Rising incidence of breast cancer in Brunei Darussalam

Vui Heng CHONG [1], Pemasari Upali TELISINGHE [2]
[1] Department of Medicine, and [2] Department of Pathology,
RIPAS Hospital, Bandar Seri Begawan, Brunei Darussalam

ABSTRACT

Introduction: Breast cancer is one of the most common cancers in women and the incidence rates are reported to be increasing. This study looks at breast cancer in Brunei Darussalam in particular the incidence rates, the demographic and types of breast cancers over a 27-year-period (1984 to 2010). **Materials and Methods:** The Cancer Registry maintained by the State Department of Pathology was retrospectively reviewed. Over this period there were a total of 874 cases of breast cancer diagnosed, nine of which were men (1.1%) and these were excluded from analysis. The crude incidence rates, Age Standardised Rates (ASR) and the age specific incidence rates were calculated based on population projections. Age was unavailable from 1984 and 1985 and these two years were excluded from ASR analyses. **Results:** The mean age at diagnosis was 48.7 ± 11.7 years old. The ethnic distribution showed predominantly Malays (69.1%) followed by Chinese (20.1), 'Others' (9.1%) and Indigenous group (1.5%). The types of cancers were predominantly ductal (84.9%), followed by lobular (5.5%), Malignant Phyllodes tumour (4.4%), 'Others' (4.6%) and papillary (0.7%). Breast accounted for 17.6 to 26.6% of all female cancers from 2001 to 2010. 22.3% of breast cancers occurred in the young patient group (less than 40 years old). The crude rates increased from 11.0 per 100,000 women (1984-1986) to 40.7 per 100,000 women (2008-2010) and the ASR increased from 14.7 per 100,000 (1987-1989) to 43.9 per 100,000 women (2008-2010). The ASR for the Chinese increased markedly from 1992-1995 peaking in 2002-2004 followed by a declining trend whereas the trend is increasing in the Malays. **Conclusions**: Our study showed that the overall incidence of breast cancers in Brunei Darussalam is increasing. Chinese had higher incidence rates than the Malays. The age adjusted incidence rate is approaching the rates reported by the more developed Southeast Asian nations. Importantly, young breast cancer accounts for a fifth of the patients.

Keywords: Age adjusted incidence, breast carcinoma, incidence, trends

INTRODUCTION

Breast cancer is the top most common cancer in women especially in the developed Western nations. [1, 2] Worldwide, breast cancer accounts for 22.9% of all cancers (excluding non-melanoma skin cancers) in women and accounted for 13.7% (458,503) of cancer related deaths in women in 2008. [3] The incidence of breast cancer are reported to be increasing including in some of the developing nations and this has been attributed to the increase in life expectancy, increased urbani–

Correspondence author: Vui Heng CHONG
Department of Medicine, RIPAS Hospital,
Bandar Seri Begawan BA 1710, Brunei Darussalam
Tel: +673 2242424 Ext 5231
E mail: chongvuih@yahoo.co.uk

sation and adoption of western lifestyles. [2] Such changes are often associated with delayed first pregnancy, fewer pregnancies, shorter breast feeding practices, smoking, alcohol, obesity and sedentary life style. Such situations are also true in the East, including the Southeast Asian region where the rates have been reported to be highest in the Asian region. [4-9] The rates get progressively lower along a south-to-north gradient with a four-fold variation. [9] However, there are differences between the East and the West. In the East, the age of diagnosis is typically one decade younger and the proportion of young cancers (less than 40 years old) accounts for 10 to 25% compared to the sixth decade and less than 7% in the West. [10] The mortality rates associated with breast cancers are higher in Asian countries compared to the West. This is also true in Brunei Darussalam where breast cancer is the most common cancer among women. To date, there is no published data available on breast cancer incidence in Brunei Darussalam. The study assesses the incidence of breast cancer over a 27-year period (1984 to 2010) and also looks at the differences between demography and tumour types.

MATERIALS AND METHODS

The Cancer Registry that is maintained by the State Department of Pathology, RIPAS Hospital was retrospectively reviewed for this study. This registry only captures histologically proven breast cancers. This registry has been prospectively maintained since 1984 and the data captured include age, gender, ethnicity and types of breast cancer.

From 1984 to 1985, only the total numbers of breast cancer, gender and tumour types were recorded. Age was not available for these two years. From 1986 to 2010 the patients' complete details captured by the registry were available.

We also collected the annual total numbers of cancer cases in women to calculate the proportion of breast cancer compared to the overall cancers in women from 2001 to 2010.

For the calculation of the annual crude and age adjusted rates, the population estimations and age group breakdowns available from the Ministry of Health National Health Fact booklets were used. [11] Age Standardised Rates (ASR) calculations were done using the standard method referring to the World population. The ASR and the age adjusted incidence rate for the Malays and Chinese were also calculated. The overall data from 1984 to 2010 was used to calculate the crude rates. For the age adjusted rates, the data from 1987 to 2010 was used. These were calculated in three year blocks. For the calculation of the age specific incidence rates for the Malays and Chinese, we used the age breakdown of 2005. [11] The age groups were divided into five years groups (0-4, 5-9, 10-14, 15-19, 20-24, 24-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69 and ≥70 years old).

Over a 27 year period (1984 to 2010) there were a total of 874 cases of breast cancer diagnosed, nine of which were men (1.1%) and these were excluded from analysis.

The data collected was entered in the Microsoft WordExcel programme and later

transferred to the Statistical Program for Social Sciences (SPSS, Version 10.0. Chicago, Il, USA) for analyses. We assessed the annual crude incidence rate, the annual age adjusted incidence rates, the age adjusted incidence rates for the Malays and Chinese which were presented as a graph. We also compared the mean age of diagnosis between the years, ethnic groups and the tumour types. The Analysis of Variance (ANOVA) was used to compare the continuous variables while the Chi Square test was used to compare the categorical variables where appropriate. Continuous variables are presented in mean and standard deviation and the categorical variables in absolute number and percentages. Statistical significance was taken when the *p* value is less than 0.05.

RESULTS

The demographics of the patients are shown in Table 1. Among the different ethnic groups, the Malays accounted for the most followed by the Chinese. Among the 'Others' group; the breakdown consisted of Filipino (n=16), Caucasians (n=12), Indonesians (n=12), Indians (n=8) and one Japanese. The mean age at diagnosis was 48.9 ± 11.5 year old and appears to be an increasing trend but non-significant trend (Figure 1). The mean proportion of patients under the age of 40 years

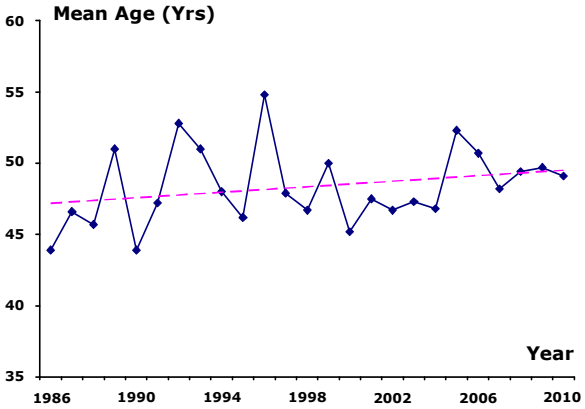

Fig. 1: The mean age of diagnosis indicated by continuous blue line and the trend shown in pink.

Table 1: Patient demographics and the types of cancers over the study period (1986 to 2010) (n=838).

Variables	**n (%)**
Age groups	
<20 year old	4 (0.5)
20-29	22 (2.6)
30-39	143 (17.1)
40-49	324 (38.7)
50-59	210 (25.1)
60-69	88 (10.5)
>70	47 (5.6)
Ethnicity	
Malay	580 (69.2)
Chinese	166 (19.8)
Indigenous	13 (1.6)
Others	79 (9.4)
Tumour types *	
Ductal	699 (84.1)
Lobular	51 (6.1)
Malignant phyllodes tumour	33 (4.0)
Others	43 (5.1)
Papillary	5 (0.6)

* missing data in 7 patients

Table 2: Comparison between the ethnic groups in the age groups.

	Malays	Chinese	Indigenous	'Other'	*P* value
<40 years old	123 (21.2)	21 (12.7)	5 (38.5)	20 (25.3)	0.017
≥ 40 years old	457 (78.8)	145 (87.3)	8 (61.5)	59 (74.7)	for trend

Data presented as absolute number and percentage (parenthesis).

over the period was 22.3%.

The most common tumour type was the ductal type followed by lobular type (Table 1). Among the 'Others' group, this consisted of mucinous type (n=14), tubular (n=8), medullary (n=10), lymphomatous (n=4), Paget's (n=2), squamous cell (n=1), basal cell (n=1), tubulo-lobular (n=1), malignant fibrous histiocytoma (n=1) and primary angiosarcoma (n=1).

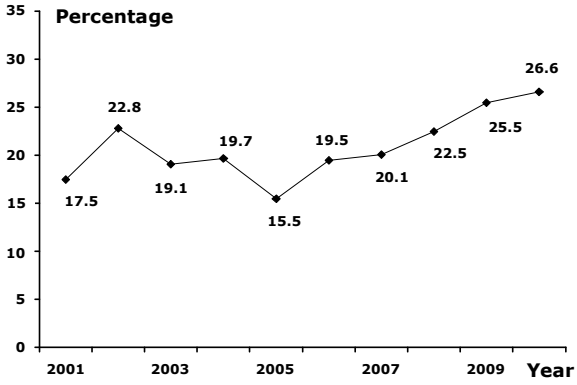

Fig. 2: Proportion of breast cancer among all cancer in women between 2001 to 2010.

The proportion of breast cancer among overall cancers in women increased from 17.5% (2001) to 26.6% (2010) (Figure 2).

The Chinese (50.1 ± 11.2 years old) were older than the Malays (48.7 ± 12.0 years old), the indigenous group (46.7 ± 10.4 years old) and the 'Others' (45.5 ± 9.3 years old), but the difference was only significant between the Chinese and the 'Other' (p= 0.020) group. There were significantly fewer Chinese diagnosed with breast cancers at a younger age compared to the Malays, Indigenous and 'Other' (Table 2) (p=0.017 for trend).

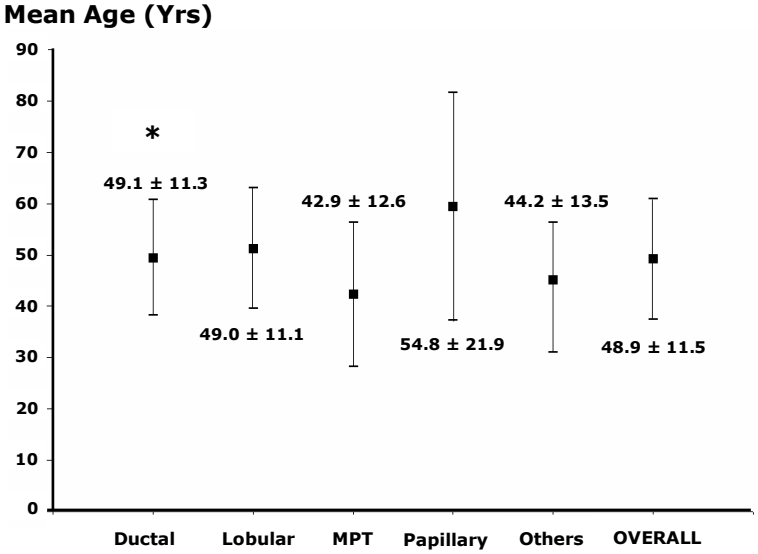

Fig. 3: The mean age of diagnosis of the various tumours types.
MPT: Malignant Phyllodes Tumour
*** p<0.05**

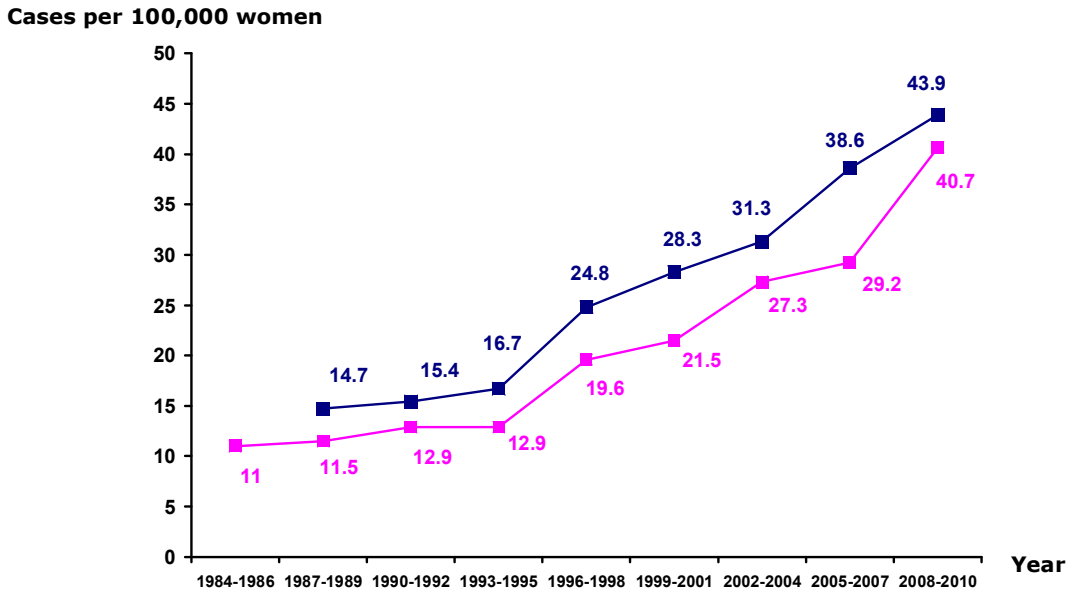

Fig. 4: The crude incidence rates (Pink) and the Age Standardised Rates (ASR) (Blue).

Between the tumour types, patients with Malignant Phyllodes tumour were much younger compared to the other groups. This was significant when compared to the ductal type (Figure 3) ($p<0.05$).

The annual crude rates increased from 11.0 per 100,000 women (1984-1986) to 40.7 per 100,000 women (2008-2010) and ASR increased from 14.7 per 100,000 (1987-1989) to 43.9 per 100,000 women (2008-2010) (Figure 4). (*Refer to supplementary text for the rates of individual years*).

Between the two main ethnic groups, the Chinese had higher ASR compared to the Malays for most of the years except for two periods (1987-1989 and 1993-1995) (Figure 5). Overall, the trends show an increase for the Chinese from 1993-95, peaking in 2002–

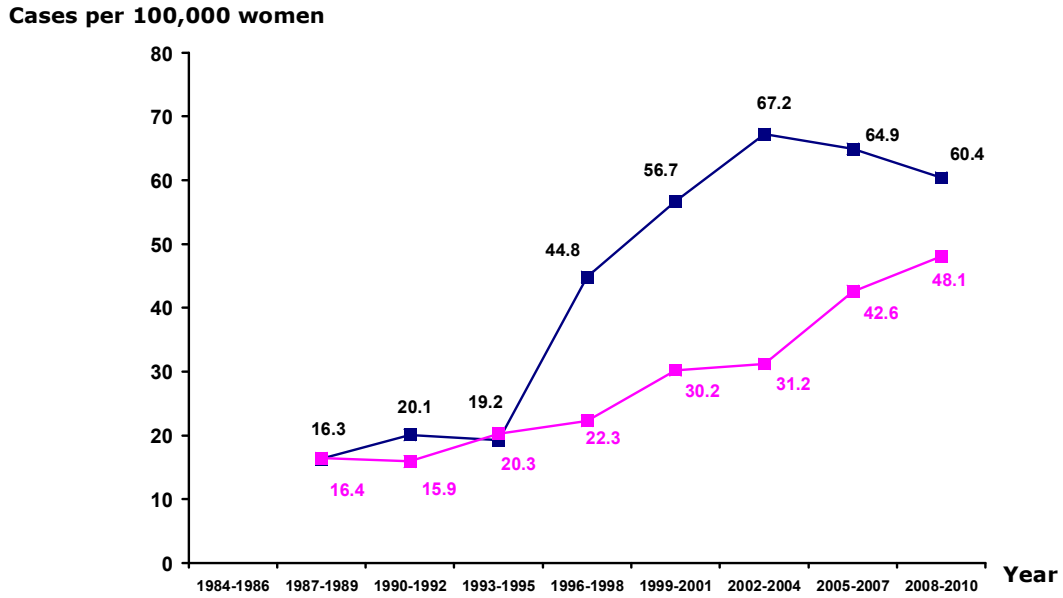

Fig. 5: The Age Standardised Rates (ASR) for Malays (Pink) and Chinese (Blue).

2004 and then declining slightly. For the Malays, the trends show steady increase.

The age specific rates are shown in Figure 6. This showed that the Chinese had higher rates in the 40 to 64 year old group.

DISCUSSION

Our study showed that overall incidence rate for breast cancers in Brunei Darussalam has increased over the last 27 years. The crude incidence rates increased from 11.0 per 100,000 women to 40.7 per 100,000 women, almost a fourfold increase. The increase was most marked in the last ten years and among the Malay population. After adjusting for the world population, our age standardized incidence rate increased from 28.3 (1999-2001) to 43.9 per 100,000 women (2008-2010). If we look at the annual rates, there are wide fluctuations (*Refer to Supplementary text*) and this is likely to be due to the overall small population of Brunei Darussalam. Our overall age adjusted rate is comparable to the rates reported from Malaysia (46.2 per 100,000 women) and lower than the rate reported from Singapore (57.1 per 100,000 women). [7, 8] However, these rates were reported several years ago, 2002 to 2006 for Singapore and 2003 for Malaysia. Therefore, more recent rates are likely to be higher. The differences observed are likely to be related to the stage of development of these three countries. Generally, our rates and those reported in the Asian regions are still much lower than the rates reported by developed Western nations where the annual adjusted incidences rates are approaching or over hundred cases per 100,000 women. [1] (*Refer to Supplementary text*).

Among the different ethnic groups, our Chinese population had higher rates than the Malays throughout the study period. This finding is similar to those reported in Singapore and Malaysia where the major ethnic groupings are similar. In Singapore, the age adjusted rates for Chinese was 58.7 per 100,000 and the Malays 52.4 per 100,000. [7] In Malaysia, the reported rates were 59.7 per

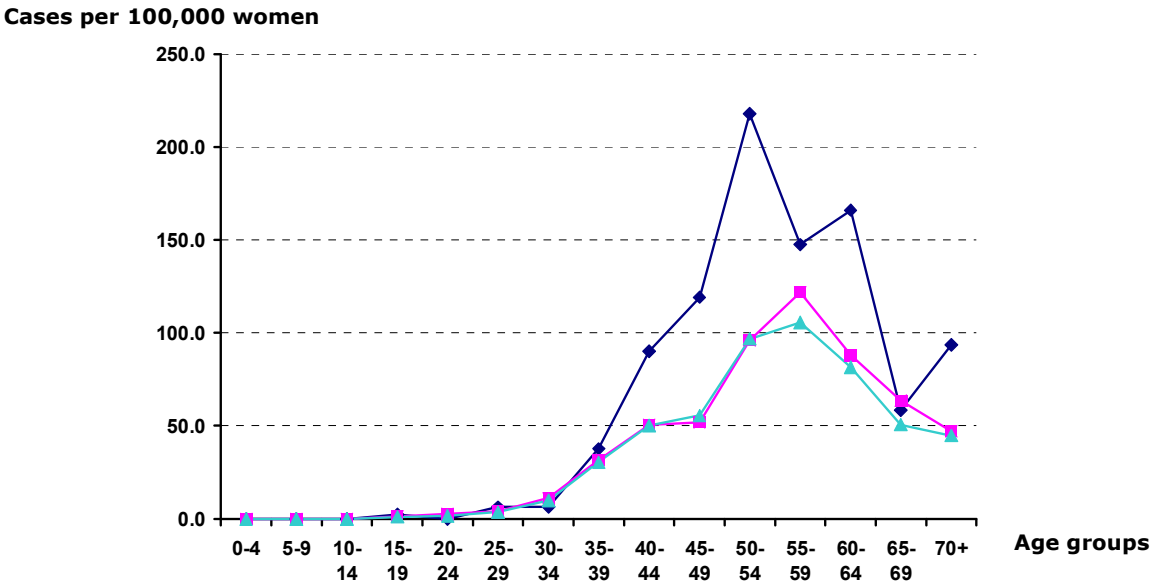

Fig. 6: The Age Specific Incidence Rates for Overall (Light blue), Malays (Pink) and Chinese (Dark blue).

100,000 for the Chinese and 33.9 per 100,000 for the Malays. [8] Possible explanations for slightly higher rates among our Chinese compared to Singapore and Malaysia could be due to better catchment of data as our population is small and healthcare for breast cancers is more centralised. Alternatively, our Chinese population may have higher risk. The trends showed a rapid increase among our Chinese population and seems to have peaked in the later period (2002-2004). In contrast, the trends for the Malay population is still showing a steady increase. Given the rate of increase, it is very likely that the rates for the Malays may approach the rates for the Chinese in decade's time.

Differences in rates for the different ethnic groups are well known and widely reported. In Singapore and Malaysia, compared to the Chinese and Malays, the Indians have the lowest rates. In the United States of America the rate is highest among Caucasians (123.5 per 100,000) followed by the African Americans (113 per 100,000), American Indians (91.7 per 100,000), Hispanics (90.2 per 100,000) and lowest among American Asian/ Pacific Islanders (81.6 per 100,000). Even among Caucasian populations in Europe, the rates vary from country to country and even within countries. Studies showing increases in the incidence among migrants such Asian and Japanese to United States confirmed the importance of lifestyle changes. [2, 12, 13]

Explanations for the high rates among our Chinese and the increasing trend seen in our Malay population are probably similar to what has been reported in other countries. Chinese are known to have higher rates even in gastrointestinal disorders and this could be associated with economic, social and genetic reasons. The economic and social developments in Brunei Darussalam have been steady and progressing. This ultimately leads to changes that come with these developments. Change in life style, later age at first birth, not having children or fewer pregnancies, breast feeding practices, increase in smoking, dietary changes with resultant overweight, sedentary lifestyles and increasing social standings are all contributing factors. It is common for people to start a family later and family size is now smaller. The birth rate is Brunei has been decreasing in the last decade. [11] The obesity rate is also increasing. [12]

Among the types of breast cancer, the ductal type was the most common accounting for 84.9% followed by the lobular type accounting for 5.5%. This is consistent with what has been reported in the literature. [13] Malignant Phyllodes Tumour was the third most common. Rare breast cancers included a case of malignant fibrous histiocytoma and primary angiosarcoma. Importantly, we are now seeing some cases of early cases of breast cancer (ductal carcinoma in situ-DCIS) and this may be due to better awareness and the existing mammogram screening which is still largely voluntarily. However, more needs to be done to close this gap.

The mean age of diagnosis in Brunei is comparable to other neighbouring countries. There is also a slow increasing trend. Generally, the mean age of diagnosis in developing and underdeveloped countries including the Southeast Asia region is usually a decade earlier compared to the sixth decade in the west. [2, 10] Our Chinese population is

older at diagnosis compared to the Malays but this was statistically non-significant. Between the tumour types, patients with Malignant Phyllodes tumour were younger than the others.

Importantly, 22.3% of breast cancers were diagnosed in the younger group (<40 years old). This is much higher than what has been reported in the Western literature. In the West, breast cancers in the younger group only account for 5% or less. Our rate is comparable to what has been reported in the Asian region. Between 10 to 25% of all breast cancers in the Asian regions are diagnosed in those younger the 35 years old. [10] The rates are higher in the less developed countries. On the other extreme, breast cancers in the elderly (>65 years) only accounted for 8.1% which is much lower than what has been reported.

Like any retrospective studies, there are limitations. Apart from the retrospective nature of our study, the main limitation is the amount of data captured by the registry which only included patient demography and type of cancers. Data on the stage of disease, family history and other risk factors are not available. Such data will be important in order to study the risk factors for cancers in our local setting. Although minor, another limitation is that the registry only captures histological proven breast cancer diagnosed in the country. Patients diagnosed and treated in other countries will be missed. However, this is likely to be very small considering that treatment for breast cancers is well established in Brunei Darussalam and treatment elsewhere is now uncommon. The main strength of our study is that all are tissue proven cases and the registry captures the data for the whole country. Therefore, the data reported is very reliable and very representative for the country.

In conclusion, breast cancer incidence is increasing and this is most marked recently. The incidence had almost doubled merely within the last ten years and this is a major concern. More needs to be done to address this issue. Further studies are required to study the characteristics, risk factors and treatment outcomes. Public education is needed to enhance the general awareness and expansion of targeted mammography screening so that diagnosis can be made at the early stages.

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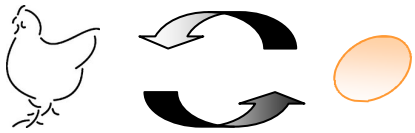
HUMERUS

Mystery solved !! The chicken and the egg situation. Which one comes first?

The Mysteries Investigator

CVH

INTRODUCTION: The situation of the chicken and the egg remains a mystery and continue to baffle many. The aim of the study was to assess which one comes first in our local setting.



MATERIALS and METHODS: A survey was conducted among the multi ethnic health care workers working in RIPAS Hospital.

RESULTS: The results of the survey is tabulated in the table. Our study showed that, whether the chicken or the egg comes first depended on who you speak to.

Chicken first	
English	**Chicken** Egg
Chinese (Mandarin)	**Chee** Tan
Chinese (Hokkien)	**Kui** Ne'ng
Chinese (Hakka)	**Kai** Choon
Hindi	**Murgi** Ki Anda
Tamil	**Muttai** Kozhi
Egg first	
Malay	**Telur** Ayam
Iban	**Telu** Manuk
Dusun	**Puni** Manuk
Tagalog	**Talong** Manuk
Thai	**Khai** Kai

CONCLUSION: This study showed that either the chicken or the egg can come first depending on the language and dialect spoken. However, the situation may not be as clear cut if spoken by someone who is not fluent in the spoken language or dialect.