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Respiratory Disease Among Residents of the Illawarra Health Area

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Respiratory Disease Among Residents of the Illawarra Health Area

Abstract

Deaths and hospitalisations due to respiratory disease -focussing on asthma and chronic obstructive pulmonary disease (COPD) - among people resident in the Illawarra Health Area, and each of its Local Government Areas, are reported in this issue of The Illawarra Population Health Profiler. In addition, population-based survey data relating to asthma prevalence, severity and management among Illawarra adults aged 16 years and over are reported.

Keywords

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Respiratory Disease Among Residents of the Illawarra Health Area □

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Deaths and hospitalisations due to respiratory disease – focussing on asthma and chronic obstructive pulmonary disease (COPD) - among people resident in the Illawarra Health Area, and each of its Local Government Areas, are reported in this issue of *The Illawarra Population Health Profiler*. In addition, population-based **survey** data relating to asthma prevalence, severity and management among Illawarra adults aged 16 years and over are reported.

Methods

Data for this profile were obtained from:

- NSW Health's *NSW Inpatients Statistics Collection* and *NSW Health Surveys*; and
- Australian Bureau of Statistics' *Death Registrations* (from the Registry of Births, Deaths and Marriages) and *Estimated Resident Populations*.

The hospital separation, mortality, and population data were accessed and analysed through NSW Health's *Health Outcomes and Information Statistical Toolkit* (HOIST), using the Statistical Analysis System (SAS, Version 6.12).

The survey data were accessed from NSW Health's on-line NSW Health Survey report.¹

Standardised Separation Ratios (SSR), and **Standardised Mortality Ratios (SMR)**, have been used to compare the study population (e.g. residents of the whole Illawarra Health Area or Kiama Local Government Area), with the total NSW population. The SSRs have been calculated for the two-year period 1997/98 and 1998/99. The SMRs cover the five-year period 1994-1998. A SSR (or SMR) of 1.0 indicates that the rate for the study population equals the NSW rate, after taking

into account differences in age structures of the populations (by indirect age-standardisation). A SSR (or SMR) of 2.0

indicates a rate for the study population double (or 100% higher than), and a SSR (or SMR) of 0.5 indicates a rate half (or 50% lower than), that of the NSW population. Arrows in the tables indicate whether any differences between the study and NSW populations are statistically significant at the 5% level.

'**Excess Separations**' and '**Excess deaths**' represent the number of hospital separations or deaths which occurred above (+) (or below (-)) the numbers expected based on the NSW average. **Age-specific rates** for both males and females are shown to demonstrate which age/sex groups are at highest risk.

In addition, **directly age-standardised rates** for hospitalisations and mortality, by sex and Local Government Area, are reported. These direct standardisations used the 1991 Australian population as the standard. In contrast to the (indirectly age-standardised) SSRs, directly age-standardised rates can be directly compared between each other, e.g. males with females, Kiama with Wollongong Local Government Area (LGA).

Directly age-standardised rates also allow a comparison over time, so **trends** over the last decade are shown. Comparable trend data which have been published for NSW residents are also shown.²

In addition responses about asthma among Illawarra residents aged 16 years and over who responded to the 1997 and 1998 *NSW Health Surveys*¹ are summarised in this report. The *NSW Health Surveys* in 1997 and 1998 included a module of questions which explored the **prevalence, severity and management of asthma**. Prevalence estimates are based on responses from 2,060 Illawarra residents (1,026 in 1997 and 1,034 in 1998), including 209 respondents with current asthma (108 in 1997 and 101 in 1998). These estimates are compared with those for NSW residents (based on 35,025 respondents). Again, any differences between the Illawarra and NSW populations are reported as statistically significant at the 5%

level. In addition, for some asthma indicators, age-specific prevalence rates, for Illawarra males and females, are reported.

Some Data Limitations

Readers should note that hospital separation data do not give an accurate picture of the occurrence of disease nor of the outcome of disease management in the community, for a number of reasons, including that they count episodes rather than individual people, hospitalisation may be indicated when asthma is unstable (not just for severe attacks), and admission and disease coding practices can vary between hospitals and over time.

Importantly, in the Illawarra if a person presents and is admitted to one hospital, but is then transferred to another hospital, two hospital separations may be recorded for the one episode of care. This potential for double-counting in the Illawarra means that hospitalisation rates for Illawarra residents may be artificially inflated (relative to the rest of NSW); this is particularly relevant here for chronic obstructive pulmonary disease (COPD).

The population-based survey data from the *NSW Health Survey* fill the of the information gaps for asthma, in terms of disease prevalence, management and outcome. In addition readers are referred to the *Profiler's Issue on Cardiovascular Disease Mortality, Morbidity and Risk Factors among Residents of the Illawarra Health Area*, which reports survey data related to risk factors for asthma and COPD development and exacerbation, in terms of active and passive exposure to tobacco smoke. (In addition, Issue 4 reports data from the *NSW Midwives Data Collection* about smoking prevalence among women during pregnancy, by Local Government Area, and, for the Wollongong LGA, at the level of smaller geographic areas, based on postcodes and postcode groupings.)

However the *NSW Health Survey* data have their own limitations, including that they are based on self-report, and are limited to adults aged 16 years and over. With the exception of data related to tobacco smoke, the *NSW Health*

Survey also does not collect information related to risk factors for respiratory disease.

Importantly, many of the survey estimates are based on relatively small numbers of respondents. For example, while some indicators reported for Illawarra residents with current asthma (i.e. based on responses from about 200 people) appear to differ considerably from the NSW estimates, small numbers may mean that there is insufficient power to detect a statistically significant difference (if an underlying difference really does exist). Sex and age-specific rates for the various severity and management indicators are based on fewer than 20 responses in some of the age/ sex groups, hence these particular estimates must be considered imprecise. In addition, the numbers of respondents in each LGA are too small to give meaningful LGA-based estimates, so these have not been reported.

Overview

- Respiratory disorders are the third commonest cause of death, and seventh commonest cause of hospitalisation, among Illawarra residents.

Asthma

- In 1997-1998 7.7% of Illawarra males and 11.7% of Illawarra females aged 16 years and over reported having **current asthma** (symptoms of, and/ or taken treatment for, asthma in previous 12 months), and 13.1% of Illawarra males and 18.5% of Illawarra females had ever been diagnosed with asthma.

While these prevalence figures are not significantly different from the NSW averages, the prevalence of 'ever asthma' among Illawarra males was the lowest of the NSW Health Areas.

- In 1997/98-1998/99, asthma accounted for 13% (1,542) of respiratory **hospitalisations** and 0.72% of total hospitalisations. Asthma hospitalisation rates among Illawarra

residents were **35% lower** than the NSW average among males and **26% lower** among females, both significant differences.

This equates to 345 fewer than expected asthma hospitalisations annually among Illawarra residents.

Asthma hospitalisation rates were significantly lower than the NSW average in all Local Government Areas (LGAs) (except for Shellharbour females). Rates were highest among Shoalhaven males and females, followed by Shellharbour males and females.

- In 1994-1998 asthma accounted for 5.2% (53) of respiratory **deaths**, and 0.43% of total deaths. Asthma mortality rates (all ages) in the Illawarra were 31% lower than the NSW average for males (based on 21 deaths) and 28% lower for females (based on 32 deaths); however these differences were not statistically significant.
- Asthma prevalence, hospitalisation rates, and mortality rates are higher among females than males (at least among adults). While mortality rates are highest among the elderly, asthma prevalence and hospitalisation rates are highest in the younger age groups.
- Over the previous decade asthma **mortality** rates among Illawarra residents (all ages, 5-34 years) have **declined**, consistent with the overall NSW (and national) trend.

Similarly, asthma **hospitalisation** rates among Illawarra residents (all ages, 5-34 years) have **declined**, albeit to a less degree than mortality. In contrast, in NSW asthma hospitalisation rates have been relatively stable, at least in the 'all ages' group.

- While death (and even hospitalisation) is fortunately a rare outcome of asthma, asthma has a significant impact - in terms of symptoms and diminished quality of life - for large numbers of people who develop asthma.

In 1997-1998 about a quarter of Illawarra adults with current asthma reported that their asthma caused **moderate to extreme interference with daily activities**, and a similar proportion reported that their **sleep had been disturbed** by asthma on more than two nights in the previous month.

- While asthma cannot be cured, it can be effectively managed, for example, through use of written asthma management plans, and regular preventive medications for people with moderate or severe asthma.

In 1997-1998 about a third of Illawarra adults with asthma reported having a written asthma management plan. About 60% of Illawarra adults reported using preventer medications, with about 40% using them on at least half the days in the previous month.

Chronic Obstructive Pulmonary Disease

- In 1997/98-1998/99, COPD accounted for 17% (1,951) of respiratory **hospitalisations** and 0.91% of total hospitalisations.

COPD hospitalisation rates among Illawarra males and females were **average** for NSW.

COPD **hospitalisation** rates among both males and females resident in the **Shellharbour** and **Shoalhaven** LGAs were significantly **higher** than among residents of both the Wollongong and Kiama LGAs. The COPD hospitalisation rate among Shellharbour males was also significantly higher than the NSW average.

- In 1994-1998 COPD accounted for 60% (609) of respiratory **deaths**, and 5.0% of all deaths.

COPD mortality rates among Illawarra males and females were **average** for NSW.

COPD mortality rates were highest among Shoalhaven males and Shellharbour females; however, differences in mortality

rates between LGAs, and between each of the LGAs and NSW, were not significant.

- COPD hospitalisation and mortality rates are considerably higher among males than females, and increase steeply with age.
- Over the previous decade the COPD **mortality** rate among Illawarra residents has **declined** (at least among males), while **hospitalisation** rates have **increased** considerably.

Respiratory Disease

- Respiratory disorders are the third commonest cause of death (following circulatory disorders and neoplasms), and seventh commonest cause of hospitalisation (6th for males and 8th for females), among residents of the Illawarra Health Area (Tables 1-2).

- In 1994-1998 respiratory disease accounted for 8.3% of total deaths (1,020 of 12,287) among Illawarra residents. These included 581 deaths (8.5% of total) among Illawarra males and 439 deaths (8.0%) among females (Table 1).

- In 1997/98-1998/99 respiratory disease accounted for 5.4% of all hospitalisations (11,600 of 215,326) among Illawarra residents. Respiratory disease accounted for a slightly higher proportion of hospitalisations among males (6.3%, 6,449 of 102,558) than females (4.6%, 5,151 of 112,768) (Table 2).

Asthma

- In 1994-1998 asthma accounted for 5.2% (53) of **deaths** from respiratory disease, and 0.43% of total deaths. Of the 53 asthma deaths, 32 (60%) were among females and 21 (40%) among males (Table 3).

- In 1997/98-1998/99, asthma accounted for 13% (1,542) of **hospitalisations** for respiratory disease and 0.72% of total

hospitalisations. Of the 1,542 asthma hospitalisations, 54% (826) were among females and 46% (716) among males (Table 3).

- In 1997-1998, 13.1% of Illawarra males and 18.5% of Illawarra females aged 16 years and over reported that they had **ever** been told by a doctor, or at a hospital, that they had **asthma** (Figure 1).¹

An estimated 7.7% of Illawarra males and 11.7% of Illawarra females reported **'current asthma'** (symptoms of, or taken treatment for, asthma in previous 12 months) (Figure 1).¹

Comparisons with NSW

- Compared to the NSW averages, in 1994-1998 asthma **mortality** rates (all ages) in the Illawarra were 31% lower for males (based on 21 deaths) and 28% lower for females (based on 32 deaths); however these differences were not statistically significant (Table 3).
- Similarly, in 1997/98-1998/99 asthma **hospitalisation** rates among Illawarra residents were **35% lower** than the NSW average among males and **26% lower** among females, both significant differences (Table 3).
- In 1997-1998 **asthma prevalence** rates (ever and current) among Illawarra males and females aged 16 years and over were not significantly different from the NSW averages (Figure 1).¹ However, notably, the prevalence of ever being diagnosed with asthma among Illawarra males was the lowest of the NSW Health Areas.¹

Excess Deaths and Hospitalisations

- The relatively low asthma mortality and hospitalisation rates among Illawarra residents equate, on an annual basis, to **4 fewer deaths**, and **345 fewer hospitalisations** (195 for males and 150 for females) (i.e. fewer than the numbers

expected based on the NSW averages) (Table 3).

Age and Sex Comparisons

- In 1994-1998 the asthma **mortality rate** (directly age-standardised) was slightly (15%) higher among Illawarra females than males (3.1 as compared to 2.7 per 100,000 per annum).

Asthma mortality rates increase steeply with age, from about 60 years (Figure 2). Of the 53 asthma deaths in 1994-1998, 38 (72%) were among people aged 65 years and over (12 deaths (57%) for males and 26 deaths (81%) for females). Only six asthma deaths (11%, 3 males, 3 females) were among Illawarra residents aged 5-34 years.

- In 1997/98-1998/99 the asthma **hospitalisation rate** (directly age-standardised) among Illawarra females was 12% higher than among males (239.2 as compared to 213.3 per 100,000 per annum) (Figure 3).

Similarly, in each of the Local Government Areas (LGAs), asthma hospital separation rates were 6% (Shoalhaven) to 22% (Wollongong) higher among females than males, except in Kiama where the rate among females was 42% lower than among males (Figure 3).

In contrast to deaths, asthma hospitalisation rates peak among children aged less than five years for both males and females, and are lowest among 55-64 year olds for males and 25-34 year olds for females (Figure 4).

In the age group less than 5 years, the asthma hospitalisation rate among males is more than double that of females. However during adulthood, hospitalisation rates are from 40% (for 15-24 year olds) to 300% (55-64 year olds) higher among females (Figure 4).

- Similarly, asthma **prevalence** is higher among females than males (aged 16 years and over) – in 1997-1998 current asthma

prevalence was 50% higher among Illawarra females than males (11.7% as compared to 7.7%) (Figure 1).¹

Current asthma prevalence was highest among 16-24 year old females (20.0%) (Figure 5). (While current asthma prevalence was highest in this age group among NSW males as well as NSW females, this was not observed among Illawarra males, which could well reflect imprecision in the Illawarra estimates).

Local Government Areas

- In 1994-1998, asthma **mortality** rates were **average**, or below the average, for NSW, among males and females resident in each of the Illawarra LGAs (with any differences being insignificant) (Table 3).
- In 1997/98-1998/99 asthma **hospitalisation** rates were **lower** than the NSW average for both males and females in all LGAs; rates were significantly lower than the NSW average in all LGAs except for Shellharbour females (Table 3).
- Asthma hospitalisation rates were **highest** among **Shoalhaven** males and females, followed by **Shellharbour** males and females. Asthma hospitalisation rates were lowest among Wollongong (followed by Kiama) males, and Kiama (followed by Wollongong) females (Figure 3).

Asthma hospitalisation rates among residents of the Shoalhaven and Shellharbour LGAs were significantly higher than among Wollongong males and females and Kiama females (Figure 3).

Sub-Areas within Wollongong LGA

- Asthma **hospitalisation** rates (all ages) among Wollongong LGA **males** were significantly **lower** than the NSW average in **all sub-areas** (ranging between 50% lower in the Warrawong sub-area to 38% lower in the Dapto sub-area).

For **females**, asthma **hospitalisation** rates (all ages) were significantly **lower** than the

NSW average in the **Thirroul** (53% lower), **Corrimal** (21% lower), **Unanderra** (62% lower) and **Dapto** (37% lower) sub-areas (i.e. all sub-areas except Warrawong and Wollongong) (Table 5).

Trends

- Over the decade from 1989 to 1998 the directly age-standardised asthma **mortality** rate among Illawarra residents of all ages **decreased** by 18% in males (from 3.42 to 2.18 per 100,000, based on 16 and 11 deaths in 1989-1991 and 1996-1998 respectively) and 53% in females (from 6.68 to 3.15 per 100,000, based on 31 and 16 deaths in 1989-1991 and 1996-1998 respectively) (Figure 6).

(While the numbers of asthma deaths among Illawarra residents in the 5-34 years age group are too small for meaningful analysis, it is worth noting that the decline in deaths in this age group appears to be similar to the 'all ages' group. In 1989-1993 10 people, and in 1994-1998 6 people, aged 5-34 years died from asthma).

A similar decline in asthma deaths has been seen across NSW and Australia, more marked for 'all ages' than the 5-34 years age group (Figure 6). The decline is thought to be due to improved classification of the cause of death, and improvement in asthma management and education.²

- Between 1989/90 and 1998/99 directly age-standardised asthma **hospitalisation** rates among Illawarra residents (all ages) **decreased** by 14% among males (from 272.2 to 233.3 per 100,000), and 23% in females (from 299.9 to 231.5 per 100,000) (Figure 7). In the age group 5-34 years asthma hospitalisation rates among Illawarra residents decreased by 10% among males (from 225.9 to 204.0 per 100,000) and 29% among females (from 303.9 to 214.9 per 100,000) (Figure 8).

In contrast, in NSW as a whole, asthma hospitalisation rates have remained fairly stable, at least in the 'all ages' group (Figures 7-8).²

Asthma Severity

- In 1997-1998 about a third of Illawarra residents with asthma (males: 38.0%, females: 32.4%) reported that their asthma interfered with their daily activities to some degree. About a quarter (males: 26.9%, females: 23.6%) reported that their asthma caused **moderate to extreme interference with daily activities** (Figure 9).¹

A similar proportion of Illawarra females (25.9%), and slightly lower proportion of males (18.7%) with asthma, reported that their **sleep was disturbed** by asthma on more than two nights in the previous month, while 18.9% of males and 16.5% of females reported that they had had more than two days in the previous year when their asthma had made them **too unwell to carry out their normal activities** (Figure 9).¹

Interference with daily activities increased with age for both Illawarra males and females. There was no clear pattern of sleep disturbance according to age, except for perhaps less disturbance in the middle years (Figures 10-11).

- Females were more likely than males to report requiring (and seeking) **medical attention for asthma attacks** in the previous year. In 1997-1998 29.0% of Illawarra males and 36.3% of females had an attack requiring a GP visit, and 15.8% of males and 17.9% of females had more than two such attacks (Figure 12).¹

Based on responses to the *NSW Health Survey*, in 1997-1998 an estimated 1.4% of Illawarra males and 6.8% of females with asthma required an ED visit, and 0% of males and 8.3% of females required hospitalisation, for an asthma attack in the previous year (Figure 12).¹

Asthma Management

- While asthma cannot be cured, it can be effectively managed, through strategies such as: adherence to written asthma management plans; regular medical review

for people with persistent symptoms; regular preventive medications for people with moderate or severe asthma (and not reliance on reliever medications); and appropriate medical and educational follow-up for people leaving hospital after treatment for asthma.³

- In 1997-1998 most Illawarra respondents with current asthma (92.9% males, 92.0% females) reported that they used **reliever** medication (such as Ventolin, Respolin, Asmol or Bricanyl). About 30% (33.4% males, 27.7% females) reported using them every day in the last month, about 20% (26.3% males, 17.2% females) on half or most days, about 30% (26.9% males, 29.8% females) on less than half the days, and about 15% (6.4% males, 18.3% females) reported that they had used these medications but not in the last month.¹

Overall, 59.6% of Illawarra males and 43.9% of Illawarra females reported that they had used reliever medication on at least half the days in the previous month (Figure 13).¹

- Fewer people use **preventer** medication (such as Becotide, Becloforte, Aldecin, Pulmicort, Flixotide, Intal, Intal Forte, Cromogen or Tilade). In 1997-1998 about 60% of Illawarra respondents with current asthma reported using preventer medication (67.8% males and 56.4% females), with about a third (40.8% males and 26.8% females) using them every day.¹

Overall 44.4% of Illawarra males and 35.5% of Illawarra females reported that they had used preventer medication on at least half the days in the previous month.

Reflecting the overall NSW pattern, reliever and preventer use generally increased with age among both males and females (Figures 14-15).¹

- About a third of Illawarra residents aged 16 years and over (36.7% of males, 30.2% of females) reported that they had a **written asthma management plan** from their

doctor on how to treat their asthma (Figure 13).¹

Having a written asthma management plan was most commonly reported by the relatively young and the elderly (being lowest in the age group 55-64 years) (Figure 16). The apparently high level of plans among young people in the Illawarra stands in contrast to the pattern in NSW as a whole, where males and females with asthma aged 16-24 years were the least likely to report having a plan (Illawarra males: 35.3%, NSW males: 26.8%, Illawarra females: 40.0%, NSW females: 29.7%) (Figure 16).¹

- Illawarra males with asthma appear to use more asthma medication (reliever and preventer) than the NSW average. In 1997-1998 the proportion of Illawarra males with asthma who reported using a reliever (on at least half the days in the previous month) was the highest of the NSW Health Areas, and significantly higher than the NSW average.¹

Similarly the proportion of Illawarra males with asthma who had used a preventer (on at least half the days in the previous month) was the second highest of the NSW Health Areas, although this was not significantly different from the NSW average.¹

None of the other indicators of asthma severity nor management among Illawarra residents (males and females) were significantly different from the NSW averages.

Readers should be reminded that these estimates for Illawarra residents reporting current asthma are based on small numbers and hence cannot be considered precise. It may well be that the apparently low asthma prevalence among male respondents reflects the fact that some with mild asthma have not reported asthma (symptoms and/or diagnosis); hence the average severity for those who did report asthma in the survey is relatively high. Therefore, the apparently high level of medication use among Illawarra males with asthma (Figure 13),

consistent with the apparently high level of interference in daily activities (Figure 9), may actually reflect a relatively low level of diagnosis and recognition of asthma among the Illawarra male respondents (and possibly the Illawarra male population), rather than a relatively high prevalence of severe asthma.

The relatively low asthma hospitalisation rate among Illawarra residents (Table 3), which tends to confirm the survey findings of a low level of hospitalisation of Illawarra males for asthma attacks (Figure 12), also suggests that the occurrence of relatively severe asthma among Illawarra males is not high relative to the NSW average.

Chronic Obstructive Pulmonary Disease

- In 1994-1998 COPD accounted for 60% (609) of respiratory **deaths**, and 5.0% of all deaths. Of the 609 COPD deaths, 64% (387) were among males and 36% (222) among females (Table 4).
- In 1997/98-1998/99, COPD accounted for 17% (1,951) of **hospitalisations** for respiratory disease and 0.91% of total hospitalisations. Of the 1,951 COPD hospitalisations, 61% (1,183) were among males and 39% (768) among females (Table 4).

Comparisons with NSW

- In 1994-1998 COPD **mortality** rates (all ages) among Illawarra males and females were **average** for NSW (Table 4).
- Similarly, in 1997/98-1998/99 COPD **hospitalisation** rates among Illawarra males and females were **average** for NSW (Table 4). (Readers should be reminded here that COPD hospitalisation rates among Illawarra residents are likely to be inflated by some degree of double-counting of people transferred between Illawarra hospitals during the one episode of care.)

Age and Sex Comparisons

- In 1994-1998 the COPD **mortality rate** (directly age-standardised) among Illawarra males was 2.43 times (i.e. 143%) higher than the rate among Illawarra females (48.3 as compared to 19.9 per 100,000 per annum) (Figure 17).

Similarly in each of the LGAs, COPD mortality rates were 84% (Shellharbour) to 203% (Kiama) higher among males than females (Figure 17).

- In 1997/98-1998/99 the COPD **hospitalisation rate** (directly age-standardised) among Illawarra males was 1.85 times (i.e. 85%) higher than the rate among females (312.7 as compared to 169.4 per 100,000 per annum) (Figure 18).

Similarly in each of the LGAs, COPD hospital separation rates were 66% (Shoalhaven) to 131% (Kiama) higher among males than females (Figure 18).

- COPD mortality and hospitalisation rates increase steeply with age, from about 65 years, particularly among males (Figures 19-20).

Local Government Areas

- In 1994-1998, COPD **mortality rates** were highest among **Shoalhaven males** and **Shellharbour females**, and lowest among Kiama males and females. However differences in COPD mortality rates between LGAs, and between each of the LGAs and NSW, were not significant (Table 4, Figure 17).

- In 1997/98-1998/99 COPD **hospitalisation rates** were highest among **Shellharbour** males and females (followed by **Shoalhaven** males and females), and lowest among Kiama males and females (Figure 18).

COPD hospitalisation rates among both males and females resident in the Shellharbour and Shoalhaven LGAs were

significantly higher than among residents of both the Wollongong and Kiama LGAs. COPD hospitalisation rates among Kiama males and females were significantly lower than for residents in all of the other LGAs (Figure 18).

- Similarly, in 1997/98-1998/99 COPD hospitalisation rates were higher than the NSW average among Shellharbour males (23% higher), and lower than the NSW average among Kiama males (40% lower) and females (52% lower), and Wollongong females (17% lower) (Table 4).

Sub-Areas within Wollongong LGA

- COPD **hospitalisation rates** (all ages) among Wollongong LGA **males** were significantly **higher** than the NSW average in the **Corrimal** (19% higher) and **Warrawong** (31% higher) sub-areas, and significantly lower in the Thirroul (59% lower) and Wollongong (31% lower) sub-areas.

For females, COPD hospitalisation rates (all ages) were significantly lower than the NSW average in the Thirroul (30% lower), and Unanderra (58% lower) sub-areas (Table 5).

Trends

- Over the decade from 1989 to 1998 the directly age-standardised COPD **mortality rate** among Illawarra residents of all ages **decreased** steadily. This decrease was entirely accounted for by a decrease among males (from 69.4 to 39.2 per 100,000), while the rate among females remained stable (at about 20 per 100,000) (Figure 21).
- In contrast, between 1989/90 and 1998/99 directly age-standardised COPD **hospitalisation rates** among Illawarra residents (all ages) **increased** by 34% among males (from 252.4 to 338.6 per 100,000), and 73% among females (from 110.8 to 191.6 per 100,000) (Figure 22).

**TABLE 1:
Causes of Death Among Illawarra Residents, 1994 – 1998**

ICD9 CHAPTER HEADING (ICD9 codes)	MALES		FEMALES	
	Number	Per cent	Number	Per cent
CIRCULATORY (390-459)	2,889	42.4	2,579	47.1
NEOPLASM (140-239)	2,079	30.5	1,462	26.7
RESPIRATORY (460-519)	581	8.5	439	8.0
INJURY & POISONING (excl. medical misadventure etc) (E800-869, E880-929, E950-999)	420	6.2	177	3.2
DIGESTIVE (520-579)	188	2.8	167	3.0
ENDOCRINE, NUTRITIONAL, METABOLIC & IMMUNITY (240-279)	145	2.1	135	2.5
NERVOUS SYSTEM & SENSE ORGANS (320-389)	138	2.0	132	2.4
MENTAL DISORDERS (290-319)	117	1.7	91	1.7
INFECTION (001-139)	81	1.2	51	0.9
GENITOURINARY (580-629)	70	1.0	113	2.1
OTHER	101	1.5	132	2.4
TOTAL	6,809	100.0	5,478	100.0

Source: ABS Death Registrations for 1994-1998 accessed from NSW Health's Health Outcomes Information and Statistical Toolkit.

**TABLE 2:
Causes of Hospitalisation Among Illawarra Residents, 1997/98 – 1998/99**

ICD9 CHAPTER HEADING (ICD9 codes)	MALES		FEMALES	
	Number	Per cent	Number	Per cent
DIGESTIVE (520-579)	12,752	12.4	13,407	11.9
CIRCULATORY (390-459)	10,801	10.5	7,826	6.9
INJURY & POISONING (800-999)	8,974	8.8	5,934	5.3
NEOPLASM (140-239)	6,713	6.5	6,634	5.9
MUSCULOSKELETAL/ CONNECTIVE TISSUE (710-739)	6,633	6.5	6,255	5.5
GENITOURINARY (580-629)	4,108	4.0	8,418	7.5
RESPIRATORY (460-519)	6,449	6.3	5,151	4.6
NERVOUS SYSTEM & SENSE ORGANS (320-389)	5,344	5.2	5,910	5.2
SYMPTOMS/ SIGNS/ ILL-DEFINED CONDITIONS (780-799)	5,646	5.5	5,387	4.8
MENTAL DISORDERS (290-319)	2,871	2.8	3,085	2.7
PERINATAL (760-779)	1,642	1.6	1,308	1.2
SKIN/ SUBCUTANEOUS TISSUE (680-709)	1,493	1.5	1,441	1.3
BLOOD & BLOOD-FORMING ORGANS (280-289)	1,519	1.5	1,243	1.1
INFECTION (001-139)	1,240	1.2	1,214	1.1
ENDOCRINE, NUTRITIONAL, METABOLIC & IMMUNITY (240-280)	1,228	1.2	1,319	1.2
CONGENITAL ANOMALIES (740-759)	800	0.8	709	0.6
PREGNANCY-RELATED (630-676)	-	0.0	14,385	0.1
SUPPLEMENTARY V CODES (V01-82)	24,345	23.7	23,142	20.5
TOTAL	102,558	100.0	112,768	100.0

Source: NSW Inpatients Statistics Collection for 1997/98 – 1998/99 accessed from NSW Health's Health Outcomes Information and Statistical Toolkit.

TABLE 3:
Deaths and Hospitalisations (1997/98-1998/99) Due to Asthma (Icd9 Code 493), By Local Government Area (LGA)

Local Government Area	MALES			FEMALES		
	Number	Standardised mortality or separation ratio	Excess deaths or separations	Number	Standardised mortality or separation ratio	Excess deaths or separations
DEATHS						
Wollongong	13	0.82	-3	15	0.62	-9
Shellharbour	3	0.86	0	2	0.40	-3
Kiama	1	0.52	-1	3	0.97	0
Shoalhaven	4	0.44	-5	12	0.99	0
Total Illawarra	21	0.69	-9	32	0.72	-12
HOSPITALISATIONS						
Wollongong	318	0.55↓	-263	400	0.66↓	-203
Shellharbour	149	0.78↓	-41	164	0.89	-20
Kiama	38	0.62↓	-24	26	0.41↓	-37
Shoalhaven	211	0.76↓	-61	236	0.85↓	-41
Total Illawarra	716	0.65↓	-389	826	0.74↓	-301

Source: NSW Inpatients Statistics Collection for 1997/98 – 1998/99 (and Australian Bureau of Statistics (ABS) *Estimated Resident Populations* for 30 June 1998), ABS *Death Registrations* for 1994-1998 (and ABS *Estimated Resident Populations* for 30 June 1996) accessed from NSW Health's *Health Outcomes Information and Statistical Toolkit*.

Notes: 1. The SSR is the ratio of the actual (or 'observed') number of Illawarra Health Area (or LGA) resident separations to the 'expected' number of Illawarra Health Area (or LGA) resident separations. The 'expected' number of separations is calculated by multiplying the age-specific separation rates in the NSW population by the population numbers resident in the Illawarra Health Area (or LGA). The SMR is calculated in the same way using death data.

TABLE 4:
Deaths (1994-1998) and Hospitalisations (1997/98-1998/99) Due to Chronic Obstructive Pulmonary Disease (Icd9 Codes 490-492, 494-496), By Local Government Area

Local Government Area	MALES			FEMALES		
	Number	Standardised mortality or separation ratio	Excess deaths or separations	Number	Standardised mortality or separation ratio	Excess deaths or separations
DEATHS						
Wollongong	201	1.04	+8	113	0.96	-4
Shellharbour	39	1.03	+1	29	1.29	+6
Kiama	16	0.64	-9	9	0.58	-7
Shoalhaven	131	1.13	+15	71	1.16	+10
Total Illawarra	387	1.04	+15	222	1.02	+5
HOSPITALISATIONS						
Wollongong	570	0.93	-41	365	0.83↓	-72
Shellharbour	168	1.23↑	+32	111	1.13	+13
Kiama	46	0.60↓	-31	26	0.48↓	-28
Shoalhaven	399	1.09	+33	266	1.14↑	+32
Total Illawarra	1,183	0.99	-7	768	0.93	-56

Source: NSW Inpatients Statistics Collection for 1997/98 – 1998/99 (and Australian Bureau of Statistics (ABS) *Estimated Resident Populations* for 30 June 1998), ABS *Death Registrations* for 1994-1998 (and ABS *Estimated Resident Populations* for 30 June 1996) accessed from NSW Health's *Health Outcomes Information and Statistical Toolkit*.

Notes: 1. The SSR is the ratio of the actual (or 'observed') number of Illawarra Health Area (or LGA) resident separations to the 'expected' number of Illawarra Health Area (or LGA) resident separations. The 'expected' number of separations is calculated by multiplying the age-specific separation rates in the NSW population by the population numbers resident in the Illawarra Health Area (or LGA). The SMR is calculated in the same way using death data.

TABLE 5:
Hospitalisations due to Asthma (Icd9 Codes 493) and Chronic Pulmonary Disease (COPD) in Sub-Areas within the Wollongong LGA, 1997/98-1998/99

Sub-area (postcodes)	MALES			FEMALES				
	Number	Standardised separation ratio	Excess separations	Number	Standardised separation ratio	Excess separations		
ASTHMA								
Thirroul (2508,2515,2516,2517)	59	0.53	↓	-52	52	0.47	↓	-58
Corrimal (2518,2519)	56	0.52	↓	-52	92	0.79	↓	-24
Wollongong (2500)	49	0.56	↓	-39	87	0.84		-16
Warrawong (2502,2505,2506)	42	0.50	↓	-42	76	0.88		-11
Unanderra (2525,2526)	53	0.61	↓	-34	32	0.38	↓	-53
Dapto (2530)	52	0.62	↓	-33	50	0.63	↓	-30
COPD								
Thirroul (2508,2515,2516,2517)	42	0.41	↓	-61	54	0.70	↓	-23
Corrimal (2518,2519)	154	1.19	↑	+24	100	1.11		+10
Wollongong (2500)	81	0.69	↓	-36	74	0.82		-16
Warrawong (2502,2505,2506)	131	1.31	↑	+31	68	1.05		+3
Unanderra (2525,2526)	77	1.14		+9	20	0.42	↓	-27
Dapto (2530)	71	1.26		+15	43	1.03		+1

Source: NSW Inpatients Statistics Collection for 1997/98 – 1998/99 (and Australian Bureau of Statistics (ABS) *Estimated Resident Populations* for 30 June 1996) accessed from NSW Health's *Health Outcomes Information and Statistical Toolkit*. 30 June 1996 populations for sub-areas were compiled from Census postcode populations provided by the Australian Bureau of Statistics.

Notes:

1. The SSR is the ratio of the actual (or 'observed') number of sub-area resident separations to the 'expected' number of sub-area resident separations. The 'expected' number of separations is calculated by multiplying the age-specific separation rates in the NSW population by the population numbers resident in the sub-area.
2. Observed numbers in this table are slightly less than in the previous tables for Wollongong LGA residents, as records where postcodes were incompatible with the Wollongong LGA coding have been excluded. In addition, the SSR and 'excess separations' should be considered estimates as 30 June 1996 populations were used (rather than populations pertaining to the mid-point of the time period of interest, i.e. 30 June 1998).

FIGURE 1:
Asthma Prevalence, Persons Age 16 Years and older, by Sex, Illawarra Health Area and NSW, 1997 and 1998 (NSW Health Survey)¹

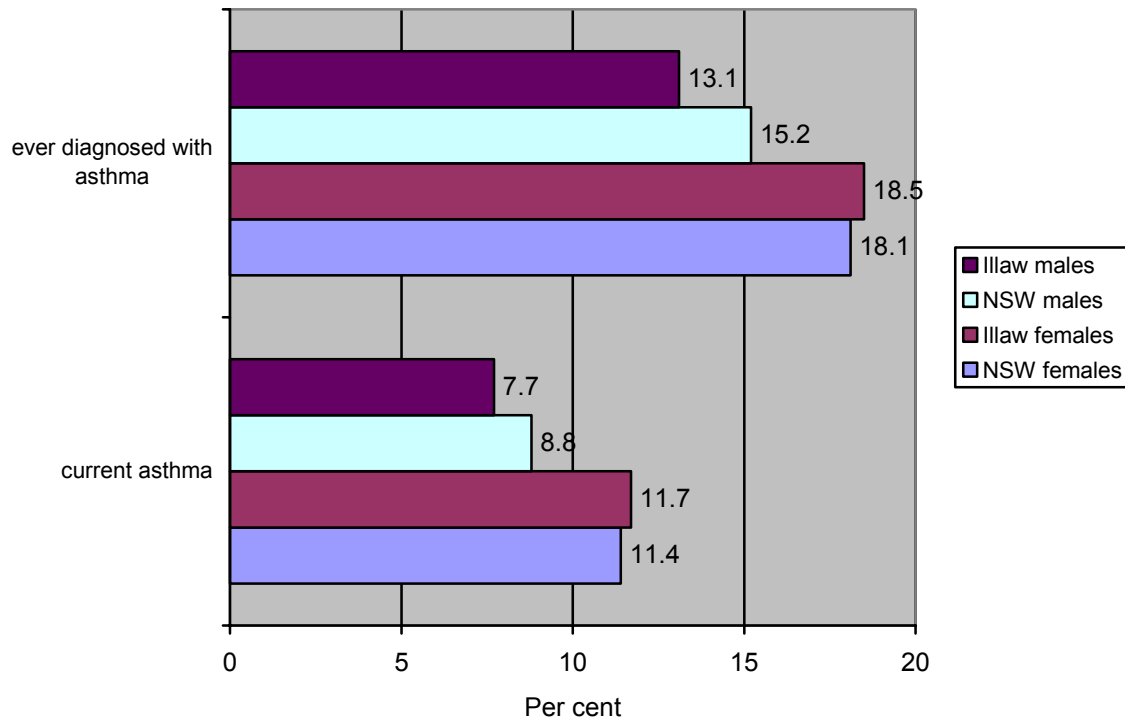


FIGURE 2:
Age-Specific Mortality Rates for Asthma among Residents of the Illawarra Health Area, By Sex, 1994-1998

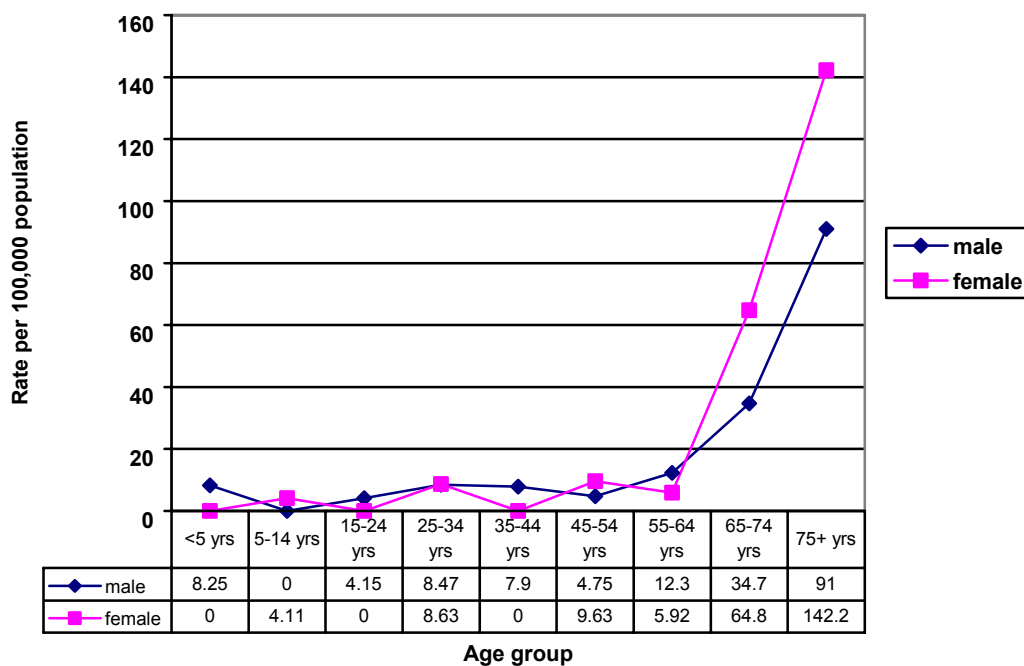


FIGURE 3:
Directly Age-Standardised Asthma Hospital Separation Rates among Residents of Illawarra Health Area, and each of its Local Government Areas, by Sex, 1997/98-1998/99

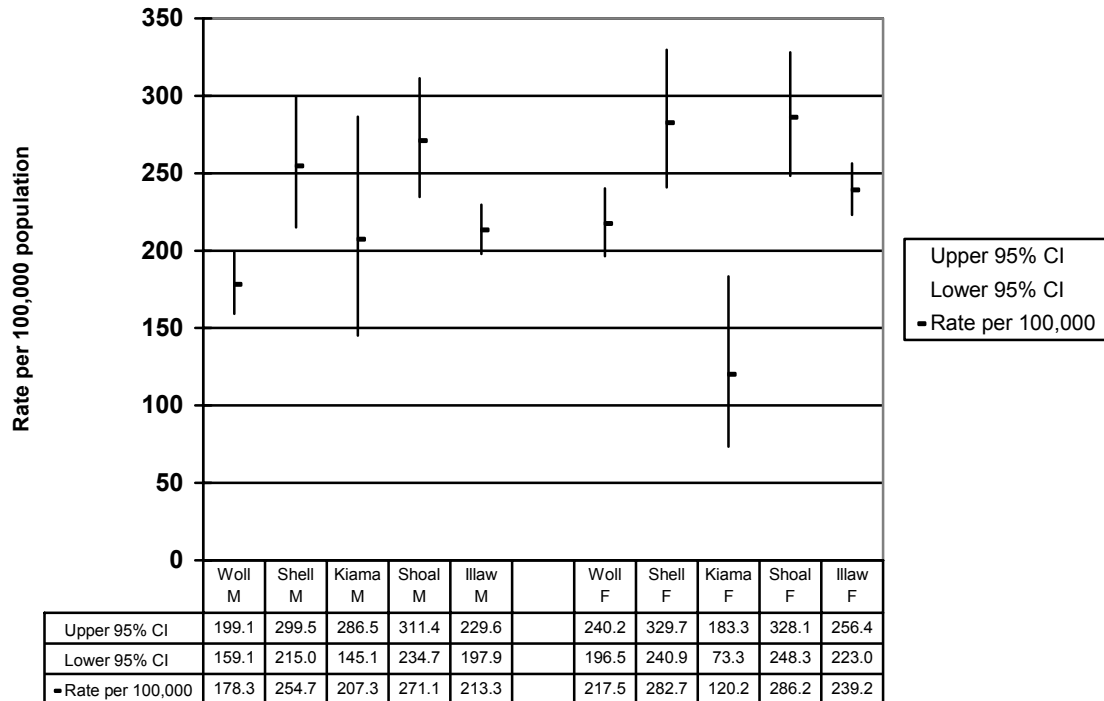


FIGURE 4:
Age-Specific Hospital Separation Rates for Asthma among Residents of the Illawarra Health Area, by Sex, 1997/98-1998/99

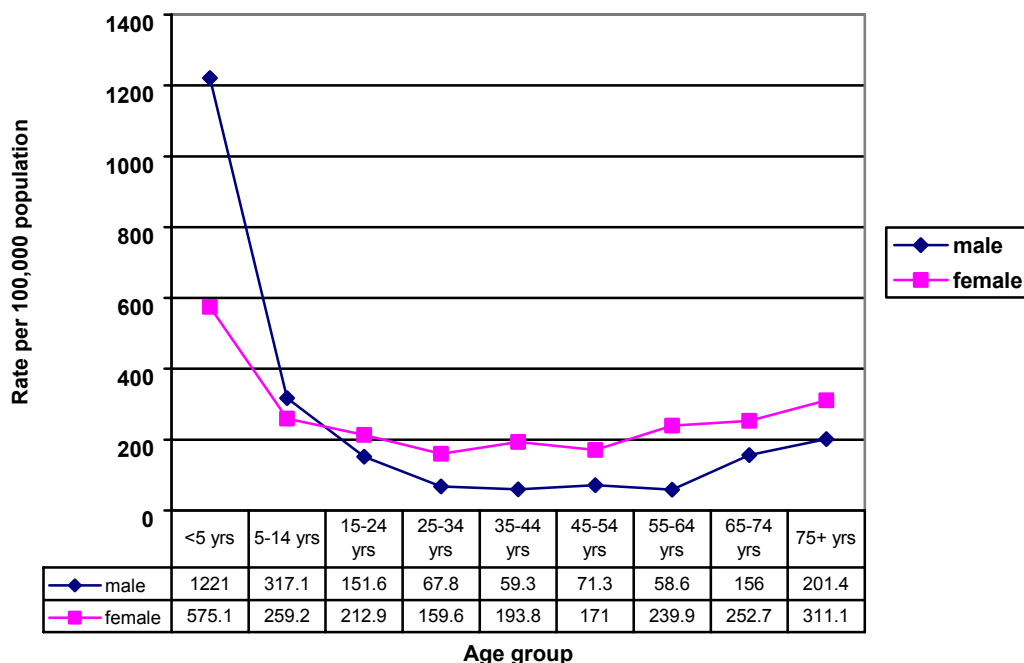


FIGURE 5:
Current Doctor Diagnosed Asthma, Illawarra Residents Aged 16 Years and older, by Age and Sex, 1997 and 1998 (NSW Health Survey)¹

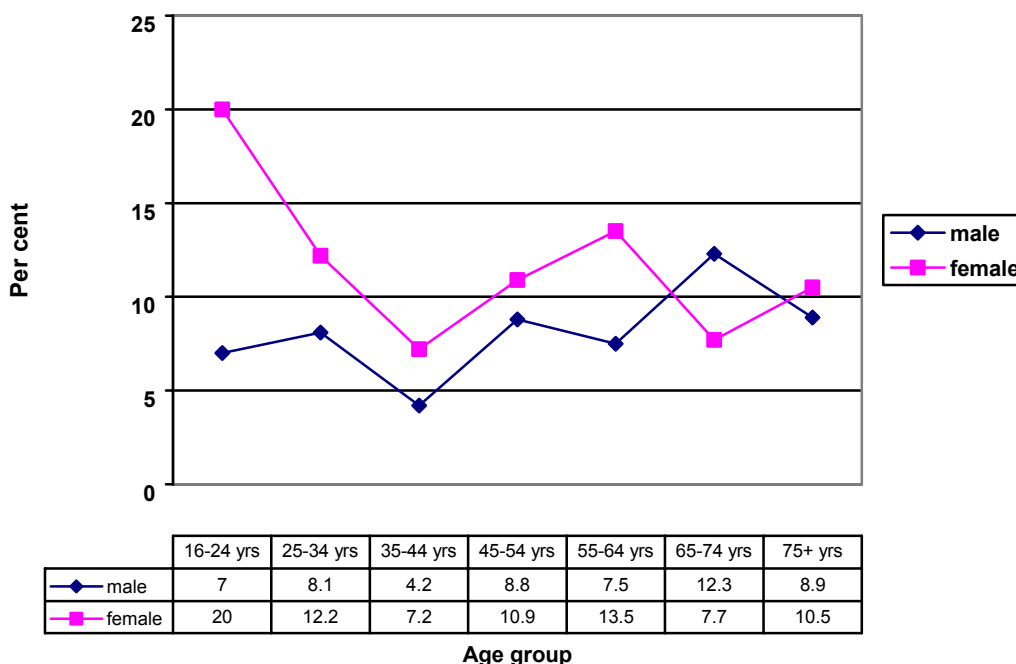


FIGURE 6:
Trends in Directly Age-Standardised Asthma Mortality Rates among Residents of the Illawarra Health Area (As 3-Year Moving Average) and NSW², all Ages, by Sex, 1989-1998

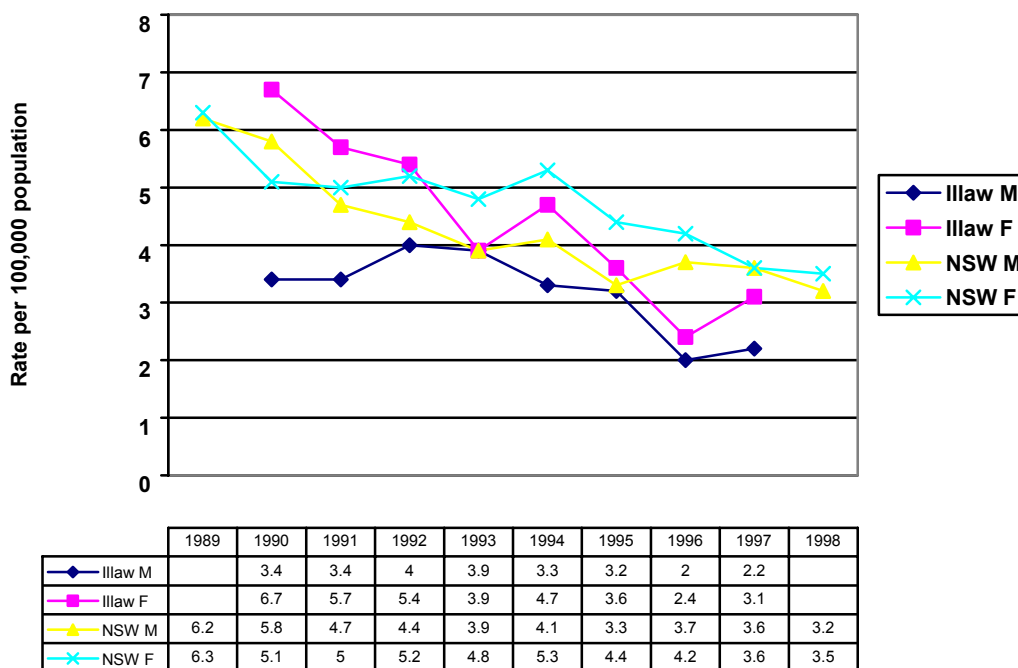


FIGURE 7: Trends in Directly Age-Standardised Hospital Separation Rates for Asthma among Residents of the Illawarra Health Area and NSW², all Ages, by Sex, 1989/90-1998/99

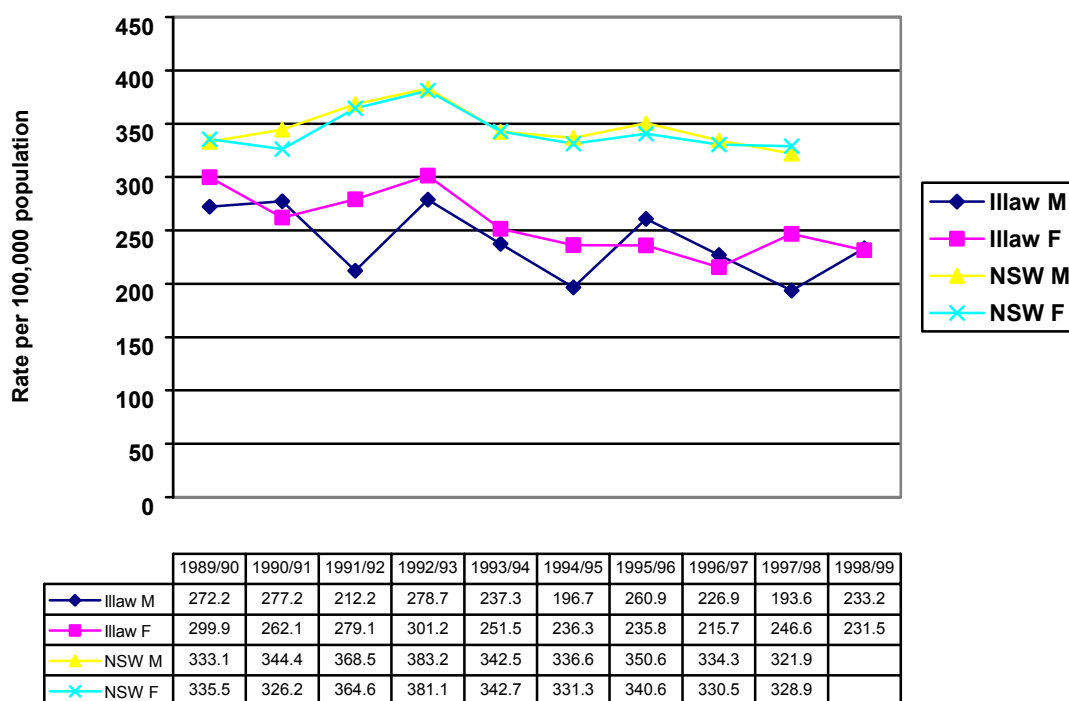


FIGURE 8: Trends in Directly Age-Standardised Hospital Separation Rates for Asthma among Residents of the Illawarra Health Area and NSW², 5-34 Years, by Sex, 1989/90-1998/99

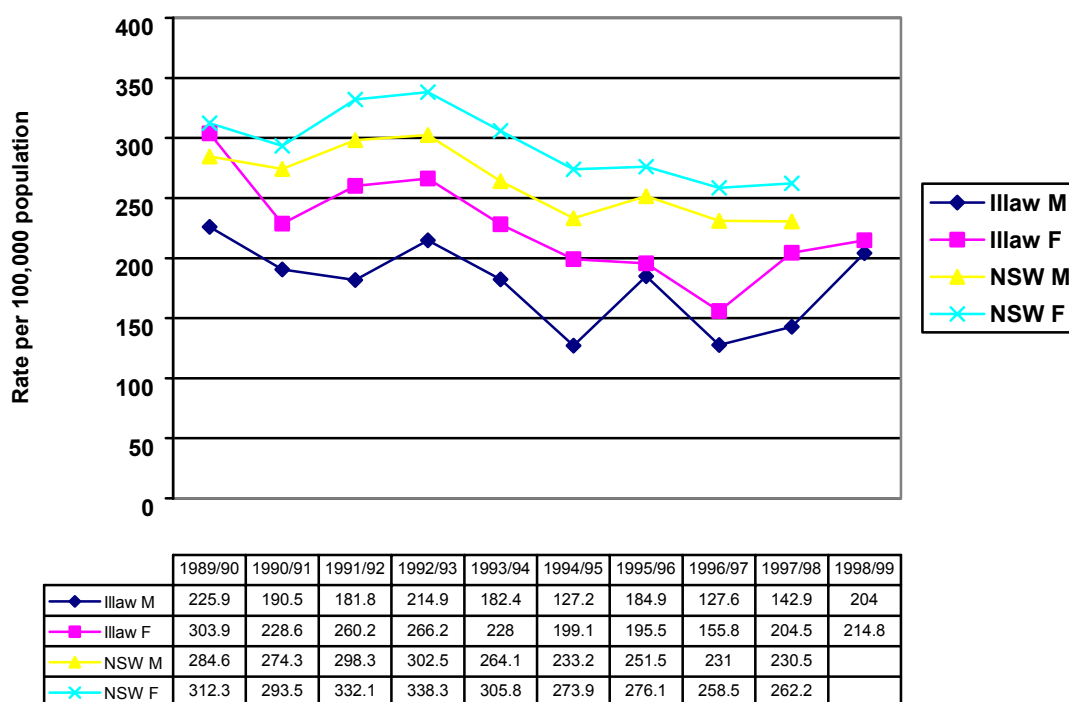


FIGURE 9:
Asthma Severity – Interference with Daily Activities and Sleep, Persons Aged 16 Years and older with Current Asthma, by Sex, Illawarra Health Area and NSW, 1997 and 1998 (NSW Health Survey)¹

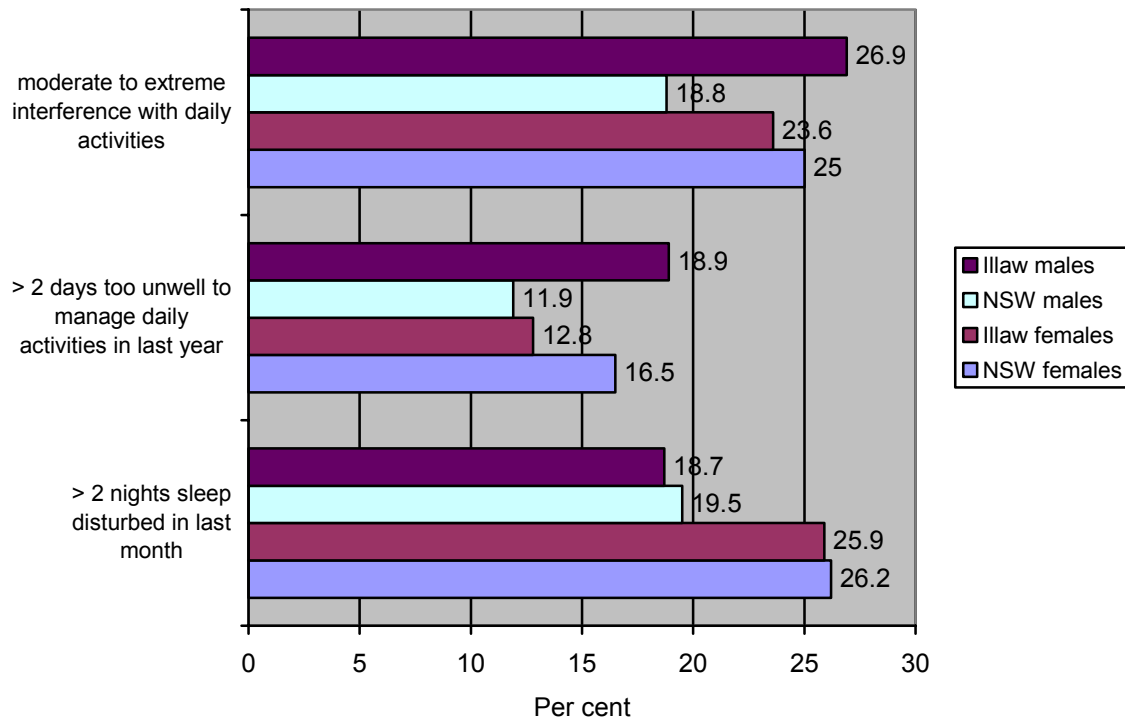


FIGURE 10:
Moderate to Extreme Interference with Daily Activities, Illawarra Residents Aged 16 Years and older with Asthma, by Age and Sex, 1997 and 1998 (NSW Health Survey)¹

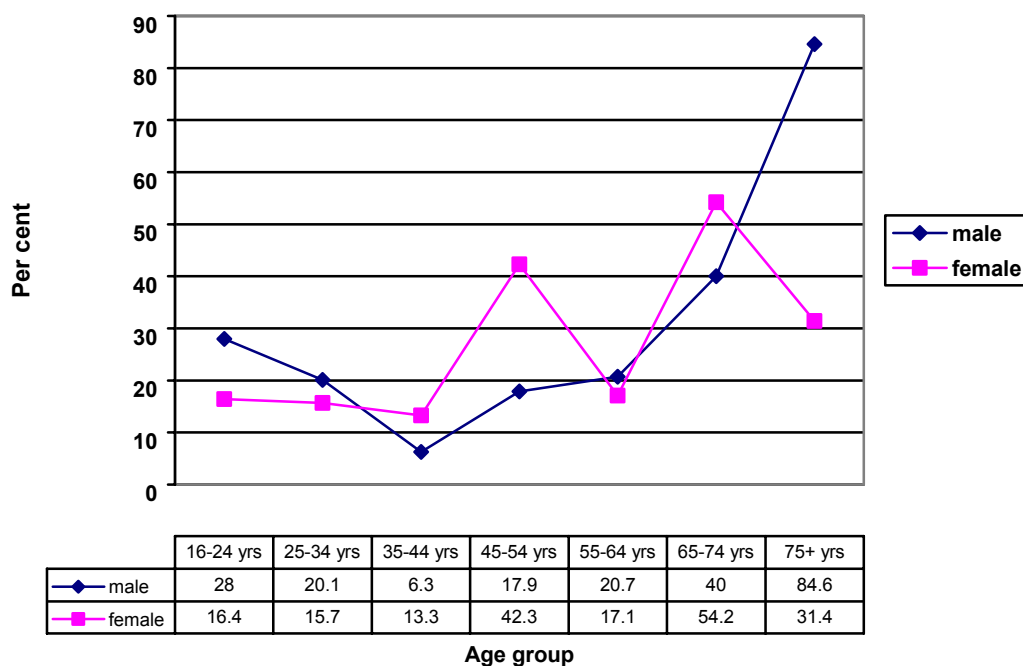


FIGURE 11:
More Than Two Nights Sleep Disturbed Due to Asthma, Illawarra Residents Aged 16 Years and older with Asthma, by Age and Sex, 1997 and 1998 (NSW Health Survey)¹

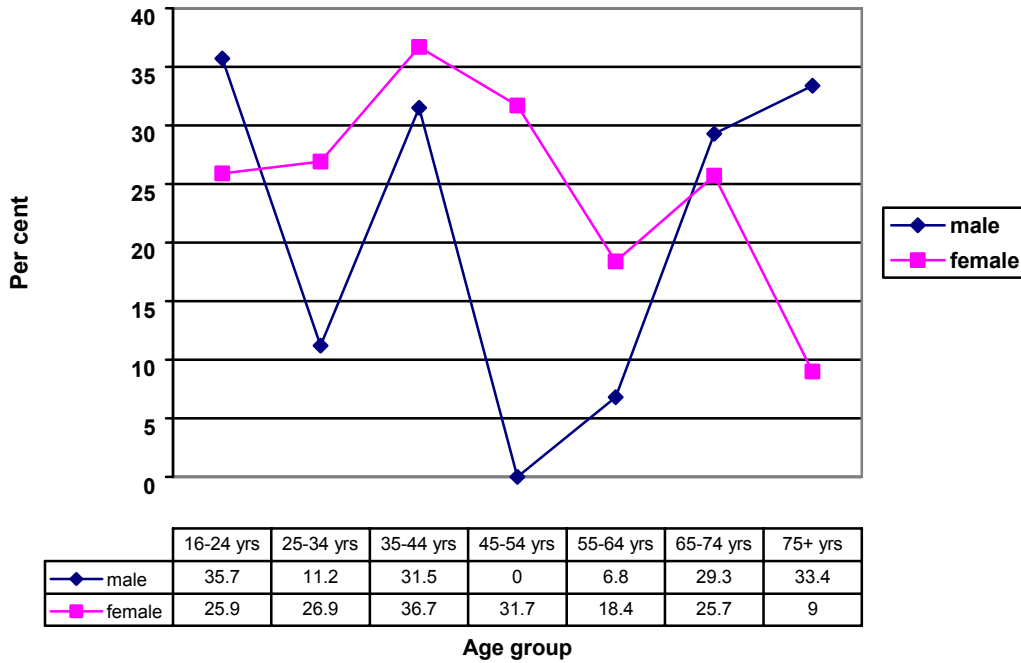


FIGURE 12:
Asthma Severity – Attacks Requiring Medical Attention in Previous Year, Persons Aged 16 Years and older with Current Asthma, by Sex, Illawarra Health Area and NSW, 1997 and 1998 (NSW Health Survey)¹

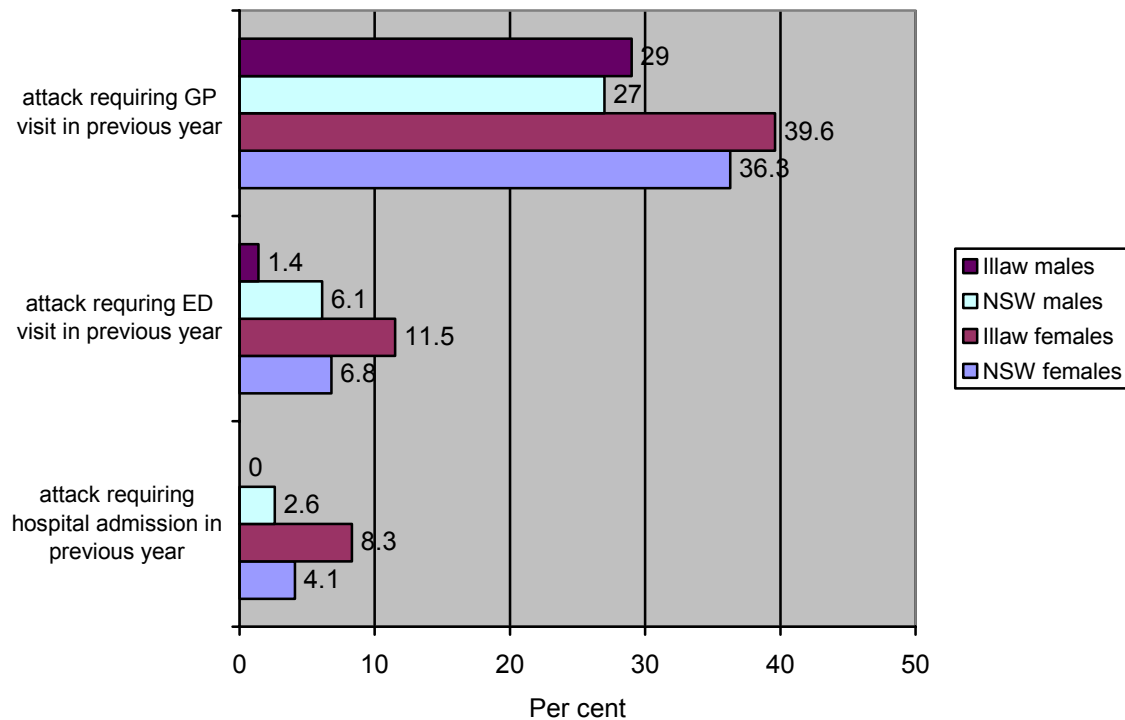


FIGURE 13:
Asthma Management, Persons Aged 16 Years and older with Current Asthma, by Sex, Illawarra Health Area and NSW, 1997 and 1998 (NSW Health Survey)¹

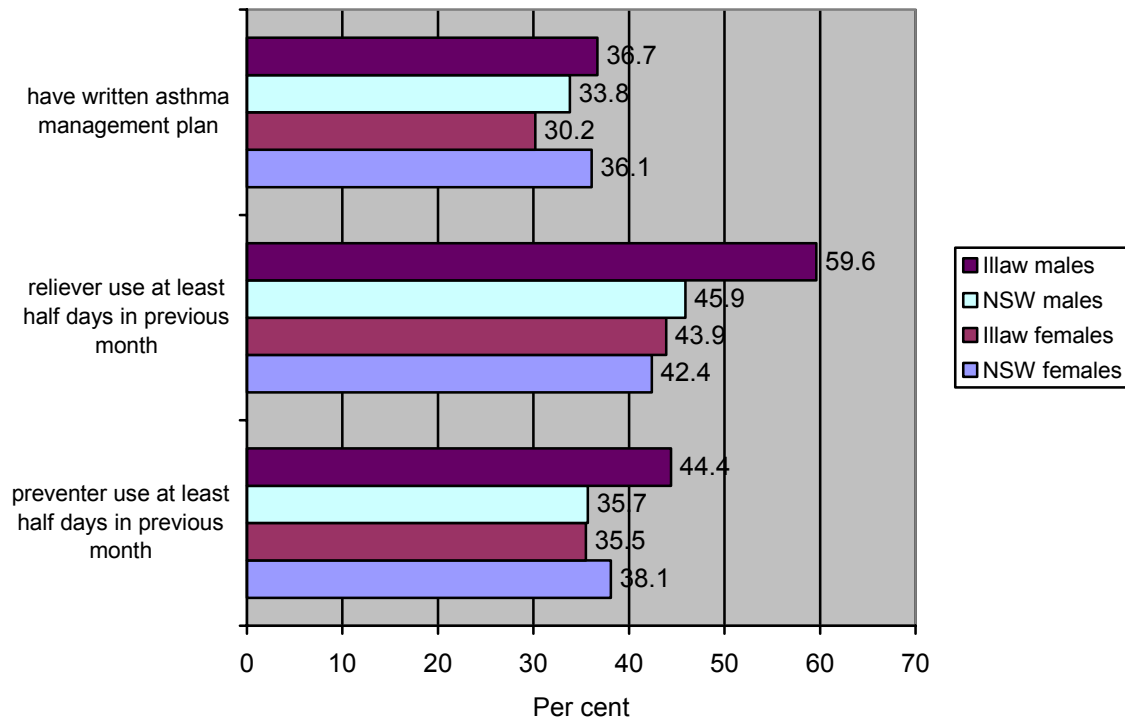


FIGURE 14:
Asthma Reliever Medication for at Least Half Days in Previous Month, Illawarra Residents Aged 16 Years and older with Asthma, by Age and Sex, 1997 and 1998 (NSW Health Survey)¹

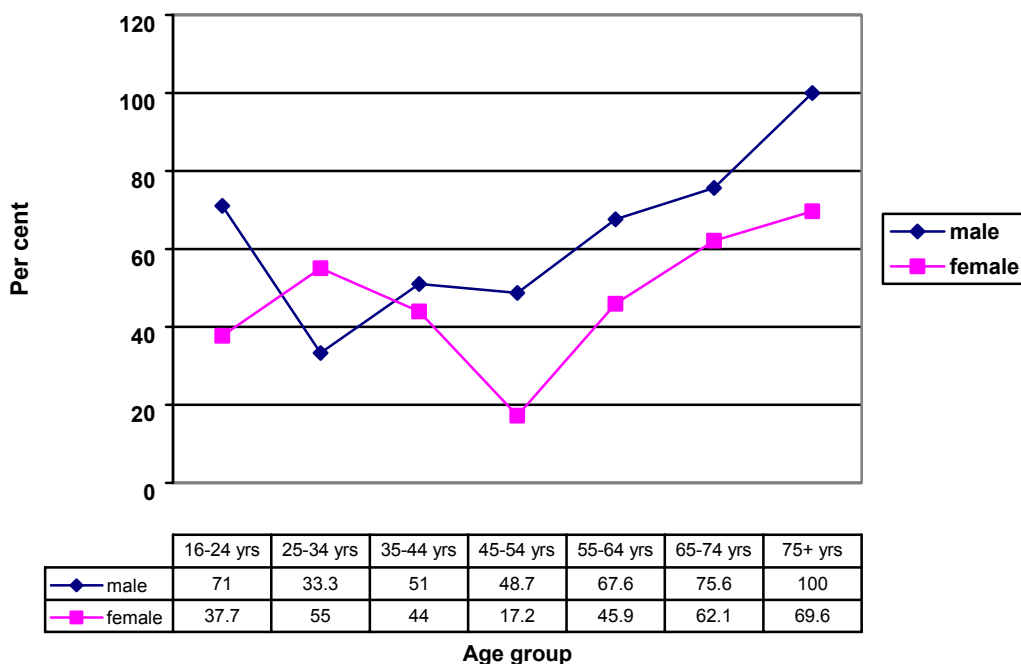


FIGURE 15:
Asthma Preventer Medication for at Least Half Days in Previous Month, Illawarra Residents Aged 16 Years and older with Asthma, by Age and Sex, 1997 and 1998 (NSW Health Survey)¹

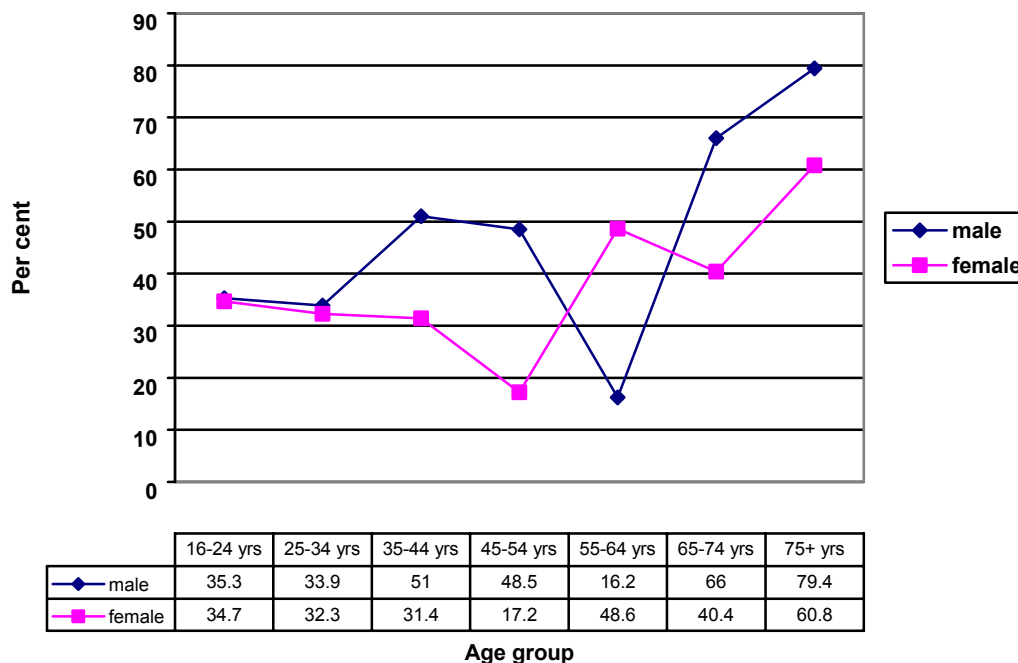


FIGURE 16:
Have a Written Asthma Management Plan, Illawarra Residents Aged 16 Years and older with Asthma, by Aged and Sex, 1997 and 1998 (NSW Health Survey)¹

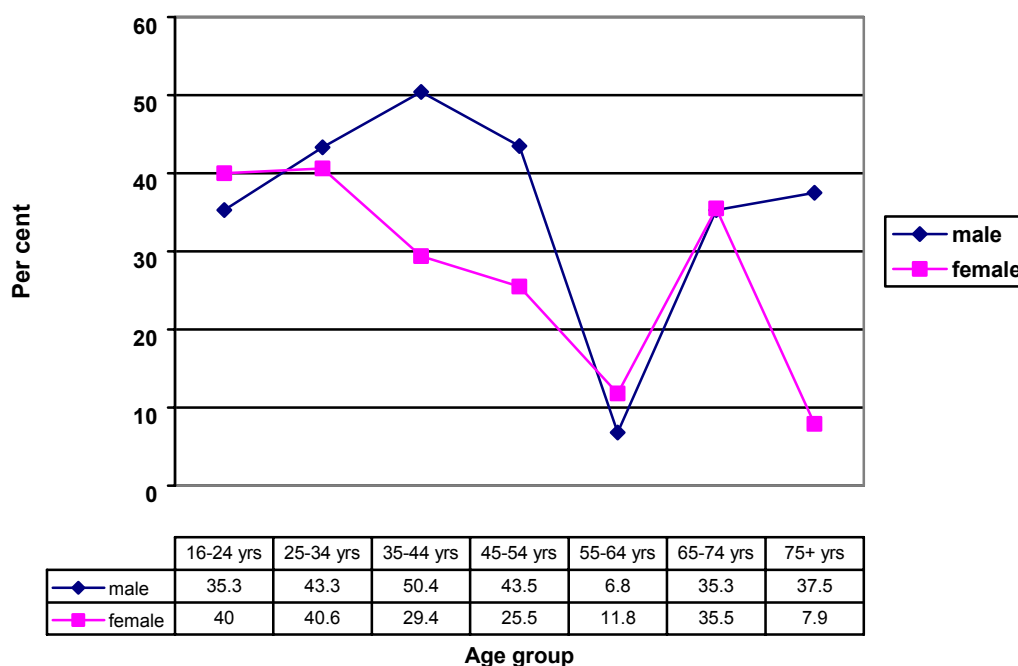


FIGURE 17:
Directly Age-Standardised COPD Mortality Rates among Residents of Illawarra Health Area, and each of its Local Government Areas, by Sex, 1994-1998

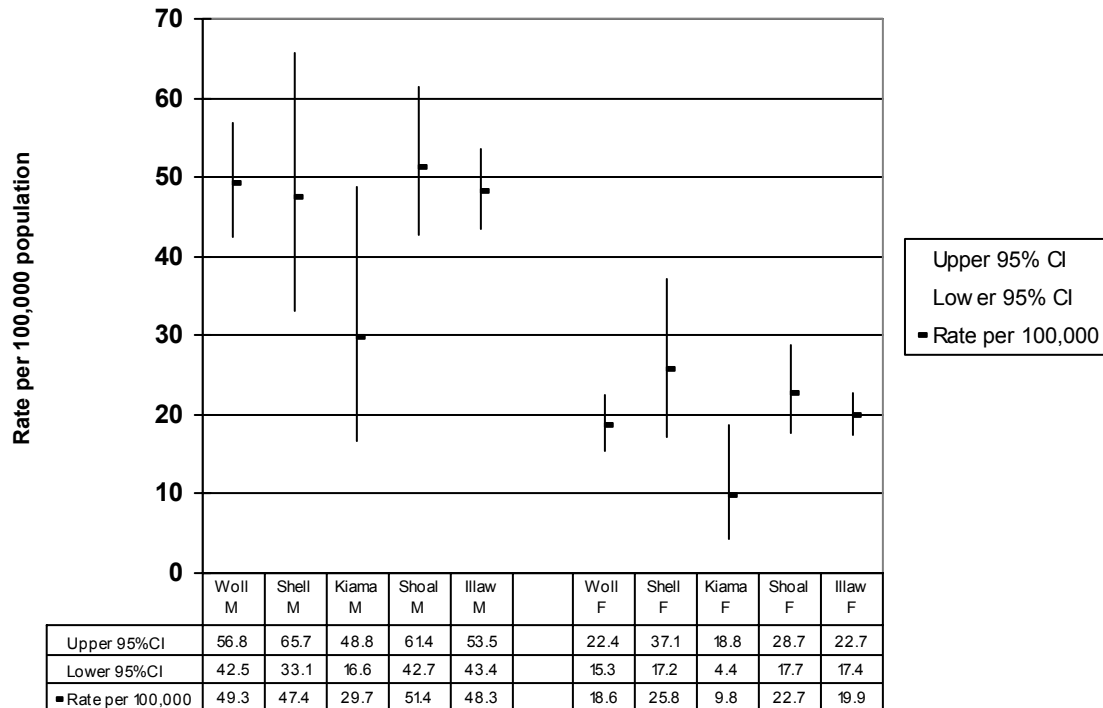


FIGURE 18:
Directly Age-Standardised COPD Hospital Separation Rates among Residents of Illawarra Health Area, and each of its Local Government Areas, by Sex, 1997/98-1998/99

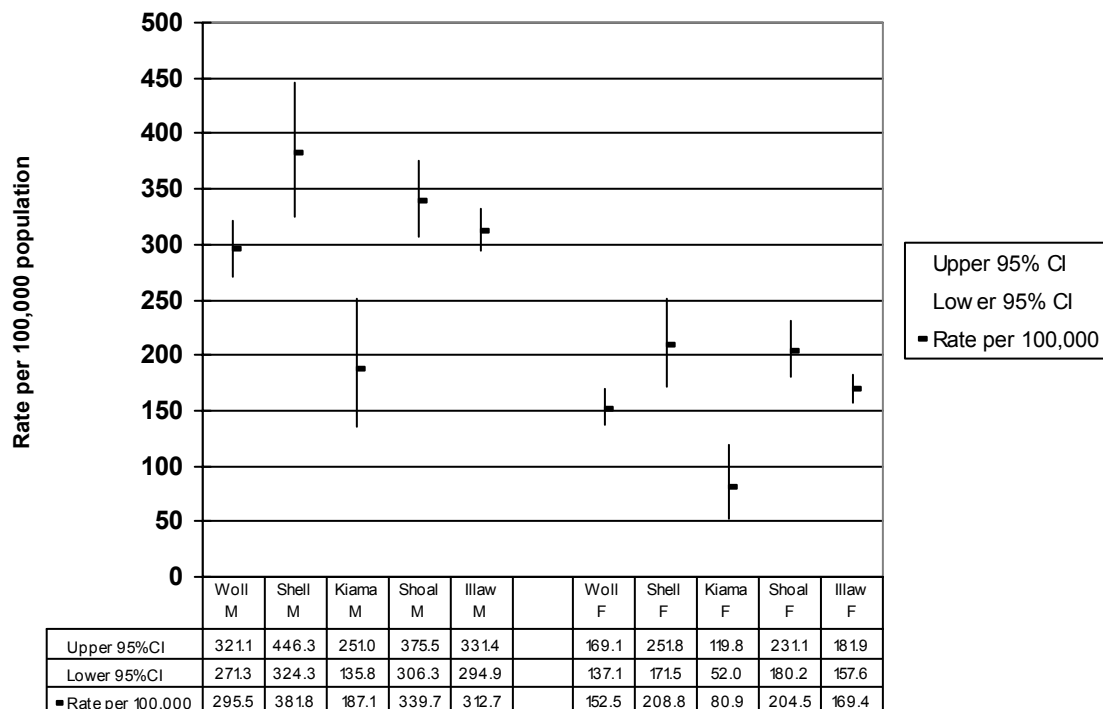


FIGURE 19:
Age-Specific Mortality Rates for COPD among Residents of the Illawarra Health Area, by Sex, 1994-1998

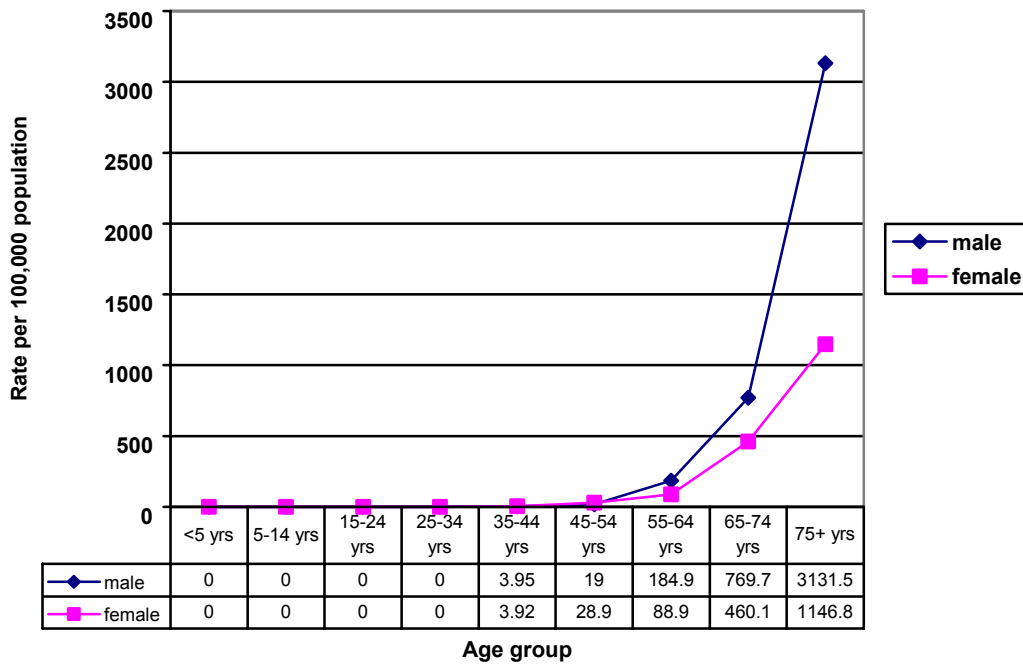


FIGURE 20:
Age-Specific Hospital Separation Rates for COPD among Residents of the Illawarra Health Area, by Sex, 1997/98-1998/99

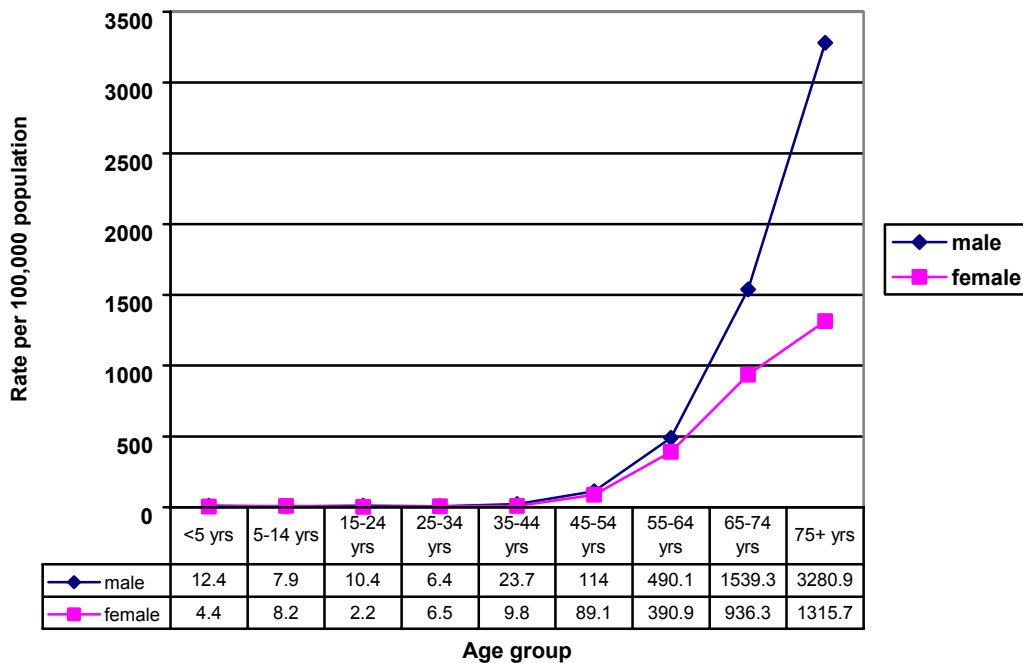


FIGURE 21:
Trends in Directly Age-Standardised COPD Mortality Rates among Residents of the Illawarra Health Area, all Ages, by Sex, 1989-1998



FIGURE 22:
Trends in Directly Age-Standardised Hospital Separation Rates for COPD among Residents of the Illawarra Health Area, all Ages, by Sex, 1989/90-1998/99



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1. Public Health Division. *Report on the 1997 and 1998 NSW Health Surveys*. NSW Health Department, Sydney, 2001. Available at <http://www.health.nsw.gov.au/public-health/nswhs>. Accessed 5 July 2001.
2. Public Health Division. *The health of the people of New South Wales – Report of the Chief Health Officer, 2000*. NSW Health Department, Sydney, 2000. Available at <http://www.health.nsw.gov.au/public-health/chorep>.
3. Illawarra Asthma Project Committee and Working Parties. *Illawarra Asthma Strategic Plan 2001-2003*. Illawarra Area Health Service, Wollongong, 2001.

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