

5 July 2011

INFORMATION PAPER ON PROSTATE CANCER

What you need to know

Prostate cancer is the third most common cancer among Singapore males between 2003-2007, having risen from the 5th position in the previous 5-year period. The incidence has been steadily increasing over the last 40 years and is especially high among Chinese males.

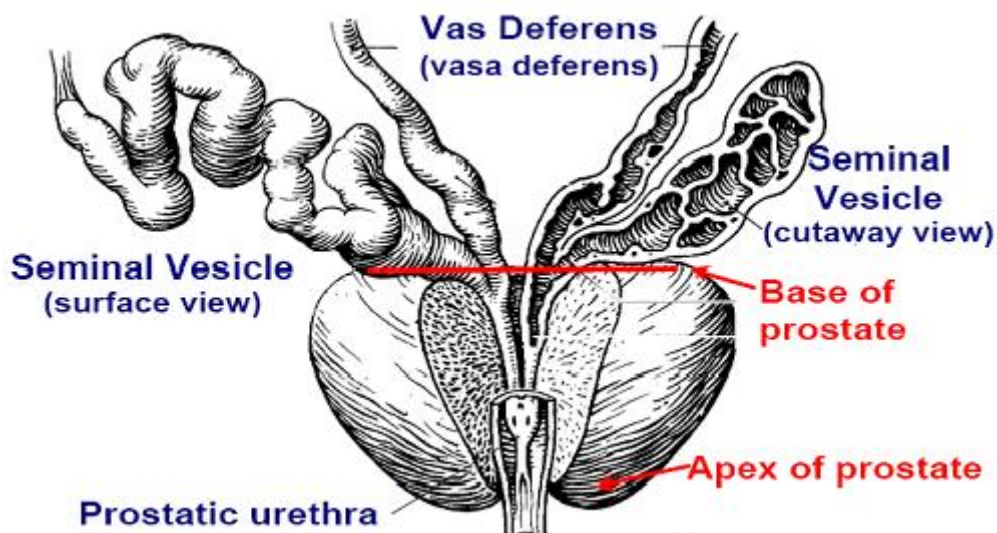
OBJECTIVES

This paper provides an overview of the trends of prostate cancer in Singapore, its associated risk factors and screening for prostate cancer.

INTRODUCTION

The prostate sits above the base of the penis below the urinary bladder and backs onto the front wall of the rectum. The main function of the prostate is to secrete fluid that nourishes and protects sperm. Figure 1 shows the anatomy of the prostate.

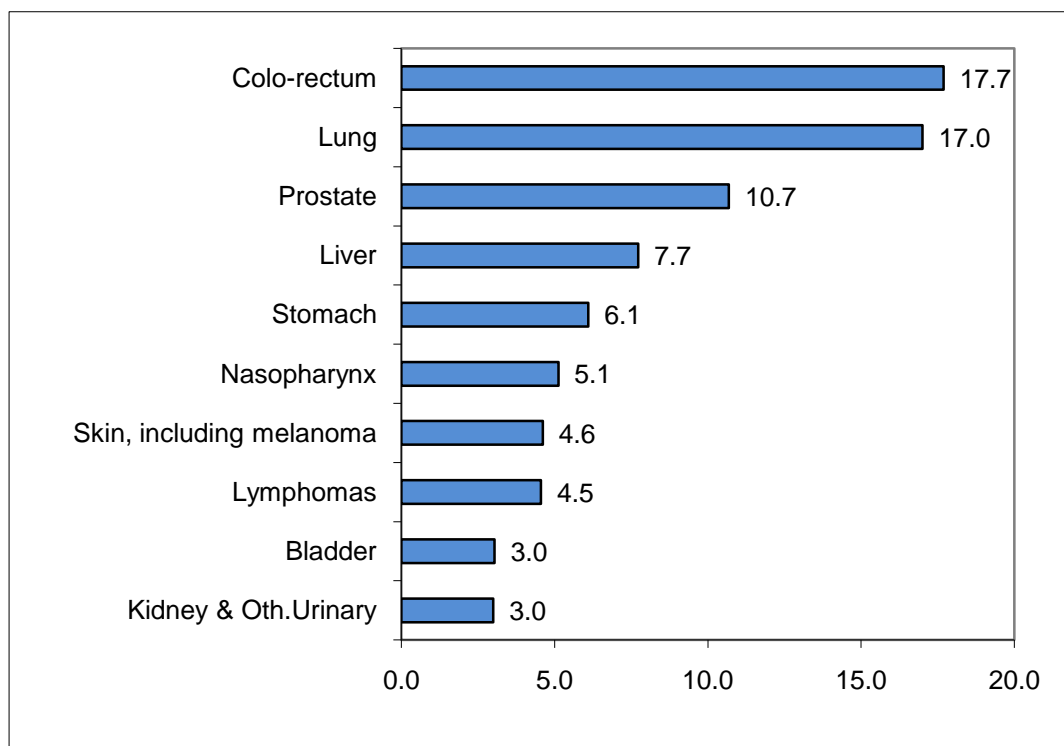
Figure 1: Anatomy of the Prostate¹



¹ A. Fritz and Associates, LLC

Epidemiological data from the Singapore Cancer Registry for the period 2004 to 2008 showed that prostate cancer was the third most common cancer in males (10.7%) after colorectal and lung cancers (Chart 1).

Chart 1: Ten Most Frequent Cancers (%) in Males, 2004 – 2008



Chinese males have the highest incidence of prostate cancer followed by Malays and Indians (Table 1).

Table 1: Crude and Age-Standardised Incidence Rates for Prostate Cancer by Ethnic Group, 2004 – 2008

Ethnicity	CR*	ASR**
Chinese	28.6 (27.3-29.9)	25.5 (24.3-26.6)
Malay	14.2 (12.1-16.4)	17.9 (15.2-20.7)
Indian	15.6 (12.8-18.5)	15.9 (12.9-18.9)
Overall	25.4 (24.3-26.5)	24.1 (23.1-25.1)

* CR Crude rate per 100,000 per year

**ASR: Age-standardised rate per 100,000 per year

Prostate cancer primarily afflicts older men. The incidence of prostate cancer increases substantially with age above 50 years (Table 2).

Table 2: Age-Specific Rates for Prostate Cancer, 2004-2008

Age Group	Incidence Rate
35-39	0.27
40-44	0.50
45-49	2.55
50-54	11.90
55-59	47.89
60-64	118.96
65-69	196.30
70-74	286.04
75-79	336.51
80+	361.88

Based on cancer registry data for the period 2004-2008, the lifetime risk for prostate cancer was estimated to be 2.7%². This means that Singapore men have a 1 in 37 chance of developing prostate cancer in their lifetime.

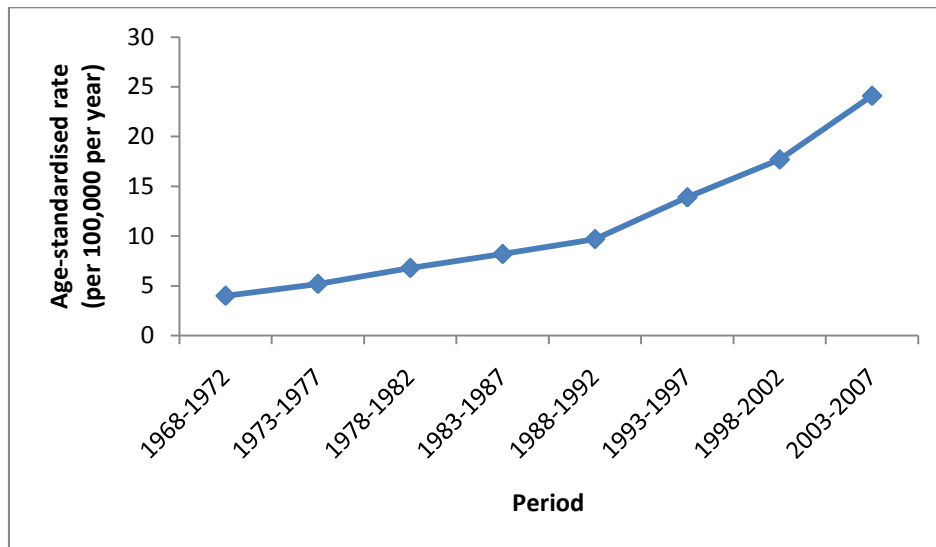
TRENDS OF PROSTATE CANCER IN SINGAPORE, 1968-2007

Prostate cancer has risen from being the fifth most common cancer in the period 1998-2002 to being the third most common cancer in the period 2003-2007 in males.

The number of newly diagnosed prostate cancer cases (incidence) has increased from 94 cases in the period 1968-1972 to 2188 cases in the period 2003-2007. The age-standardised incidence rates have increased from 4.0 to 24.1 per 100,000 per year in males during the same periods (Chart 1).

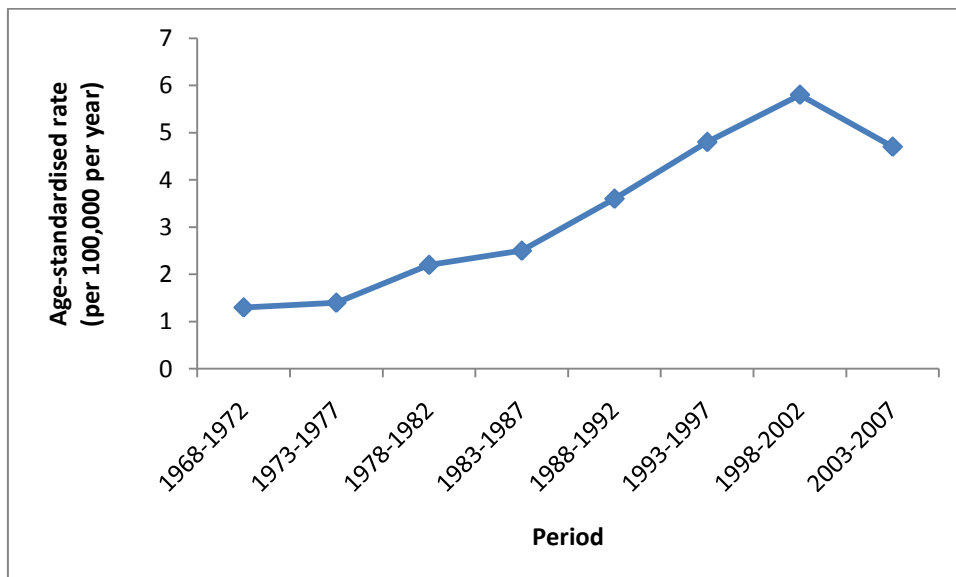
² Using competing risk methodology in Devcan. National Cancer Institute, US. [accessed 15/11/2010]; Available from: <http://surveillance.cancer.gov/devcan/download.html>

**Chart 1: Age-Standardised Incidence Rates for Prostate Cancer
(per 100,000 per year), 1968-2007**



The age-standardised mortality rates for prostate cancer in males have increased from 1.3 per 100,000 per year to 4.7 per 100,000 per year from the period 1968-1972 to the period 2003–2007 with a dip in the most recent period (Chart 2).

**Chart 2: Age-Standardised Mortality Rates for Prostate Cancer
(per 100,000 per year), 1968-2007**

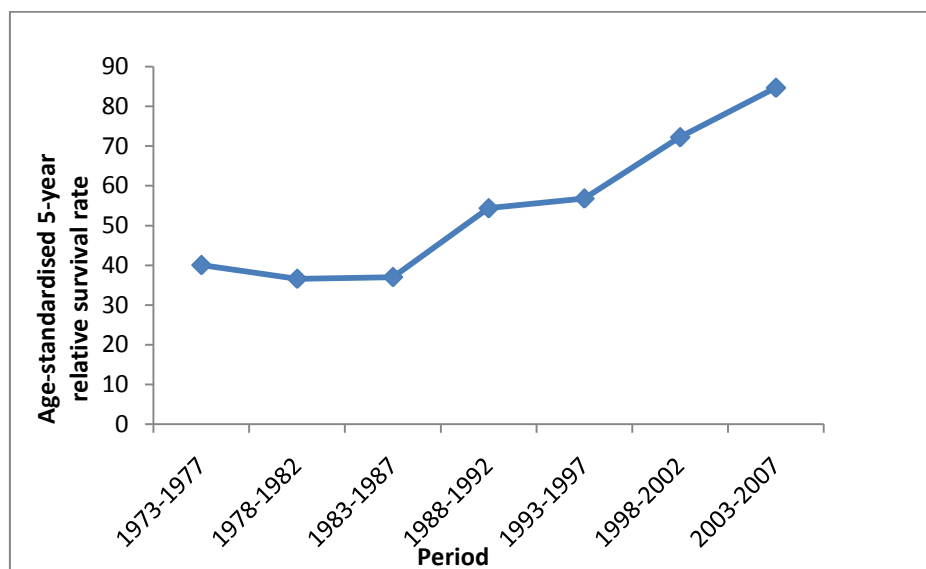


At the same time, the age-standardised 5-year survival rate³ for prostate cancer has increased from 40.0% in 1973-1977 to 84.7% in 2003-2007

³ Relative survival rates, computed using period approach

among males (Chart 3). This metric reflects both advances in treatment and early detection through screening over the years.

Chart 3: Age-Standardised 5-year Survival Rates for Prostate Cancer, 1973-2007



The improvement in prostate cancer survival has to be interpreted alongside its trends in incidence and mortality. For instance, this improvement could be attributed to the increased detection (ie. incidence) of non-fatal cases through prostate-specific antigen (PSA) screening. However, since mortality has also been increasing in the history of the cancer registry, this suggests that there had been a true increase in population risk of prostate cancer. Fortunately, there has been a downward trend in mortality in the recent 2003-2007 period.

The rapid rise in prostate cancer incidence in the 90s can be partly attributed to the advent of the PSA test. The rates of prostate cancer overdiagnosis due to PSA testing for cases diagnosed in the US between 1988 and 1998 were estimated by a simulation model⁴.

Overdiagnosis in the study was defined as the detection of prostate cancer through PSA testing that otherwise would not have been diagnosed within the patient's lifetime. Overdiagnosis rates were found to be approximately 29% for white men and 44% for black men.

For the period 2004 to 2008 there were about 2481 newly diagnosed cases of prostate cancers and about 502 cases of deaths related to prostate cancer.

⁴ Etzioni R, Penson DF, Legler JM et al. (2002) Overdiagnosis due to prostate-specific antigen screening: Lessons from US Prostate Cancer Incidence Trends. *JNCI* 94(13): 981-990.

RISK FACTORS OF PROSTATE CANCER

Data from twin studies suggest that 30-40% of prostate cancer risk can be explained by genetic factors⁵.

In Singapore, Chinese males have a significantly higher risk of prostate cancer incidence compared to Malay or Indian males.

Presently, age, ethnicity and family history are the only established risk factors for prostate cancer⁴. As a result, no intervention strategy exists that could predictably reduce the incidence of prostate cancer.

PROSTATE CANCER SCREENING

Prostate cancers range from slow growing to aggressive type cancers. The former is more common and may not cause any symptoms or shortening of life span. There are two initial tests for the detection of prostate cancer. One is the digital rectal exam (DRE), where the physician inserts a gloved finger into the rectum to feel the prostate for abnormalities known as nodules. The other is the PSA test, where a blood sample is taken to detect a substance that is naturally produced by the prostate gland to help liquefy semen. If the DRE and PSA tests are abnormal, further tests such as biopsies should be done.

Currently, as there is no evidence supporting the improvement of disease-free prostate cancer survival by screening, population-based screening in Singapore is not being implemented⁶. Additionally, the PSA test has a high false positive rate, which means that a substantial number of men who don't actually have prostate cancer end up with an abnormal PSA test reading.

⁵ Textbook of Cancer Epidemiology, Second Edition. Hans-Olov Adami, David Hunter, Dimitrios Trichopoulos (eds).

⁶ MOH Clinical Practice Guidelines on Health Screening 2010