher for South Asian women, both at one year (92.5% compared with 89.8%) and at five years (71.3% compared with 67.8%): the 95% confidence intervals do not overlap.

![Figure 1](http://jech.bmj.com/) Five year survival (%) from breast cancer, with 95% confidence intervals, by material deprivation and ethnic group: England and Wales, women diagnosed 1986–1990.

SANGRA because of unusual variations in spelling, were identified among the 1157 records inspected to check for false negatives. This would suggest that 0.1%–0.2% of women with breast cancer who were identified as non-South Asian might actually be South Asian.

In South Asian women, five year survival was highest for those aged 60–69 years at diagnosis (74.2%), while for non-South Asian women the highest survival was seen for women aged 40–49 (73.3%). Overall (all ages) survival was some 3% higher for South Asian women, both at one year (92.5% compared with 89.8%) and at five years (71.3% compared with 67.8%): the 95% confidence intervals do not overlap.

**Table 1** Incidence per 100 000 and relative survival (%) from breast cancer at one and five years, by age at diagnosis and ethnic group, women diagnosed 1986–90, England and Wales

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>Incidence rate per 100 000</th>
<th>Women Number</th>
<th>% Deaths</th>
<th>One year Survival (%) 95% CI</th>
<th>Five years</th>
<th>Deaths Survival (%) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Asian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15–39</td>
<td>10.2</td>
<td>159</td>
<td>15.7</td>
<td>17</td>
<td>89.3</td>
<td>83.3 to 93.2</td>
</tr>
<tr>
<td>40–49</td>
<td>77.5</td>
<td>289</td>
<td>28.6</td>
<td>13</td>
<td>95.7</td>
<td>92.5 to 97.5</td>
</tr>
<tr>
<td>50–59</td>
<td>111.7</td>
<td>286</td>
<td>28.3</td>
<td>22</td>
<td>92.8</td>
<td>88.9 to 95.3</td>
</tr>
<tr>
<td>60–69</td>
<td>149.2</td>
<td>174</td>
<td>17.2</td>
<td>16</td>
<td>92.0</td>
<td>86.4 to 95.4</td>
</tr>
<tr>
<td>70–79</td>
<td>160.9</td>
<td>71</td>
<td>7.0</td>
<td>8</td>
<td>91.5</td>
<td>79.7 to 96.6</td>
</tr>
<tr>
<td>80–99</td>
<td>211.8</td>
<td>31</td>
<td>3.1</td>
<td>13</td>
<td>93.0</td>
<td>90.4 to 95.1</td>
</tr>
<tr>
<td>Overall</td>
<td>42.8</td>
<td>1010</td>
<td>100.0</td>
<td>89</td>
<td>92.5</td>
<td>89.6 to 93.0</td>
</tr>
<tr>
<td>Age standardised*</td>
<td>40.5</td>
<td>(95% CI 37.9 to 43.2)</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-South Asian</th>
<th>Incidence rate per 100 000</th>
<th>Women Number</th>
<th>% Deaths</th>
<th>One year Survival (%) 95% CI</th>
<th>Five years</th>
<th>Deaths Survival (%) 95% CI</th>
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<tr>
<td>15–39</td>
<td>12.9</td>
<td>5594</td>
<td>4.9</td>
<td>343</td>
<td>93.9</td>
<td>93.3 to 94.5</td>
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<td>40–49</td>
<td>102.8</td>
<td>16967</td>
<td>14.8</td>
<td>853</td>
<td>95.1</td>
<td>94.8 to 95.5</td>
</tr>
<tr>
<td>50–59</td>
<td>171.1</td>
<td>22235</td>
<td>19.4</td>
<td>1744</td>
<td>92.6</td>
<td>92.2 to 92.9</td>
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<tr>
<td>60–69</td>
<td>222.2</td>
<td>29294</td>
<td>25.5</td>
<td>3056</td>
<td>90.7</td>
<td>90.4 to 91.1</td>
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<tr>
<td>70–79</td>
<td>227.2</td>
<td>24395</td>
<td>21.3</td>
<td>4062</td>
<td>86.1</td>
<td>85.6 to 86.6</td>
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<td>80–99</td>
<td>247.6</td>
<td>16217</td>
<td>14.1</td>
<td>5298</td>
<td>74.2</td>
<td>73.3 to 75.0</td>
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<tr>
<td>Overall</td>
<td>111.2</td>
<td>114702</td>
<td>100.0</td>
<td>15356</td>
<td>89.8</td>
<td>89.6 to 90.0</td>
</tr>
<tr>
<td>Age standardised*</td>
<td>57.4</td>
<td>(95% CI 57.0 to 57.7)</td>
<td></td>
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</tbody>
</table>

*Incidence rates are standardised to the world standard population, and survival rates to the combined age structure of South Asian and non-South Asian women included in the analyses.
South Asian women with breast cancer are younger than other women, however: age standardised one year survival was similar in South Asian women (89.6%) and other women (88.8%). Five year age standardised survival in South Asian women (70.3%, 95% CI 65.2 to 75.4) was still 3.6% higher than for non-South Asian women (66.7%, 95% CI 66.4 to 67.0), but the confidence intervals overlap.

Depression status was known for some 99% of both ethnic groups. South Asian women were categorised as more deprived: over half (54%) lived in the two most deprived quintiles, compared with only a third (32%) of non-South Asians.

Within each deprivation category, South Asian women had higher survival: 2.8%–5.4% higher at one year and 3.5%–8.5% higher at five years (table 2, fig 1), although none of these differences is individually significant. In both ethnic groups, five year survival was 8%–9% higher for affluent women than deprived women.

Breast cancer survival varies with anatomical sub-site and morphological type, but the distribution of both variables was similar in both ethnic groups (data not shown).

**DISCUSSION**

This is the first national study of cancer survival among South Asians, the largest ethnic minority in Britain. The survival up to 1995 of South Asian women diagnosed with breast cancer in England and Wales during 1986–90 seems to hold over-crowding” (more than one person per habitable room) may lead to bias in the assessment of deprivation in South Asian women with breast cancer at one and five years, by deprivation category and ethnic group, women diagnosed 1986–90, England and Wales

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>Deprivation</th>
<th>Number</th>
<th>%</th>
<th>Deaths</th>
<th>Survival (%) 95%CI</th>
<th>Deaths</th>
<th>Survival (%) 95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Asian</td>
<td>1 (Affluent)</td>
<td>156</td>
<td>15.5</td>
<td>9</td>
<td>94.9 89.7 to 97.6</td>
<td>45</td>
<td>75.9 67.7 to 82.3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>143</td>
<td>14.2</td>
<td>12</td>
<td>93.4 87.2 to 96.7</td>
<td>42</td>
<td>74.7 66.0 to 81.5</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>157</td>
<td>15.5</td>
<td>10</td>
<td>95.3 89.8 to 97.8</td>
<td>44</td>
<td>76.3 68.0 to 82.6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>222</td>
<td>22.0</td>
<td>22</td>
<td>91.3 86.5 to 94.4</td>
<td>76</td>
<td>69.0 62.0 to 74.9</td>
</tr>
<tr>
<td></td>
<td>5 (Deprived)</td>
<td>321</td>
<td>31.8</td>
<td>36</td>
<td>90.2 86.1 to 93.2</td>
<td>115</td>
<td>67.3 61.5 to 72.4</td>
</tr>
<tr>
<td></td>
<td>6 (Unknown)</td>
<td>11</td>
<td>1.1</td>
<td>0</td>
<td>– –</td>
<td>3</td>
<td>– –</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>1010</td>
<td>100</td>
<td>89</td>
<td>92.5 90.6 to 94.1</td>
<td>325</td>
<td>71.3 68.2 to 74.1</td>
</tr>
<tr>
<td>Non-South Asian</td>
<td>1 (Affluent)</td>
<td>25390</td>
<td>22.1</td>
<td>2855</td>
<td>91.6 91.2 to 92.0</td>
<td>9482</td>
<td>70.6 69.9 to 71.2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>26211</td>
<td>22.9</td>
<td>3258</td>
<td>90.7 90.2 to 91.1</td>
<td>10392</td>
<td>69.2 68.5 to 69.8</td>
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<tr>
<td></td>
<td>3</td>
<td>24708</td>
<td>21.5</td>
<td>3269</td>
<td>89.9 89.4 to 90.3</td>
<td>10219</td>
<td>67.8 67.1 to 68.5</td>
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<td></td>
<td>4</td>
<td>21504</td>
<td>18.8</td>
<td>3161</td>
<td>88.6 88.1 to 89.0</td>
<td>9469</td>
<td>65.5 64.7 to 66.2</td>
</tr>
<tr>
<td></td>
<td>5 (Deprived)</td>
<td>15364</td>
<td>13.4</td>
<td>2391</td>
<td>86.4 85.8 to 87.0</td>
<td>7221</td>
<td>62.4 61.5 to 63.3</td>
</tr>
<tr>
<td></td>
<td>6 (Unknown)</td>
<td>1525</td>
<td>1.3</td>
<td>222</td>
<td>– –</td>
<td>608</td>
<td>– –</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>114702</td>
<td>100</td>
<td>15356</td>
<td>89.8 89.6 to 90.0</td>
<td>47391</td>
<td>67.8 67.5 to 68.1</td>
</tr>
</tbody>
</table>

South Asians, the largest ethnic minority in England and Wales during 1989–92 (SMR = 100), however,33 and the national life tables we used to estimate relative survival, which reflect background mortality during 1990–92 for all ethnic groups combined, are therefore likely to be perfectly adequate for South Asian women. The validity of the Carstairs index as a measure of material deprivation in South Asians is unclear. Inclusion of “household-over-crowding” (more than one person per habitable room) may lead to bias in the assessment of deprivation in South Asians.

**Policy implications**

- This is the first national study of cancer survival in any ethnic group in England and Wales. South Asians are the largest ethnic minority (2.7%). It suggests that breast cancer survival in South Asian women is higher than in non-South Asian women, both overall and in each category of deprivation.
- This surprising finding represents an important baseline for surveillance of cancer survival in South Asians. Data on cancer incidence, survival, and mortality in ethnic minorities are vital for addressing their specific public health concerns, but such data remain sparse in the UK. Surveillance of screening compliance, stage at diagnosis, and equality of access to treatment is also required.
- Making information on cancer in ethnic minority populations routinely available will require systematic recording of ethnicity at hospital admission, cancer registration, and certification of death.
census enumeration districts with large numbers of South Asians, who tend to live together with more members of the extended family. “Over-crowding” in these districts would not necessarily indicate deprivation to the same degree as in other enumeration districts. The effect of any bias is likely to be attenuated, however, because over-crowding is only one of the four components of the Carstairs index.

Breast cancer incidence in South Asian women was lower than for other women in every age group, and age-standardised incidence was some 30% lower. Survival varied considerably with age in both populations. Age-standardised five year survival was slightly higher in South Asians than other women. Five year survival was 8%–9% higher for both South Asian and other women in affluent areas than for those in deprived areas, the same pattern seen for all women in England and Wales.25

One year and five year survival rates were consistently higher in South Asians in each deprivation category. None of the ethnic differences in survival for a given socioeconomic group was conventionally significant, but the consistency is striking. It is unlikely to be an artefact, as mortality from breast cancer in the age range 20–69 years during 1989–92 was significantly lower in South Asian women than other women in England and Wales (SMR = 59, 95% CI 52 to 66).26 The corroboration is important,34 35 because the data streams that generate cancer mortality and cancer survival statistics are independent.

Ethnic differences in breast cancer survival in England and Wales could be partly attributable to differences in stage distribution, but information on stage is not available in the National Cancer Registry for patients diagnosed before 1993. South Asian women with breast cancer were more deprived than other women, and deprived groups generally have more advanced disease at diagnosis.7 This would be expected to reduce the observed difference in survival between the two ethnic groups. Differences in breast cancer survival between South Asian and other women in south east England were not explained by differences in stage at diagnosis.37

South Asians in Britain are a heterogeneous group with respect to diet and lifestyle, but these differences would be expected to influence the risk of developing cancer rather than the probability of surviving it.27 In principle, higher compliance with breast screening among South Asian women could contribute to the observed difference in survival. Compliance seems to be lower among South Asian women than other women, however, and the differences are small after socioeconomic deprivation is taken into account.37 Less than a third of all breast cancers occur in the screening age range 50–64 years.41

Most ethnic minorities in the USA have systematically lower cancer survival rates than the white majority.42 African American women diagnosed with breast cancer in the USA during 1986–96 had later stage at diagnosis and poorer survival than white women.43 These differences were partially explained by adjustment for socioeconomic variables, which may reflect variations in access to and use of healthcare services. Clinical trials have shown that black and white women diagnosed at a comparable stage and treated appropriately have similar survival.44 Such results provide evidence that equal treatment yields equal outcome, regardless of race.45 The evidence suggests, however, that black people in the USA tend to receive less aggressive investigation or less appropriate treatments than white people, both for cancer and other diseases.46 47

Asian Americans are an interesting exception to the pattern of lower survival in minority racial/ethnic groups in the USA. Age and stage adjusted five year survival for women diagnosed with breast cancer during 1988–97 and followed up to 1988 in the SEER programme areas was slightly higher for Asian Americans than for other racial groups.48 As in our data, socioeconomic gradients in breast cancer survival were seen among both Asian and other ethnic groups across three categories defined by median census tract income for women diagnosed 1988–1994.49 South Asians in England and Wales are persons with an origin in the Indian subcontinent (India, Pakistan, Bangladesh) whereas in the USA, Asian Americans are persons of Chinese, Japanese, or Filipino origin. The finding that breast cancer survival is higher among Asian women than other women in both countries is thus all the more surprising. It is difficult to explain on the basis of chance, artefact, or the choice of life tables. Confounding by stage of disease, socioeconomic status, or healthcare access cannot be excluded, but would be expected to confer lower survival on South Asians in the UK. We can speculate that differential access to (or compliance with) treatment or differences in tumour biology, or both, may contribute to the differences in survival.

Asian Americans also had higher survival than other ethnic groups in the USA for prostate cancer and for colorectal cancer in both sexes,49 and it would be interesting to examine survival for other cancers in British Asians.

Data on cancer incidence, survival, and mortality are vital to address the public heath concerns of ethnic minorities, but such data remain sparse in the UK. Better health surveillance is required for these communities, as in the USA, including incidence, compliance with screening, stage at diagnosis, access to treatment, survival, and mortality.

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REFERENCES