Cancer patterns in four districts of the Transkei region — 1991 - 1995

Nontuthuzelo I M Somdyala, Walter F O Marasas, Francois S Venter, Hester F Vismer, Wentzel C A Gelderblom, Sonja A Swanevelder

Background. Oesophageal cancer (OC) is an important public health problem among the Xhosa-speaking people of the Transkei region in the Eastern Cape Province, South Africa, with incidence rates for males among the highest in the world.

Objectives. To record the occurrence of cancer among men and women of all ages in four districts in the Transkei during the period 1991 - 1995, to identify common cancers and to compare the variations in cancer incidences in this region with incidences in Africa and the rest of the world.

Design. Cancer registration of cases reported from all clinics and hospitals was conducted in the four selected districts.

Setting. The districts included Centane (Kentani), Butterworth, Bizana and Lusikisiki in the Transkei region.

Methods. Active and passive methods were used to collect data, which were analysed using the Statistical Analyses Systems (SAS) package.

Results. The mean annual number of all cancer cases reported was 310, with age-standardised incidence rates (ASIRs, world standard) of 98.2/100 000 and 74.3/100 000 for males and females, respectively. The most frequently reported cancer was OC, with mean annual ASIRs of 76.6/100 000 and 36.5/100 000 for males and females, respectively, with a male/female ratio of 2:1.

Conclusion. The present data confirm previous reports that OC rates in Centane have consistently remained very high, whereas time-dependent changes in the incidence of OC have occurred in Butterworth, Bizana and Lusikisiki suggesting changes in the risk determinants in these districts.

year) to hospitals located in the four districts and in certain
neighbouring districts, including Umtata General Hospital (the
regional referral centre). Medical records were scrutinised to
check for completion of the notifications, and missing or
incomplete records were updated. The information recorded
for each case, using specially designed notification forms,
included name and surname, age, sex, address, hospital
number, clan name, primary cancer site, and radiograph and
biopsy numbers. Trained voluntary hospital personnel
collected and recorded all the information required on cancer
registration and mailed this to PROMEC (the Programme on
Mycotoxins and Experimental Carcinogenesis) on a monthly
basis. Cases comprised only residents defined as having lived
in these districts for at least 6 months. A uniform information
collection process was ensured by discussing problems that
arose during visits to the hospitals and clinics.

Data were computerised and coded at the time of entry,
following the tumour nomenclature and coding for topography
and morphology. After correcting for duplicates, the data
were analysed using the Statistical Analyses Systems (SAS)
package. The Adjust Age software programme (ADJAGE) was
used to calculate the age-standardised incidence rates (ASIRs)
(world standard) per 100 000 per annum for each sex using
the mean estimated annual population figures based on the
1996 census figures for the four districts. The ASIRs (using the
African standard) were also calculated and included to adjust
for differences in the number of people in the various age
categories between developed and developing countries for
comparative purposes. All ASIR data based on the African
rather than the world standard are specified in the text, tables
and figures.

Results and discussion
A total of 1 553 cancer cases were reported in the four districts
during the period 1991 - 1995, with the mean annual number
being 310. The overall mean annual rates for all cancers were
98.2/100 000 and 74.3/100 000 for males and females,
respectively (Table I). Histopathological confirmation was
obtained for only 8.4% (ranging from 0.8% to 18.4% per
annum) of the reported tumours, while radiograph reports
were available for 20.2% (ranging from 9.2% to 27.7% per
annum). In contrast, Makaula et al. reported that during the
period 1985 - 1990, histopathological confirmation was
obtained for 52.6% of reported tumours. A similar calculation
for the period 1985 - 1990 using the same database revealed
that 30.3% (ranging from 0% to 47.8% per annum) of the cancer
cases were histopathologically confirmed and 62.7% (ranging
from 20.3% to 81.1% per annum) had undergone radiographic
examination.

The most frequently reported cancer was OC, with 914 cases
reported for both males (76.6/100 000) and females (36.5/100 000),
with a male/female ratio of 2:1 (Table II). The highest OC
incidence rates in males occurred in Centane (61.8/100 000),
while similar incidence rates were reported in Lusikisiki
(57.6/100 000) and Butterworth (53.6/100 000). The lowest OC
incidence rate in males was reported in Bizana (33.4/100 000).
Among females the highest OC incidence rate was reported in
Centane (50.0/100 000) followed by Lusikisiki (48.4/100 000)
and Bizana (29.0/100 000), with the lowest rate (18.4/100 000)
recorded in Butterworth (Table II).

The present data were also calculated to reflect the African
standard because of remarkable differences in the age profiles
of developed versus developing countries. In developing
countries such as Zimbabwe and South Africa (Transkei) the
average population aged above 30 years is much lower than in a
developed country where the life expectancy is far higher.
Adjustment of the present ASIR data to reflect the world
standard resulted in higher OC incidence rates in all the
districts except Bizana (Table II). The ranking of the four
districts remained the same, with the highest OC rates for
males and females recorded in Centane. The HIV/AIDS
epidemic in southern Africa will most probably further distort
the ASIR of OC, as it will dramatically affect the population
indices in the Transkei region and will therefore further
complicate the use of the world standard in Africa.

Table I. Annual age-standardised incidence rates (ASIRs) for all reported cancers in four districts of Transkei during 1991 - 1995

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Bizana</td>
<td>98</td>
<td>54</td>
<td>12</td>
<td>83</td>
<td>15</td>
<td>92</td>
<td>54</td>
<td>27</td>
<td>22</td>
<td>31</td>
<td>40.2</td>
<td>57.4</td>
</tr>
<tr>
<td>Lusikisiki</td>
<td>98</td>
<td>93</td>
<td>13</td>
<td>164</td>
<td>85</td>
<td>118</td>
<td>102</td>
<td>94</td>
<td>124</td>
<td>88</td>
<td>84.4</td>
<td>111.4</td>
</tr>
<tr>
<td>Butterworth</td>
<td>65</td>
<td>45</td>
<td>157</td>
<td>28</td>
<td>63</td>
<td>38</td>
<td>60</td>
<td>39</td>
<td>33</td>
<td>30</td>
<td>75.6</td>
<td>36.0</td>
</tr>
<tr>
<td>Centane</td>
<td>154</td>
<td>115</td>
<td>386</td>
<td>47</td>
<td>238</td>
<td>110</td>
<td>114</td>
<td>68</td>
<td>70</td>
<td>121</td>
<td>192.4</td>
<td>92.2</td>
</tr>
<tr>
<td>Overall mean</td>
<td>98.2</td>
<td>74.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

M = male; F = female.
Liver cancer was the second most common cancer reported in males (2.2/100 000), whereas it was the lowest cancer recorded in females (1.2/100 000) (Table III). Incidence rates in the four districts ranged between 0.8/100 000 and 5.6/100 000 in males and between 0/100 000 and 3.4/100 000 in females, with the highest incidence rates recorded in both sexes in Lusikisiki. Cervical (22.2/100 000) and breast cancers (2.6/100 000) were the second and third commonest cancers reported in females. The highest incidence rate for cervical cancer was reported in Lusikisiki (41.6/100 000), while for breast cancer the highest rates were recorded in Centane (4.0/100 000) and Lusikisiki (3.2/100 000). The rates for cervical cancer are comparable to rates from the National Cancer Registry of South Africa reports for 1990 - 1991 (ASIR 35.4/100 000), 5 1992 (ASIR 30.5/100 000), 7 1993 - 1995 (ASIR 31.2/100 000) 19 and those published in 1993 for the Transkei (ASIR 17.5/100 000).19 Very low incidence rates for other cancers including prostate, stomach, lung, etc. were reported in both sexes in the four districts.

When considering the cancer incidence trends in the four districts during the past 15 years, changes in the estimated population profiles have to be taken into account. In Centane, the population did not change much during the period 1981 - 1995 and remained remarkably constant for both males and females. A similar trend was noticed in Butterworth, except that the male and female populations almost doubled during the 1991 - 1995 period compared with the 1985 - 1990 period.11 In the two north-eastern districts of Bizana and Lusikisiki, the population of both males and females has increased steadily over the past 15 years.10, 11 The ASIR data using the African standard were used for comparative purposes to evaluate the trends for breast, cervical and liver cancer during the past 15 years (Figs 1 and 2), and the OC cancer pattern over the past 40 years (Fig. 3). There was a remarkable increase in the incidence of breast cancer in Centane and Lusikisiki (Fig. 1a), while the incidence of cervical cancer tended to decrease in Butterworth and remained consistently high in Lusikisiki (Fig. 1b). The incidence of liver cancer has increased markedly in Lusikisiki in both males (Fig. 2a) and females (Fig. 2b), while it remained low in the other districts. In Butterworth and Centane very low incidence rates for liver cancer were recorded among females during the past 15 years.

The incidence pattern of OC in Centane has remained the same for the past 40 years, and the ASIRs for both males and females in this district were the highest of the four selected districts (Fig. 3). In Butterworth, the incidence rates for both

### Table II. Annual age-standardised incidence rates (ASIRs) for oesophageal cancer in four districts of the Transkei during 1991-1995*

<table>
<thead>
<tr>
<th>District</th>
<th>Reported cases (1991-1995)</th>
<th>Estimated population†</th>
<th>ASIR/100 000‡</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>Bizana</td>
<td>150</td>
<td>77</td>
<td>218</td>
</tr>
<tr>
<td>Lusikisiki</td>
<td>340</td>
<td>95</td>
<td>360</td>
</tr>
<tr>
<td>Butterworth</td>
<td>142</td>
<td>68</td>
<td>696</td>
</tr>
<tr>
<td>Centane</td>
<td>282</td>
<td>36</td>
<td>054</td>
</tr>
<tr>
<td>Overall mean</td>
<td>76.6</td>
<td>36.5</td>
<td>(44.9)</td>
</tr>
</tbody>
</table>

*Values in parentheses represent ASIRs calculated using the African standard.
†Mean estimated population from 1991 to 1995 (see Materials and methods section).
‡Values were calculated using the estimated population for each year.
M = male; F = female.

### Table III. Mean age-standardised incidence rates (ASIRs) for liver, cervical and breast cancers in four districts of the Transkei during 1991-1995

<table>
<thead>
<tr>
<th>District</th>
<th>Liver</th>
<th>Cervical</th>
<th>Breast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASIR/100 000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bizana</td>
<td>0.8</td>
<td>1.2</td>
<td>17.6</td>
</tr>
<tr>
<td></td>
<td>(0.4)</td>
<td>(0.8)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>Lusikisiki</td>
<td>5.6</td>
<td>3.4</td>
<td>41.6</td>
</tr>
<tr>
<td></td>
<td>(4.0)</td>
<td>(2.6)</td>
<td>(28.0)</td>
</tr>
<tr>
<td>Butterworth</td>
<td>0.4</td>
<td>0.0</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>(0.8)</td>
<td>(0.0)</td>
<td>(7.4)</td>
</tr>
<tr>
<td>Centane</td>
<td>1.8</td>
<td>0.0</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td>(0.8)</td>
<td>(0.0)</td>
<td>(12.6)</td>
</tr>
<tr>
<td>Mean</td>
<td>2.2</td>
<td>1.2</td>
<td>22.2</td>
</tr>
<tr>
<td></td>
<td>(1.5)</td>
<td>(0.9)</td>
<td>(15.0)</td>
</tr>
</tbody>
</table>

*Values in parentheses represent ASIRs calculated using the African standard.
M = male; F = female.
males and females are progressively decreasing when compared with the early reports published for 1955 - 1959 and 1965 - 1969, but have tended to stabilise over the last 15 years. In contrast, the incidence rates of OC in both males and females in Bizana and Lusikisiki have increased progressively. In Bizana and Lusikisiki the ASIR for males increased to similar levels reported in Butterworth and Centane during the period 1985 - 1990. In females the ASIRs markedly increased in Lusikisiki and Bizana and closely mimic the rates in Centane, over the past 10 years.

Data on the cancer incidence patterns between 1996 and 2000 have recently been compiled and show similar trends with regard to OC in Centane for males and females. The altered OC patterns, reflected by an increase in Bizana and Lusikisiki and a decrease in Butterworth in both males and females, were confirmed. Cervical cancer is still the highest in Lusikisiki, while comparable rates were noted in the other districts. In contrast, the highest rates of breast cancer were reported in Butterworth, while rates were markedly decreased in Centane and Lusikisiki. No change was observed in Bizana. The high incidence rates of liver cancer in males and females in Lusikisiki during the 1991 - 1995 period were not confirmed as they were similar to those recorded in the other districts. However the absence of liver cancer among females in Butterworth and Centane was confirmed.

Cancer incidence patterns in the Transkei have common features with those of other African countries. The most common cancers in males were OC and liver cancer, and in females OC and cervical cancer predominated while breast cancer was increased. These rates are comparable to rates for the African population in Harare, Zimbabwe. However, when using the world standard in males, both OC and liver cancers had high incidence rates (30.4/100 000 and 34.6/100 000, respectively), as did cervical and breast cancers in females (67.0/100 000, 10.8/100 000, respectively). In another study in South Africa, the OC incidence rate among black goldminers almost doubled from 8.0/100 000 (1980 - 1989) to 14.8/100 000 (1990 - 1994 period). Conversely, the National Cancer Registry of South Africa, which conducts a histopathology-based cancer registry, reflects decreasing incidence rates of OC...
Many speculative hypotheses can be developed including economic, social, cultural or traditional practices. Scientists, clinicians, nutritionists and anthropologists are greatly challenged to find reasons for the changing patterns of the disease in the four districts. Further development of this limited population-based cancer registry is imperative to include all new cancer cases for each district. This will greatly improve our knowledge of unbiased estimates of cancer incidence and survival while important aetiological and epidemiological studies can be conducted in this region.

We thank Ms N A Makaula for her contribution. We are indebted to all medical superintendents and nurses in all hospitals and referral hospitals in the Transkei region who participated in this study for their valued contribution and support towards cancer data collection. The Medical Research Council (MRC) and Cancer Association of South Africa (Cansa)/MRC Oesophageal Cancer Research Consortium financially support this cancer registry.

References