## **Cervical Cancer Epidemiology and Screening Behaviour in Singapore**

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### Introduction

Cervical cancer is mainly caused by persistent infection with the human papillomavirus (HPV), specifically HPV types 16 and 18 which account for 70 per cent of all cases<sup>1</sup>. Other risk factors include infection with the human immunodeficiency virus, a weakened immune system, early age of sexual activity, multiple lifetime sexual partners, history of sexually-transmitted infections, long-term use of oral contraceptives, and tobacco smoking.

The risk of cervical cancer can be reduced by addressing these risk factors. In addition, regular cervical cancer screening in women can facilitate the detection of precancerous lesions and early-stage cancer for prompt treatment to achieve good health outcomes.

In 2004, the Health Promotion Board (HPB) launched the Cervical Screen Singapore (CSS), a national cervical cancer screening programme. This programme invites women aged 25-69 years, who had ever had sex, to undergo cervical cancer screening once every three years. Eligible women receive subsidised Papanicolaou (Pap) tests<sup>2</sup> at polyclinics. It also encourages women to go for Pap smear screening at private clinics through educational campaigns aimed at increasing awareness of cervical cancer screening and the importance of follow-up. This article presents the epidemiology of cervical cancer based on data up till 2015 from the Singapore Cancer Registry, and highlights how Pap smear screening behaviour among women surveyed in the National Health Surveys has changed over the years.

# Epidemiology of Cervical Cancer in Singapore

Between 2011 and 2015, a total of 1,037 new cases of cervical cancer were diagnosed. From being the 4<sup>th</sup> most common cancer in the 1970s, cervical cancer is now ranked as the 10<sup>th</sup> most common cancer.

Trend analysis of the Age-Standardised Incidence Rates  $(ASIR)^3$  of cervical cancer corroborated this observation. It showed that the rates had declined over the years, with a steeper decline from 1994 to 2011 as compared to the period 1976-1994 (Chart 1).



CHART 1 TREND ANALYSIS<sup>4</sup> OF CERVICAL CANCER ASIR, 1976-2015

<sup>1</sup> There are over 100 different types of HPV, of which at least 13 are cancer causing (high-risk types).

<sup>2</sup> The Papanicolaou test (Pap smear) is a method of cervical screening in which a small brush or spatula is used to gently remove cells from the cervix (opening of the uterus) so that they can be checked under a microscope for cervical cancer or cell changes that may lead to cervical cancer. Abnormal findings are followed up by more sensitive diagnostic procedures, and if indicated, interventions that aim to prevent the progression to cervical cancer. The test was invented by, and named after, the prominent Greek doctor Georgios Papanicolaou.

<sup>3</sup> The ASIR is a weighted average of the age-specific incidence rates. The weights used are from the population distribution of a standard population, in this case, Segi's World Population. Age-standardisation is used to account for the effect of population growth and ageing.

<sup>4</sup> Using Join-Point Regression. This method is used here to determine the number of trend segments needed to adequately explain the relationship between cervical cancer incidence rates and time. Any change in trend detected is indicated by a 'join-point', which connects two different trend segments.

However, there seems to be a reversal of this downward trend in recent years as the ASIR increased (albeit not statistically significantly) from 6.3 per 100,000 person-years in 2011 to 7.7 per 100,000 person-years in 2015.

Given the serious impact of cervical cancer on a woman's well-being, the rates should be continually monitored to see if the change in trend is warranted.

Analysis of the stage distribution of cervical cancer shows that there is a rising proportion of late-stage cancers (Chart 2). The proportion of stage III-IV cancers increased from the period 2006-2010 to the period 2011-2015 across all age groups of women 30 years and above.

In light of this finding, there is a need to improve screening rates among younger women to ensure detection and intervention at the early stages, particularly in the 10 years<sup>5</sup> prior to the progression to late-stage cancer.

The overall survival rates of cervical cancer patients had remained stagnant over the past 40 years. The 5-year Age-Standardised Relative Survival (ASRS)<sup>6</sup> of cervical cancer was 57.5 per cent and 58.7 per cent for 1976-1980 and 2011-2015 respectively.

Although survival for late-stage cervical cancer had improved over the last decade, due likely to advances in treatment modalities and improvement in quality of healthcare, this had not translated to an improvement in overall survival due to the significant number of cancers diagnosed in the later stages.

Again, this highlights the importance of screening to effect a shift in the stage distribution towards early-stage cancer and consequently improve the survival of cervical cancer patients.

CHART 2 STAGE DISTRIBUTION OF CERVICAL CANCER BY AGE GROUP AND TWO 5-YEAR PERIODS, 2006-2010 and 2011-2015



5 It usually takes 10-15 years for precancerous cells in the cervix to develop into invasive cancer cells (www.arhp.org/Publications-and-Resources/Patient-Resources/Fact-Sheets/cervical-cancer).

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#### CHART 3 KNOWLEDGE OF THE PAP SMEAR TEST AND SCREENING BEHAVIOUR, 2001-2013



# Trends in Pap Smear Screening Coverage, Knowledge and Attitudes

Based on results from the National Health Surveys<sup>7</sup>, Pap smear screening rates improved between 2001 and 2007, but fell in recent years (Chart 3).

In 2013, close to 2 in 3 (64.8%) women aged 25-69 years reported that they had ever gone for a Pap smear test. However, only 1 in 2 women (48.7%) had been screened within the past three years, the recommended screening interval.

In addition, the proportion of women with knowledge of the Pap smear test increased sharply from 69.3% in 2001 to 91.5% in 2013. Despite the improvement in awareness, a corresponding increase in Pap smear screening rates was not observed.

Over the years, the most commonly cited reasons by women who had never gone for a Pap smear test were: "Never heard about it", "Not at risk", "Not necessary as I am healthy" and "Too young". On the other hand, reasons such as "Advised by doctor" and "Routine" were most commonly cited by women who had ever gone for a Pap smear test.

These findings suggest that many still lack proper understanding of cervical cancer and its risk factors.

### Conclusion

As cervical cancer is a screen-detectable and thus highly-preventable cancer among women, it is important to not only understand the epidemiology of cervical cancer in Singapore but also the behaviour and attitudes of women toward screening.

The findings presented in this article suggest that more can be done to improve the screening rate of cervical cancer, especially among younger women, by raising awareness of its associated risk factors.

To further encourage screening uptake and follow-up amongst Singaporean women, the Ministry of Health (MOH) recently enhanced the subsidies for HPB's Screen for Life programme. This programme offers screening for cervical cancer, in addition to colorectal cancer and cardiovascular risk factors (diabetes, hypertension and hyperlipidaemia).

From 1 September 2017, eligible Singaporeans pay no more than \$5 for screening and the first post-screening consultation.

For more information on the Screen for Life programme, please visit: www.healthhub.sg/programmes/61/Screen for Life

7 National Health Surveillance Survey (NHSS) 2001, 2007 & 2013 and National Health Survey (NHS) 2004 & 2010 conducted by the Ministry of Health.