Reproductive health indicators, Australia, 2002

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indicators developed by the World Health Organization (WHO) (WHO 1999), customised for the Australian context. Forty-four indicators where chosen for inclusion in the report, covering six key areas: fertility, subfertility, sexually transmissible infections, cancers of the reproductive tract, family planning and pregnancy and childbirth (including prenatal/antenatal health factors, pregnancy and assisted conception, childbirth, maternal health outcomes and fetal and infant health outcomes).

Each of the 44 indicators is presented in a clear two-page format, which includes definition, context, data sources and relevant measures. Where possible, disaggregation by age, sex, geographical location and other appropriate categories has been performed to provide an insight into the health status of various sub-populations.

Australia compares well in a world context of reproductive health. In 1999, the crude birth rate in Australia was 13.1 per 1,000 population, and the total fertility rate was 1.75, which is comparable to countries such as the United Kingdom, United States, Canada, France, Sweden and Japan (ABS 2000a; UNPD 2000). In the same year, the national caesarean rate in Australia was almost 22%, the highest level ever recorded in Australia (AIHW National Perinatal Statistics Unit perinatal collection), and the vaginal birth after a caesarean section rate was almost 25%. These rates are comparable to other more developed countries; however the WHO recommends a

available, other indicator areas such as maternal morbidity, infertility and family planning generally reflect a lack of standardised definitions and data collection tools. This assessment serves to emphasise that significant gaps remain in our knowledge of reproductive health.

This report supports the need for the development of a national conceptual and information framework for reproductive health. Such a framework must include a clear and accepted definition of reproductive health, a conceptual model of reproductive health, a list of core reproductive health indicators, and a plan for a comprehensive and cohesive surveillance and performance measurement system. The selection of the 44 core indicators and the identification and evaluation of currently available reproductive health data sources provides an invaluable foundation from which to advance the understanding and measurement of reproductive health for the benefit of all Australians.

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Preparation of specific indicators

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Abbreviations

AACR   Australasian Association of Cancer Registries

AAS   Anabolic-androgenic steroids

Report layout

This report provides a contemporary representation of the status of Australia's reproductive health using a set of reproductive health indicators. It is also intended as a reference source for currently available data on Australian reproductive health. The report is organised into Part A and Part B.

Part A provides a background discussion on the selection of the indicators, available data sources and a summary of the key indicator findings. Part A is organised into the following four sections:

Section 1 discusses the concept of reproductive health, the objectives of the report and the use of indicators in health surveillance.

Section 2 provides a discussion of the selection process and relevance of selected indicators.

Section 3 details the primary data sources used for the measurement of the indicators and provides a critique of the limitations of each data source.

Section 4 highlights some key findings from the report, discusses overall deficiencies in currently available information, and recommends future steps for advancing the formation of a reproductive health frameworkomme(orkomme)o-3.2((orkom9(o)1.5(-0.8rTw[ind7((orko5

References

Australian Bureau of Statistics (ABS) 2000a. Births, Australia 1999. Cat. no. 3301.0. Canberra: ABS.

Australian Bureau of Statistics (ABS) 2000b. Deaths, Australia 1999. Cat. no. 3302.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries (AACR) 2000. Cancer in Australia 1997: incidence and mortality data for 1997 and selected data for 1998 and 1999. AIHW cat. no. CAN 10. Canberra: AIHW (Cancer Series no. 15).

Caan W & Messent R 2002. Caesarean section rate in England and Wales. British Medical Journal 324 (7335): 486.

Eberhardt MS, Ingram DD, Makuc DM, et al. 2001. Urban and rural health Chartbook. Health, United States, 2001. Hyattsville, Maryland: National Centre for Health Statistics.

International Agency for Research on Cancer (IARC)/World Health Organization (WHO) 2001. GLOBOCAN 2000: cancer incidence , mortality and prevalence worldwide, version 1.0. IARC Cancer Base No. 5. Lyon IARC Press 2001 (online). Available from Internet: URL: http//www-dep.iarc.fr/globocan/globocan.htm (cited 22 August 2002).

PART A: Reproductive health

Section 1: Introduction

1.1 The concept of reproductive health

Reproductive and sexual health is central to what it means to be human and is of critical importance at an individual, societal and global level. Whilst the importance of reproductive health is being increasingly recognised, its definition, the concepts it encompasses and information to describe and monitor it are still poorly developed.

The World Health Organization defines reproductive health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes' (WHO 1999).

The International Conference on Population and Development held in Cairo in 1994 provided a major international forum for considering the breadth of issues concerning reproductive health. The Conference concluded that:

> reproductive health therefore implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the rights of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of

reflected and measured in this report by the physiological, behavioural and health-care factors that are important determinants of reproductive and sexual health outcomes.

The scope of reproductive health covered in this report is centered primarily on the 15–49 years age group, and includes the following six key areas of reproductive health:

- Fertility: the child-bearing performance of the population, including birth and fertility rates.
- Subfertility: the degree of reduced fertility in the population.
- Sexually transmissible infections: the prevalence of sexually transmissible diseases in the population and knowledge of preventative practices.
- Family planning: the use of methods to regulate fertility through contraception and induced terminations.
- Pregnancy and childbirth: the degree of safe and healthy motherhood, including antenatal factors, pregnancy, childbirth, and maternal, fetal and infant health outcomes.
- Cancer of the reproductive tract: the incidence of selected female and male reproductive tract cancers.

1.2 Objectives of this report

The primary objectives of this inaugural report on Australian reproductive health indicators are:

- to provide a snapshot of Australia's reproductive health status, by systematically measuring a set of reproductive health indicators. This enables risk and protective factors relevant to reproductive health to be highlighted, and provides a basis from which international and sub-population comparisons can be made;
- to provide base lines for prospective measurement and monitoring of Australia's reproductive health. The indicators reviewed in this report will act as a benchmark against which future analyses of reproductive health will be measured;
- to provide a comprehensive and cohesive description of currently available information sources for measuring Australia's reproductive health. An assessment of the usefulness and value of each data source is provided, and further information requirements explored;
- to provide a foundation from which a comprehensive conceptual and information framework on reproductive health can be developed.

1.3 Health status indicators

Health status indicators are statistical measures of a specific health outcome, determinant or attribute. Indicators are generally expressed quantitatively in terms of absolute numbers, rates, frequencies and percentages. They are important health surveillance tools that can be used to establish benchmarks and to monitor and compare the health status of population groups over time. They are useful for monitoring and evaluating the effectiveness of health care initiatives, for generating public debate regarding health care issues, and ultimately, for setting the agenda for health care priorities.

When considered as a framework, such as in this report, health status indicators provide a useful representation of the status of health of a population. The 44

Section 2: Reproductive health indicators

2.1 WHO reproductive health indicators

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2.4 How to read the indicators in this report

The indicators are presented in the format shown below. Details of the type of information included in each indicator are also included to give the reader a guide on how to read each of the indicators.

Indicator

> This section gives a brief outline of the indicator, that is, the target population, the denominator for calculation of rates

Background information
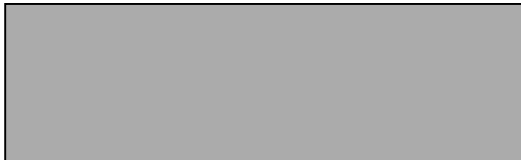
- Is designed to highlight some of the key issues raised in current research, particularly Australian research.
- Often includes a definition of the terms, if required.
- May include some risk factors or outcomes associated with the indicator.

Current data

- Being a national report, ideally all data reported would be population based. Where national data are not

Data source(s)

Lists the primary sources of data and supplementary State and Territory sources where appropriate.

References

- List of all articles, reports or books referred to in the text of each indicator, presented alphabetically.
-

References

Al-Azzawi F 2001. The menopause and its treatment in perspective. Postgraduate Medical Journal 77(907): 292.

Al-Yaman F, Bryant M & Sargeant H 2002. Australia's children: their health and wellbeing 2002. AIHW cat. no. PHE 36. Canberra: AIHW.

Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries (AACR) 2000. Cancer in Australia 1997: incidence and mortality data for 1997 and selected data for 1998 and 1999. AIHW cat. no. CAN 10. Canberra: AIHW (Cancer Series no. 15).

Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries (AACR) 2001. Cancer in Australia 1998: incidence and mortality data for 1998. AIHW cat. no. CAN 12. Canberra: AIHW (Cancer Series no. 17).

Hurst T, Shafir E & Lancaster P 2001. Congenital malformations Australia 1997. Sydney: AIHW National Perinatal Statistics Unit. Available on Internet: http://www.npsu.edu.au.

World Health Organization (WHO) 1999. Monitoring reproductive health: selecting a short list of national and global indicators. WHO: Geneva.

Writing Group for the Women's Health Initiative Investigators 2002. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the Women's Health Initiative randomized controlled trial. Journal of the American Medical Association 288: 321–333.

Section 3: Data sources

As noted on each of the relevant indicators, data for one State were excluded for 1994 and 1995 due to systematic coding errors.

-

Statistics' Private Health Establishments Collection, which has wider coverage (AIHW 1999a).

- The NHMD was not designed as a data collection for epidemiological research. Data can reflect an aspect of the burden of diseases in the community, but they are not usually used as measures of the incidence or prevalence of conditions since not all people with a particular illness are treated in hospital, and differing admission practices and levels of service provision may affect admission patterns.
- The State-specific hospital separation rates have not been controlled for differences in populations such as age distribution, access to services, education, parity and geographic factors, all of which may impact upon the rates.
- Key information about pregnancy such as parity, pre-existing medical conditions and risk behaviours such as smoking is not collected.
- Large variations among State and Territory separations identifying Indigenous status cast doubt on the ascertainment of Indigenous status.
- The data do not allow calculation of prevalence estimates of the presented conditions or procedures.

AIHW National Perinatal Data Collection (NPDC)

The AIHW National Perinatal Data Collection (NPDC) is based upon a national perinatal minimum data set first introduced in 1979.

Overview

This data set is produced from notification forms for each birth in Australia, which are completed by midwives, and sometimes medical practitioners.

Access to data

The NPSU are data custodians of the perinatal data collected by individual States and Territories. The perinatal data are provided annually by the States and Territories and are collated and compiled by the NPSU to enable analysis of national

Data quality

State and Territory perinatal data groups constantly request further information on missing or doubtful data items from hospitals and homebirth practitioners. In addition, edit checks and summaries of data provided in reports to individual hospitals enable review of data quality. Most States and Territories have also conducted validation studies on their perinatal data (Nassar et al. 2001).

Data limitations

- There are limitations in the ascertainment of data items such as maternal medical

- In most cases HIC data presented here cover the three most recent years for which data are available, 1998–2000.
- HIC data are used as a primary data source for rate of vasectomy, but are included for comparison with other data in many other indicators including incidence of procedures related to erectile dysfunction, operations for undescended testes, number of tubal ligation and ectopic pregnancy rate.

Data quality/data limitations

- Medicare records only include services that qualify for Medicare benefits and for which claims have been processed. They do not include services that qualify for benefits under the Department of Veterans' Affairs National Treatment Account.
- HIC data do not include services that have been provided by a doctor in a hospital to public patients or services provided in outpatients or emergency departments of hospitals.
- For some items individual State and Territory data are not available, only combined State/Territory data (for example, induced abortion data).
- HIC data are not always presented in five-year age groups.
- Ascertainment of certain services may be under-reported due to misclassification of services to other item codes.
- The data do not allow calculation of prevalence estimates of the presented conditions or procedures.

Australian Bureau of Statistics (ABS)

The Australian Bureau of Statistics (ABS) is Australia's official statistical agency. It provides statistics on a wide range of economic and social matters, covering government, business and the population in general (ABS 2000a).

Overview

The ABS data presented in this report relate to vital statistics, primarily birth and mortality data. Registration of births and deaths is a legal requirement in Australia, and compliance is virtually complete. Registrars provide birth and death data to the ABS for coding and compilation into national statistics.

Access to data

ABS data were sourced through published reports and de-identified unit record files of registered births and perinatal deaths.

Relevant items

- The ABS births publication (ABS 2000b) covers births in Australia, confinements, fertility rates, fertility differentials, projected fertility and Aboriginal and Torres Strait Islander births.

- The ABS deaths publication (ABS 2000c) covers population change, standardised death rates, infant mortality, expectation of life, leading causes of death and deaths in Aboriginal and Torres Strait Islander people.
- Australian Bureau of Statistics data has been used as a primary data source in the following indicators: total fertility rate, perinatal mortality rate and infant mortality rate.

Data quality/data limitations

Generally, statistics on births and deaths are registered in the calendar year of occurrence, however:
- There is usually an interval between the occurrence and registration of a birth and, as a result of delay in registration, some births occurring in one year are not registered until the following year or even later (ABS 2000b). For example, in 1998 there was a 15.3% discrepancy between the number of live births recorded in the perinatal collections (253,771) and the number of live births in 1998 registered in the same year (220,010) (AIHW NPSU perinatal collections, and ABS births, 1999 data).
- There is a time lag between the occurrence of a death and the registration of the event so that some deaths that occur late in the year are registered in the early part of the following year (ABS 2000d). For example, in the case of perinatal deaths occurring in 1998, 87.3% were registered in the relevant year and the remaining registered in subsequent years (ABS perinatal deaths, 2000 data).
- Compliance with birth registration is not complete. Births in 1997 are not comparable between the perinatal collection (254,390) and live birth registrations (248,429) with a 2.4% discrepancy between the collections (AIHW NPSU perinatal collections, and ABS births, 1999 data).

State and Territory data: State-based surveys (SBS)

Where national data were not available, State and Territory data have been used in the compilation of indicators.

State and Territory data presented in this report came primarily from the perinatal data collections. Each State and Territory has a perinatal data collection in which midwives and other staff, using information obtained from mothers and from hospital or other records, complete notification forms for each birth. The aggregated data form the AIHW Perinatal Data Collection described above.

Although the perinatal collections are based on a national perinatal minimum data set, additional items are collected by some States and Territories. These items are often reported in the State or Territory reports.

The indicators reporting some of the additional items collected by State and Territory perinatal collections include those covering anaemia, smoking in pregnancy, prenatal diagnostic testing, induced abortions and antenatal care.

National surveys and registries

Another important data source in this report was the results of national surveys that have been conducted in Australia. Brief details of the surveys and registries referred to in this report are presented below.

National drug and alcohol surveys

The National Drug and Alcohol Survey 1995 and the 1998 National Drug Strategy Household Survey were comprehensive national surveys of Australians aged 14 years and older. They involved a national geographic stratified random sample

recommended by The National Health & Medical Research Council (NHMRC). The notifiable disease data incorporated in this report include syphilis, chlamydia, gonorrhoea and urethritis.

HIV surveillance

Newly diagnosed HIV infection is also a notifiable condition in all State and Territory health jurisdictions in Australia. Cases of diagnosed HIV infection are notified through State/Territory health authorities to the national HIV surveillance centre (National Centre for HIV Epidemiology and Clinical Research (NCHECR)) on the first occasion of diagnosis. Sentinel surveillance for HIV infection is also conducted based on a network of metropolitan sexual health clinics. Data from the NCHECR have been reported in the prevalence of HIV among adolescents and prevalence among pregnant women indicators.

Smaller community-based data

Where national or State and Territory data are not available, data from smaller community-based studies have been presented in the indicators. These studies, however, are usually used to supplement other data from larger data sources. Where smaller, community-based studies are included they are not intended to be representative of the whole population. Such studies have been included to highlight some of the potential issues related to these sub-groups.

3.2 Other data sources for future reports

The list of data sources described above is not an exhaustive list. It represents the primary data sources deemed to be relevant to reporting on the selected list of reproductive health indicators. Future reports will use an expanded list of data sources to reflect the changing core set of indicators, and new sources of Australian reproductive health information. A few possible future sources of data on reproductive health include the Bettering the Evaluation and Care of Health (BEACH) data and Family Planning Australia data.

Family Planning Australia data

Family Planning Australia collects some data on client visits to their clinics including demographic data, contraceptive use of clients, use of services for management of sexually transmitted infections and reproductive health investigation services.
In 1996–1997 the database included information on 185,879 clients. This data may be useful in reporting on contraceptive use and other aspects of the management of reproductive health.

3.3 Limitations of currently available data sources

Less than half of the 44 indicators (21, 48%) presented in this report were considered to be complete at the time of press (Table 1). An indicator was considered 'complete' if there was sufficient national and/or State- and Territory-based data to ensure the indicator represented an inclusive, valid and reliable measure of reproductive health. Multiple data sources were used where possible to maximise the comprehensiveness of each indicator (Table 1).

Indicators relating to fertility, fetal and infant health outcomes, pregnancy and assisted conception, and cancers of the reproductive tract were considered to be complete. However, the indicators relating to the remaining reproductive areas were considered to be only partially complete, with information relating to subfertility and prenatal/antenatal factors being particularly deficient. Specific data limitations associated with each of the ten reproductive areas are summarised in subsequent paragraphs.

T███████████████████ █ completeness for reproductive
h█████████████████

Indicator	Indicator complete [2]	Primary data sources [1]						
		NHMD	NPDC	ABS	HIC	NS	SBS	Other
Fertility								
Crude birth rate	✔							
Total fertility rate			×					
Teenage fertility rate			×	×				
Subfertility								
Prevalence of infertility in women							×	
Prevalence of infertility in men								×
Prevalence of erectile dysfunction							×	
Prevalence of undescended testes		×						
Sexually transmissible infections								
Prevalence of sexually						×		
						×		
Knowledge of HIV-related prevention practices							×	
Family planning								
Prevalence of contraceptive use								

Table 1 (continued): Principal data sources and assessment of data completeness for reproductive health indicators, Australia

Indicator	Indicator complete [2]	NHMD	NPDC	ABS	HIC	NS	SBS	Other
		Primary data sources [1]						
Pregnancy and assisted conception								
Pregnancy rates and outcomes after assisted conception	✔							×
Multiple pregnancy rate	✔		×					
Childbirth								
Percentage of all labours which were induced/augmented	✔		×					
Percentage of institutional deliveries	✔		×					
Caesarean birth rate	✔	×	×					
Proportion of vaginal births after caesarean section			×					
Rate of instrumental vaginal deliveries	✔		×					
Percentage of births attended by skilled health personnel						×	×	
Obstetric service providers by rural/remote classifications						×		
Maternal health outcomes								
Maternal morbidity		×						
Maternal mortality ratio	✔	×		×				
Ectopic pregnancy rate		×			×			
Fetal and infant health outcomes								
Perinatal mortality rate	✔		×	×				
Infant mortality rate	✔			×				

Fertility (3 indicators)

There are national-level data available on the three indicators, allowing computation of the indicators. There is good ascertainment of the number of births in Australia, through national births and perinatal data collections, both of which are based upon State and Territory collections. The data could be strengthened by standardised collection of data on induced and spontaneous abortions by all States and Territories.

Subfertility (4 indicators)

There are limiteTJ/TT109(9(l)-2fTh)m-0.0sta available .0s the indicators in the subfertility section. There are /TT109o national survey data on infertility in men or women; and this information is /TT109ot collecteTJ/TT10by other routine data sets. There are /TT109o adequate proxy collections that provide information /TT10that could be useTJ/TT10to inform policy or evaluate programs and heh initiatives targeteTJat /TT10the populations with infertility problems. There are no /TT109(9(l5(a)-0.6(t)10.4(i)-3.1(on(9(l5(a)10.3(l)-3.1(populatio)12.7(n(9(l5(-b)9.gg.sed data o available on the notification rates for gonorrhoea and chlamydia. The national surveillance o HIV is li lack o uniform /TT109otificatireening procedures for the States and Territories. The survey data available about knowledge .f HIV is adeualow-prevalessch as Australia.

Family planning (3 indicators)

There is limiteTJ/TT10national data avable on all the indicators. TheJ/TT101995 National Health Survey wahe seco0d .f twoJ/TT10natio0al populatio0-baseTJsurveys that looked at contraceptive use. TheJdata are limited by their age (six years old0 and0lack o information on /TT10contraceptive use in teenagers. There is no routine collection of information on /TT10contraceptive use by States and Territories. There is incomplete ascertainmeninduceTJ/TT10abortio0nnAunh Aulia, the Northern Territory, Auian Capital Territory and Western /TT10Auia reure /TT10notification of induceTJabortion /TT10at a State /TT10and Territory level. Stat/TT10e-levelJdata are not collected in New South Wales, Victoria a()-5.1(d Qu)5(eens)10.6(l)-2.7(a)10.7(()-5.1(d. A)5.9gs)-0.3(certai)8.2(nme)11.4 abortions uing the /TT10HIC asd NHsMD are iscomplete, asd have /TT109ot bees presested with studies having shown that both data sources under-asn the number .f induceTJabortions performed. There is /TT10no routine moitorig o iduceTJabortons that oc/TT1(cu)6T2(r)4.7(in)10.9(fr)4.7(eesta)11.9(ndi)9.49(s)3.9(g cl)9.49inics.

There are alsoJ/TT10limits i te data /TT10collectio0 .f the tree operative procedures:

private hospitals) and the HIC (covering freestanding clinics, private hospitals and private patients in public hospitals). The incidence rate for any of these procedures cannot be calculated using a combination of these data due to the inclusion of private patients in both data collections.

Antenatal factors (9 indicators)

There are no national data collected on any of the presented antenatal factors: anaemia in pregnancy, periconceptional use of folate during pregnancy, smoking, alcohol and drug use in pregnancy, sexually transmissible infection and HIV infection in pregnancy, proportion of women attending antenatal care and prenatal diagnostic testing undertaken. A number of the States and Territories collect information indirectly on anaemia as a complication of pregnancy or a pre-existing medical condition of the mother. The importance of this indicator needs to be reviewed with the development of a definition and gestational age for data collection. A number of the States and Territories collect information on smoking in pregnancy, but there is no standardised national data definition. Development of standardised data items in the national perinatal minimum data set for smoking in pregnancy would greatly improve the ascertainment of this important indicator. There are very limited data on the use of alcohol and illicit drugs during pregnancy, with the National Drug Strategy Household Survey providing the only national data. It is anticipated that data will be strengthened in the next survey with more specific and sensitive questions on alcohol and illicit drug use in the current pregnancy.

Periconceptional use of folate during pregnancy has only been measured by periodic surveys. There are no national data collected specifically on the prevalence of STIs or HIV infection in pregnant women. The development and inclusion of a composite antenatal screening indicator in the perinatal collection would improve ascertainment of these indicators. Only three States collect information on women undergoing prenatal testing including the outcomes such as termination of pregnancy. There needs to be development of a system for monitoring the use and outcomes of prenatal diagnostic tests.

Pregnancy and assisted conception (2 indicators)

There is a lack of population-based information about male and female infertility and the use of assisted conception in Australia. The State and Territory perinatal collections do not have information on fertility drug use or other assisted conception procedures; this limits the interpretation of data on multiple births, ascertainment of

ascertainment of the proportion of vaginal births after caesarean section, with only some of the State and Territory perinatal collections collecting the information. The quality of the data item vaginal birth after caesarean section would be improved if there was a nationally accepted definition. Data quality would also be improved if we were able to discriminate between ever having a caesarean section and caesarean section as a form of delivery in the confinement previous to the current one. There is no routine collection of data on the service provider present during delivery by the State and Territory perinatal data collections, which could be linked to the development of an indicator on the number of obstetric service providers by rural and remote classification.

Maternal heath outcomes (3 indicators)

The ascertainment of ectopic pregnancy could be strengthened. Interpretation of the current data are limited by the NHMD reporting separations, not individuals, and only covering ectopic pregnancies treated in the hospital setting; and the HIC only covering services claimed from Medicare Benefits Schedule (for example, free-

References

Australian Bureau of Statistics (ABS) 2000a. Annual report 1999–2000. Cat. no. 1001.0. Canberra: ABS.

Australian Bureau of Statistics (ABS) 2000b. Births, Australia 1999. Cat. no. 3301.0. Canberra: ABS.

Australian Bureau of Statistics (ABS) 2000c. Deaths, Australia 1999. Cat. no. 3302.0. Canberra: ABS.

Australian Bureau of Statistics (ABS) 2000d. Causes of death, Australia 1999. Cat. no. 3303.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) 1999a. Australian hospital statistics 1997–98. AIHW cat. no. HSE 6. Canberra: AIHW (Health Services Series).

Australian Institute of Health and Welfare 1999b. 1998 National Drug Strategy Household survey: first results. AIHW cat. no. PHE. 15. Canberra: AIHW (Drug Statistics Series).

Section 4: Discussion

4.1 Key findings—Australia's reproductive health

The systematic measurement of the 44 reproductive health indicators presented in this report provides a snapshot of Australia's reproductive health, and highlights a number of relevant factors and trends. By reviewing the 44 indicators and comparing them to other countries, it is evident that Australia continues to rate well, in terms of the indicators, in a world context of reproductive health.

Highlights from each of the key areas of reproductive health examined in this report are summarised in the following paragraphs.

Fertility

Australia's crude birth rate was 13.1 per 1,000 population in 1999. This is the lowest rate ever recorded in Australia, representing a continual and gradual decline in crude birth rate over previous decades. Australia's total fertility rate is also declining with an average woman estimated to have 1.75 children by the end of her reproductive life. Current fertility rates suggest that 26% of Australian women will remain childless at the end of their reproductive lives (ABS 2000a). These rates are comparable to countries such as the United Kingdom, United States, Canada, France, Sweden and Japan (UNPD 2000)

Subfertility

A national data collection on infertility is not available in Australia, but it is generally assumed that the prevalence and causes are similar to those in other developed countries. Almost 25,000 hospital separations in 1998 had a principle diagnosis of female infertility (AIHW 1999). It is estimated that male infertility affects one man in 20, and is the underlying reason for 40% of infertile couples using assisted-reproductive techniques (McLachlan & de Krester 2001).

Sexually transmissible infections

Sexually transmissible infections are a major public health problem worldwide. Notifications of chlamydia, gonorrhoea and syphilis to the National Notifiable Diseases Surveillance System (NNDSS) have increased over the last decade. Reported notifications for chlamydia, gonorrhoea and syphilis were 74.5, 29.7 and 9.0 per 100,000 population in 1999 (NCHECR 2000; Thomson et al. 2000). The prevalence of diagnosed HIV infection among adolescents (13–19 year olds) was 1.54 per 100,000 females, and 3.57 per 100,000 males in 2000 (Law M personal communication; NCHECR 2001).

Family planning

Forty-four per cent of all women aged 18–49 years reported current use of a method of contraception in 1995. The most commonly reported methods were the oral contraceptive pill (60%) and condoms (27%) (Yusuf & Siedlecky 1999).

Induced abortions are subject to different legal requirements in the different States and Territories of Australia. Only South Australia, Western Australia and Australian Capital Territory require notification of all induced abortions. In 1999 the State-based notification systems in South Australia and Western Australia reported an induced abortion rate of 17.8 and 19.6 per 1,000 women aged 15–44 years, respectively (Chan et al. 2000; personal communication Executive Director of Public Health, Western Australia).

Prenatal/antenatal factors

Comprehensive and reliable data are not widely available in this area. The available measures primarily reflect national- or State-based collections. However, one of the critical indicators is smoking in pregnancy; in a New South Wales survey conducted in 1998, almost 20% of mothers reported smoking during pregnancy. Of these, 96% continued smoking during the second half of their pregnancy, the time of greatest risk to the health of both mother and baby (Taylor et al. 2000).

Pregnancy and assisted conception

The use of assisted conception has increased significantly during the 1990s. In 1999, among all assisted conception treatment cycles, there were 23,947 embryo transfer cycles resulting in 4,288 viable pregnancies. The viable pregnancy rates varied between 17% and 21%, depending on the procedure (Hurst & Lancaster 2001).

Childbirth

In 1999, 25.9% of all deliveries were induced and 20.6% of all spontaneous births in Australia were augmented (Nassar et al. 2001). The national caesarean rate in the same year was 21.9%, the highest level ever recorded in Australia (AIHW NPSU perinatal collection). Vaginal birth after a caesarean section rate was almost 25% in 1999, a slight increase from 22% in 1997 (ACHS 2001). These rates are comparable to other more developed countries, however the WHO recommends a figure of 15% as a reasonable national rate for caesarean section (Caan & Messent 2002; Eberhardt et al. 2001; WHO 1985).

Maternal health outcomes

The maternal mortality rate was 12.9 deaths per 100,000 live births in Australia in the three years from 1994 to 1996. This rate includes maternal deaths from direct and indirect causes, and reflects a slight increase from the previous triennium (AIHW & NHMRC 2001).

The reproductive health indicators chosen for this inaugural report were based on WHO reproductive health indicators customised to the Australian context. One of the conditions for inclusion was that sufficient data were available to provide meaningful measures. This report demonstrates that limited surveillance can be conducted using routinely collected data from hospital-captured services and health insurance claims. However, a key finding of this report is that there is a need to strengthen the quality and breadth of information available on reproductive health in Australia.

The information available in Australia reflects the international picture to a large extent, where despite advancing on a policy agenda, women's health and reproductive health lack standard definitions, rigorous assessment and surveillance tools and adequate funding. A comprehensive approach to reproductive health care is also needed that includes men as well as women and encompasses the full age spectrum of reproductive life.

There isn't an integrated national public health surveillance of reproductive health in Australia. There is national surveillance of perinatal health through the AIHW National Perinatal Data Collection (NPDC), which is based upon the State and Territory perinatal or midwives collections. However, the NPDC is limited for reproductive health surveillance by: a lack of risk factor and behavioural information on the mothers; no data on the fathers; and poor quality data on the complications of pregnancy, childbirth and the puerperium arising from a lack of standardised data definitions and collection methods.

The report is also limited by the lack of standardised definitions and data collection tools to measure the proposed core indicators. Of the 44 indicators covered in the report, the authors consider available data on 21 (48%) indicators to be adequate, while the remaining 23 indicators were considered to be incomplete. This assessment serves to emphasise that there remain significant areas related to reproductive health about which little is known.

Information on contraceptive use, sterilisation and termination of pregnancy is limited, with no routine collection of it. There are large gaps in the monitoring of sexually transmissible diseases in pregnant women where, for example, syphilis rates in pregnant women could not be identified. The extent of morbidity associated with pregnancy-related complications remains poorly documented and measured. While there have been a large number of hospital-based studies, these give little indication

information on public patients in public hospitals and the NHMD collects information on separations not individuals. Neither data collection was designed for epidemiological study of particular diseases and procedures or for surveillance of the health care system. This report does not provide prevalence estimates of the presented conditions.

The HIC data and NHMD are both significantly affected by the sensitivity and specificity of the coding systems they use to accurately capture the diagnosis or procedure—the Medicare benefit schedule for the HIC and the international disease classification for NHMD. During the data time period for this report the NHMD coding has changed from ICD-9-CM to ICD-10-AM, with resulting changes to some reproductive-related codes. Both data sources miss key demographic, risk factor and

Australian definition of reproductive health	Conceptual framework of reproductive health	Core indicators of reproductive health
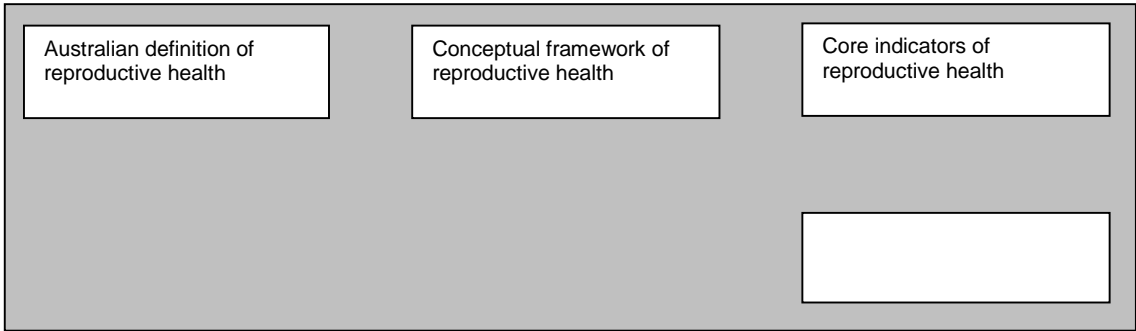
framework, and that these would be supplemented with additional data and perhaps additional purpose-built systems.

National reproductive health surveillance system—The information framework would form the basis for a comprehensive and cohesive surveillance and performance measurement system. This would allow the core reproductive health indicators to be measured and monitored in a systematic and reliable manner. It would allow emerging reproductive trends to be identified and tracked, allow health care initiatives to be evaluated, and set the agenda for reproductive health priorities.

References

Australian Bureau of Statistics (ABS) 2000a. Births, Australia 1999. Cat. no. 3301.0. Canberra: ABS.

Australian Bureau of Statistics (ABS) 2000b. Deaths, Australia 1999. Cat . no. 3302.0. Canberra: ABS.

Australian Council on Healthcare Standards (ACHS) 2001. Determining the potential to improve the quality of care in Australian health care organisations: results from the ACHS clinical indicators data 1998–1999. Sydney: ACHS.

McLachlan RI & de Kretser DM 2001. Male infertility: the case for continued research. Medical Journal of Australia 174: 116–117.

Moon L, Rahman N & Bhatia K 1998. Australia's children: their health and wellbeing 1998. AIHW cat. no. PHE 7. Canberra: AIHW.

Nassar N, Sullivan EA, Lancaster P & Day P 2001. Australia's mothers and babies 1998. AIHW cat. no. PER 15. Sydney: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series no. 10).

National Centre in HIV Epidemiology and Clinical Research (NCHECR) 2000. HIV/AIDS, hepatitis C and sexually transmitted infections in Australia annual surveillance report 2000. New South Wales: NCHECR, University of New South Wales.

Taylor L, Pym M, Bajuk B, Sutton L, Travis S & Banks C 2000. New South Wales mothers and babies 1998. NSW Public Health Bulletin Supplement, Number 1, February 2000. Sydney: NSW Health Department.

Thomson J, Lin M, Halliday L, Preston G, McIntyre P, Gidding H, Amin J, Roberts L, Higgins K, Brooke F, Milton A, O'Brien E, Witteveen D & Crerar S 2000. Australia's notifiable diseases status, 1998. Annual report of the National Notifiable Diseases Surveillance System. Vol. 23 (11), October. Canberra: AGPS.

United Nations Population Division (UNPD) 2000. World population prospects: the 2000 revision. New York: United Nations.

World Health Organization (WHO) 1985. Appropriate technology for birth. (Sometimes referred to as the Fortelesa Declaration.) Geneva: WHO.

Yusuf F & Siedlecky S. 1999. Contraceptive use in Australia: evidence from the 1995 National Health Survey. Australian and New Zealand Journal of Obstetrics and Gynaecology 39(1):58-62.

PART B: Selected reproductive health indicators

Fertility

The child-bearing performance of the population:

-

Crude birth rate

Indicator

The number of live births
per 1,000 population

Background information

The crude birth rate is the number of
live births registered during the
calendar year per 1,000 estimated
resident population of Australia at
30 June that year (ABS 2000).
The crude birth rate is the most easily
obtained and most often reported
fertility measure.

Current data

There were 248,870 live births
registered in Australia in 1999—a
crude birth rate of 13.1 per 1,000
population (ABS 2000).
The rate in Australia is at its lowest
ever, continuing a gradual decline in
the overall crude birth rate from 21.7
per 1,000 population in 1971
(Figure 4).
The crude birth rate varied among

Source: ABS 2000.

Figure 4: Crude birth rate, Australia, 1971–1999

Total fertility rate

Indicator

Background information
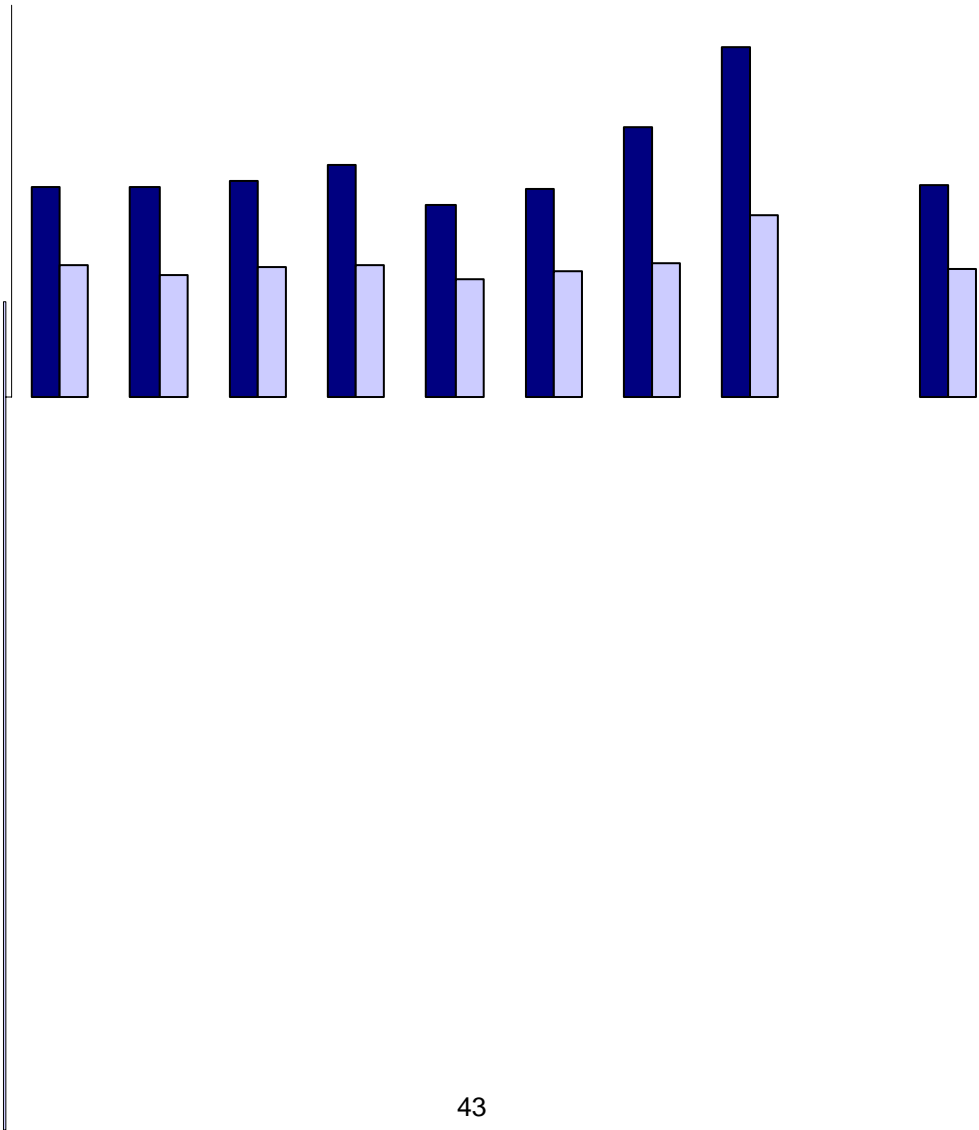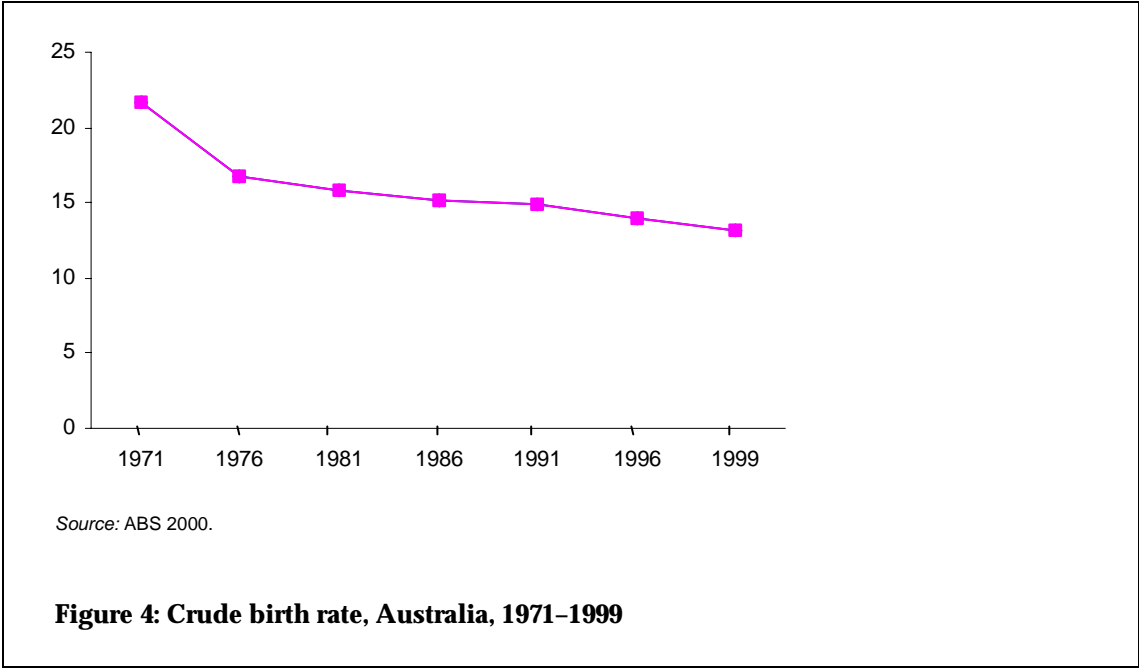
- The total fertility rate is based on the summation of age-specific fertility rates. Age-specific fertility rates[1]

Rate per 1,000 women aged 15–49 years

Source: ABS 2000.

Figure 6: Total fertility rate, Australia, 1971–1999

Rate per 1,000 women

* Includes births to mothers aged less than 15 years.

** Includes births to mothers aged 50 years and over.

Source: ABS 2000.

Figure 7: Age-specific fertility rate, Australia, 1999

Data limitations
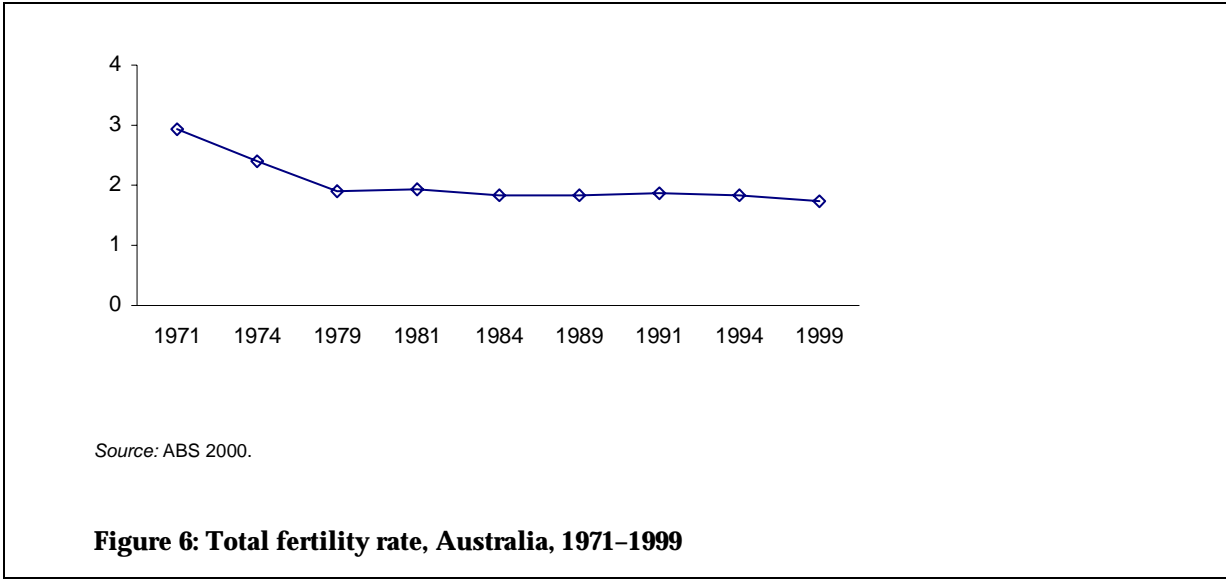
Age-specific fertility rates or, more strictly, age-specific birth rates do not include any information about stillbirths or induced and spontaneous abortions. Data on abortions in each age group are needed to give more accurate pregnancy rates. However, for the calculation of the total fertility rate, only births are relevant.

Indicator status

Adequate.

Data source

Australian Bureau of Statistics (ABS 2000).

References

- Australian Bureau of Statistics 2000. Births, Australia, 1999. Cat. no. 3301.0. Canberra: ABS.
- Barnes A 2001. Low fertility: a discussion paper. Occasional paper no. 2. Canberra: Department of Family and Community Services.

Teenage fertility rate

Indicator

> The number of live births to mothers aged less than 20 years in a given year per 1,000 females aged 15–19 years

Background information

- Over the last 30 years there has been a steady decline in the teenage fertility rate which has been attributed to increased access to and use of contraception and safe abortion (ABS 2000a).

- Teenage childbearing is often related to

Per 1,000 females aged 15–19 years

Figure 8: Teenage fertility rate, States and Territories, 1999

Note: The birth rate of Indigenous mothers in the Australian Capital Territory is not included due to small numbers.

Source: ABS 2000b.

Data limitations
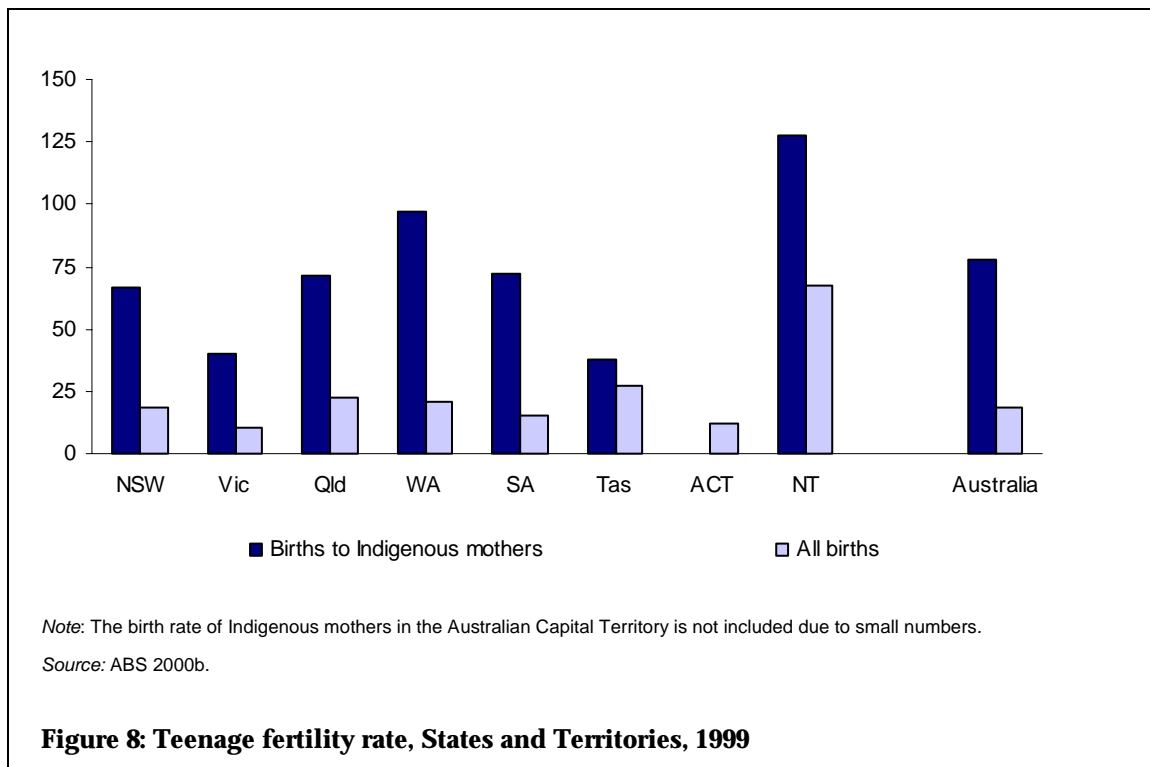
Age-specific fertility rates are an imprecise measure of pregnancy rates as they are based on live births and do not include any information about stillbirths or induced and spontaneous abortions. Currently, only South Australia, Western Australia and the Northern Territory collect population-based data on induced abortions.

Indicator status

Adequate.

Data source

Australian Bureau of Statistics

References

- American Academy of Paediatrics 1999. Adolescent pregnancy: current trends and issues, 1998. Paediatrics 103(2): 516–520.
- Australian Bureau of Statistics (ABS) 2000a. Teenage fertility. Australian demographic statistics, June quarter 2000. Cat. no. 3101.0. Canberra: ABS.

- Australian Bureau of Statistics 2000b. Births Australia, 1999. Cat. no. 3301.0. Canberra: ABS.
- Bai J, Wong F & Stewart H 1999. The obstetric and neonatal performance of teenage mothers in an Australian community. Journal of Obstetrics and Gynaecology 19(4): 345–348.
- Chan A, Scott J, McCaul K & Keane R 1999. Pregnancy outcome in South Australia 1998. Adelaide: Pregnancy Outcome Statistics Unit, Epidemiology Branch, Department of Human Services, Government of South Australia.
- Coory M 2000. Trends in birth rates for teenagers in Queensland, 1988–1997: an analysis by economic disadvantage and geographic remoteness. Australian and New Zealand Journal of Public Health 24(3): 316–319.
- Zhang B & Chan A 1991. Teenage pregnancy in South Australia 1986–1988. Australian and New Zealand Journal of Obstetrics and Gynaecology 31(4): 291–298.

Subfertility

The degree of reduced fertility in the population:

- Prevalence of infertility in women
- Prevalence of infertility in men
- Prevalence of erectile dysfunction
- Prevalence of undescended testes

Prevalence of infertility in women

Indicator

> Percentage of women of reproductive age (15–49 years) at risk of pregnancy who report trying unsuccessfully for a pregnancy for one year or more

Background information

- While the WHO indicator definition for female infertility is based on a period for attempting to conceive of two years or more, Australian studies have tended to use a definition of one year or more.
- Differing definitions of infertility affect the measurement of infertility,(y is ba3494 ks8ephus .8(lit)-hs ba3e4(r a)TJT*4.0006 Tc40.005 Tw7(l)b8(l(l)-fert .8(lit6)-4.9

Table 2: Prevalence of current infertility, surgical sterility and associated reproductive disability according to age of the female partner

Woman's age (years)	Number of couples*	Current infertility*	Surgical sterility*	Associated reproductive disability
	Number	Per cent	Per cent	Per cent
16–19	25	–	–	–
20 to 24	146	2.1	2.1	1.4
25 to 29	315	3.8	12.4	3.5
30 to 34	382	4.2	31.7	4.1
35 to 39	342	3.5	53.5	3.7
40 to 44	285	3.5	72.2	1.7
All women	*1,495*	*3.5*	*37.1*	*3.1*
95% CI		2.6–4.4	34.7–39.5	2.2–4.4
Mean age		33.3	37.2	32.9
SE		5.8	4.7	5.1

* For current infertility and surgical sterility there were 16 cases where information was missing.
Note: 'Associated reproductive disability' applied to couples who, because of biomedical or psychosocial factors associated with either infertility or surgical sterility, were unable to achieve their desired level of reproductive function.

Source: Webb & Holman 1992.

Data limitations

- There have been no national population-based studies of female infertility. As already noted, the authors of the Perth study note the prevalence of current infertility they found seemed unusually low using international comparisons (Webb & Holman 1992).
- The Perth study did not have a high response rate and is quite old, however it is the only published population-based study on female infertility in Australia.

Indicator status

Incomplete. National population-based data on the prevalence of female infertility are not currently available in Australia. At present data on female infertility are limited to small studies and hospital data.

Data sources

- Western Australian study by Webb and Holman 1992
- AIHW Australian Hospital Statistics 1997–98 using data from the National Hospital Morbidity Database (AIHW 1999).
- AIHW National Perinatal Statistics Unit Assisted Conception database.

References

- Australian Institute of Health and Welfare

Prevalence of infertility in men

Indicator

Per cent

Source: AIHW NPSU Assisted Conception database.

Figure 9: Cause of infertility among assisted conception pregnancies, Australia, 1990–1998

Indicator status
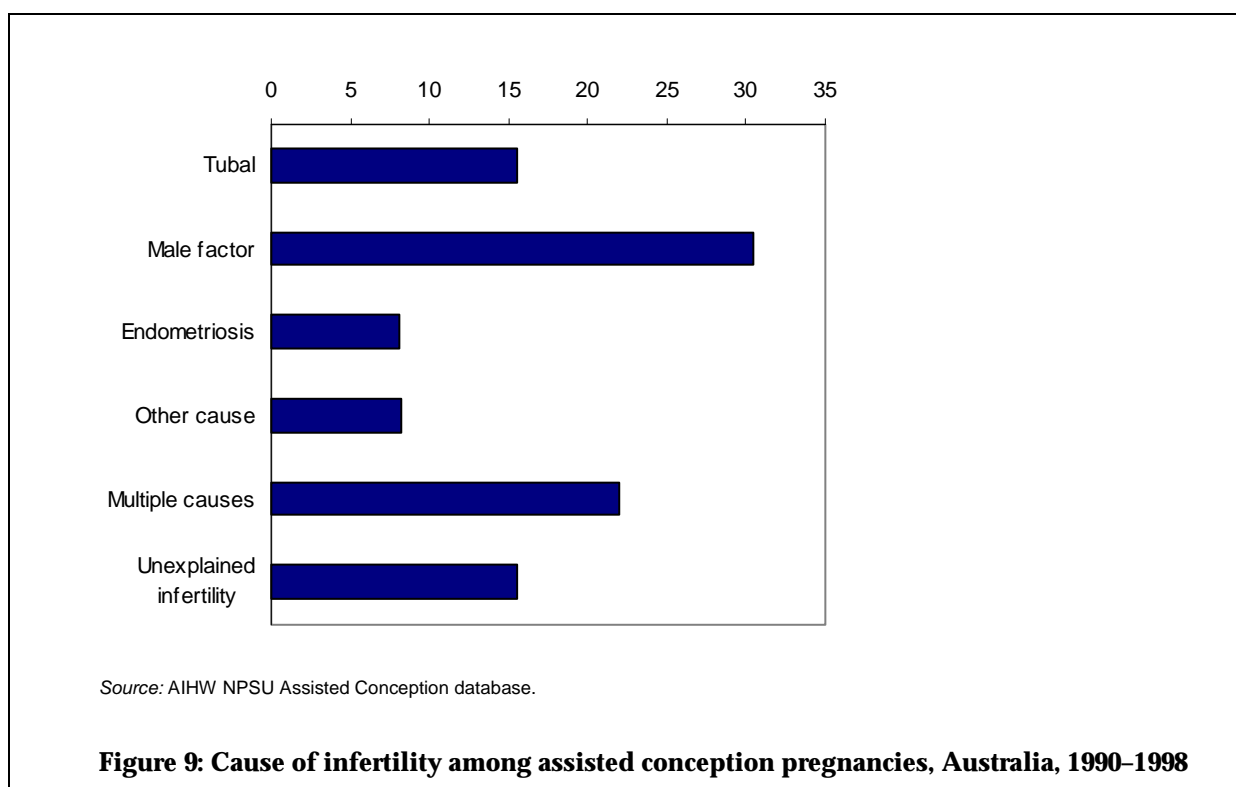
Incomplete. Population-based data on the prevalence of male infertility are not currently available in Australia.

Data source

AIHW National Perinatal Statistics Unit. Assisted conception database 2001. For further information: www.npsu.unsw.edu.au.

References

- Handelsman DJ 1997. Sperm output in healthy men in Australia: magnitude of bias due to self-selected volunteers. Human Reproduction 12: 2701–2705.
- McLachlan RI & de Kretser DM 2001. Male infertility: the case for continued research. Medical Journal of Australia 174: 116–117.
- Nieschlag E & Behre HM (eds) 1997.

Prevalence of erectile dysfunction

Indicator

Proportion of men with erectile dysfunction, that is, a persistent inability to achieve and/or maintain an erection sufficient for satisfactory sexual activity

Background information

- Erectile dysfunction (ED) is a common problem affecting especially the elderly and those with cardiovascular disease and

Table 3: Percentage of erectile dysfunction in a community study by age group, Western Australia, 2000

Age group	Number of participants	ED occasionally	ED often	ED all the time	ED all grades
<20	9	0	0	0	0
20–29	87	4.6	2.3	2.3	9.2
30–39	119	5.9	1.7	0.8	8.4
40–49	199	6.5	4.5	2	13.1
50–59	215	13.5	11.2	8.4	33.5
60–69	293	14	13.7	21.2	51.5
70–79	214	8	12.6	44.9	69.2
80+	84	8.3	6	52.4	76.2
All ages*	1240	9.6	8.9	18.6	39.4

ED = Erectile dysfunction Indicator status
* Includes 20 participants for whom the age group was not known.

Source: Chew et al. 2000.

Data limitations

- The AIHW National Hospital Morbidity Database has only been able to report on injections into the penis for impotence since July 1998.
- Health Insurance Commission data only includes services claimed from Medicare. Services to public patients in public hospitals are not included. There are no data on the use of Viagra to treat erectile dsyfunction.
- The Perth study (Chew et al. 2000) does not provide an accurate estimate of population prevalence, being conducted among men attending GPs.

Indicator status

Incomplete. Population-based data on the incidence of erectile dysfunction are not currently available in Australia.

Data sources

- Perth study of men attending general practices (Chew et al. 2000).
- Health Insurance Commission medical benefits scheme data (HIC).

References

- Chew KK, Earle CM, Stuckey BGA, Jamrozik K & Keogh EJ 2000. Erectile dysfunction in general medicine practice: prevalence and clinical correlates. International Journal of Impotence Research 12(1): 41–45.
- Health Insurance Commission (HIC) 2000. Medicare Benefits Schedule item reports accessible at HIC online: Accessed www.hic.gov.au/statistics 4 April 2001.
- Lowy MP 1999. Erectile dysfunction in the Australian community. Medical Journal of Australia 171: 342–343.
- McMahon C 1999. New treatment options for erectile dysfunction. Australian Family Physician 28(8): 783–790.
- Pinnock CB, Stapleton AMF & Marshall VR 1999. Erectile dysfunction in the community: a prevalence study. Medical Journal of Australia 171: 353–357.

Prevalence of undescended testes

Indicator

> Prevalence of undescended testes in boys aged 0–15 years

Background information

- During fetal development of males, the testes form on the posterior abdominal wall before descending into the scrotum. If one or both testes do not reach the scrotal sac, it is known as undescended testes (cryptorchidism).
- Descent of the testes usually takes place in the 28th week of fetal development in the uterus (Moore 1982).
- It is generally believed that testicular descent is controlled by the hormones gonadotropins and androgens (Moore 1982).
- Undescended testes often require an operation (orchidopexy) which is usually performed in early childhood.
- The increased survival of pre-term babies may influence the rates of undescended testes. Rates of undescended testes have been found to be elevated among low birthweight, pre-term, small-for-gestational age and twin neonates (Bertowitz, Lapinski, Dolgin et al. 1993).
- Associated complications of undescended testes include infertility and malignancy (Gordon 1995). Jannini et al. (1995) suggest impairment of fertility is a complication mainly in those with a history of bilateral cryptorchidism.

Current data

- AIHW National Hospital Morbidity data and Health Insurance Commission data both indicate that most surgery for undescended testes is performed on children aged 0–4 years (accounting for 51.0% and 53.4%, respectively) (Figures 10 and 11).
- The age-specific rate of separations involving orchidopexy between July 1998 and June 1999 in the National Hospital

Morbidity data was 11.4 per 10,000 males aged 0–15 years. The highest age-specific rate occurred in Tasmania (24.0), with the lowest being in Northern Territory (4.0).
- The reasons for the high rate of orchidopexy in Tasmania are not immediately obvious and require further investigation.
- The number of cases of surgery in public and private hospitals for undescended testes dropped by 23.7% between July 1996 and June 1999 from 4,118 to 3,142 (Figure 10).
- The age-specific rate of surgery in private hospitals, free-standing clinics and on
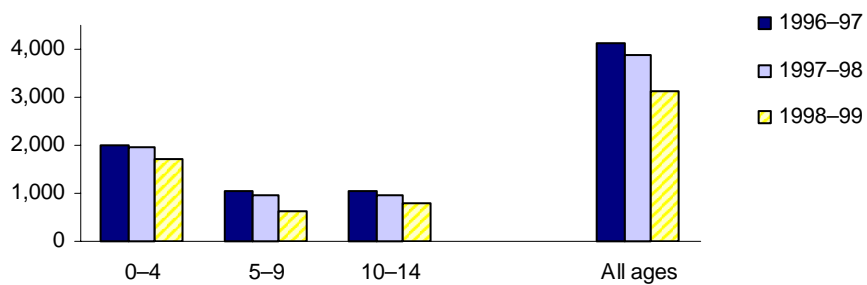
Source: AIHW National Hospital Morbidity Database.

Note: Includes mobilisation and replacement of testis in scrotum, orchidopexy with detorsion of testis, Torek operation and/or transplantation to and fixation of testis in scrotum.

Figure 10: Number of cases of surgery for undescended testes (orchidopexy), public and private hospitals, Australia, July 1996–June 1999

Sexually transmissible infections
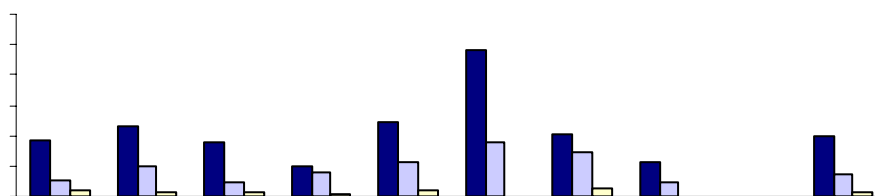
The prevalence of sexually transmissible diseases in the population:

- Syphilis rates have increased slightly over the last few years to 9.0 per 100,000 population with increases in the Northern Territory, Queensland and the Australian Capital Territory. Higher notification rates were reported in the Northern Territory and the Kimberley region of Western Australia (Thomson et al. 2000).
- The Australian Longitudinal Study on Women's Health found in 1997 that of women aged 18–22 years, 1.7% had a history of infection with chlamydia and 2.1% had

had other STIs diagnosed in the past (Research Institute for Gender and Health 1997).
- A study in Western Australia found chlamydia infection among 27% of a cohort of pregnant adolescents. The screening and treatment of chlamydia was associated with a significant decrease in the incidence of newborn febrile morbidity (Quinlivan, Petersen & Gurrin 1998).
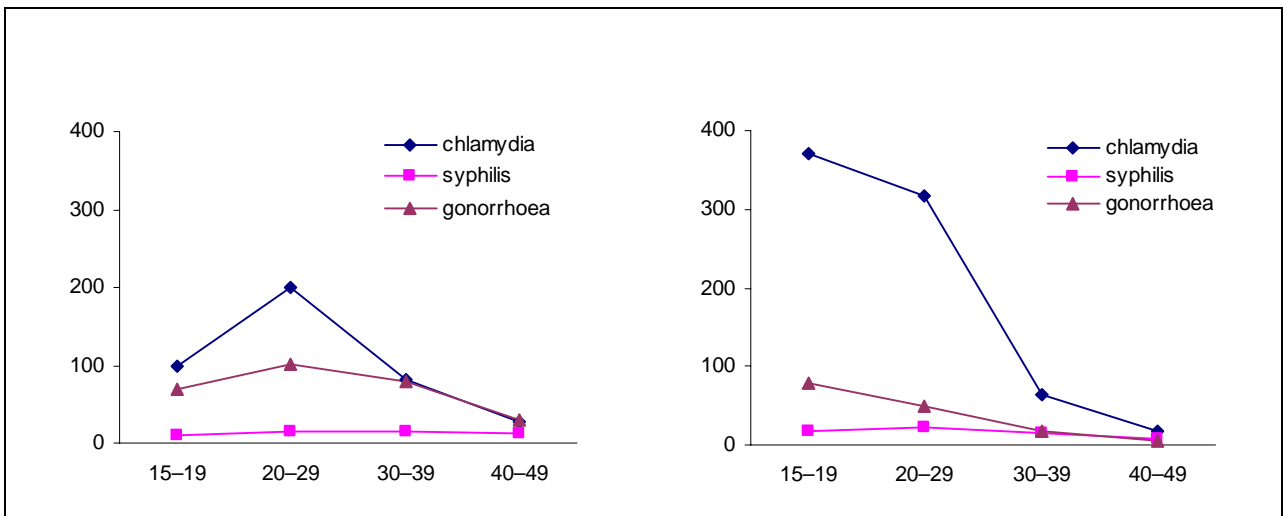
Source: NCHECR 2000.

N

- National Centre in HIV Epidemiology and

The percentage of all respondents who have accurate and appropriate

Prevalence of HIV among adolescents

Indicator

> Prevalence of diagnosed HIV
> infection in adolescent males
> and females (aged 13–19
> years) per 100,000 population

Background information

- Newly diagnosed HIV infection is a
  notifiable condition in all States and
  Territory health jurisdictions in
  Australia. Cases of diagnosed HIV
  infection are notified through all State
  and Territory health authorities to the
  National HIV surveillance centre on
  the first occasion of diagnosis in
  Australia (McDonald et al. 1994).
- Sentinel surveillance of HIV infection
  is also conducted based on a network
  of metropolitan sexual health clinics in
  Australia. At the end of each quarter
  and annually, tabulations are
  provided of the number of people
  seen, the number tested for HIV
  antibody and the number newly
  diagnosed with infe(e)6ind thiK1o6. At t1oc1o6. Atann10ld w sexuxnf8 tdNnC0By8B5084528IchD( )Tj/TT6 1 Tf1.

Per 100,000 population

Figure 14: Age-specific rates for adolescent males and females living with diagnosed HIV infection, Australia, 1998–2000

Data limitations
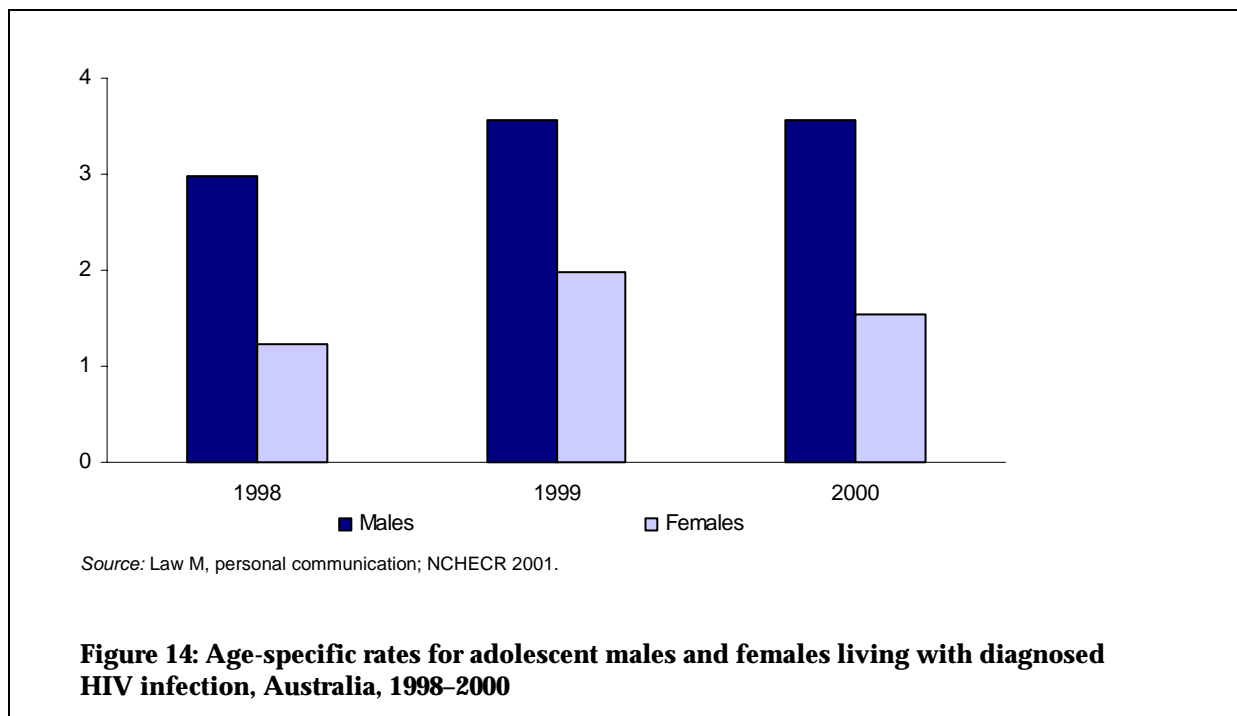
The numbers of adolescent males and females living with undiagnosed HIV infection during the time periods considered is unknown. However, it is estimated that of all people living with HIV infection in Australia, at least 80% have been diagnosed with HIV infection (NCHECR 2000).

Indicator status

Adequate. Australia is a low prevalence country for HIV infection.

Data source

National Centre for HIV Epidemiology and Clinical Research.

References

- McDonald AM, Crofts N, Blumer CE, Gertig DM, Patten JJ, Roberts M, Davey T, Mullins SE, Chuah JCP, Bailey KA & Kaldor JM 1994. The pattern of diagnosed HIV infection in Australia, 1984–1992. AIDS 8: 513–519.
- National Centre in HIV Epidemiology and Clinical Research (NCHECR) 2000. HIV/AIDS, hepatitis C and sexually transmitted infections in Australia: annual surveillance report 2000. NCHECR. New South Wales: University of New South Wales.
- Rosenthal D, Smith A & Lindsay J 1998. Change over time: high school students' behaviours and beliefs, 1992 to 1997. Venerology 11(4): 6–13.

Family planning

The use of methods to regulate fertility through contraception and induced terminations:

- Prevalence of contraceptive use
- Vasectomy rate
- Tubal occlusion rate
- Hysterectomy rate
- Annual number of induced abortions

Prevalence of contraceptive use

Indicator

Percentage of women of
reproductive age (15–49 years and
at risk of pregnancy) who are
using (or whose partner is using)
a contraceptive method at a
particular point in time

Background information

- Contraception is a means of avoiding
  pregnancy despite sexual activity. There
  are two main types of contraceptive
  methods—barrier and non-barrier. Barrier
  methods provide a physical barrier which
  prevents the sperm reaching the cervix
  and include condoms, female condoms,
  cervical caps, diaphragms and sterilisation.
  Non-barrier methods include hormonal
  (oral, injectable and implant)
  contraceptives, intrauterine devices
  (IUDs), spermicides and natural family
  planning methods. The level of
  contraceptive protection varies by method
  and user compliance.
- At an international level, research
  continues into developing new and
  existing contraceptives, including
  emergency contraception, injectable
  hormonal preparations for use by women
  and by men, immunocontraceptives, and
  non-surgical methods of pregnancy
  termination (WHO 1999)
- Family Planning Australia (FPA) reports
  that the three most commonly sought
  contraceptive services at their clinics
  include the combined oral pill (pill), the
  emergency pill and Depo-Provera (FPA
  2000). FPA does not capture information
  on the provision and sale of condoms,
  since they are sold over the counter.

Current data

- Results from the 1995 National Health
  Survey showed that more than 44% of all
  women aged 18-49 years reported current
  use of a method of contraception. Among
  users, the two most commonly reported

methods were the oral contraceptive pill
(60%)53 TDamrs, thtm   4of)-c.0t2-50h

Figure 15: Contraceptive use by women at risk, Australia, 1995
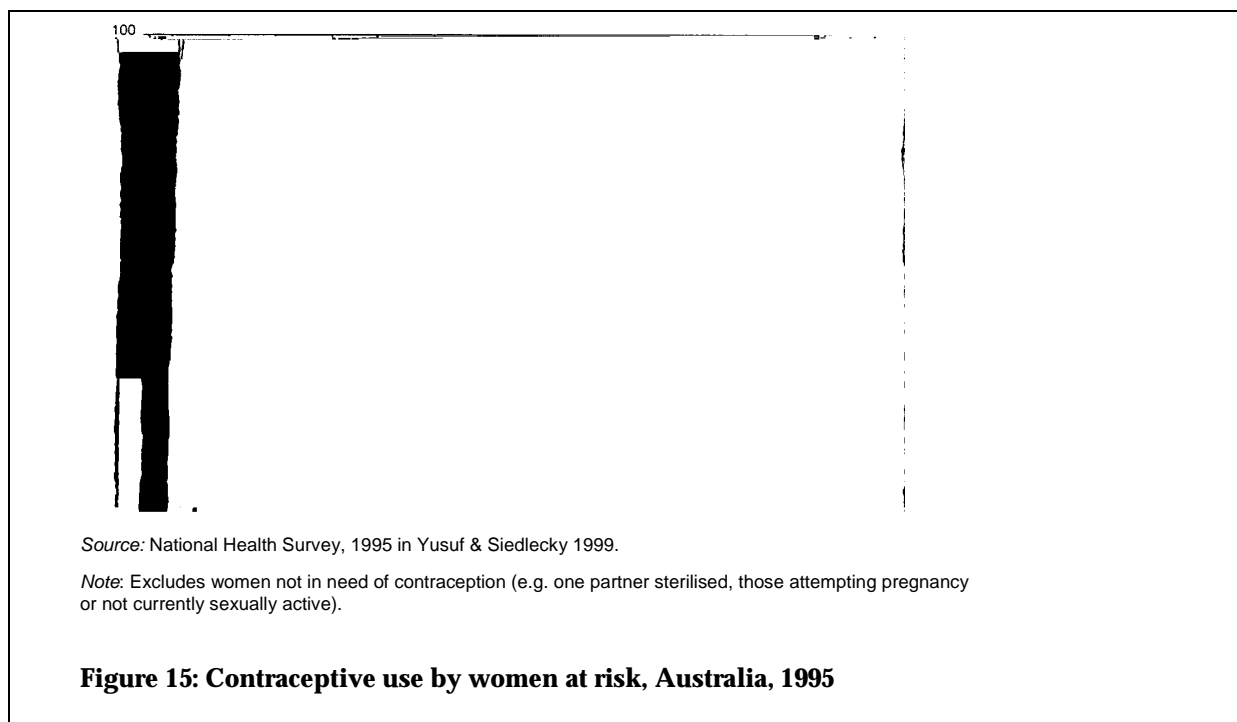
Table 4: Estimated age distribution of women reporting contraceptive use, and the reason for non-use of contraception, Australia: National Health Survey, 1995

Age in years	18–24	25–29	30–34	35–39	40–44	45–49	18–49
% reporting contraceptive use	61.1	60.4	49.1	40.1	27.7	16.4	44.2
Reasons for nonuse:							
hysterectomy/ tubal ligation	0.4	2.3	7.0	15.5	25.9	33.6	12.8
partner vasectomized	0.1	1.8	9.2	16.1	18.1	17.4	9.7
pregnant or trying to get pregnant	4.1	11.4	10.9	5.5	2.5	0.6	5.9
no partner/ not sexually active	22.3	10.0	8.8	9.2	7.9	10.8	12.2
not in need*	1.0	2.1	1.2	2.2	2.8	5.8	2.4
other reasons**	1.8	3.3	3.3	2.4	2.7	1.4	2.4
not stated	9.1	8.6	10.4	9.0	12.1	14.0	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Vasectomy rate

Indicator definition

Rate of vasectomies per 1,000 male
population (aged 15–64) per year

Australian Hospital Statistics 1997–98
(AIHW 1999) reported 'vasectomy and
ligation of vas deferens' as one of the 30
principal procedures for male hospital
Victoria.

Background information

A vasectomy involves surgical
sterilisation of males via cutting or
blocking both vasa deferentia. Vasotomy
refers to the surgical incision of the vas
deferens.
Analysis of the 1995 National Health
Survey by family income found that for
women aged 35–50 years, the percentage
of partners sterilised increased with
increasing income (Amir & Donath 2000).

Current data

The number of vasectomies or vasotomies
(Item number 37622, 37623) claimed
through the Medicare Benefits Scheme has
declined by 5.2% since 1999. In 1998 there
were 28,066 claims for services compared
with 28,495 in 1999 and 26,603 in 2000
(HIC 2000).
The highest vasectomy rate (in free-
standing clinics and on private patients in
public and private hospitals) was
recorded in Tasmania (6.4 per 1,000 male
population) with the lowest in the
Northern Territory (3.4) (Figure 16).
The highest vasectomy rate occurred
among 35–44 year olds (10.9 per 1,000
male population in HIC data, 5.5 per 1,000
male population in AIHW National
Hospital Morbidity data) (Table 5).
Thirty per cent of all vasectomies/
vasotomies performed in Australia in
1999, as identified in health insurance
data, were performed on males aged
35–44 years in New South Wales and
Victoria.

Rate per 1,000 m ale population

Note: Rates were calculated using population estimates for 1999.

Source: HIC 2000.

Figure 16: Age-specific rate of vasectomies, free-standing clinics and private patients in public and private hospitals, Australia, January 1999–December 1999
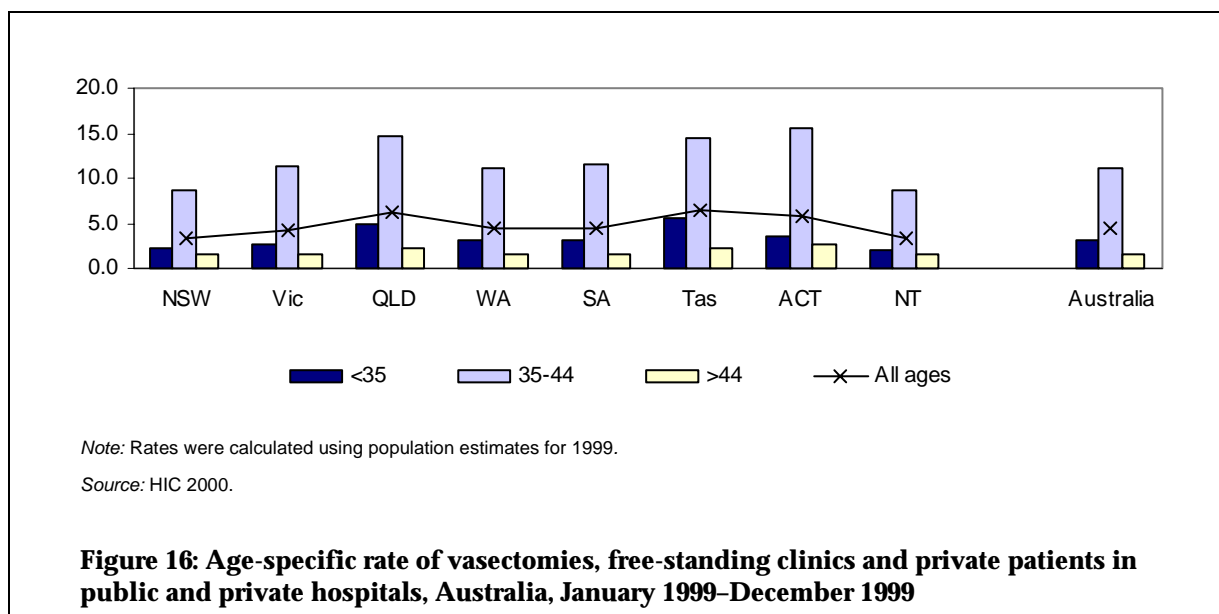
Table 5: Vasectomy rates by age group, public and private hospitals (National Hospital Morbidity Database) compared with free-standing clinics and private patients in public and private hospitals (Health Insurance Commission), Australia, July 1998–June 1999

	15–24*	25–34	35–44	45–54	55–64	Australia
Health Insurance Commission						
Number of services	153	8,441	15,987	3,144	274	27,999
Rate per 1,000 male population	0.1	5.8	10.9	2.5	0.3	4.4
Hospital Morbidity Database						
Number of separations	97	4,118	8,032	1,716	138	14,101
Rate per 1,000 male population	0.1	2.8	5.5	1.3	0.2	2.2

* AIHW National Hospital Morbidity Data only include males aged 20–24, not 15–24.

Sources: AIHW National Hospital Morbidity Database; HIC 2000.

Indicator status

Incomplete. Population-based data on the number of vasectomies are not currently available. Data from the National Hospital Morbidity Database (covering public and private hospitals) and the Health Insurance Commission (covering free-standing clinics, private hospitals and private patients in public hospitals) provide proxy rates of vasectomy in Australia. However, an overall rate of vasectomies using a combination of these data sets cannot be calculated due to the inclusion of private patients in both data sets. Furthermore, without the inclusion of vasectomies performed in FPA clinics, the national rate will be understated.

Data sources

- Health Insurance Commission Medicare Benefits Schedule statistics (HIC 2000).
- AIHW National Hospital Morbidity Database.

References

- Amir LH & Donath SM 2000. Rate of vasectomy rises with increasing income. Australian and New Zealand Journal of Obstetrics and G1c12.een.9(c)2.3(e)†isese06 0 0 d G1ccl1): 9

Tubal occlusion rate

Indicator

Background information

- Tubal occlusion is an effective form of female sterilisation. It is a surgical procedure that involves ligation or cauterisation (closure) of the fallopian tubes to prevent a fertilised egg from reaching the uterus. It may involve ligation and resection, or application of rings or clips to the fallopian tubes, or electrocoagulation of a segment of the fallopian tubes. Salpingectomy, involving the surgical removal of the fallopian tubes, or salpingo-oophorectomy, involving excision of the fallopian tube and ovaries, are other methods of sterilisation that may be performed. The procedure, if carried out laparoscopically or by laparotomy[3], is associated with low rates of morbidity.
- A large case-control study conducted in eastern Australia between 1990 and 1993, that included 824 women aged 18–79 years diagnosed with epithelial ovarian cancer and 855 randomly selected controls, found tubal sterilisation was associated with a 39% reduction in risk of ovarian cancer (Green et al. 1997).
- There are conflicting findings over whether tubal occlusion is a predictor or a risk factor for hysterectomy (Taffe et al. 2000; Treloar et al. 1999).

Current data

- For the three-year period from July 1996 to June 1999 the AIHW National Hospital Morbidity Database shows (among women aged 25–49 years) there were 22,028 hospital separations in 1996–1997 (financial year) with any diagnosis of female sterilisation. This declined to 20,863 in 1997–1998 and to 20,492 in 1998–1999, representing a 7.0% fall in the number of procedures over the period. Seventy-one per cent of these

separations involved a principal diagnosis of female sterilisation.
- The age-specific rates of hospital separation for female sterilisation were highest among 35–39 year olds (9.0 per 1,000 female population) and 30–34 year olds (8.0 per 1,000 female population) (Figure 17).
- The number of claims related to tubal occlusions[4] presented to the Health Insurance Commission over the period 1998–2000 declined by 24.3% from 8,185 in 1998, to 6,464 in 1999 and 6,200 in 2000. There were another 870 sterilisations performed at the time of caesarean section recorded in the Health Insurance Commission data in 2000.
- Sixty-five per cent of tubal occlusions were performed on women aged 35 years and over (Figure 18).
- The Australian Longitudinal Study on Women's Health survey of 12,146 women aged 47–52 years found over 37% of women had had a tubal occlusion performed. The highest rates were among women from remote areas (41.1%) while the lowest were among women from capital cities and other metropolitan areas (34.2%) (Research Institute for Gender and Health 1999).

Data limitations

- The lack of a dedicated code for tubal occlusion in ICD-10-AM inhibits the reporting of tubal occlusions performed in public and privlo-20(l o41a)-4.50(l r)TJ184aaad

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[3] See glossary.

Hysterectomy rate

Indicator

Background information

- Hysterectomy, whereby the uterus is partially or completely removed, is one of the most common gynaecological surgical procedures performed. In Australia, just over one in ten women will undergo a hysterectomy by the age of 40 years, and around one in five women will undergo a
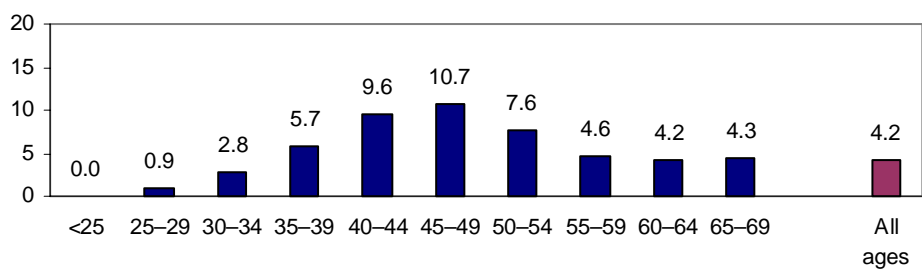
Notes: Rate calculated per 1,000 female population, using 1999 population estimates.
Includes women aged 10–69 years

Source: AIHW National Hospital Morbidity Database.

Figure 19: Age-specific hysterectomy separation rate, public and private hospitals, Australia, July 1998–June 1999
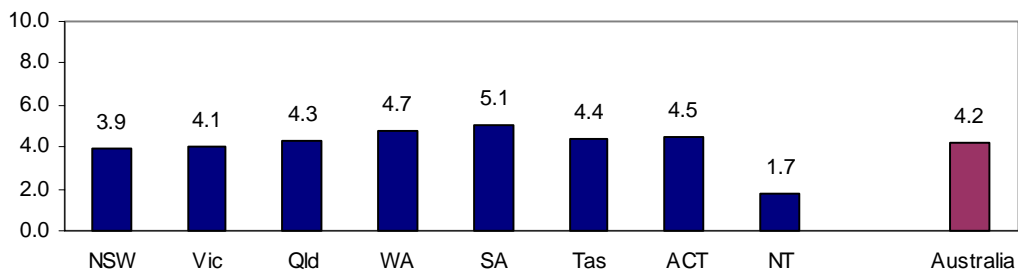
Notes: Rate calculated per 1,000 female population, using 1999 preliminary population estimates.
Includes women aged 10–69 years.

Source: AIHW National Hospital Morbidity Database.

Figure 20: Hysterectomy separation rate, public and privatDatn, 8 8 8I48epar Hoc3l44TJ3l44TJBT/TTa3l4aA J

Number of induced abortions

Indicator

> Annual number of induced abortions[6] among women aged 15–44 years

Background information

- Induced abortion involves the termination of pregnancy by medical or surgical means. This is usually done before the time of fetal viability (20–22 weeks) but some induced abortions are carried out later where indicated, such as for severe congenital malformations.
- Induced abortions are subject to different legal requirements and interpretations in the different States and Territories of Australia, and there are variations in the extent to which statistics are collected. Legislation in South Australia and
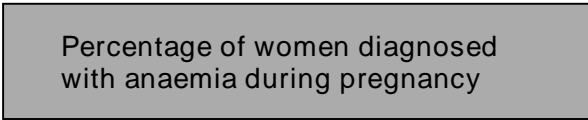
rate was 19.6 per 1,000 women aged 15–44 years. The highest abortion rate was 31.3 per 1,000 women aged 20–29 years (personal communication, Executive Director of Public Health, Western Australia).

- The Australian Capital Territory *Health Regulation (Maternal Health Information) Act 1998* requires quarterly reporting of abortions from approved facilities. The Territory-based notification system recorded 1,447 induced abortions for the period 1 July 2000 to 30 June 2001, with an overall abortion rate of 18.8 per 1,000 women aged 15–44 years (*Health*

Pregnancy and childbirth

The degree of safe and healthy motherhood, including antenatal factors, pregnancy, childbirth and maternal, fetal and infant outcomes:

Prenatal/ antenatal factors

- Prevalence of anaemia in pregnant women
- Periconceptional use of folate
- Prevalence of positive syphilis serology in pregnant women
- Prevalence of HIV among pregnant women
- Prevalence of smoking in pregnancy
- Alcohol use in pregnancy
- Illicit drug use in pregnancy
- Prenatal diagnostic testing
- Percentage of women attending antenatal care

Pregnancy and assisted conception

- Pregnancy rates and outcomes after assisted conception
- Multiple pregnancy rate

Childbirth

- Percentage of all labours which were induced or augmented
- Proportion of institutional deliveries
- Caesarean birth rate
- Proportion of vaginal births after caesarean section
- Rate of instrumental vaginal deliveries
- Percentage of births attended by skilled health personnel
- Number of obstetric service providers by rural/remote classification

Maternal outcomes

- Maternal morbidity rate
- Maternal mortality ratio
- EctopTconrtalityEctope6mg2 Tce0h26913.606 470.24031riiEctope6mcriiEcte11.512.yli512.s1.173606 470.24
-

Prevalence of anaemia in pregnant women

Indicator

Percentage of women diagnosed
with anaemia during pregnancy

Background information

- Anaemia is a condition in which the blood
is deficient in red blood cells, haemoglobin
or total volume. The most common cause
of anaemia is iron deficiency. Iron
deficiency occurs when an insufficient
amount of iron is absorbed to meet the
body's requirements. Women of
reproductive age, especially pregnant
women, are at risk.
- Iron deficiency anaemia during the first
two trimesters of pregnancy is associated
with a two-fold risk of pre-term delivery
and three-fold increased risk of delivering
a low birthweight baby (CDC 1998).
- Evidence from a study of randomised
controlled trials revealed that iron
supplementation in pregnancy appears to
prevent iron deficiency at birth. However,
the effects on maternal and fetal outcomes
were inconclusive (Mahomed 2001).
- Groups at higher risk for iron deficiency
include vegetarians, multiparous women,
those with multiple pregnancies, women
with a past history of iron deficiency,
blood donors, women of poor
socioeconomic status, immigrants and
adolescents (Fleming, Martin & Stenhouse
1984).
- WHO recommends that the haemoglobin
concentration should not fall below
11.0 g/dL at any time during pregnancy.
- RANZCOG guidelines recommend that
haemoglobin levels be assessed at the first
antenatal visit and then retested at
28 weeks gestation. Anaemia is indicated
when haemoglobin levels are less than
10.5 gm or if other risk factors of iron
deficiency are present (RANZCOG 2000).

Current data

- Anaemia was present in 6.6% of 18,421
mothers who gave birth in South Australia
in 1998. However, gestational date of
testing was not noted (Figure 21) (Chan
et al. 1999).
- Of mothers who gave birth in 1998, 0.4% in
Queensland, 0.9% in Western Australian
and 2.3% in the Australian Capital
Territory were reported as anaemic during
pregnancy (Figure 21) (Queensland Health
2000; Gee & O'Neill 2000; and Bourne
2001, respectively).
- One of the explanations for the reported
higher rate of anaemia amongst pregnant
women in South Australia may be that
anaemia is specified as a category in the
maternal medical conditions on the
midwives data collection form in South
Australia. However, it is not included
amongst the maternal medical conditions
on the forms in the other States and
Territories where it is reported.
- The 1995 National Nutrition Survey of
Australian Women reported that pregnant
women consumed, in the previous
24 hours, on average, 44% less iron than
the recommended daily intake (ABS 2000).

Data limitations

- There is no current national data definition
of anaemia in pregnancy, hence, no
standardised data item to collect
information on anaemia. There is no
national surveillance of anaemia in
pregnancy or uniform collection of
information on anaemia in pregnancy by
the States and Territories. Some States and
Territories ask a specific question on
anaemia while others incorporate this
information as 'other complications of
pregnancy' or 'medical conditions of
mother' in their perinatal data collection.
The current data on anaemia do not
specify the gestational age of testing,
which limits its usefulness.

- There needs to be consideration of development of an antenatal care data element for the *National Health Data* *Dictionary* and the inclusion of anaemia in pregnancy as an explicit data category.

Per cent
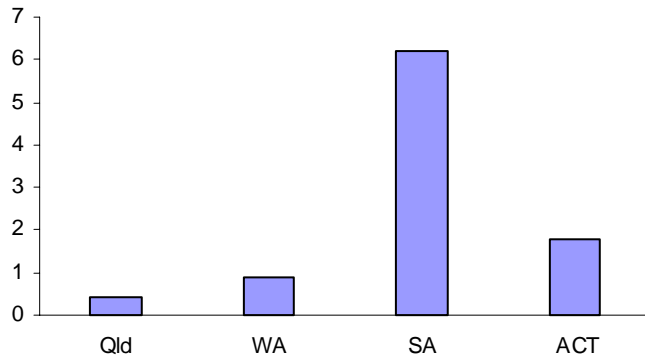
Note: No data available from New South Wales, Victoria, Tasmania and the Northern Territory.
Source: Bourne 2000; Chan et al. 1999; Gee et al. 2000; Queensland Health 2000.

81

Periconceptional use of folate

Indicator

Background information

Neural tube defects (NTDs), which include spina bifida, anencephaly and encephalocoeles are serious malformation that occur during the first 17–30 days after conception. These congenital malformations may result in fetal death, termination of pregnancy and death or disability among liveborn infants (Hurst, Shafir & Lancaster 2001).

Evidence from the Cochrane Review of international randomised controlled trials shows that periconceptional folate supplementation—before pregnancy and in the first two months of pregnancy—has a strong protective effect against neural tube defects (Lumley et al. 1999; Lumley et al. 2001).

- A cross-sectional study of 140 women in South Australia in 1999 found the rate of periconceptional folate supplementation was 31% (Henry & Crowther 2000).

Per cent

Source: Bower et al. 1997

Figure 22: Knowledge of folate–spina bifida association, Western Australia, 1992–1995

Data limitations
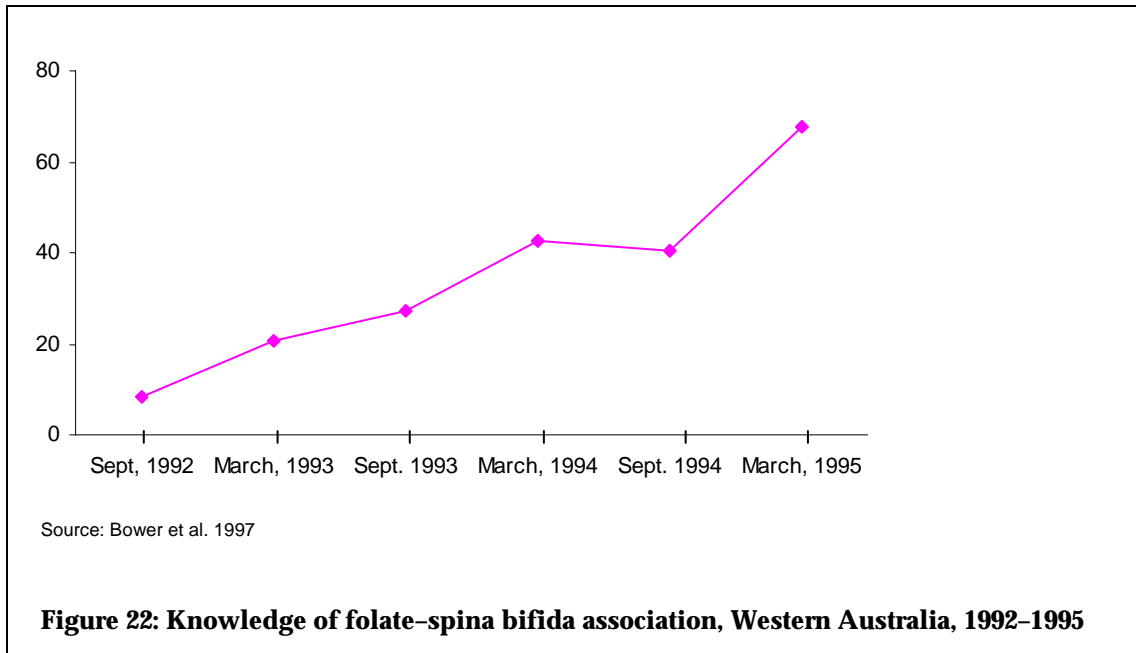
- Periconceptional use of folate has only been measured by periodic surveys. There is no national or state-based surveillance of folate use during
ee08tdby pe9.56fo pe9.r th pe9..6(97.00068427.52031446(Pe)-59(e)-5(i)-0.5(Tj)7.1(Na5(nal He 6.)lth 97.0-031446(4(l)-

Prevalence of HIV among pregnant women

Indicator

Prevalence of HIV infection in pregnant women per 100,000 live births

Background information

-

Prevalence of smoking in pregnancy

Indicator

Percentage of women
smoking during pregnancy

Background

- Smoking during pregnancy is associated with low birthweight, pre-term birth and perinatal death. Smoking cessation programs in pregnancy reduce smoking, low birthweight and pre-term birth (Lumley, Oliver & Waters 2001).
- A review of a number of studies by English et al. (1995) found maternal smoking to significantly increase the risk of spontaneous abortion, ectopic pregnancy, antepartum haemorrhage, premature rupture of membranes and pre-eclampsia. Adverse outcomes in infants include an increased risk of low birthweight, stillbirth, perinatal mortality, birth defects and sudden infant death syndrome (Walsh, Lowe & Hopkins 2001).
- Analysis of retrospective data collected from women aged 45–49 years surveyed in the Australian Longitudinal Women's Health Study found a strong positive relationship between smoking status and the number of reported miscarriages. Compared with women who had never smoked, ex-smokers were more likely (1.25 times more likely) to have had two or more miscarriages, as were light smokers (1–19 cigarettes per day) (1.39 times more likely), and women who smoked 20 or more cigarettes per day (1.78 times more likely). An inverse relationship was also found between age at starting to smoke and a history of miscarriages (Schofield, Mishra & Dobson 1999).

Current data

- Almost one-quarter (24.0%) of pregnant or breastfeeding women surveyed in the National Drug Strategy Household Survey in 1998 had smoked in the previous 12 months. In comparison, one-third of women (30%) neither pregnant nor breastfeeding smoked during the same period (Figure 24) (Higgins, Cooper-Stanbury & Williamsc0.7.9(o)8.3(n s)6.6(45 Tc-0.001

Alcohol use in pregnancy

Indicator

> Percentage of women who consume alcohol during pregnancy

Background information

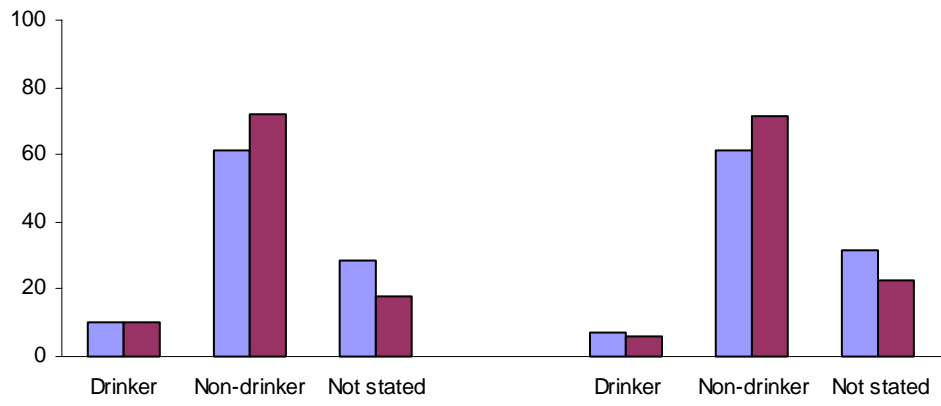- Maternal alcohol abuse is associated with adverse perinatal outcomes. These include the fetal alcohol syndrome, pseudo-Cushing's syndrome, alcohol withdrawal in the newborn, and increased risk of perinatal mortality (Tai, Saunders & Celermajer 1998).

-

Women who consumed alcohol during pregnancy were less likely to have pre-term or low birthweight babies, than abstainers (Bell & Lumley 1989).

Per cent

Illicit drug use in pregnancy

Indicator

> Percentage of women who use an illicit drug during pregnancy
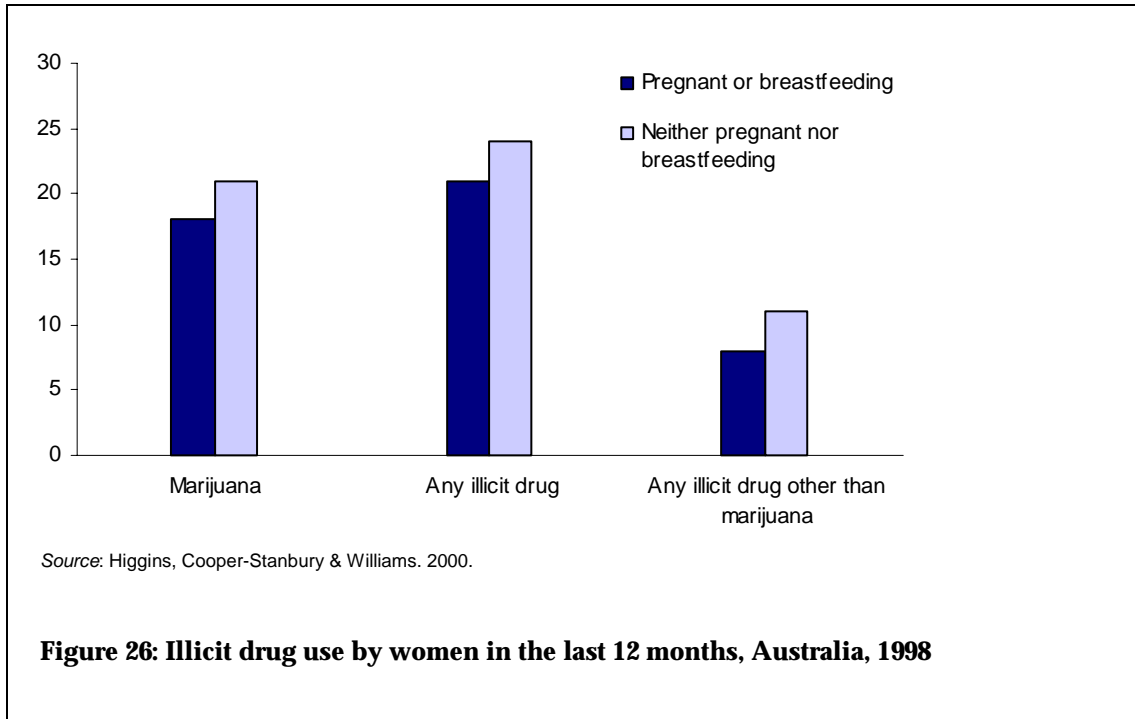
Background information

- Illicit drugs are defined as illegal drugs, drugs and volatile substances used illicitly, and pharmaceuticals used for non-medical purposes. These may include painkillers/analgesics, tranquillisers/ sleeping pills, steroids, barbiturates, amphetamines, marijuana/ cannabis, heroin, methadone, cocaine, LSD/synthetic hallucinogens, ecstasy and other designer drugs (AIHW 1999).
- Cocaine use during pregnancy has been associated with maternal complications including heart problems, strokes, seizures, bowel ischaemia, hyperthermia and sudden death. Congenital anomalies in infants, such as limb-reduction defects, brain defects, congenital heart defects, urinary tract anomalies and genitourinary tract malformations have also been identified (Cunningham et al. 1997).
- Infants of mothers who use heroin commonly experience fetal growth retardation and perinatal complications or death. Mild development delay or behavioural disturbances have been observed in children of heroin-addicted mothers (Cunningham et al. 1997).
- Withdrawal symptoms, including tremors, irritability, sneezing, vomiting, fever, diarrhoea and seizures have been observed in the first 10 days in 40–80% of infants (Cunningham et al. 1997).
- Methadone is primarily used in a medical situation as maintenance therapy for heroin addiction. A number of studies have found that methadone treatment for women using heroin during pregnancy is associated with improvements in birthweight and neonatal mortality (Hulse et al. 1998). However, withdrawal from methadone is more severe for infants, taking up to 3 weeks (Cunningham et al. 1997).
- A meta-analysis, incorporating seven individual studies, found that there was an increased risk of neonatal mortality in infants of women using heroin (RR=3.27) or both heroin and methadone (RR=6.37) during pregnancy. However, women who received methadone treatment only, during pregnancy, did not have a significantly increased risk of neonatal mortality (Hulse et al. 1998).

Current data

- It is estimated that in 1998 there were

Per cent

- Pregnant or breastfeeding
- Neither pregnant nor breastfeeding

Marijuana   Any illicit drug   Any illicit drug other than marijuana

Source: Higgins, Cooper-Stanbury & Williams. 2000.

Figure 26: Illicit drug use by women in the last 12 months, Australia, 1998

Data limitations

- There are no national or State or Territory level prevalence data of illicit drug use in pregnancy.
- The 1998 National Drug Strategy Household Survey did not ask specific questions about drug use in relation to
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Prenatal diagnostic testing

Indicator

Number of amniocenteses performed and chorionic villus samples obtained annually among pregnant women

Background information

- Amniocentesis and chorionic villus

Year

Percentage of women attending antenatal care

Indicator

> Percentage of women who attended, at least once during pregnancy, by skilled personnel for reasons related to pregnancy

Background information
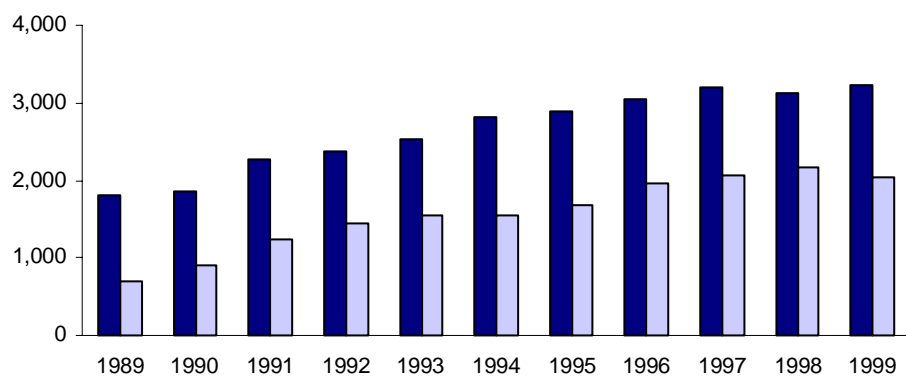
- Antenatal care in Australia is provided primarily by obstetricians, general practitioners and midwives. The care is delivered in a number of settings including private doctors' rooms and outpatient clinics in public hospitals and community centres. The aim of antenatal care is to maximise the health outcomes of the mother and baby. It aims to identify and manage risk factors or complications, and to monitor progress with information and support during pregnancy.

- Current recommendations for antenatal screening by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists recommend that tests at the first antenatal visit should include:
  - blood group and antibody screen
  - full blood count
  - rubella antibody status
  - syphilis serology
  - hepatitis B serology
  - hepatitis C serology (for high-risk groups)
  - HIV serology
  - cervical cytology.

 In addition, practitioners providing care should discuss:
  - the availability of maternal serum screening for Down syndrome
  - ultrasound examination at 18–20 weeks gestation (RANZCOG 2000).

- Evidence from a cochrane review of various randomised trials comparing antenatal programs found that a reduction in the number of antenatal visits was not associated with an increase in adverse maternal and perinatal outcomes. However, some women appeared to be less satisfied with reduced visits (Villar et al. 2001).

Current data

- During 1999, 78.4% of pregnant women in South Australia had seven or more antenatal visits. Less than 1% (65; 0.4%) of women reported that they did not receive any antenatal care (Chan et al. 1999).

- Information from New South Wales was collected on the duration of pregnancy at first antenatal visit. More than 1 in 8 (13.4%) women attended their first antenatal visit after 20 weeks of pregnancy (Taylor et al. 2000).

- In 1998 in the Australian Capital Territory, almost 90% of pregnant women reported eight or more antenatal visit (Bourne 2000).

- Over 98% of mothers in Queensland had two or more antenatal visits during pregnancy in 1998 (Queensland Health 2000).

- A study conducted in Victoria in 1998 over a four month period highlights that in 22,257 pregnancies, approximately 80% of women attended antenatal care in the first trimester of pregnancy (Figure 28) (Halliday, Ellis & Stone 1999).
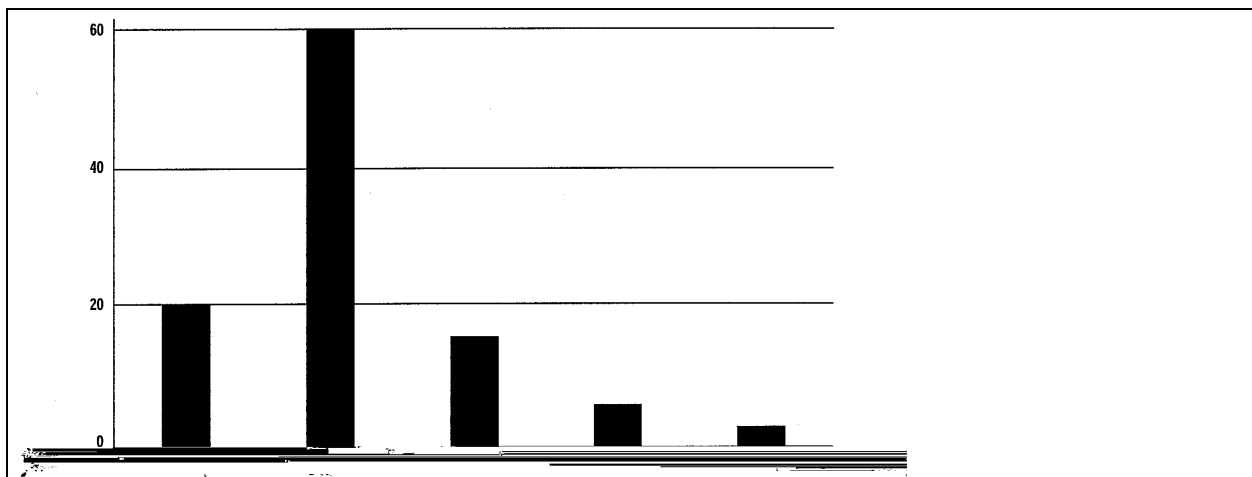
Source: Halliday, Ellis & Stone 1999.

Figure 28: Percentage of women attending for first antenatal visit at different gestations, Victoria, 1998

Data limitations

- There is no standardised collection of data on the total number and timing of the first antenatal visits by State and Territory perinatal data collection units. There is a need to develop a national definition of antenatal care to be incorporated in the *National Health Data Dictionary*.
- Data are usually collected at the time of delivery which may lead to recall bias about early pregnancy care. The implementation of patient-held communication cards completed during antenatal care may be sourced to provide accurate information at time of delivery.
- A validation study performed by the New South Wales midwives data collection (MDC) unit in 1998 found that there was 78% agreement between medical records and the MDC for the item-duration of pregnancy at first antenatal check (Taylor et al. 2000).

Indicator status

Incomplete.

Data source

Reports based on each State and Territory perinatal data collection published by State and Territory health authorities.

References

- Bourne M 2000. ACT maternal and perinatal 1997 Tables. Canberra: Clinical Epidemiology and Health Outcomes Centre (Health Series no. 25).
- Chan A, Scott J, Nguyen A & Keane R 1999.

Pregnancy rates and outcomes after assisted conception

Indicator

> Number of viable pregnancies per 100 assisted conception treatment cycles

Pregnancy rates are expressed per 100 treatment cycles that reach the stage of oocyte retrieval. In treatment cycles where embryos were transferred after embryo freezing or oocyte donation, pregnancy rates are expressed per 100 embryo transfer cycles. Pregnancy rates can be expressed in terms of viable pregnancies (those reaching 20 weeks gestation) or clinical pregnancies.

Background information

- Assisted conception pregnancies are those achieved by means of in-vitro fertilisation (IVF), intracytoplasmic sperm injection (ICSI) or gamete intrafallopian transfer (GIFT), and may include use of donor sperm, donor egg or surrogacy, but do not include pregnancies achieved by the use of fertility drugs only or artificial insemination of sperm (partner or donor).
- In Australia, assisted conception has been available to infertile couples for more than two decades.
- The first successful assisted conception pregnancy in Australia was in 1979.
- In 2001, there are 34 assisted conception units providing clinical services. Data on

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Table 7: Pregnancy rates after assisted conception in Australia, 2000

Stage of treatment cycles	Fresh transfers			Frozen/thaw transfers	
	IVF	ICSI	GIFT	IVF	ICSI
Treatment cycles	7713	8938	1380	*n.a.*	*n.a.*
Oocyte retrieval cycles	6447	8032	1263	*n.a.*	*n.a.*
Embryo transfer cycles	5416	7086	1237	4386	4248
Clinical pregnancies	1259	1603	319	734	643
Viable pregnancies	962	1276	229	550	498
Clinical pregnancy rate*	19.5	20.0	25.3	16.7	15.1
Viable pregnancy rate*	14.9	15.9	18.1	12.5	11.7

* Per 100 oocyte retrieval cycles for fresh transfer cycles and per 100 embryo transfers for frozen/thaw transfers.

Source: AIHW NPSU Assisted Conception database.

Table 8: Adverse infant outcomes of women undergoing assisted conception treatment in Australia in 1999 who had births in 1999 and 2000

Plurality

Multiple pregnancy rate

Indicator

> The number of multiple pregnancies expressed per 1,000 confinements

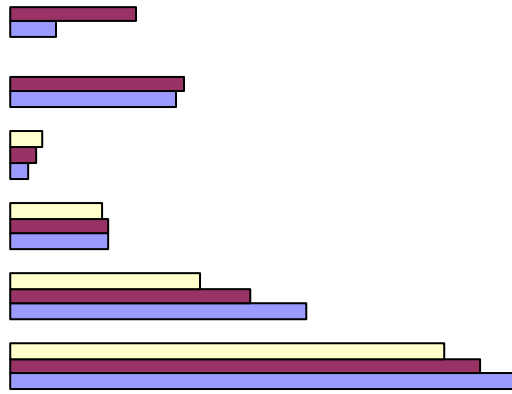A related indicator is the multiple birth rate based on the number of live births and stillbirths from a multiple pregnancy expressed per 1,000 live births and stillbirths.

Background information

- Multiple pregnancies include twin, triplet or higher-order multiple gestations.
-

Table 9: Multiple pregnancies by maternal age, Australia, 1999

Maternal age (years)	Twin	All multiple pregnancies

Proportion of institutional deliveries

Indicator

> Annual percentage of women
> who gave birth in hospital
> settings

Background information

- Most births in Australia occur in hospitals, either in conventional labour-ward settings or in hospital birth centres.
- Planned home births and births occurring unexpectedly before arrival in hospital comprise only a very small proportion of births in Australia.
- In 1998–1999 there were 341 obstetric/maternal services and 30 neonatal intensive care units in public acute hospitals in Australia (AIHW 2000).
- The actual number of maternity units in a region depends on its geographical location, the population of the region and policies regarding maternity services.

Current data

- In 1999, over 99% of births in Australia took place in hospitals. Less than 1% of births were at home or born before arrival at hospital (Table 11) (Nassar et al. 2001).
- During 1998, most births in the Northern Territory occurred in hospitals (95.2%), however, 50 (4.1%) Indigenous women from the Northern Territory gave birth in a community health centre (Gladigau et al. 1999).
- The higher proportion of births in birth centres in the Australian Capital Territory (7.5%) may be attributed to the higher ratio of birth centres to the number of women giving birth each year (n=4,599) compared with the other States and Territories (Table 11).
-

Table 11: Place of birth, all confinements, States and Territories, 1999

Place of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
				Number					
Hospital	83,216	60,333	47,256	24,765	17,220	5,726	4,214	3,425	246,155
Birth centre	2,249	888	387	417	925	81	346	–	5,293
Home	139	298	164	126	39	8	21	47	842
Born before arrival	363	62	234	70	49	84	18	–	880
Other	–	5	1	–	–	11	–	78	95
Not stated	–	1	–	–	–	86	–	–	87
All places of birth	85,967	61,587	48,042	25,378	18,233	5,996	4,599	3,550	253,352
				Per cent					
Hospital	96.8	98.0	98.4	97.6	94.4	96.9	91.6	96.5	97.2
Birth centre	2.6	1.4	0.8	1.6	5.1	1.4	7.5	–	2.1
Home	0.2	0.5	0.3	0.5	0.2	0.1	0.5	1.3	0.3
Born before arrival	0.4	0.1	0.5	0.3	0.3	1.4	0.4	–	0.3
Other	–	0.0	0.0	–	–	0.2	–	2.2	0.0
All places of birth	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Source*: Nassar & Sullivan 2001.

Data limitations

No breakdowns are available by type of hospital and Rural, Remote and Metropolitan Areas classification in the AIHW National Perinatal Data Collection.

Indicator status

Adequate.

Data source

AIHW National Perinatal Data Collection.

References

-

Caesarean birth rate

Indicator

Background information

- The caesarean rate in Australia has continued to increase in recent decades (Lancaster & Pedisich 1993).
- Factors associated with higher caesarean rates include advancing maternal age, first births compared to subsequent births, multiple pregnancy, breech presentation, low birthweight and private accommodation status in hospital (Nassar
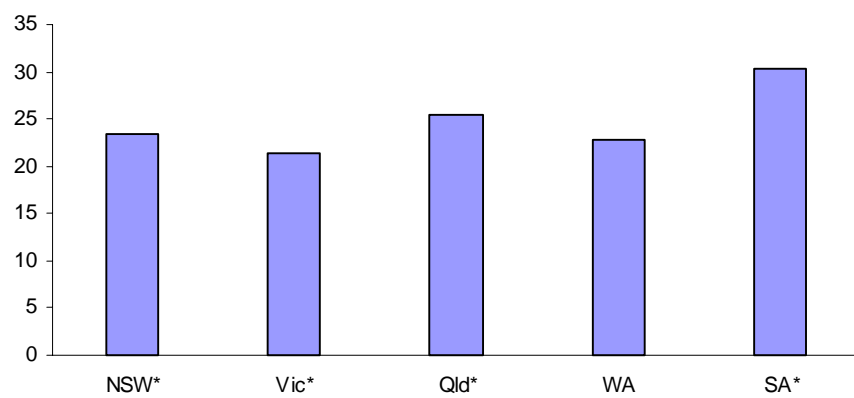
Per cent of confinements
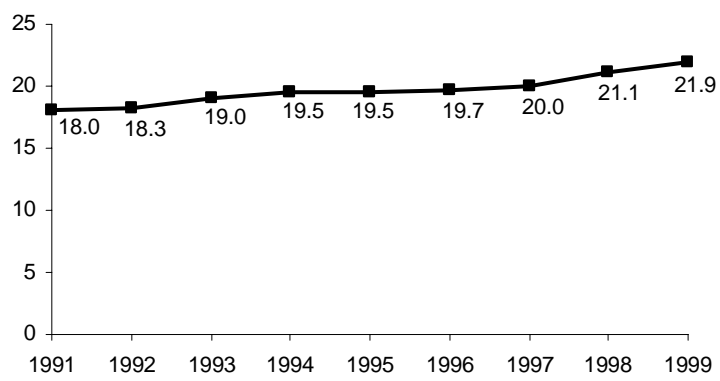
Figure 30: Births by caesarean section, Australia, 1991–1999

The number of women who have had

Per cent

* Based on ACHS clinical indicator for vaginal births after caesarean section.
Sources:

Rate of instrumental vaginal deliveries

Indicator

Background information

- Vacuum extraction involves the delivery of an infant using a traction cup that is attached to the infant's head. Forceps delivery involves delivery of an infant using obstetrical forceps.
- Evidence from the systematic review of a number of randomised clinical trials found the use of the vacuum extractor instead of forceps appeared to reduce maternal morbidity (Johanson & Menon 2001).
- In a population-based study of women with low-risk pregnancies in New South Wales in 1996–1997 the authors concluded there was a significantly higher rate of instrumental deliveries among private patients in private hospitals (34%) than for public patients (17%). Results also showed that higher rates of interventions amongst private patients were due to instrumental deliveries rather than caesarean sections (Roberts, Tracy & Peat 2000).
- In a study in Victoria, assisted vaginal births (forceps and vacuum extraction) were associated with the highest rates of maternal morbidity when compared with spontaneous vaginal births (Brown & Lumley 1998). There was an increased likelihood of reporting perineal pain, sexual problems, urinary incontinence, bowel problems and haemorrhoids.

Current data

- In 1999, there were 13,864 (5.5%) vacuum extractions and 14,253 (5.6%) forceps deliveries resulting in an instrumental delivery rate of 11.1 per 100 confinements (Nassar & Sullivan 2001).

- The overall instrumental delivery rate has dropped from 12.5 per 100 confinements in 1991 to 11.1 per 100 confinements in 1999 (Nassar & Sullivan 2001).
- Between 1991 and 1999 the proportion of forceps deliveries has decreased from 10.0% to 5.6% of all deliveries in Australia. In contrast, vacuum extraction deliveries have risen from 2.5% to 5.5% in the same (Nassar & Sullivan 2001).
- In 1999, there were more vacuum extraction deliveries than forcep deliveries in Western Australia and New South Wales (Figure 32) (Nassar et al. 2001).
- The highest age-specific rate of instrumental delivery was among women aged 30–34 years (11.2 per 100 confinements) with the lowest rate among women aged 15–24 years (8.7 per 100

Per cent confinements

Note: Data for Tasmania unavailable, 1998 data used as an estimate.
Source: Nassar & Sullivan 2001.

Figure 32: Instrumental delivery rates, all confinements, States and Territories, 1999
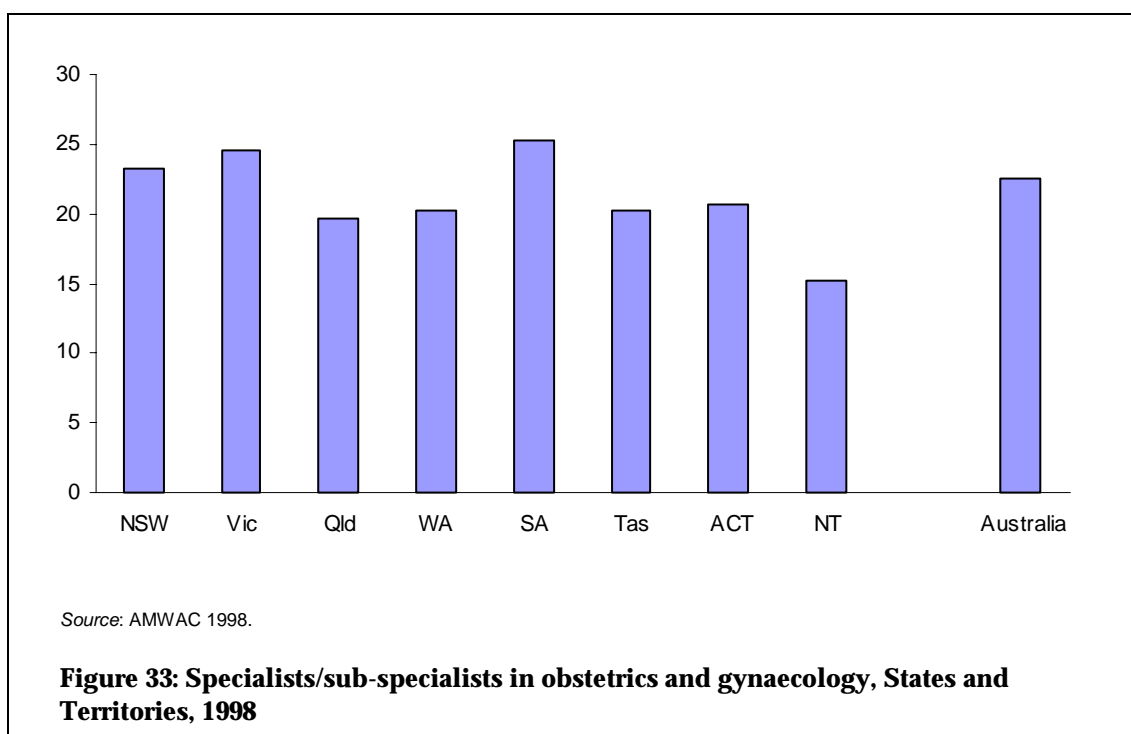
Data limitations
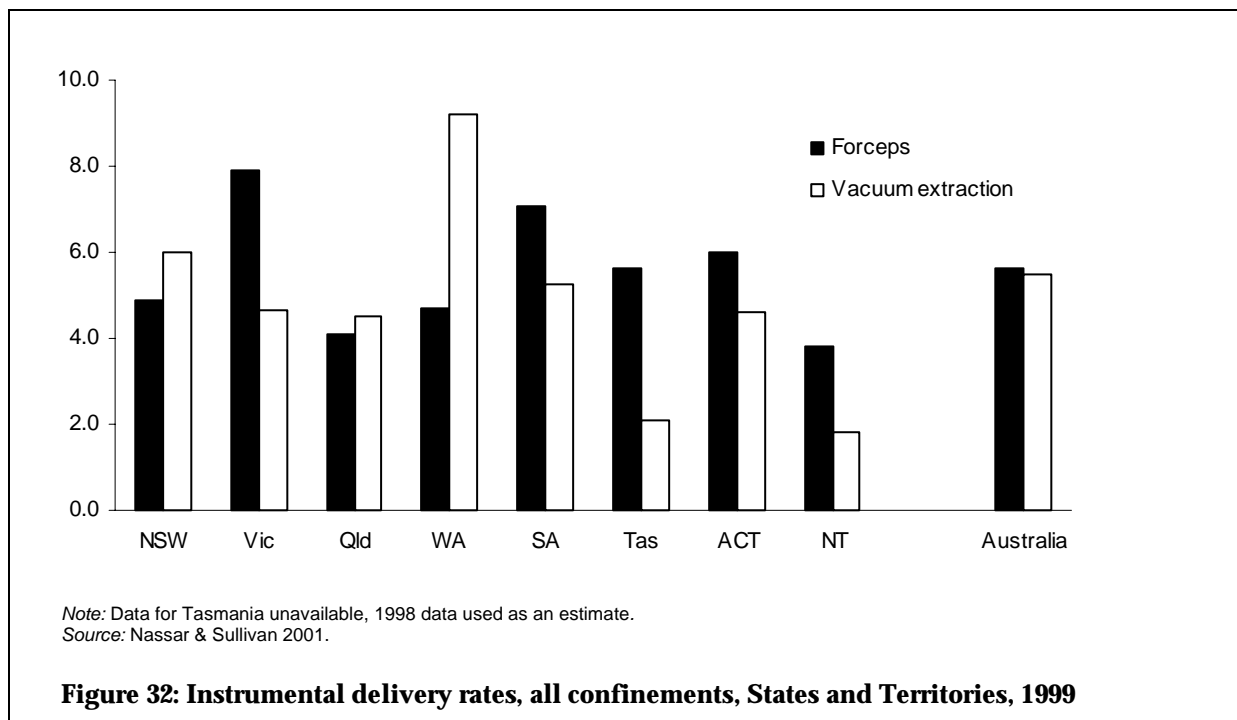
The ability to track the maternal morbidity associated with instrumental vaginal deliveries is limited by (a) the lack of uniform reporting of maternal morbidity in the National Perinatal Data Collection, and (b) the lack of a data item specifying parity in the AIHW National Hospital Morbidity Database.

Indicator status

Adequate. Although WHO define instrumental deliveries as a proportion of live births, the availability of confinement data in Australia allows the rate to be reported per 100 confinements.

Data source

Il

Percentage of births attended by skilled health personnel

Indicator

> Percentage of births attended by skilled health personnel

Background information

- Skilled health personnel refers to a doctor (specialist or non-specialist), nurse, midwife or other health worker with midwifery skills who can diagnose and manage obstetric complications as well as normal deliveries.
- In Australia, pregnancy care is provided by specialist obstetricians and gynaecologists, general practitioners (GPs) with obstetric training and midwives.
- The person assisting during the time of birth is often called the accoucheur.
- GPs providing obstetric and gynaecology services are qualified with a Diploma of RANZCOG and are able to perform normal and assisted deliveries (AMWAC 1998).
- Midwives are legally qualified to provide total care for the well woman during her pregnancy, birthing and postnatal period.
- Australia has good access to care compared with developing countries. However, the pattern of health care provision varies by region, with specialist involvement more likely in capital cities and less likely in regional areas. In rural and remote areas, GP and midwifery care is predominant (AMWAC 1998).

Current data

- WHO health indicators reported that in 1991–1993, 99.9% of all deliveries in Australia were attended by trained personnel.

- In Western Australia, in 1998, obstetricians attended 33.6% of all births and performed three-quarters (75%) of all caesarean sections.
- Medical officers performed the remaining 25% of caesarean section deliveries. Midwives were present at more than one-third of births (37.3%) and were involved in 60% of spontaneous vaginal deliveries. One in four women confined were assisted by a medical officer (Gee & O'Neill 2000).
- A study by the Victorian Perinatal Data i1 Tf0.4578 0 Ta30 -2.00050 -1.253 TD-0.0016.mfs(t)-1.0.0005

113

Rate per 100,000 females aged 15–49 years

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia

Source: AMWAC 1998.

Figure 33: Specialists/sub-specialists in obstetrics and gynaecology, States and Territories, 1998

Data limitations

There is no routine collection of data on the birth attendant present during delivery (accoucheur) by States and Territory perinatal data collection units. Development is needed for the birth attendant during pregnancy to be included as a data element in the *National Health Data Dictionary*.

Indicator status

Incomplete.

Data sources

Australian Medical Workforce Advisory Committee.

References

- Australian Institute of Health and Welfare 1997. Medical labour force 1995. AIHW cat. no. HWL 1. Canberra: AIHW (National Health Labour Force Series no. 10).
- Australian Institute of Health and Welfare (AIHW) 1999. Nursing labour force 1998. AIHW cat. no. HWL 14. Canberra: AIHW (National Health Labour Force Series).
- Australian Institute of Health and Welfare 2000. Medical labour force 1998. AIHW cat. no. HWL 15. Canberra: AIHW (National Health Labour Force Series no. 16).
- Australian Medical Workforce Advisory Committee (AMWAC) 1998. The obstetrics and gynaecology workforce in Australia. Sydney: AMWAC.
- Gee V & O'Neill MT 2000. Perinatal statistics in Western Australia, 1998: 16th annual report of the Western Australian Midwives Notification System. Perth: Health Department of Western Australia.
- Halliday J, Ellis I & Stone C 2000. WUDWAW: Who Usually Delivers Whom and Where: report on models of antenatal care. Melbourne: Victorian Perinatal Data Collection Unit, Department of Human Services.
- Tracy S, Barclay L & Brodie P 2000. Contemporary issues in the workforce and education of Australian midwives. Australian Health Review 23(4): 78–88.

Obstetric service providers by rural/remote classification

Indicator

> Number of obstetric service providers by rural/remote classification per 100,000 female population
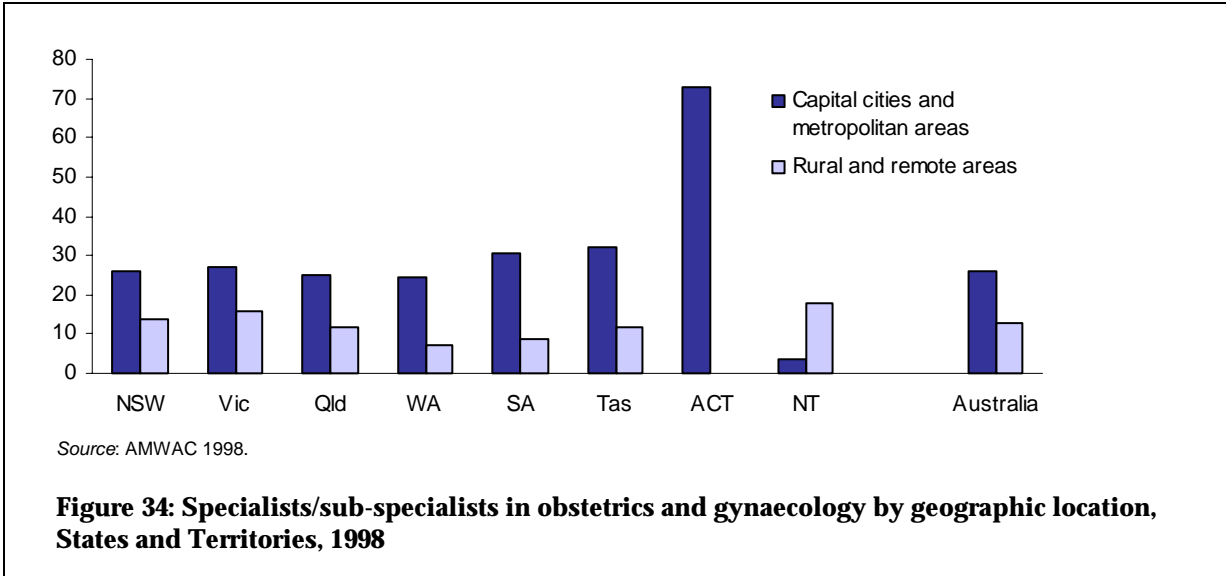
Background information

A recent report found that the general health of people living in rural and remote areas is poorer than that of those in metropolitan areas. This is evident in the higher mortality rates, lower life expectancy and higher hospitalisation rates for some causes among rural and remote area dwellers (AIHW 1998).

People in rural and remote areas also have less access to health care compared with those living in metropolitan areas (AIHW 1998). The rural and remote access to reproductive health services, in particular, does not appear to have been quantified.

In 1998, it was estimated that there were 22.5 obstetrics and gynaecology specialists in Australia per 100,000 females aged 15–49 years (AMWAC 1998).

The Royal Australian College of Obstetrics and Gynaecology (RACOG—now known as RANZCOG) recommends that the acceptable specialist to population ratio for females in urban areas is 1:10,000 and for rural and remote areas 1:15,000 (AMWAC 1998).

Specialist obstetricians are not the only medical personnel providing pregnancy care in Australia; midwives and some general practitioners with obstetric training also provide care.

Findings from a RACOG/AMWAC survey of 501 RACOG fellows suggest that there is little incentive for specialists to practise in rural areas. Reasons stated include long hours, professional isolation, career dislocation, lack of relative financial reward, strain on family/spouse, lifestyle issues and lack of locum cover during leave (AMWAC 1998).

Current data

Specialist obstetricians and gynaecologists practise mainly in capital cities and metropolitan areas (84.7% of the workforce). Fifteen per cent of specialists are located in rural and remote areas, where 28.5% of the female population lives (AMWAC 1998).

In 1998, there were more than twice (26.2 versus 12.7 per 100,000 females aged 15–49 years) the number of specialists/sub-specialists on a per capita basis in capital cities and metropolitan areas compared with rural and remote areas (Figure 34). Using the urban specialist to population ratio indicator from RANZCOG, the Northern Territory falls below the suggested ratio with 0.3 specialists per 10,000 female population. In rural and remote areas all States and Territories appear to have adequate provision of specialists. There are no rural or remote areas in the Australian Capital Territory (Figure 34) (AMWAC 1998).

Medicare data presented in Table 13 shows that in 1995–1996, over 95% of obstetric and gynaecology services were provided by specialists in urban and large rural areas. However, in small rural and in remote areas an increasing proportion of services are provided by GPs (AMWAC, 1998).

According to Medicare data, only half (47.9%) of patients in 'other remote areas' have their obstetrics and gynaecology care provided by specialists (Table 13) (AMWAC 1998).

The majority of nurses employed as clinicians in midwifery, obstetrics and gynaecology in 1995 were based in capital cities/metropolitan centres (74.1%), with only 23.9% located in rural areas and 1.9% in remote areas (AMWAC 1998).

Rate per 100,000 females aged 15–49 years

Figure 34: Specialists/sub-specialists in obstetrics and gynaecology by geographic location, States and Territories, 1998

Table 13: Distribution (%) of obstetrics and gynaecology Medicare service providers (including GPs) by geographic location, Australia, 1995–1996

Provider location	Metropolitan		Rural			Remote
	Capital cities	Other	Large centres	Small centres	Other	Remote

Maternal morbidity rate

Indicator

Background information

'Maternal morbidity' is generally defined
as any illness or injury (to the mother)
caused by, aggravated by, or associated
with pregnancy or childbirth (National
Research Council 2000).

With decreasing maternal mortality ratios,
international attention has been turned to
the ascertainment of maternal morbidity.
This may be seen as an important indicator
of the standard of maternal care during
pregnancy, childbirth and the puerperium.

International estimations of the extent of
maternal morbidity range from 16–100
episodes of illness/acute obstetrical
complications for every maternal death
(Koblinksy 1995; Liskin 1992).

One recent UK study developed
definitions for six severe obstetric
morbidities, and found an incidence of

02.0 recent UK study developed morbidity pe3.7(tern)6(al care dur20.74(nce ofare d(e stan7c 01.8()]TI 19e(ve)-6e2l 1

Table 14: Selected maternal morbidity, Australia, January 1994 – December 1996

Type of morbidity	Number	Rate
Single-episode morbidity		
Ruptured uterus	351	0.5 *
Septicaemia	6,175	8.9 *
Pulmonary embolism	510	0.7 *
Third/fourth degree perineal tears	7,877	11.4 *
Multiple-episode morbidity		
Antepartum haemorrhage	33,982	29.8 **
Severe pre-eclampsia/eclampsia	5,921	5.2 **
Postpartum haemorrhage	47,226	41.4 **
Severe venous complications	1,101	1.0 **

*Rate per 1,000 confinements (hospitalisations involving a birth outcome code).

**Ratio per 1,000 pregnancy-related hospitalisations (hospitalisations involving any of the pregnancy, childbirth and puerperium codes from ICD-9-CM).

Source: AIHW National Hospital Morbidity Database.

Indicator status

Incomplete. The lack of population-based data on individual women and their outcomes do not allow complete ascertainment of the burden of maternal morbidity. Surveillance of maternal morbidity in Australia would be strengthened by uniform definitions of maternal conditions reported in the NPDC, the inclusion of key pregnancy-related data items in the AIHW NHMD and the development of linked data allowing the tracking of individual women and their pregnancy outcomes.

Data source

AIHW National Hospital Morbidity Database, January 1994–December 1996, excluding one State for 1994 and 1995 and all cases of false/threatened labour.

References

- Koblinksy MA (1995). Beyond maternal mortality: magnitude, interrelationship, and consequences of women's health, pregnancy-related complications and nutritional status on pregnancy outcomes. International Journal of Gynaecology and Obstetrics 48 Supp: S21–S32.

- Liskin LS (1992). Maternal morbidity in developing countries: a review and comments. International Journal of Gynaecology and Obstetrics 37(2): 77–87.
- National Research Council (2000). The consequences of maternal morbidity and mortality: report of a workshop (Committee on Population), in HE Reed, MA Koblinsky & WH Moseley (eds), Commission on behavioural and social sciences and education. Washington DC: National Academy Press.
- Waterstone M, Bewley S & Wolfe C 2001. Incidence and predictors of severe obstetric morbidity: case-control study. British Medical Journal 322: 1089–1092.

Maternal mortality rate

Indicator

Annual number of maternal deaths
per 100,000 live births

Background information

- The maternal mortality ratio in Australia,
  as calculated by the World Health
  Organization (WHO 1999) is comparable
  with other developed countries such as the
  United Kingdom, Denmark and Ireland.
- Triennial reports on maternal mortality in
  Australia have been produced since 1964.
  Maternal deaths are divided into three
  categories: direct, indirect and incidental.
  Whilst direct and indirect maternal deaths
  are related to the pregnant state, incidental
  maternal deaths are those in which the
  pregnancy is unlikely to have contributed
  significantly to the death (Figure 35).
- Maternal mortality as defined by the WHO
  is the death of a woman while pregnant or
  within 42 days of the termination of

Figure 35: Classification of maternal deaths in Australia

Direct deaths: are those resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above. They are complications of the pregnancy itself, e.g. eclampsia, amniotic fluid embolism, rupture of the uterus, postpartum haemorrhage.

Indirect deaths: are those resulting from pre-existing disease or disease that developed during pregnancy and was not due to direct obstetric causes, but which may have been aggravated by the physiological effects of pregnancy, e.g. heart disease, diabetes, renal disease.

Incidental deaths: are those due to conditions occurring during pregnancy, where the pregnancy is unlikely to have contributed significantly to the death, although it is sometimes possible to postulate a distant association, e.g. road accidents, malignancies.

Source: NHMRC & AIHW 2001.

Ectopic pregnancy rate

Indicator

> Ectopic pregnancy rate per 1,000
> confinements per year

Background information

- Ectopic pregnancy is where implantation of the blastocyst occurs outside the uterine cavity, that is, the presence of a gestation outside the uterus. The majority of ectopic pregnancies involve the fallopian tubes. Ectopic pregnancies are not uncommon, with more than 1 in every 100 pregnancies in the United States being an ectopic pregnancy (Cunningham et al. 1997).
- Earlier and more accurate diagnosis of ectopic pregnancy has allowed a wider array of conservative treatment options ranging from less radical surgery to medical treatment and even expectant management, in certain cases (Choong 1998).
- The sub-population of women utilising assisted reproductive techniques is at particularly high risk of ectopic pregnancy (Choong 1998).

Current data

- In 1996 there were 4,165 separations involving a diagnosis of ectopic pregnancy, representing a rate of 16.5 to every 1,000 confinements recorded in the National Perinatal Data Collection (Figure 36).
- In 1996, the highest age-specific hospital separation rate involving ectopic pregnancy was among women aged 40 and over (35.9 per 1,000 confinements) while the lowest age-specific rate was among women aged 15–19 years (12.7 per 1,000 confinements) (Figure 36).
- In 1996, the highest ectopic pregnancy separation rate was in Western Australia (19.6 per 1,000 confinements) with the lowest separation rate in Victoria (14.5) (Figure 37).
- Health Insurance Commission data from the Medicare Benefits Schedule indicate

there were 1,764 ectopic pregnancies removed between 1998 and 2000 in free-standing clinics and among private patients in public and private hospitals. The number of services dropped from 637 in 1998, to 575 in 1999 and 552 in 2000 (Item numbers 35676–35678) (HIC 2000).

- There were 825 ectopic pregnancies after assisted conception[10] between 1990 and 1998, representing 3.1% of assisted conception pregnancies. The proportion of ectopic pregnancies after assisted conception has decreased from 5.0% in

Perinatal mortality rate

Rate per 1,000 births
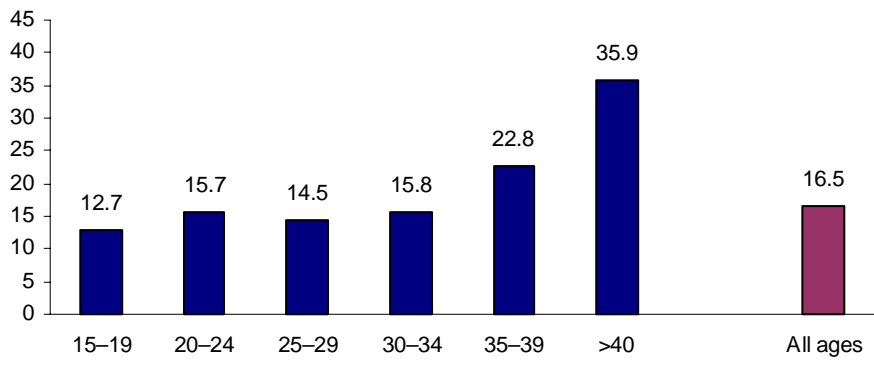
Figure 38: Fetal, neonatal and perinatal mortality rates, States and Territories, 1999

Data limitations

- Over one-quarter (26%) of perinatal deaths do not have a specific cause of death recorded.
- Time lag between the occurrence of a death and the registration of the event so that some deaths which occurred late in the year are registered in the early part of the following year.
- Analysis of gestational age and birthweight are limited by the fact that not all perinatal deaths are linked to the birth record in the perinatal data collection.
- Varying definitions of perinatal death restrict international comparisons of perinatal mortality.

Indicator status

Adequate.

Data source

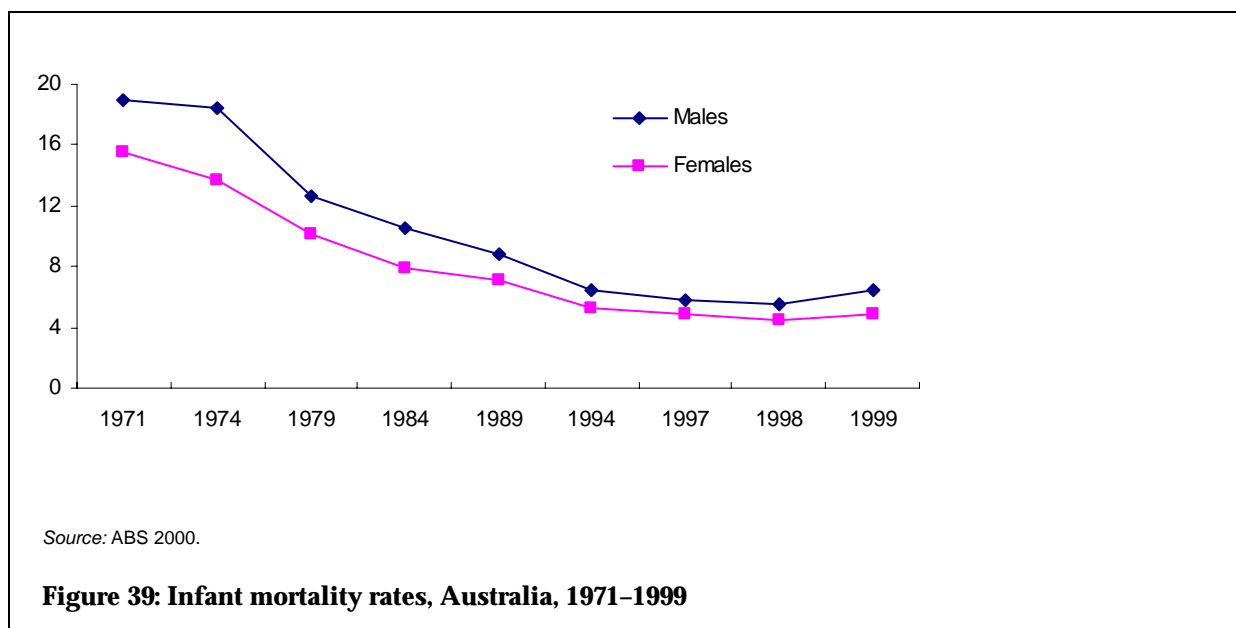Australian Bureau of Statistics.

References

- Australian Bureau of Statistics (ABS) 2000. Causes of death, Australia 1999. Cat. no. 3303.0. Canberra: ABS.
- Australian Bureau of Statistics (ABS) & Australian Institute of Health and Welfare (AIHW) 2001. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples. Cat. no. 4704.0. Canberra: ABS.
- Nassar N & Sullivan EA 2001. Australia's mothers and babies 1999. AIHW cat. no. PER 19. Sydney: AIHW National Perinatal Statistics Unit.

Infant mortality rate

Indicator

> Deaths of infants aged less than one year per 1,000 live births

Background information

- Infant deaths are, in general, divided into neonatal and postneonatal periods. Deaths in the neonatal period are those occurring in the first 28 days after birth (0–27 days), while postneonatal deaths are those occurring in the remainder of the first year (28 days to 364 days).
- Rates of infant mortality have tended to be used as a national indicator of standard of living and socioeconomic wellbeing.
- Socioeconomic disparities in overall rates of infant mortality are evident (Turrell & Mengerson 2000).
- Two major groups of causes accounted for 95% of all neonatal deaths during the 15-year period 1982–1996. These were: perinatal conditions (e.g. hypoxia, birth asphyxia, fetal growth problems) (62% of neonatal deaths) and congenital malformations (33%) (ABS 1998).
- Three causes accounted for 76% of all postneonatal deaths during the 15-year reference period. These were: sudden infant death syndrome (SIDS) (49%), congenital malformations (18%) and perinatal conditions (9%) (ABS 1998).
- SIDS emerged as the leading cause of death in the postneonatal period, accounting for nearly half of all postneonatal deaths (ABS 1998). Ninety-five per cent of SIDS deaths occur in the first year of life (SIDS Australia 2001).

Current data

- The 1999 infant mortality rate was 5.7 deaths per 1,000 live births, a slight increase from the 1998 rate of 5.0 deaths per 1,000 live births (ABS 2000). There was a downward trend in the infant mortality rate in Australia between 1987 and 1996 (Moon, Rahman & Bhatia 1998; ABS 2000) (Figure 39).
- Over one-third (37%) of all infant deaths in 1999 occurred within one day of birth (ABS 2000d).
-

Rate per 1,000 live births

Source: ABS 2000.

Figure 39: Infant mortality rates, Australia, 1971–1999

Indicator status

Adequate.

Data sources

Australian Bureau of Statistics.

References

- Australian Bureau of Statistics (ABS) 1996. Australian social trends 1996: family formation: trends in fertility. Canberra: ABS.
- Australian Bureau of Statistics (ABS) 1998. Causes of infant and child deaths, 1982–96 Australia. Cat. no. 4398.0. Canberra: ABS.
- Australian Bureau of Statistics (ABS) 2000. Causes of death, Australia, 1999. Cat. no. 3302.0. Canberra: ABS.
- Moon L, Rahman N & Bhatia K 1998. Australia's children: their health and wellbeing 1998. AIHW cat. no. PHE 7. Canberra: AIHW.
- SIDS Australia 2001. Australian SIDS death rate 1979–1997. Accessible at: www.sidsaustralia.org.au
- Turrell G & Mengerson K 2000. Socioeconomic status and infant mortality in Australia: a national study of small urban areas, 1985–1989. Social Science and Medicine 50: 1209–1225.

Incidence of low birthweight births

Indicator

Background information

- The *National Health Data Dictionary* (NHDD) defines birthweight as the first weight of the fetus or baby obtained after birth. The World Health Organization (WHO) defines the following categories:
    – low birthweight: less than 2,500 g
    – very low birthweight: less than 1,500 g
    – extremely low birthweight: less than 1,000 g (AIHW 1999).
- The weight of infants at birth is a principal determinant of their chances of survival and good health. Low birthweight is a risk factor for neurological and physical disabilities, the risk of adverse outcomes increasing with decreasing birthweight.
- Low birthweight may be an indicator of inadequate fetal growth, resulting from pre-term birth or fetal growth restriction or both (Institute of Medicine 1985).
- Low birthweight is a major determinant of neonatal mortality. Infants weighing less than 2,500 g are almost 40 times more likely to die within the first 28 days than infants of normal birthweight (Institute of Medicine 1985).
- A cohort study in Victoria of 25,231 infants born with congenital malformations between 1983 and 1995 found that congenital malformations were more common in infants of multiple pregnancies and low birthweight (Riley, Halliday & Lumley al. 1998).
- In a study of low birthweight babies in the Australian Capital Territory, low birthweight infants were more likely than normal birthweight babies to have 1- and 5-minute Apgar scores of less than 7, to
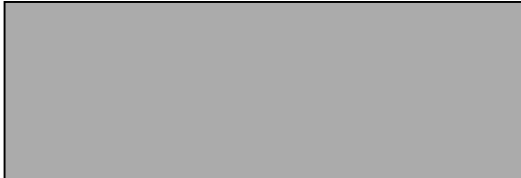
Sex ratio of births

Indicator

Ratio of male to female births
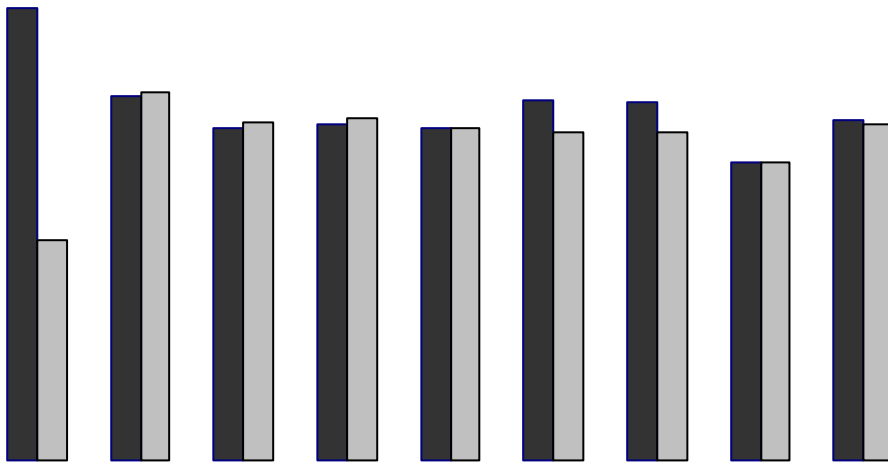
The sex ratio is the number of male births expressed per 100 female births. It may also be reported as the male proportion of total births.

Background information

- Prenatal sexual differentiation is a complex process which takes place between 6 and 9 weeks of gestation (Davis, Gottlieb & Stampnitzky 1998).
- A number of factors that may reduce the male proportion include older age of parents, stress, in-vitro fertilisation, non-Hodgkins lymphoma, hepatitis and use of fertility drugs, such as clomiphene (Davis, Gottlieb & Stampnitzky 1998).
- Studies have found that a decrease in the proportion of males born may be attributed to exposure to specific workplace and environmental contaminants such as pesticides, aluminium industry, alcohol, lead, solvents and other toxic agents (Davis, Gottlieb & Stampnitzky 1998).
- A study of children born to parents exposed to dioxin in a chemical explosion in Seveso, Italy, 1976 found higher dioxin exposure of the father decreased the likelihood of having sons compared to daughters. For those aged under 19 at the time of the accident, the sex ratio was 62 boys born for every 100 girls (Mocarelli et al. 2000).

Current data

- In 1999, among 257,394 births in Australia, the sex ratio was 105.6 male births per 100 female births (Nassar & Sullivan 2001).
- The sex ratio varied among the States and Territories. The highest sex ratio of 110.4 was in Tasmania and the lowest of 103.4 in the Australian Capital Territory (Figure 41) (Nassar & Sullivan 2001).
- The proportion of males for singleton births was 0.513 (sex ratio of 105.6), 0.511 (sex ratio of 104.7) for twins and 0.508 (sex ratio of 103.4) for other multiple births (Nassar & Sullivan 2001).
- In 1999, among 4,730 assisted conception births of at least 20 weeks gestation the sex ratio was 106.8 male births per 100 female births. The sex ratio varied amongst different methods of assisted conception, ranging from 109.0 for IVF to 105.4 for intracytoplasmic sperm injection (ICSI) (Hurst & Lancaster 2001).
- In an Australian study of the proportion of male births between 1921–1925 and 1991–1995, there was a slight, but insignificant, increase from 0.5125 to 0.5133. This finding was in contrast to the declining trends in many countries in the northern hemisphere (Lancaster & Day 1998).
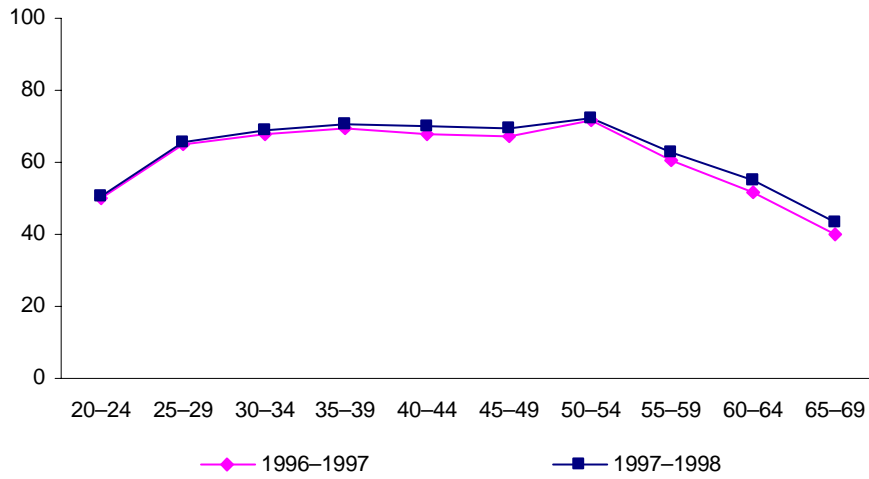
Proportion of women screened for cervical cancer

Indicator

> Proportion of women aged
> 20–69 years screened in a
> two-year period for cancer of
> the cervix

Background information

- Cervical screening has been available in Australia on an ad hoc basis since the 1960s, however, in the early 1990s an organised national approach to cervical screening was introduced.
- The major objective of the National Cervical Screening Program is to minimise the incidence of cervical cancer by detecting treatable pre-cancerous lesions before their progression to cancer (AIHW 2000).
- Women aged 20–69 years have been identified as the target population group for cervical screening. The current Australian recommendation for cervical screening is for all women in the target age group 20–69 years who have been sexually active at any stage in their lives to have a Pap smear every 2 years until the age of 70 years (AIHW 2000).
- Cervical cytology registers have been legislated and implemented in all States and Territories to provide reminder services for re-screening and follow-up for women with abnormal Pap smears.
- A number of Australian studies have found that 70% or more of women who get cervical cancer are either unscreened or under-screened (New South Wales Cervical Screening program 2000).
- Increased recruitment for cervical screening of Indigenous and older women and women from non-English-speaking backgrounds is required to improve overall participation rates (AIHW 2000).
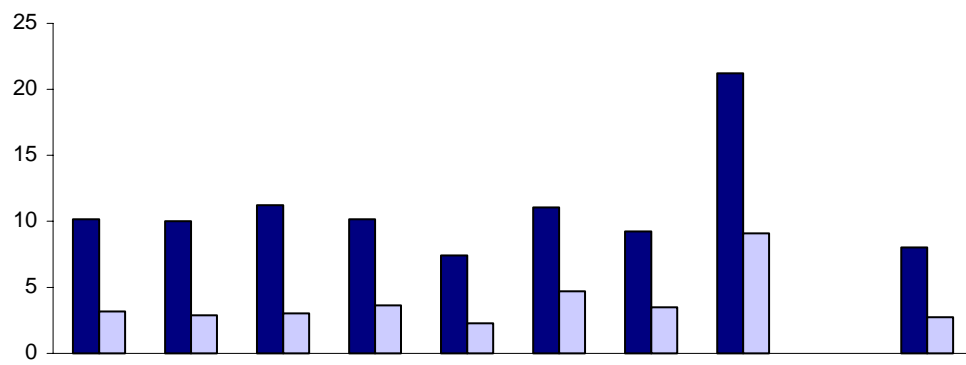
Current data

- Cervical cancer is the 15th most common cause of cancer deaths in Australian women (AIHW 2000).
- In 1997, there were 795 new cases and 291 deaths due to cancer of theS

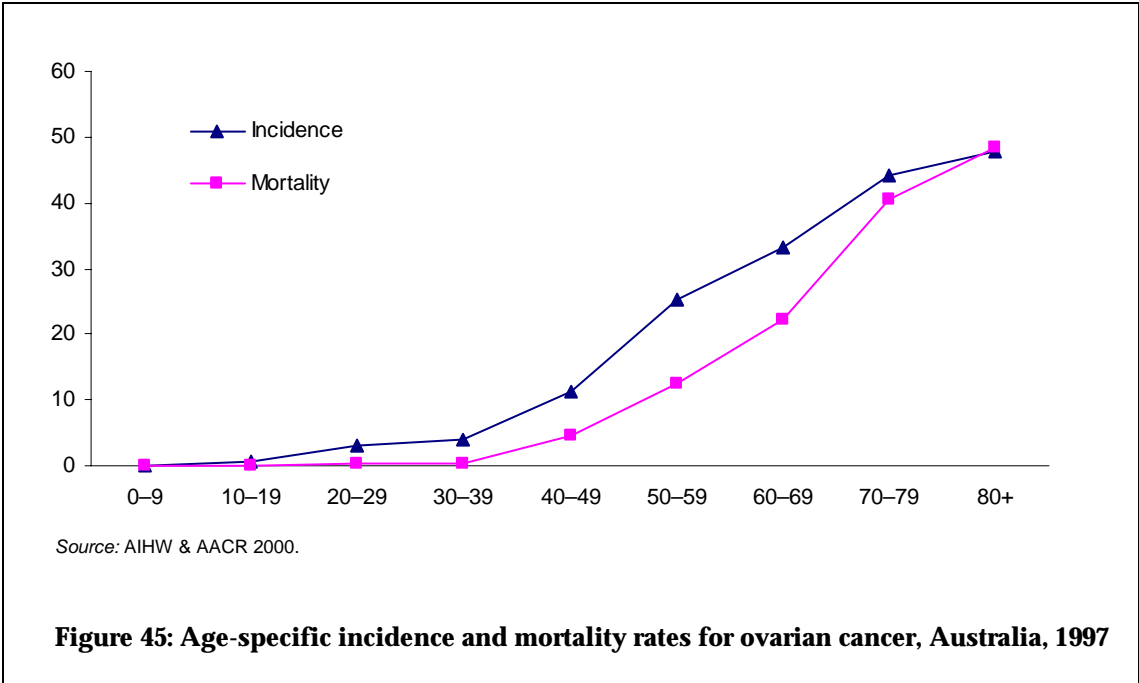-

Per cent

Note: Data from Queensland not available.

Source: AIHW 2000.

Figure 42: Percentage of *T.4(te)TJ/T -1.7TT2 1 4n in the (g)(tat)12(o)6.3t a(o)6.3 (o)6.t   Twy o961 (at)12s, pat

Incidence and mortality rates
of cervical cancer per 100,000

135

Per 100,000 population

Figure 45: Age-specific incidence and mortality rates for ovarian cancer, Australia, 1997

Data limitations

Incidence and mortality
rates of testicular cancer per

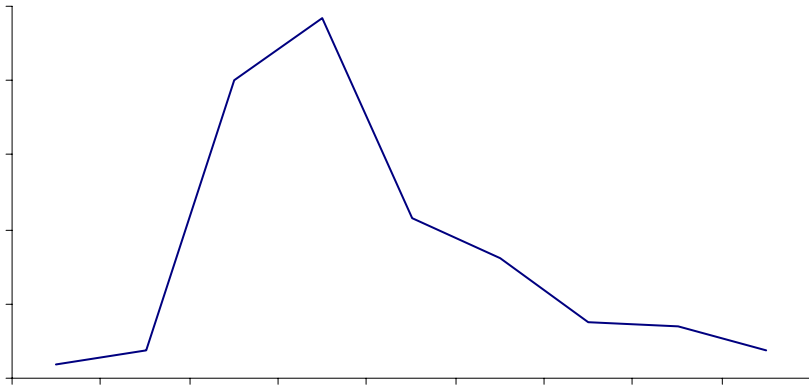# Appendix: Calculation of rates

Age-specific rates

Age-specific rates are calculated by dividing the number of cases occurring in each specified age group by the corresponding population in the same age group expressed as a rate per 100,000 population. This rate may be calculated for particular age and sex groupings (AIHW and AACR, 2000).

Age-standardised rates (AS rate)

Rates are adjusted for age to facilitate comparisons between populations which have different age structures, e.g. between youthful and ageing communities. There are two different methods commonly used to adjust for age. *Direct standardisation* is the method used in this report and involves the use of age-specific rates which are multiplied against a constant population (the Australian 1991 Populations Standard

Glossary

Age-specific fertility rate: the number of live births during the calendar year, according to the age or age-group of the mother, per 1,000 female resident population of the same age or age group at 30 June.

Amniocentesis: sampling of the fluid in the amniotic sac during pregnancy.

Anaemia: a condition in which the blood is deficient in red blood cells, haemoglobin or total volume.

Androgens: hormones based on the structure of testosterone and capable of developing and maintaining masculine sexual characteristics.

Augmented labour: enhances uterine contractions after labour has commenced.

Azoospermia: the absence of spermatozoa in the semen or failure of formation of spermatozoa.

Birthweight: the first weight of the baby (stillborn or liveborn) obtained after birth (usually measured to the nearest five grams and obtained within one hour of birth).

Caesarean section: operative birth through an abdominal incision.

Chorionic villus sampling (CVS): a sample of the chorionic villi obtained during pregnancy for genetic testing, particularly for chromosome abnormalities.

Clinical pregnancy: any type of pregnancy that can be confirmed by ultrasound, or verified from the products of conception. This definition includes ectopic pregnancy, blighted ovum, missed abortion, spontaneous abortion and termination of pregnancy.

Confinement: pregnancy resulting in at least one birth.

Congenital malformations: structural or anatomical abnormalities that are present at birth, usually resulting from abnormal development in the first trimester of pregnancy.

Contraception: means of avoiding pregnancy despite sexual activity.

Crude birth rate: the number of live births registered during the calendar year per 1,000 estimated resident population at 30 June of that year.

Ectopic pregnancy: a pregnancy that occurs outside the uterus.

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Erectile dysfunction: the persistent inability to achieve and/or maintain an erection sufficient for satisfactory sexual activity.

Fetal death: (stillbirth) is the delivery of a child of at least 400 g birthweight or at least 20 weeks gestation who did not breathe or show any other evidence of life, such as a heartbeat, pulsation of the umbilical cord or definite movement of voluntary muscles.

Forceps delivery: involves delivery of an infant using obstetrical forceps.

Gestational age: the duration of pregnancy in completed weeks calculated from the date of the first day of a woman's last menstrual period and her baby's date of birth, or derived from clinical assessment during pregnancy or from examination of the baby after birth.

Hysterectomy: the surgical procedure whereby all or part of the uterus is removed.

Illicit drugs: illegal drugs, drugs and volatile substances used illicitly, and pharmaceuticals used for non-medical purposes. These may include painkillers/analgesics, tranquillisers/sleeping pills, steroids, barbiturates, amphetamines, marijuana/cannabis, heroin, methadone, cocaine, LSD/synthetic hallucinogens, ecstasy and other designer drugs.

Indigenous: a person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander and is accepted as such by the community with which he or she is associated.

Induced labour: when an external agent is used to stimulate the onset of labour.

Infant death: death of a child under one year of age.

Infant mortality rate: the number of deaths of children under one year of age in a calender year per 1,000 live births in the same calender year.

International Classification of Diseases: The World Health Organization internationally accepted classification of death and disease. The 9th Revision (ICD-9) and the tenth revision, Australian Modification (ICD-10-AM) is referred to in this report.

Intrapartum fetal death: fetal death occurring during labour.

Iron deficiency: when an insufficient amount of iron is absorbed to meet the body's requirements.

Laparotomy: general term for abdominal surgery.

Late neonatal death: death of a liveborn baby after 7 completed days and before 28 completed days.

Termination of pregnancy: the expulsion or removal of an embryo or fetus from the mother before it is sufficiently developed to survive outside the uterus.

Web site links

Australian Bureau of Statistics: www.abs.gov.au

Index of indicators

Cancer of the reproductive tract