



Information Paper

Statistical Implications of Improved Methods for Estimating Net Overseas Migration

Australia

2007

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Improved Methods for
Estimating Net Overseas
Migration**

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AUSTRALIAN BUREAU OF STATISTICS

EMBARGO: 11.30AM (CANBERRA TIME) FRI 25 MAY 2007

ABS Catalogue No. 3107.0.55.005

ISBN 0 642 48208 X

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
Aust.	Australia
DIAC	Australian Government Department of Immigration and Citizenship
ERP	estimated resident population
GST	goods and services tax
LTRD	long-term resident departure
LTRR	long-term resident return
LTVA	long-term visitor arrival
LTVD	long-term visitor departure
NOM	net overseas migration
NSW	New South Wales
NT	Northern Territory
NZ	New Zealand
OAD	overseas arrivals and departures
PA	permanent arrival
PD	permanent departure
Qld	Queensland
SA	South Australia
STRD	short-term resident departure
STRR	short-term resident return
STVA	short-term visitor arrival
STVD	short-term visitor departure
Tas.	Tasmania
TRIPS	Travel and Immigration Processing System
Vic.	Victoria
WA	Western Australia

INTRODUCTION

ABOUT THIS PUBLICATION

As Australia's national statistical agency, one of the core functions of the Australian Bureau of Statistics (ABS) is to provide regular estimates of the size and structure of the Australian population. These official population estimates, termed the estimated resident population (ERP), are produced and published on a quarterly basis (as at 31 March, 30 June, 30 September and 31 December each year) for States and Territories, and annually (as at 30 June) for sub-state regions.

Population estimates are used for a wide variety of purposes, including the distribution of federal government funds to state, territory and local governments, as well as in the determination of the number of seats for each state and territory in the House of Representatives. The accuracy of ERP statistics is therefore of paramount importance, and they are closely monitored by a wide variety of stakeholders.

Net overseas migration (NOM) is currently a major driver of quarterly movements in the ERP, accounting for around half of population growth at the national level. International migration is also a volatile phenomenon, with a wide range of demographic, social, economic and political determinants and consequences. In recent years, many factors have presented challenges in accurately deriving estimates of NOM, including:

- increasing volumes of international movements across Australia's borders,
- changes to the composition of international visitors and their duration of stay behaviour,
- international travel patterns of Australian residents (including duration of absence and frequency of travel), and
- operational changes to more efficiently process international travellers' information.

The ABS has developed improved methods for the estimation of NOM. The key changes are:

- the introduction of a '12/16 month rule' for determining whether a person is a usual resident of Australia, replacing the need for a person to be *continuously* resident for a period of 12 out of 12 months.
- the shift from a movements-based approach to a traveller-based approach, through matched administrative data, for estimating NOM.

This information paper gives an overview of the improved methods, quantifies the statistical impacts of the improved methods on NOM estimates, and presents an implementation timetable. It builds on *Information Paper: Improved Methods for Estimating Net Overseas Migration, Australia, 2006* (cat. no. 3107.0.55.003), released on 10 February 2006.

Further information

For further information relating to the improved methods for estimating net overseas migration, or the implementation of these methods, please contact:

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INTRODUCTION

In early 2004 the Australian Bureau of Statistics (ABS) undertook a review of concepts and measurements associated with its international migration statistics. While the review did not recommend any change to the current concept of usual residence in Australia that underpins the concept of net overseas migration (NOM), it did recommend improvements to the methods currently used to measure NOM.

The improved methods have been finalised and are currently being implemented. Changes from the previous method to the improved methods are briefly explained below. For more detailed information see *Information Paper: Improved Methods for Estimating Net Overseas Migration, Australia, 2006* (cat. no. 3107.0.55.003).

Duration of Stay

At the time a person arrives in (or departs from) Australia, it is not empirically known how long they will actually stay in Australia (or overseas). As a consequence, a key issue when estimating NOM is the difference between stated travel intention and actual travel behaviour after the passage of time.

The improved methods are based on a non-continuous approach to measuring duration of usual residence, as opposed to the previous continuous method. Persons are included in the resident population if they are in Australia for a total of 12 months or more over a 16 month period (referred to as the 12/16 month rule). Therefore the accurate measurement of duration of stay has become integral to the improved method.

In the improved methods, for final estimates, the total duration of stay/absence for each traveller is determined by adding durations of stay/absence as shown by movement histories over the 16 month period following an overseas movement. The 12/16 month rule can only be fully applied when data on overseas movements are available for the 16 months following a reference quarter. Therefore, the 12/16 month rule is only applied in compiling final NOM estimates, with these estimates based around the construction of detailed movement histories for each overseas traveller.

Preliminary estimates of NOM are required five months after the reference quarter for the production of quarterly estimates of the population of Australia, states and territories. Therefore, complete traveller histories for the 16 months following a reference quarter cannot be produced in this time frame. Adjustment factors derived from final NOM estimates of the same quarter two years earlier are used to calculate preliminary NOM.

Category of Travel

Category of travel is determined by a number of dimensions: whether the traveller considers themselves to be a visitor or a resident; the direction of travel (whether an arrival or a departure); the stated intended duration of stay or absence (for visitors arriving and residents departing); and actual duration of stay or absence since the previous Australian border crossing (for visitors departing and residents returning).

For both preliminary and final estimation under the improved NOM methods, each movement is assigned one of ten categories:

- Permanent Arrival (PA)
- Long-term Resident Return (LTRR)
- Long-term Visitor Arrival (LTVA)
- Short-term Resident Return (STRR)
- Short-term Visitor Arrival (STVA)
- Permanent Departure (PD)
- Long-term Resident Departure (LTRD)
- Long-term Visitor Departure (LTVD)
- Short-term Resident Departure (STRD)
- Short-term Visitor Departure (STVD)

Travellers arriving in Australia mark their incoming passenger cards with an indication of their duration of stay as:

- a permanent arrival (a migrant);
- a visitor or temporary entrant; or
- a resident returning to Australia without any indication of their intended duration of stay in Australia.

Travellers departing Australia are required to indicate whether they are:

- a visitor or temporary entrant departing;
- an Australian resident departing temporarily; or
- an Australian resident departing permanently.

Australian residents departing are required to indicate their intended length of stay overseas, so as to distinguish between long-term resident departures (LTRD) and short-term resident departures (STRD). For examples of incoming and outgoing passenger cards see Appendix.

The categories of long-term resident return (LTRR) and short-term resident return (STRR) are based on actual (continuous) duration of stay overseas. Incoming and outgoing passenger cards are matched and this information is supplied to the ABS by the Department of Immigration and Citizenship (DIAC). Similarly the categories of long-term visitor departure (LTVD) and short-term visitor departure (STVD), are based on actual (continuous) duration of stay in Australia. A record of departure is matched with their last arrival to calculate duration of stay. ABS then converts this duration into short-term (under 12 months) and long-term (12 months or more).

While each traveller may make a number of movements during a reference quarter, for the purpose of measuring NOM under the improved methods, they are assigned one and only one category of travel for the reference quarter. See Step 2 below for a description of how this is determined.

Implausible Travel Sequences

There are circumstances where implausible travel sequences occur in a travel history. For example, a traveller is recorded as having two sequential arrivals in Australia without a departure in between, or conversely, two departures from Australia without an arrival. Under the improved NOM methods, implausible travel sequences are repaired using a logical imputation. The repair of implausible sequences is necessary in order to derive an estimate of duration of stay or absence, since time spent in Australia is derived by summing up the duration between each arrival and departure sequence.

Travellers vs. Movements

Conceptually, NOM estimates should be based on counts of travellers, rather than counts of overseas movements, since travellers may have more than one movement in a particular reference period. Under the previous system of NOM estimation, a number of adjustments to overseas arrivals and departures were required. These mainly comprised adjustments designed to reflect differences between stated travel intentions and actual travel behaviour. However, adjustments were also required to transform numbers of overseas movements into numbers of travellers.

One of the central changes with the improved methodology is that all estimation will be based on actual individual travellers and their travel histories, rather than a synthesis of movements converted to represent a traveller.

FINAL ESTIMATES

The following points summarise key steps in the construction of movement histories and subsequent final NOM estimates.

Step 1. Derive person-level data on overseas movements

Data used for quarterly NOM estimates are sourced from the Overseas Arrivals and Departures (OAD) collection, along with additional data obtained from the Travel and Immigration Processing System (TRIPS). The ABS receives both the OAD and the TRIPS data sets from the Department of Immigration and Citizenship (DIAC).

Each OAD file contains information derived from incoming and outgoing passenger cards, and is matched for each movement to selected TRIPS data items through a unique personal identifier. OAD files do not include records where a passenger card has not been matched to TRIPS (e.g. if the traveller records incorrect passport details on their passenger card, and the mismatch between this and the TRIPS record has not yet been resolved). Records from TRIPS relating to these unmatched movements are extracted and added to the quarterly OAD files for NOM estimates.

The quarterly files used for NOM estimates also contain a number of logical edits and imputations, mainly at the movement level. Person-level data are constructed from these movement data by matching movements using personal identifiers.

Step 2. Determine the category of travel for each overseas traveller

Under the improved NOM methods, travellers will be assigned to one, and only one, category of travel during a reference quarter. This represents a change from current methods, where there is a potential for persons to be included more than once through different categories of travel if they have multiple overseas movements during the quarter. However, this change is likely to have only a small impact on the resulting NOM estimates

The algorithm used to assign a category of travel to each traveller is based on:

Step 2. Determine the category of travel for each overseas traveller continued

- the last movement during the reference quarter where the traveller stated an intention to remain in Australia or overseas for 12 months or more (i.e. permanent arrival, permanent departure, long-term visitor arrival or long-term resident departure movements); otherwise,
- their first movement during the reference quarter (i.e. long-term resident return, short-term resident return, short-term visitor arrival, long-term visitor departure, short-term resident departure and short-term visitor departure) during the reference quarter.

Step 3. Derive ERP flag at start of reference quarter

An 'ERP flag' is used to indicate whether a traveller is 'IN' or 'OUT' of the Estimated Resident Population (ERP) at the start of the reference quarter. During the start-up period for the improved NOM methods, this flag has been determined by looking at the individual's previous travel history.

For subsequent periods, a traveller's ERP flag at the start of a reference quarter will be carried forward from their flag at the end of the previous quarter. If the traveller has no flag in any of the previous six quarters, their ERP flag at the start of the reference quarter will be imputed based on the direction of their first movement within the quarter i.e. 'OUT' of ERP if they are arriving in Australia; 'IN' ERP if they are departing from Australia.

Step 4. Derive the movement history and required data items for each overseas traveller

Movement histories will be constructed for each traveller based on their overseas arrivals and departures during the 16 months following an overseas movement that takes place in the reference quarter. In addition, a number of key demographic data items will be derived for each traveller, including their financial year of birth (used to calculate age at 30 June), sex, country of birth and country of citizenship. In most cases these derived items are available from the source OAD and/or TRIPS datasets. In cases where required demographic data items are missing, logical imputations similar to those in existing OAD and ERP systems will be used.

Step 5. Identify implausible movements, and impute 'missing' movements

Implausible movement sequences occur for a number of reasons, but are mainly due to non-matches between travel information (i.e. visa applications or passport information) and existing TRIPS information. Non-matches can occur when a traveller's personal details change (e.g. marital status, family name), or when their travel documentation is updated (e.g. new passport and country of passport, perhaps combined with changes to personal details). When a non-match occurs, the DIAC processing systems assign a new personal identification number to the movement before referring it to a resolution process. While most non-matches are resolved at a later date, administrative data provided to the ABS for the OAD or from TRIPS may not include all revisions relating to this process.

Some travellers with implausible movement sequences will also have a sequence (before and/or after the implausible sequence) of plausible movements over the 16 month period studied. In these cases, an assumption is made that the proportion of a traveller's time spent in Australia during the implausible movement sequence was consistent with their proportion of time spent in Australia during plausible movement sequences. Using their plausible movement sequences, a ratio of their time spent in Australia to their time spent overseas is calculated and applied to the implausible sequence to impute a 'proxy' arrival or departure movement.

Step 5. *Identify implausible movements, and impute 'missing' movements continued*

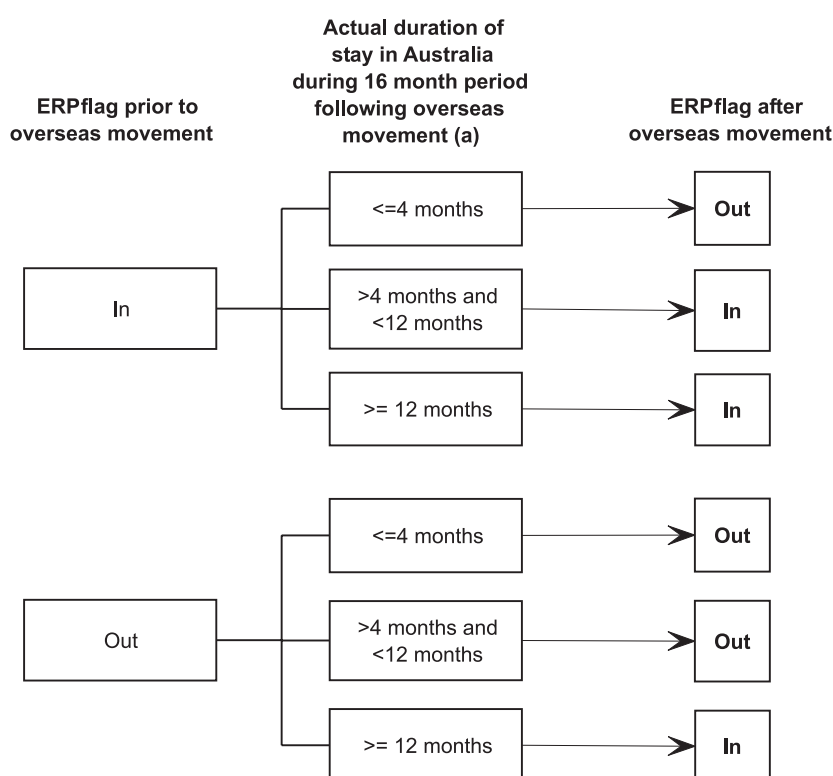
In a very small number of cases there may be no plausible movement sequence during the 16 month period analysed (e.g. a movement history may only show two or more overseas arrivals, or only show two or more overseas departures). It is assumed that these travellers spent 50% of the time between movements in Australia.

Step 6. *Determine the total duration of stay for each traveller and calculate ERP flags*

The total duration of stay/absence for each traveller is determined by adding durations of stay/absence as shown by movement histories over the 16 month period following an overseas movement.

As shown in the following diagram, these durations of stay are used to calculate whether a traveller who is 'IN' or 'OUT' of the ERP before the movement is 'IN' or 'OUT' of the ERP after the movement, regardless of their category of travel.

1.1 DERIVATION OF ERP FLAGS



(a) For the purposes of duration of stay calculations, 4 months is defined as 121 days and 12 months is defined as 365 days.

Step 7. *Calculate NOM estimates and final impact on the ERP*

Each traveller moving into the ERP during a reference quarter (i.e. an ERP flag of 'OUT' at the start of the quarter and a flag of 'IN' at the end of the quarter) is added to the total NOM estimate for the quarter. Similarly, each traveller moving out of the ERP is subtracted from the NOM estimate. Travellers whose initial and final ERP flags for the quarter are the same make no contribution to NOM. As in current publication tables, NOM estimates can be broken down according to the demographic characteristics of travellers (e.g. state or territory of usual residence, age or sex).

*Step 8. Migration
adjustment value*

At final estimation, a 'migration adjustment' (MA) value is derived for each traveller in the reference quarter, as a by-product. The MA value is equal to the difference between the traveller's actual contribution to NOM for the quarter (i.e. -1, 0 or +1) and their initial contribution to NOM based solely on their category of travel (i.e. +1 for a permanent or long-term arrival, -1 for a permanent or long-term departure, and 0 for a short-term arrival or departure). The MA value is *not* required to determine final NOM estimates for the reference quarter, but is used for estimating preliminary NOM for the corresponding quarter two years later.

STATE OR TERRITORY OF
USUAL RESIDENCE

The distribution of improved NOM estimates across states and territories is based on information as reported by travellers on incoming and outgoing passenger cards. There are two data items (State 1 and State 2) that are derived to determine a traveller's state or territory of residence/stay.

State 1

Derivation of the first data item (State 1) is dependent upon the direction of travel (either arrival or departure) and on the type of traveller (either visitor or a resident). For a visitor arrival the state or territory of residence is the state, or territory where they intend to stay (as indicated on the incoming passenger card). For a visitor departure it is the state or territory in which the traveller states they spent the most time. For a resident arrival it is the state or territory of their intended address in Australia, and for a resident departure it is the state or territory in which they lived. This information is obtained from incoming and outgoing passenger cards (see Appendix).

State 2

As a short-term visitor arrival (STVA) may move state, or territory, during their time in Australia, the second data item (State 2) is used to code them to the state, or territory, where they spent the most time as reported on their subsequent outgoing passenger card.

For example, if a short-term visitor arrival (STVA) arrives in June 2005 and this is their first arrival in Australia, they are allocated to the state or territory they have indicated on their passenger card as their state of intended stay (State 1). However, it is only possible to finalise their contribution to ERP for a reference quarter through the collection of future data i.e. the 16 months following the reference quarter. Therefore, a traveller history is collected over 16 months after the June 2005 reference quarter. If it is found through the traveller's history that they have stayed 12 out of 16 months, then in the June 2005 reference quarter this traveller would be allocated a State 2 value based on their outward movement subsequent to their category of travel movement (i.e. as stated on their passenger card). This would occur regardless of whether they had made numerous arrivals and departures during the 16 month period.

If it is found over time that the traveller has not stayed in Australia 12 out of 16 months they keep their State 1 allocation for the reference quarter, and as they have not met the required length of time for residency they will not be counted in final NOM.

State 2 is also derived for short-term visitor arrivals who did not leave Australia at all during the 16 months follow-up period. State or territory of residence for this group is imputed using the State 1 and State 2 distributions of long-term and short-term visitors who have spent more than 12 months, out of 16, in Australia and have made a subsequent departure movement.

*Example of improved final
NOM estimates*

Table 1.2 illustrates the derivation of final NOM estimates from all overseas arrivals and departures for the December quarter 2004. All overseas movements are transformed into traveller records which eliminate duplicate movements, and each traveller is assigned a unique category of travel (see Step 1 and Step 2 above). While the permanent and long-term travellers represent their initial contribution to NOM, an assessment of all travellers' durations of stay in Australia over the next 16 months is undertaken to determine their contribution to NOM for the reference quarter (see Step 7 and Step 8).

1.2 ILLUSTRATIVE EXAMPLE OF THE DERIVATION OF FINAL NOM ESTIMATES—DECEMBER QTR 2004

	<i>Arrivals</i>	<i>Departures</i>	<i>Net</i>
	'000	'000	'000
Movements	2 709.4	2 669.1	40.3
Travellers	1 860.1	1 400.4	459.7
Permanent and long-term travellers (a)	107.9	73.5	34.4
Net overseas migration	79.0	48.7	30.3

(a) Based on the unique category of travel assigned to each traveller. Net equals (PA+LTVA+LTRR) minus (PD+LTVD+LTRD).

The following example outlines the calculations undertaken in the case of an individual male traveller. If the traveller, who has never been to Australia arrives, even with the intention to stay long-term, he will be allocated an initial ERP flag of 'OUT' at the start of the reference quarter. Suppose this traveller then leaves four months later for New Zealand, and after two months there he then returns to Australia for a further 10 months. As the traveller has spent more than a total of 12 months (4 months + 10 months = 14 months) in Australia during the 16 month period following his initial arrival in Australia, he will have an ERP flag of 'IN' derived at the end of the reference quarter. This means he contributes +1 to NOM for the reference quarter, and will be included in ERP from the end of the reference quarter onwards until he leaves Australia for 12 months, or more, out of 16 months in a subsequent reference quarter. Under the previous method he would not have been included in ERP estimates as he had not spent a *continuous* period of 12 months in Australia.

PRELIMINARY ESTIMATES

The following is a summary of the calculation of preliminary NOM estimates.

At the time preliminary estimates are required for a reference quarter, the actual future duration of stay in Australia (or overseas) for a traveller in the quarter is not known. Hence their contribution to NOM cannot be explicitly determined at this time using the 12/16 rule. The preliminary estimation methodology starts by assigning the following initial contribution to NOM to each traveller, depending on their unique category of travel for the quarter:

- +1 for each traveller in a permanent or long-term arrival category;
- -1 for each traveller in a permanent or long-term departure category;
- 0 for each traveller in a short-term category.

PRELIMINARY ESTIMATES

continued

Each traveller is then given an additive migration adjustment (MA) value which represents the difference between their initial contribution to NOM (+1, -1 or 0 as above) and their expected contribution to NOM if actual duration of stay could be determined. The MA value is derived during final estimation for the corresponding quarter two years previously, with an average MA value derived for each group of travellers. The group of travellers is defined by the cross-classification of category of travel by age by citizenship by state/territory. The average MA value is calculated within each group of travellers by summing their MA values and dividing by the number of travellers within the group. See Step 8 above for a definition of MA value. Each traveller in the current reference quarter (at preliminary estimation) then receives the average MA value from its corresponding group of travellers two years previously. Preliminary NOM estimates for the reference quarter are then obtained by adding each traveller's MA value to their initial contribution to NOM, and aggregating up to the desired level (such as state/territory).

In forming the cross-classified groups of travellers for which the average MA values are derived at final estimation (for later use in preliminary estimates), the following categories are used:

- Category of travel has the 10 categories of travel listed earlier in this Chapter,
- State is divided into eight categories (New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the Australian Capital Territory). Other Territories (as defined in paragraph two of the Explanatory Notes) are not included,
- Country of citizenship is divided into five groups:
 - Australia including external territories;
 - New Zealand;
 - South-east and North-east Asia;
 - North-west Europe and North America; and
 - Other
- Age is divided into eight groups (0–4, 5–14, 15–19, 20–24, 25–34, 35–44, 45–54, 55+).

The following table is an illustration of the derivation of preliminary NOM estimates from all overseas arrivals and departures for the March quarter 2006.

1.3 ILLUSTRATIVE EXAMPLE OF THE DERIVATION OF PRELIMINARY NOM ESTIMATES—MARCH QTR 2006

	<i>Arrivals</i>	<i>Departures</i>	<i>Net</i>
	'000	'000	'000
Movements	2 831.1	2 610.9	220.2
Travellers	1 941.5	1 351.4	590.1
Permanent and long-term travellers	186.5	86.3	(a)100.3
Net overseas migration	119.9	58.6	(b)61.3

- (a) Aggregate of initial contribution to NOM for all travellers (based solely on category of travel).
- (b) Aggregate of initial contribution to NOM plus aggregate of migration adjustment values, for all travellers.

PRELIMINARY ESTIMATES
continued

At present the preliminary estimation method does not provide for assumptions of changes from State 1 to State 2. This will be reviewed when a longer series of estimates becomes available.

WHEN WILL IMPROVED
NOM DATA BE
AVAILABLE?

Revision cycle for final estimates

After consultation with users it was decided that an annual revision will be undertaken to produce final NOM estimates in March each year. This has the advantage that users will know the impact of final estimates of NOM one quarter before the Australian Statistician makes his determination of the population of each state and territory which is used for distributing GST revenue. For example, final NOM estimates for the four quarters from September 2006 to June 2007 will be published initially in March 2009 in *Australian Demographic Statistics*, September quarter 2008 (cat. no. 3101.0).

Final and preliminary estimates will be available for the quarters of the 2006–07 and 2007–08 financial years as follows:

1.4 RELEASE SCHEDULE OF NOM ESTIMATES

MONTH IN WHICH ESTIMATES
WILL BE PUBLISHED

<i>Reference Quarter</i>	<i>Preliminary</i>	<i>Final</i>
September Quarter 2006	(a) June 2007	(b) March 2009
December Quarter 2006	(c) (d) June 2007	(b) March 2009
March Quarter 2007	September 2007	(b) March 2009
June Quarter 2007	December 2007	(b) March 2009
September Quarter 2007	March 2008	(e) March 2010
December Quarter 2007	(d) (f) June 2008	(e) March 2010
March Quarter 2008	September 2008	(e) March 2010
June Quarter 2008	December 2008	(e) March 2010

- (a) Initial NOM for September quarter 2006 was published in March 2007 on previous method.
- (b) Published in *Australian Demographic Statistics*, September quarter 2008 (cat. no. 3101.0).
- (c) Release of preliminary 2006 Census-based ERP.
- (d) Release used for Statistician's determination for GST distribution.
- (e) Published in *Australian Demographic Statistics*, September quarter 2009 (cat. no. 3101.0).
- (f) Release of final 2006 Census-based ERP.

INTRODUCTION

This section presents data based on the improved NOM methods. The time series will start at December quarter 2003. The majority of the following analysis will be based on the 2004–05 financial year as it is the first full financial year for which final estimates can be compiled for the improved method. The first reference quarter to use the improved estimates in compiling estimated resident population (ERP) will be September quarter 2006. Preliminary estimates of NOM for September and December quarters 2006 using the improved method will be published in *Australian Demographic Statistics* (cat.no. 3101.0) on 5 June 2007.

Further enhancements are planned for the NOM processing system to allow more in-depth investigation and analysis of the data in the future. A summary of this analysis will be reported when additional years of final estimates can be assembled.

WHY IS THERE AN INCOMPLETE TIME SERIES?

Final Estimates

The introduction of the 12/16 month rule to determine a traveller's contribution to NOM requires that data for the 16 months following a reference quarter are available.

There is a start-up period for establishing a time series for the improved estimates, which requires six quarters of data prior to the reference quarter to establish the ERP 'IN' / 'OUT' status at the beginning of the quarter. The first set of NOM final estimates produced under the improved methods are dependent upon an initial load of monthly OAD and TRIPS data. Data from April 2002 to April 2005 are used in an initialisation phase, where traveller histories are produced and stored in order to produce the first set of final estimates for the December quarter 2003.

2.1 DATA REQUIRED TO PRODUCE IMPROVED FINAL NOM ESTIMATES, December Qtr 2003 to December Qtr 2004

<i>Quarter for which final estimates are required</i>	<i>OAD data required to produce final estimates</i>
December 2003(a)	April 2002 to April 2005
March 2004	Up to July 2005
June 2004	Up to October 2005
September 2004	Up to January 2006
December 2004(b)	Up to May 2006

-
- (a) December 2003 is the first reference quarter for which estimates can be produced using the improved NOM estimation method.
 - (b) This is the first December reference quarter in a leap year and an extra month of data is required to produce final estimates.

Final Estimates continued

As described in Chapter 1 final estimates rely on a traveller's movement history over the subsequent 16 month period to determine their duration of stay in Australia (and hence their contribution to NOM).

December quarter 2003 is the earliest quarter for which final NOM estimates can be produced, using the improved method, because there are some data quality issues with travel movement data in the March quarter 2002. The six quarter start-up period requires that complete input data be available for June quarter 2002 to September quarter 2003.

Preliminary Estimates

In order to produce preliminary estimates, final estimates must exist for the same quarter two years previously. For example, preliminary estimates for the December quarter 2005 can only be produced when the final estimates for December quarter 2003 exist. This is because the improved preliminary method incorporates migration adjustment values derived from traveller data as seen from the same quarter two years ago. This will produce a set of preliminary estimates based partly on the patterns seen in the two-year-ago data by category of travel, age, country of citizenship and state disaggregations. With the use of greater disaggregation in the compilation of preliminary estimates, it is envisaged that, in general, there will be greater consistency between the preliminary and final estimates for the improved method in comparison with the previous method. However, for now it has not been possible to adequately evaluate the performance of the improved preliminary estimates compared to improved final estimates.

WHY IS THERE A BREAK
IN THE TIME SERIES?

The primary reason for the break in the NOM time series is due to the changes in the way NOM is estimated. Previously NOM estimates were calculated using aggregate category jumping migration adjustments to resolve multiple persons being added to and subtracted from NOM. However, the improved method uses a direct calculation of duration of stay to identify those 'category jumpers' and to avoid multiple inclusions and exclusions. Therefore, caution should be used when comparing improved NOM estimates for September quarter 2006 and later quarters, with estimates for June quarter 2006 and earlier quarters.

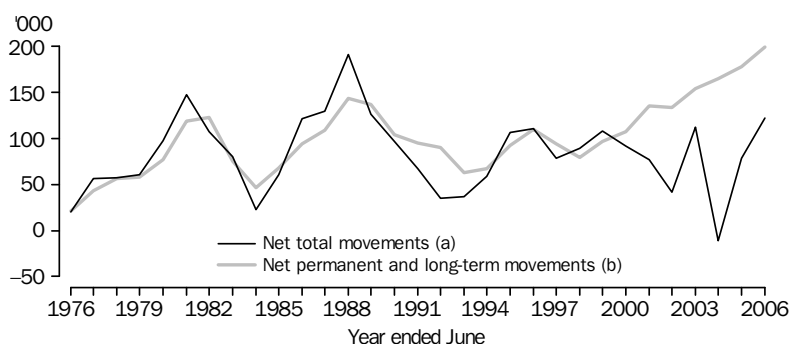
COMPARISON WITH
OTHER METHODS OF
ESTIMATING NOM

The simplest measure of net overseas migration could be described as a 'heads in - heads out' approach. Under this approach the total number of departures from Australia would be subtracted from the total arrivals into Australia. This comparison has been selected as it was used in compiling estimates of the population prior to the introduction of the ERP concept in 1981. However, since this method includes short-term arrivals and departures, it leads to volatility in the estimation of NOM for quarterly population statistics. In the following analysis it has been described as net total movements.

COMPARISON WITH
OTHER METHODS OF
ESTIMATING NOM
continued

The data presented in Graph 2.2 dampens the volatility of the net total movements series, by aggregating quarterly estimates into a series of estimates for each year ending June. This series is susceptible to changes in international travel patterns when major events occur. These international events, for example the Bali bombings, and the emergence of Severe Acute Respiratory Syndrome (SARS) may reduce or increase the number of short-term movements to and from Australia. For more information on the effect of international events on overseas arrivals and departures see *Overseas Arrivals and Departures, Australia* (cat. no. 3401.0).

2.2 COMPARISON OF NET TOTAL MOVEMENTS TO NET PERMANENT AND LONG-TERM MOVEMENTS—1976–2006



(a) Net total movements equals total overseas arrivals minus total overseas departures without any migration adjustments.
 (b) Net permanent and long-term equals total permanent and long-term overseas arrivals minus total permanent and long-term overseas departures without any migration adjustments.

Until the year ended June 1998, the net permanent and long-term movement series was closely aligned with the trend for net total movements. On an annual basis, net total movements provided a reasonable proxy for net permanent and long-term migration. However, the two series diverge in more recent years and net total movements were subject to fluctuations in international travel due to major world events such as those described above.

The increasing trend in net permanent and long-term movements is associated with a change in the measurement of actual duration of stay in Australia for temporary entrants and visitors and actual duration of absence from Australia for residents who returned from overseas. Until June 1998, the measurement of actual duration of stay or absence was based on passenger reporting on arrival (for residents returning) or departure (for visitors leaving Australia). This self-reported duration, which itself was subject to reporting error, was used to determine whether a departing visitor was leaving after a short-term or long-term stay, and whether an arriving Australian resident was a resident returning after a short-term or a long-term absence.

From July 1998 onwards, implementation of a new passenger card design and processing system enabled the derivation of a precise and continuous duration of stay in Australia for temporary entrants and visitors, or absence overseas by Australian residents. This was achieved by matching both arrival and departure movement records. An unintended consequence of this change was that frequent travellers who may have been in Australia for a long term period overall, would have their period of stay, as reported on first arrival, interrupted by each temporary departure from Australia. This is best illustrated by the

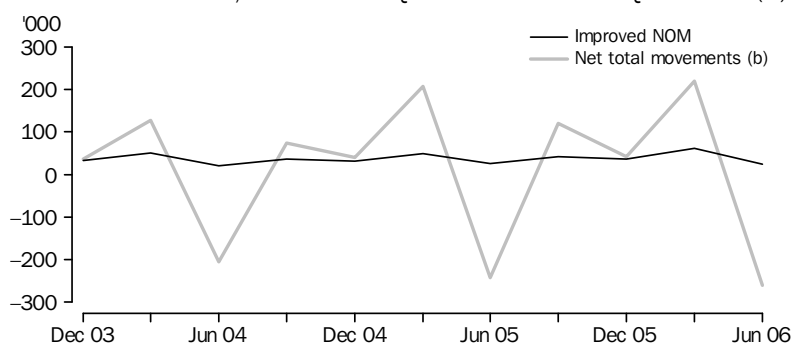
COMPARISON WITH OTHER
METHODS OF ESTIMATING
NOM *continued*

example of an overseas student staying in Australia for 3 or more years during which they made brief trips out of Australia each year. Assuming their temporary departures were undertaken at 5 to 6 month intervals, each time they depart, they would be categorised as a short-term visitor departure, whereas each time they arrived their movement may be categorised as a long-term visitor arrival. The converse situation occurs for Australians who live mostly overseas but return to Australia for short visits each year.

Consequently there is an inconsistency between the long term arrival and long term departure series in the calculation of net permanent and long-term movements. There is also the prospect of duplication during the year for frequent travellers exaggerating their contribution to international migration.

As indicated in Graph 2.3, on a quarterly basis, the net total movements series has quite implausible estimates each June quarter.

2.3 COMPARISON OF IMPROVED NOM ESTIMATES TO NET TOTAL MOVEMENTS, December Qtr 2003 to June Qtr 2006 (a)



(a) Estimates from December quarter 2005 to June quarter 2006 are preliminary.
(b) Net total movements equals total overseas arrivals minus total overseas departures without any migration adjustments.

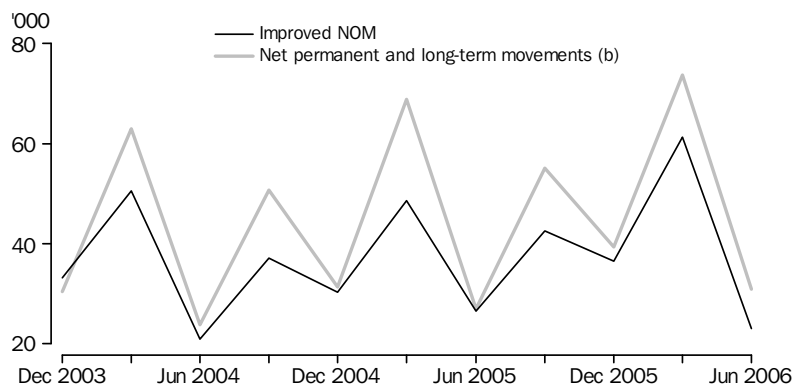
As an example of an annual comparison, the heads in - heads out count of net overseas movements for 2004–05 was 78,812 compared with the improved final NOM estimate for the same period of 142,612. The difference in 2004–05 is partially explained by the 50,000 excess of short-term resident departures compared to short-term visitor arrivals in addition to net permanent and long-term movements. This difference is again reflected in 2005–06 preliminary estimates, as the heads in - heads out was 122,292 compared with the improved NOM estimate of 163,393. This shows there are significant differences between these estimates, and further analysis comparing these two approaches will be undertaken when a longer time series is available.

COMPARISON WITH
OTHER METHODS OF
ESTIMATING NOM
continued

However, it can be observed from the figures shown in Graph 2.3 that a heads in - heads out approach is highly volatile, caused by the inclusion of short-term travellers who have a high degree of seasonality for both visitor arrivals and resident departures. For more information see *Overseas Arrivals and Departures* (cat. no. 3401.0) and *Demography Working Paper 2004/2 - Interpretation and use of Overseas Arrivals and Departures Estimates, September 2004* (cat. no. 3106.0.55.002). It also includes travellers who may change their intended length of stay in Australia, or the time they are absent from Australia.

An alternative approach to estimating NOM would be to calculate net permanent and long-term movements without any corrections or adjustments as illustrated in Graph 2.4. In 2004–05 the total net permanent and long-term movements were 177,972 compared with the improved NOM estimate of 142,612 for the same period. If no corrections were made there was the possibility of a traveller contributing more than once to NOM estimates as that traveller may have been included in two different categories of travel. With the improved method each traveller is counted only once, and is assigned a unique category of travel for the quarter. Therefore, adjustments on permanent and long-term travellers for multiple movements and category jumping, based on a review of actual duration of stay/absence, will ensure a more accurate measure of international migration is achieved.

2.4 COMPARISON OF IMPROVED NOM TO NET PERMANENT AND LONG-TERM MOVEMENTS, Dec Qtr 2003 to Jun Qtr 2006 (a)



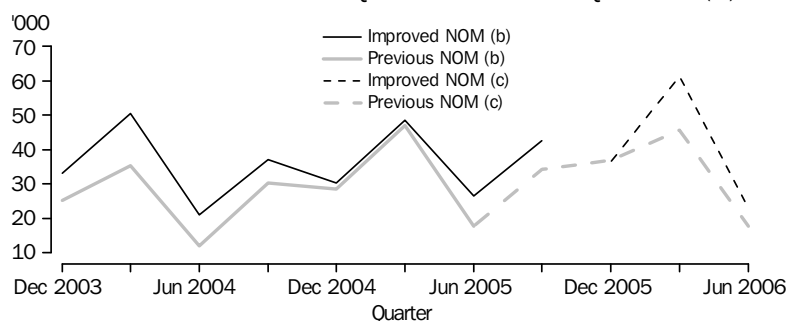
(a) Estimates for December quarter 2005 to June quarter 2006 are preliminary.
(b) Without migration adjustments.

TIME SERIES
COMPARISON OF
IMPROVED NOM AND
PREVIOUS NOM
ESTIMATES

Graph 2.5 illustrates the comparison of the improved methods (12/16 rule) of NOM estimation to the previous method (12/12 rule). This comparison suggests that there may be a general increase in total NOM estimates with the introduction of the improved NOM method. The difference in the December quarter 2003 estimates may be due to the initialisation of the improved processes whereby traveller histories are created. These estimates are considered experimental and are therefore only provided to give an indication of how the improved estimates may change over time.

TIME SERIES COMPARISON
OF IMPROVED NOM AND
PREVIOUS NOM ESTIMATES
continued

2.5 COMPARISON OF IMPROVED AND PREVIOUS NOM ESTIMATES, Australia—December Qtr 2003 to June Qtr 2006(a)



(a) Methodological differences between the two NOM estimates series should be taken into account when interpreting this data.

(b) Final estimates.

(c) Preliminary estimates.

Graph 2.5 also shows that seasonal patterns of international travel have not changed. A rise in international travel, especially long-term arrivals, occurs in the March and September quarters of each year.

Table 2.6 below shows a time series of illustrative preliminary estimates using the improved NOM estimation methods. As the preliminary estimates shown are calculated using a migration adjustment value (see Chapter 1), only three quarters of preliminary estimates are available. September quarter 2006 and December quarter 2006 preliminary estimates will be published in *Australian Demographic Statistics, Australia*, December quarter 2006 (cat. no. 3101.0) to be released on 5 June 2007, and will be the first reference quarters to use the improved NOM estimates in compiling official ERPs.

STATE AND TERRITORY
DISTRIBUTION

The state and territory distribution in the improved methods for estimating NOM is based on information reported by travellers on incoming and outgoing passenger cards. Data on the incoming passenger cards provides information on the state or territory of a traveller's intended location in Australia, while outgoing passenger cards provide information on the state or territory where a traveller lives, or spent the most time. This has largely not changed from the previous method for calculating NOM. However, changes in the method for determining the state distribution for short-term visitor arrivals have been implemented in compiling improved NOM estimates. The increase and change in number can perhaps be attributed to the inclusion of a wider range of travellers under the improved 12/16 method.

In the previous method, preliminary estimates of the national migration adjustment were distributed in aggregate to states and territories using the proportional distribution of permanent and long-term arrivals. However the new method is calculated at the level of the migration adjustment by category of travel, by state, by country of citizenship by age group. For more information on the calculation of state or territory of usual residence with the improved NOM methods, see Chapter 1.

2.6 COMPARISON OF IMPROVED AND PREVIOUS PRELIMINARY NOM ESTIMATES(a), States and Territories—December Qtr 2005 to June Qtr 2006

STATE OR TERRITORY									
Quarter	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia(b)
IMPROVED NOM ESTIMATES									
2005									
December	14 591	10 108	4 407	2 501	4 506	300	-28	151	36 533
2006									
March	17 897	18 476	11 703	4 203	7 261	488	364	919	61 311
June	6 368	6 068	5 511	1 932	2 611	45	477	21	23 033
2005-06(c)	52 780	46 086	29 083	11 256	20 436	1 157	1 218	1 380	163 393
PREVIOUS NOM ESTIMATES									
2005									
December	13 081	8 790	5 762	2 232	6 486	320	174	40	36 878
2006									
March	12 903	14 834	7 099	3 422	6 863	188	275	110	45 691
June	4 977	4 968	3 118	1 580	3 227	-13	250	-288	17 824
2005-06(c)	42 231	38 551	21 380	9 495	21 493	692	843	-113	134 560
DIFFERENCE (IMPROVED-PREVIOUS)									
2005									
December	1 510	1 318	-1 355	269	-1 980	-20	-202	111	-345
2006									
March	4 994	3 642	4 604	781	398	300	89	809	15 620
June	1 391	1 100	2 393	352	-616	58	227	309	5 209
2005-06(c)	10 549	7 535	7 703	1 761	-1 057	456	375	1 493	28 833

(a) Preliminary estimates in this table may be unrounded.

(b) Includes Other Territories – see paragraph 2 of Explanatory Notes.

(c) Improved NOM estimates are final for September quarter 2005 and preliminary for December quarter 2005, March quarter 2006 and June quarter 2006. Previous NOM estimates are preliminary for all quarters of 2005-06.

2.7 COMPARISON OF IMPROVED AND PREVIOUS FINAL NOM ESTIMATES, States and Territories—December Qtr 2003 to September Qtr 2005

STATE OR TERRITORY									
Quarter	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australian Capital Territory	Australia(a)
IMPROVED NOM ESTIMATES									
2003									
December	13 702	9 168	4 383	1 736	3 954	204	-100	201	33 266
2004									
March	14 993	15 765	9 732	2 746	5 803	456	285	850	50 630
June	6 864	5 441	4 962	1 004	2 062	61	489	69	20 952
September	13 156	10 546	5 998	1 947	4 584	338	395	235	37 203
December	11 028	7 487	5 257	1 668	4 408	412	45	-34	30 271
2005									
March	14 839	13 501	9 087	3 401	6 495	349	362	528	48 561
June	8 405	6 251	6 453	1 439	3 706	125	163	35	26 577
September	13 924	11 434	7 462	2 620	6 058	324	405	289	42 516
2004-05	47 428	37 785	26 795	8 455	19 193	1 224	965	764	142 612
PREVIOUS NOM ESTIMATES									
2003									
December	7 481	5 435	6 747	1 217	3 977	294	4	58	25 202
2004									
March	11 640	9 740	7 782	1 480	3 990	205	226	408	35 472
June	2 977	2 738	3 911	626	1 684	39	152	-59	12 068
September	9 151	8 892	6 152	1 483	3 876	243	464	131	30 393
December	7 901	6 438	7 909	1 482	4 424	440	80	-179	28 492
2005									
March	13 768	13 482	9 265	3 138	6 131	430	272	584	47 067
June	4 385	3 480	6 229	917	2 729	-68	188	-50	17 811
September	nya	nya	nya	nya	nya	nya	nya	nya	nya
2004-05	35 205	32 292	29 555	7 020	17 160	1 045	1 004	486	123 763
DIFFERENCE (IMPROVED-PREVIOUS)									
2003									
December	6 221	3 733	-2 364	519	-23	-90	-104	143	8 064
2004									
March	3 353	6 025	1 950	1 266	1 813	251	59	442	15 158
June	3 887	2 703	1 051	378	378	22	337	128	8 884
September	4 005	1 654	-154	464	708	95	-69	104	6 810
December	3 127	1 049	-2 652	186	-16	-28	-35	145	1 779
2005									
March	1 071	19	-178	263	364	-81	90	-56	1 494
June	4 020	2 771	224	522	977	193	-25	85	8 766
September
2004-05	12 223	5 493	-2 760	1 435	2 033	179	-39	278	18 849

.. not applicable
nya not yet available

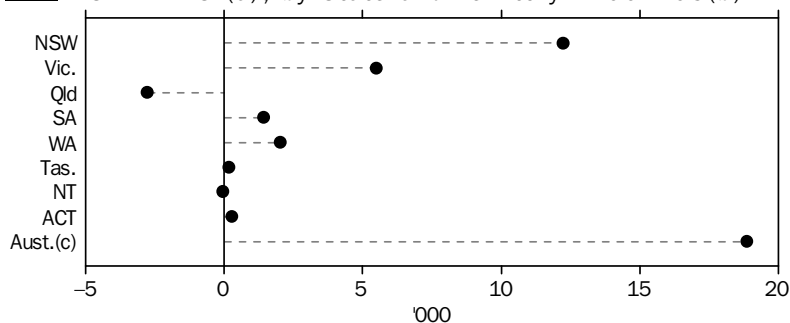
(a) Includes Other Territories - see paragraph 2 of the Explanatory Notes.

STATE AND TERRITORY
DISTRIBUTION *continued*

The differences between improved and previous NOM estimates by state and territory for 2004-05 are shown in Graph 2.8. This shows a decrease in the estimated NOM for Queensland and to a much lesser extent the Northern Territory.

STATE AND TERRITORY
DISTRIBUTION *continued*

2.8 DIFFERENCE BETWEEN IMPROVED AND PREVIOUS NOM ESTIMATES (a), by State and Territory—2004–05(b)



(a) Based on final estimates.
 (b) Methodological differences between the two NOM estimate series should be taken into account when interpreting this data.
 (c) Includes Other Territories – see paragraph 2 of Explanatory Notes.

The changes in state and territory shares of NOM with the improved method are shown in Table 2.9. Most Australian states and territories have experienced a slight increase in the proportion of the NOM estimates they receive.

2.9 COMPARISON OF STATE SHARES OF NATIONAL NOM ESTIMATES—2004–05 (a)

State or Territory	PREVIOUS NOM METHOD		IMPROVED NOM METHOD	
	<i>Net Overseas Migration</i> Persons	Share Percent	<i>Net Overseas Migration</i> Persons	Share Percent
2004–05				
State or Territory				
New South Wales	35 205	28.45	47 428	33.26
Victoria	32 292	26.09	37 785	26.49
Queensland	29 555	23.88	26 795	18.79
South Australia	7 020	5.67	8 455	5.93
Western Australia	17 160	13.87	19 193	13.46
Tasmania	1 045	0.84	1 224	0.86
Northern Territory	1 004	0.81	965	0.68
Australian Capital Territory	486	0.39	764	0.54
Australia	123 763	100.00	142 612	100.00

(a) Based on final estimates.

The Australian Capital Territory, which for the 2004–05 financial year held a 0.39% share of total NOM, has increased in percentage share to 0.54% of NOM national estimates when applying the improved NOM estimation method. New South Wales under the improved NOM estimation method has increased its share to 33.26% of total NOM for Australia 2004–05, in comparison with 28.45% in the same period under the previous NOM method. Two states and one territory experienced a decline in percentage share under the improved NOM estimation methods. Queensland dropped from a 23.88% share of NOM in 2004–05 when using the previous method to 18.79% with the improved

STATE AND TERRITORY
DISTRIBUTION *continued*

method. Also experiencing a decline in percentage share is the Northern Territory which dropped from a 0.81% share in total NOM in 2004–05 NOM estimates to a 0.68% share with the improved methods. Western Australian also indicates a small decline in percentage share from 13.87% to 13.46%.

2.10 COMPARISON OF STATE SHARES OF NATIONAL NOM ESTIMATES—2005–06 (a)

	PREVIOUS NOM		IMPROVED NOM	
	<i>Net Overseas Migration</i>	Share	<i>Net Overseas Migration</i>	Share
	persons	percent	persons	percent
2005–06				
State or Territory				
New South Wales	42 231	31.38	52 780	32.30
Victoria	38 551	28.65	46 085	28.21
Queensland	21 380	15.89	29 084	17.80
South Australia	9 495	7.06	11 255	6.89
Western Australia	21 493	15.97	20 437	12.51
Tasmania	692	0.51	1 157	0.71
Northern Territory	843	0.63	1 217	0.74
Australian Capital Territory	-113	-0.08	1 380	0.84
Australia	134 560	100.00	163 393	100.00

(a) Improved NOM estimates are final for September quarter 2005 and preliminary for December quarter 2005, March quarter 2006 and June quarter 2006. Previous NOM estimates are preliminary for all quarters of 2005–06.

Table 2.10 shows the state shares of national NOM estimates for the 2005–06 financial year. For this period three states experienced a slight decrease in percentage share of national NOM estimates when applying the improved NOM estimation methods. South Australia dropped from 7.06% under the previous methods to 6.89% under the improved NOM methods. Western Australia also experienced a decline in percentage share from a 15.97% share in national NOM estimates to 12.51% under the improved methods. Victoria also experienced a slight decrease in percentage share from 28.65% under the previous methods to 28.21% with the improved methods. All other states and territories experienced an increase in the percentage share of national NOM estimates when applying the improved methods.

CATEGORY OF TRAVEL
AND IMPROVED NOM

Under previous NOM estimation methods an assumption was made regarding a traveller's presence in or absence from the Australian ERP based on passenger card information. It was assumed that travellers within the categories of STRR, PD, LTRD, LTVD and STRD were already in the ERP at the time of their overseas movement. Alternatively, it was assumed that the other categories, PA, LTRR, LTVA, STVA and STVD were out of the ERP at the time of their overseas movement. There are no such assumptions in the improved methods for estimating NOM. A traveller's ERP status is derived from their previous movement history.

CATEGORY OF TRAVEL
AND IMPROVED NOM
continued

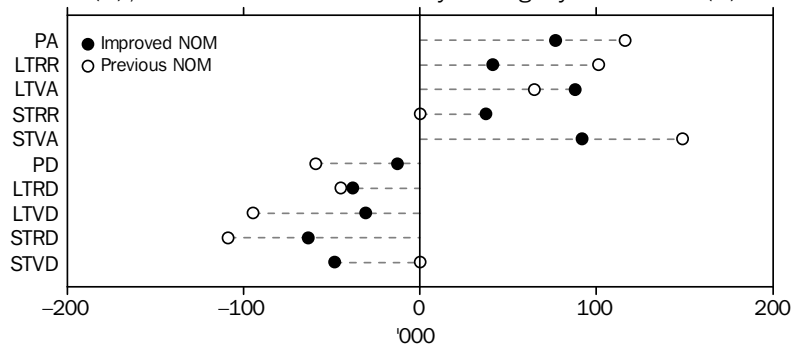
As an example, consider a traveller who has been studying in Australia for three years and has made a number of short-term trips overseas each year. When they leave Australia at the end of their course they would be categorised as an STVD, if they had made an overseas trip in the previous 12 months. However taking into account their overall stay in Australia they should be correctly coded to a LTVD. Under the previous method they would never have been in the population during their three year stay. This scenario, under the improved methods, can be corrected using initial and final ERP flags from previous travel histories.

The improved NOM methods also include the allocation of a single category of travel to each traveller during a reference quarter. This has changed from the previous NOM estimation method. Formerly there was a potential for persons to be included in more than one category of travel, and be counted in NOM estimates more than once if they had multiple movements in that reference quarter. Similarly, there is potential that a traveller could be excluded from NOM more than once.

Graph 2.11 shows the contribution to improved and previous NOM estimates by category of travel for 2004–05. Most categories of travel have declined markedly in their contribution to NOM with the improved methods. This indicates that it is likely that multiple inclusions of the same traveller did occur under the previous NOM estimation method. An exception to this decline is the contribution that long-term visitor arrivals make to NOM estimates as a result of the improved methods. This is due to the increased capture of travellers who stay in Australia for a non-continuous period of 12 out of 16 months.

The meaning of the abbreviations used for category of travel in the following graph can be found in the Abbreviations List on page vii.

2.11 COMPARISON OF IMPROVED AND PREVIOUS NOM ESTIMATES (a), Contribution to NOM by Category of Travel (b)—2004–05

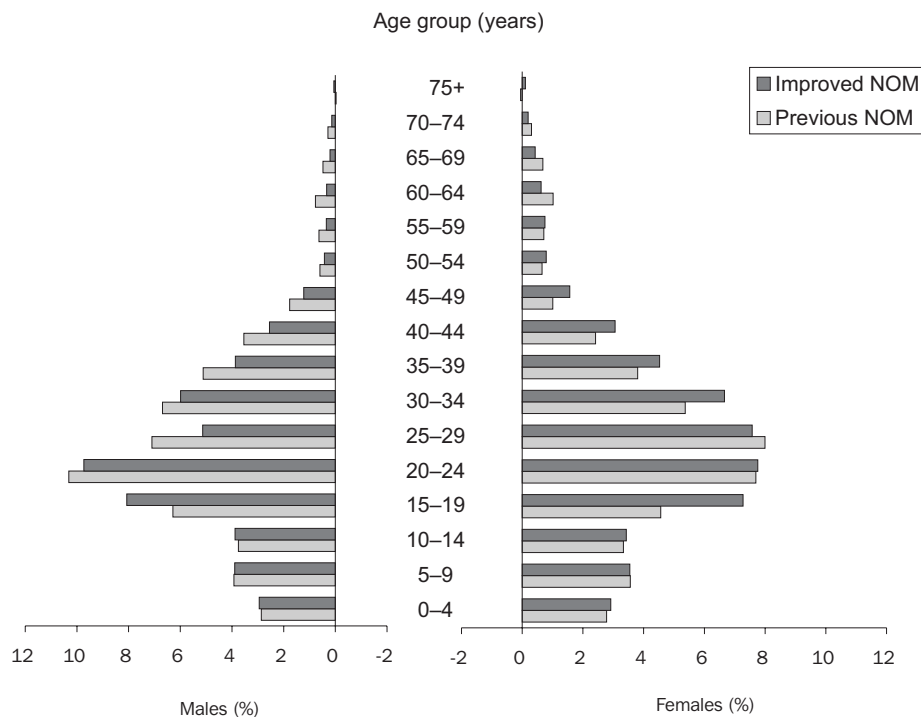


(a) Based on final NOM estimates.
(b) Category of travel for improved NOM is based on a unique category of travel assigned to each individual traveller. For previous estimates it is based on information as indicated on the traveller's passenger card(s).

AGE DISTRIBUTION OF NOM

The age distribution of NOM is changed slightly with the improved NOM estimation methods. The population pyramid below shows a comparison of age distributions between the previous NOM estimation method and the improved methods.

2.12 COMPARISON OF IMPROVED NOM AND PREVIOUS NOM ESTIMATES (a), Age and Sex Distribution—2004–05



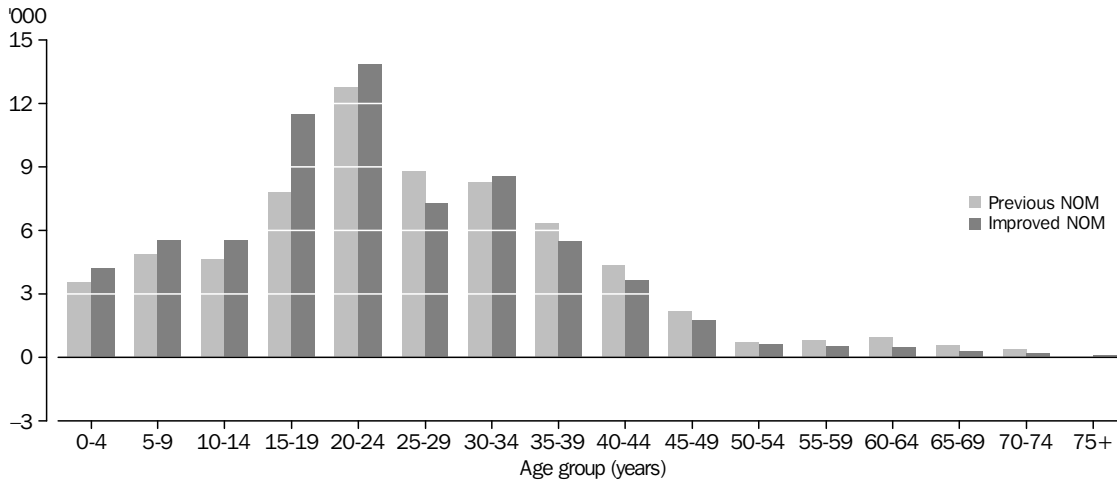
(a) Based on final NOM estimates.

With the improved method the age and sex structure indicates that there has been a substantial increase in the proportion of NOM contributed by both males and females aged 15–19 years. This change is possibly an indicator of larger numbers of student-age travellers now being accounted for in NOM through the improved 12/16 method. Graph 2.13 and 2.14 indicate an increase in the numbers in this age group.

There has also been a significant increase in females aged 30–49 years with the improved NOM estimation techniques. Males aged 25–29, 35–39 and 40–44 years have experienced a decline in proportion of NOM and number, with the change to NOM estimation methods.

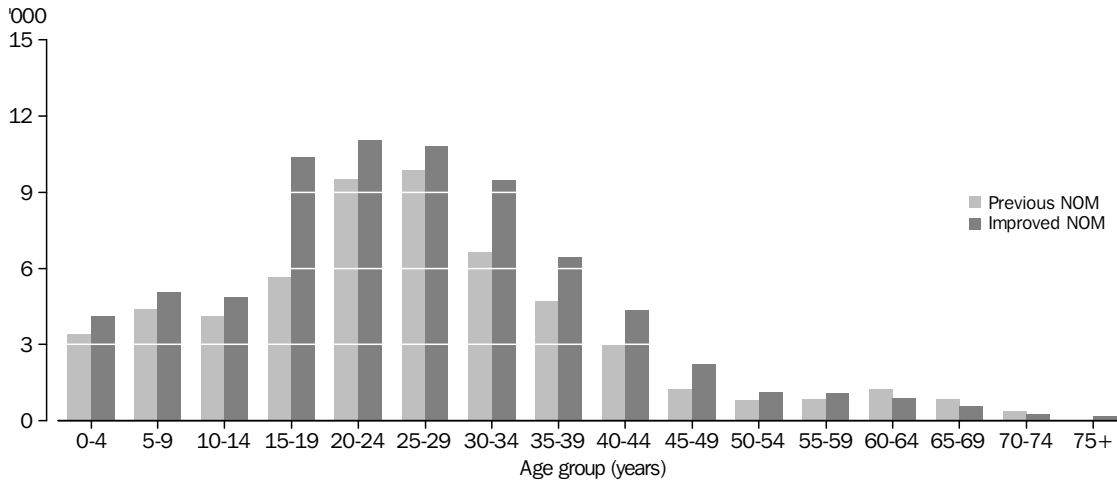
Estimates in Graph 2.13 indicate a lower improved NOM estimate for males aged 25–29 years compared to previous NOM estimates. Further analysis of this age group using preliminary data for 2005–06 shows an increase in males aged 25–29 years from 8,382 under the previous methods to 10,782 under the improved NOM methods. This suggests fluctuations in this age group over time and additional years of data will be required to better interpret the underlying patterns.

2.13 COMPARISON OF IMPROVED AND PREVIOUS NOM ESTIMATES (a), Males by age group—2004–05



(a) Based on final NOM estimates.

2.14 COMPARISON OF IMPROVED AND PREVIOUS NOM ESTIMATES (a), Females by age group—2004–05



(a) Based on final NOM estimates.

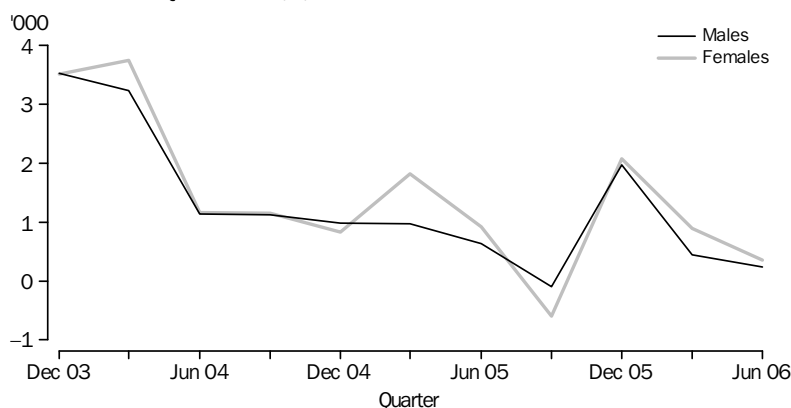
YOUNG ADULT TRAVELLERS

The improved 12/16 method was developed in order to accommodate the correct treatment of travellers who may have stayed in Australia for a period of less than 12 months *continuously* but would be long-term residents if their period of stay was measured as a *non-continuous* period of 12 out of 16 months. For example, traveller groups such as students may be in Australia for the duration of the school/academic year but return home occasionally for short periods. More travellers aged 15–24 years arrive in Australia in the March quarter than in other quarters. This supports the theory that students arrive for the beginning of the school or academic year or arrive for a mid-year tertiary intake in the September quarter. Conversely, more travellers in these age groups leave in large numbers during the December quarter, which coincides with the period when students are likely to return home for holidays or at the cessation of their studies.

YOUNG ADULT
TRAVELLERS *continued*

There are significant differences between travellers aged 15–19 years and 20–24 years. The large influx of young travellers aged 15–19 years in the September and March quarters is likely due to students arriving in Australia to complete their high school education or to commence their first year of tertiary study. Unpublished figures from the Department of Education, Science and Training show that in 2004 there were almost 27,000 overseas students studying in Australian high schools¹.

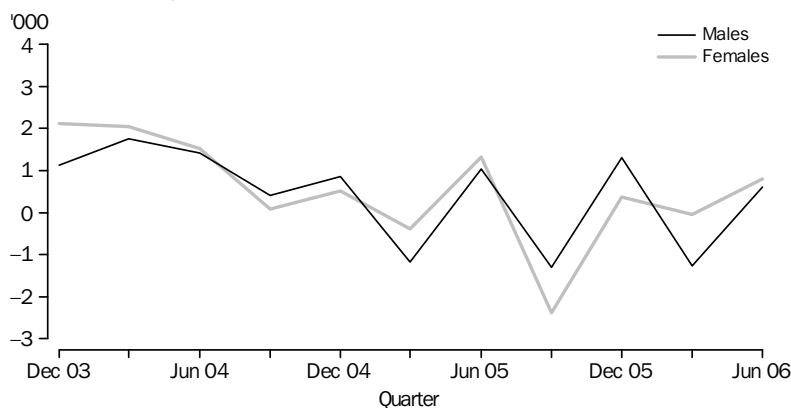
2.15 DIFFERENCES BETWEEN IMPROVED AND PREVIOUS NOM ESTIMATES, Age group 15–19 years—December Qtr 2003 to June Qtr 2006(a)



(a) Estimates for December quarter 2005 to June quarter 2006 are preliminary.

There is an overall increase in the number of young travellers in estimates produced with the improved methodology. By far the largest contributor to the improved NOM estimates, in the younger age groups, are the 20–24 year old males.

2.16 DIFFERENCES BETWEEN IMPROVED AND PREVIOUS NOM ESTIMATES, Age group 20–24 years—December Qtr 2003 to June Qtr 2006(a)



(a) Estimates for December quarter 2005 to June quarter 2006 are preliminary.

Further analysis will be undertaken when a longer time series has been accumulated, to investigate topics such as the seasonality of young adult travellers, age distribution in net overseas migration and travel categories.

¹ Department of Education, Science and Training, 2007, Unpublished Statistics.

EXPLANATORY NOTES

INTRODUCTION

1 This Information Paper outlines the statistical implications as a result of the introduction of improved methods for the estimation of net overseas migration (NOM) including possible impacts on published estimates of the estimated resident population (ERP) of Australia and the states and territories.

2 Following the 1992 amendments to the *Acts Interpretation Act* to include the Indian Ocean Territories of Christmas Island and the Cocos (Keeling) Islands as part of geographic Australia, population estimates commencing from September quarter 1993 include estimates for these two territories. To reflect this change, another category of the state and territory level was created, known as Other Territories. Other Territories includes Jervis Bay Territory, previously included with the Australian Capital Territory, as well as Christmas Island and the Cocos (Keeling) Islands, previously excluded from population estimates for Australia.

POPULATION CONCEPTS

3 Australia's population estimates for the reference periods since 1971 are compiled according to the place of usual residence of the population. An explanation of the place of usual residence conceptual basis for population estimates is given in *Demographic Estimates and Projections: Concepts, Sources and Methods* (cat. no. 3228.0). With the improved NOM estimation methods, there will be a series break in both NOM and ERP estimates from September quarter 2006, although ERP is still fundamentally constrained by data from the five-yearly Census of Population and Housing.

NET OVERSEAS MIGRATION

4 Conceptually, net overseas migration (NOM) is the difference between permanent and long-term arrivals, and permanent and long-term departures. Estimates of NOM are derived from information provided on incoming and outgoing passenger cards, as well as other data supplied by the Department of Immigration and Citizenship (DIAC). Data on the intended duration of stay of overseas visitors arriving in Australia and the intended duration of absence of Australian residents travelling overseas are used to determine the numbers of permanent and long-term arrivals, and permanent and long-term departures. Passenger card data are also used to calculate migration adjustments for category of travel, and determine the state and territory distribution of NOM. The processes of adjusting movement data on travellers' stated intentions to reflect their actual behaviour are complex and are outlined in Chapter One.

OVERSEAS ARRIVALS AND DEPARTURES STATISTICS

5 Persons arriving in, or departing from, Australia provide information in the form of incoming and outgoing passenger cards (see Appendix). Incoming persons also provide information in visa applications, apart from people travelling as Australian and New Zealand citizens. These and other information available to the Department of Immigration and Citizenship (DIAC) serve as a source for statistics of overseas arrivals and departures (OAD).

6 In July 1998, DIAC revised the incoming and outgoing passenger cards and associated procedures as well as computer systems. Some questions which obtained information already stored in the DIAC Travel and Immigration Processing System (TRIPS) (e.g. sex and marital status) were deleted. Data for the deleted questions and some other missing data (for unanswered questions or missing data) is obtained from the DIAC TRIPS. The changes also affect the data for 'previous country of residence' which is imputed for Australian and NZ citizens. For more information see the May 1998 issue of *Overseas Arrivals and Departures, Australia* (cat. no. 3401.0). Since July 1998,

OVERSEAS ARRIVALS AND DEPARTURES STATISTICS

continued

there have been additional minor changes to both incoming and outgoing passenger cards.

7 From July 2001, DIAC adopted a new passenger card processing system which involved electronic imaging of passenger cards and intelligent character recognition of the data stored in the images. This process has yielded several improvements to the processing of passenger card data, most notably the detailed information about missing values. There have also been several changes to data quality. Further information on these changes is provided in *Overseas Arrivals and Departures, Australia* (cat. no. 3401.0).

Scope

8 Overseas arrivals and departures statistics relate to the number of movements of travellers rather than the number of travellers (i.e. multiple movements of individual persons during a given reference period are each counted separately). The statistics exclude the movements of operational air and ships' crew, of transit passengers who pass through Australia but are not cleared for entry, and of passengers on pleasure cruises commencing and finishing in Australia. Similarly, these statistics exclude unauthorised arrivals.

9 For more information on overseas arrivals and departures see *Overseas Arrivals and Departures, Australia* (cat. no. 3401.0).

ROUNDING

10 Where figures have been rounded, discrepancies may occur between sums of component items and totals.

RELATED PRODUCTS

11 Other ABS products which may be of interest to users include:

- AusStats — electronic data <<http://www.abs.gov.au/ausstats>>
- *Australian Demographic Statistics* (cat. no. 3101.0)
- *Australian Demographic Trends* (cat. no. 3102.0)
- *Australian Historical Population Statistics* (cat. no. 3105.0.65.001). From the navigation bar select Themes; Demography; Australian Historical Population Statistics
- Demographic Estimates and Projections: Concepts, Sources and Methods, <<http://www.abs.gov.au>>. From the navigation bar select Themes; Demography; Concepts, Sources and Methods
- *Demography Working Paper 2004/2 – Interpretation and Use of Overseas Arrivals and Departures Estimates, September 2004* (cat. no. 3106.0.55.002)
- *Information Paper: Improved Methods for Estimating Net Overseas Migration, Australia* (cat. no. 3107.0.55.003)
- *Migration, Australia* (cat. no. 3412.0) — includes data on the country of birth of the ERP of Australia
- *Overseas Arrivals and Departures, Australia* (cat. no. 3401.0) — issued monthly
- *Short-term Visitor Arrival Estimates, Australia* (cat. no. 3401.0.55.001) — issued monthly

12 Related statistics are also published by DIAC, the Department of Industry, Tourism and Resources and Tourism Research Australia.

13 Current publications and other products produced by the ABS are listed in the *Catalogue of Publications and Products* (cat. no. 1101.0). The Catalogue is available from any ABS office or the ABS web site <<http://www.abs.gov.au>>. The ABS also issues a daily Release Advice on the web site which details the products to be released in the week ahead.

INCOMING CARD — FRONT

<p>■ Incoming passenger card • Australia</p> <p>PLEASE COMPLETE IN ENGLISH WITH A BLUE OR BLACK PEN</p> <p>▶ Family/surname <input style="width: 100%;" type="text"/></p> <p>▶ Given names <input style="width: 100%;" type="text"/></p> <p>▶ Passport number <input style="width: 100%;" type="text"/></p> <p>◆ Flight number or name of ship <input style="width: 100%;" type="text"/></p> <p>▶ Intended address in Australia <input style="width: 100%;" type="text"/></p> <p style="margin-left: 20px;">State <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/></p> <p>▶ Do you intend to live in Australia for the next 12 months? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>▶ If you are NOT an Australian citizen:</p> <p style="margin-left: 20px;">Do you have tuberculosis? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p style="margin-left: 20px;">Do you have any criminal conviction/s? Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>YOU MUST ANSWER EVERY QUESTION – IF UNSURE, <input checked="" type="checkbox"/> Yes</p> <p>▶ Are you bringing into Australia:</p> <ol style="list-style-type: none"> 1. Goods that may be prohibited or subject to restrictions, such as medicines, steroids, firearms, weapons of any kind or illicit drugs? Yes <input type="checkbox"/> No <input type="checkbox"/> 2. More than 2250mL of alcohol or 250 cigarettes or 250g of tobacco products? Yes <input type="checkbox"/> No <input type="checkbox"/> 3. Goods obtained overseas or purchased duty and/or tax free in Australia with a combined total price of more than AUD\$900, including gifts? Yes <input type="checkbox"/> No <input type="checkbox"/> 4. Goods/samples for business/commercial use? Yes <input type="checkbox"/> No <input type="checkbox"/> 5. AUD\$10,000 or more in Australian or foreign currency equivalent? Yes <input type="checkbox"/> No <input type="checkbox"/> <hr/> <ol style="list-style-type: none"> 6. Any food - includes dried, fresh, preserved, cooked, uncooked? Yes <input type="checkbox"/> No <input type="checkbox"/> 7. Wooden articles, plants, parts of plants, traditional medicines or herbs, seeds, bulbs, straw, nuts? Yes <input type="checkbox"/> No <input type="checkbox"/> 8. Animals, parts of animals and animal products including equipment, eggs, biologicals, specimens, birds, fish, insects, shells, bee products, pet food? Yes <input type="checkbox"/> No <input type="checkbox"/> 9. Soil, or articles with soil attached, ie. sporting equipment, shoes, etc? Yes <input type="checkbox"/> No <input type="checkbox"/> <hr/> <ol style="list-style-type: none"> ▶ 10. Have you visited a rural area or been in contact with, or near, farm animals outside Australia in the past 30 days? Yes <input type="checkbox"/> No <input type="checkbox"/> ▶ 11. Have you been in Africa or South America in the last 6 days? Yes <input type="checkbox"/> No <input type="checkbox"/>
<p>DECLARATION</p> <p><i>The information I have given is true, correct and complete. I understand failure to answer any questions may have serious consequences.</i></p>	<p>YOUR SIGNATURE</p> <p><input style="width: 100%;" type="text"/></p> <p style="text-align: right;">Day <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Month <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Year <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/></p>

TURN OVER THE CARD English

INCOMING CARD — BACK

<p>■ YOUR CONTACT DETAILS IN AUSTRALIA</p> <p>Phone <input style="width: 100%;" type="text"/></p> <p>E-mail <input style="width: 100%;" type="text"/></p> <p>Address OR <input style="width: 100%;" type="text"/> State <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/></p>	<p>EMERGENCY CONTACT DETAILS (FAMILY OR FRIEND)</p> <p>Name <input style="width: 100%;" type="text"/></p> <p>E-mail, Phone OR <input style="width: 100%;" type="text"/></p> <p>Mail address <input style="width: 100%;" type="text"/></p>
<p>PLEASE COMPLETE IN ENGLISH</p> <p>▶ In which country did you board this flight or ship? <input style="width: 100%;" type="text"/></p> <p>◆ What is your usual occupation? <input style="width: 100%;" type="text"/></p> <p>▶ Nationality as shown on passport <input style="width: 100%;" type="text"/></p> <p>▶ Date of birth Day <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Month <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Year <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/></p>	<p>▶ PLEASE X AND ANSWER A OR B OR C</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%; border: 1px solid black; padding: 5px;"> <p>A Migrating permanently to Australia <input type="checkbox"/></p> </div> <div style="width: 30%; border: 1px solid black; padding: 5px;"> <p>B Visitor or temporary entrant <input type="checkbox"/></p> <p>▶ Your intended length of stay in Australia Years <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Months <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Days <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> OR <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/></p> <p>▶ Your country of residence <input style="width: 100%;" type="text"/></p> <p>▶ Your main reason for coming to Australia (X one only)</p> <p style="margin-left: 20px;">Convention/conference <input type="checkbox"/> 1 Employment <input type="checkbox"/> 4 Holiday <input type="checkbox"/> 7</p> <p style="margin-left: 20px;">Business <input type="checkbox"/> 2 Education <input type="checkbox"/> 5 Other <input type="checkbox"/> 8</p> <p style="margin-left: 20px;">Visiting friends or relatives <input type="checkbox"/> 3 Exhibition <input type="checkbox"/> 6</p> </div> <div style="width: 30%; border: 1px solid black; padding: 5px;"> <p>C Resident returning to Australia <input type="checkbox"/></p> <p>▶ Country where you spent most time abroad <input style="width: 100%;" type="text"/></p> </div> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; text-align: center;"> <p>MAKE SURE YOU HAVE COMPLETED BOTH SIDES OF THIS CARD. PRESENT THIS CARD ON ARRIVAL WITH YOUR PASSPORT.</p> </div>

Information sought on this form is required to administer immigration, customs, quarantine, statistical, health, wildlife and currency laws of Australia and its collection is authorised by legislation. It will be disclosed only to agencies administering these areas and those entitled to receive it under Australian law. The leaflet *Safeguarding your personal information* is available at Australian ports and airports.

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15 (Design date 03/05)

Incoming passenger card used from March 2005.

GLOSSARY

Australian resident (for Overseas Arrivals and Departures)	Australian resident is self-defined as reported by travellers when completing an incoming or outgoing passenger card.
Average migration adjustment	The average migration adjustment is a by-product of final estimation to be used in preliminary estimates for the corresponding quarter two years later. It is derived for a group of travellers that is defined by the cross-classification of category of travel by age by citizenship by state/territory. It is the sum of all migration adjustment values (see <i>migration adjustment value</i>) divided by the number of travellers in a particular group.
Category jumping	<p>Category jumping was the name given to the adjustment made to the components of net overseas migration, when these were applied, up until the year ending 30 June 1997. Category jumping was set to zero for the years ending 30 June 1998 to 2001.</p> <p>Category jumping was the term used to describe changes between intended and actual duration of stay of travellers to/from Australia, such that their classification as short-term or as long-term/permanent movers is different at arrival/departure from that after twelve months. For more information, see <i>Migration, Australia 2002</i> (cat. no. 3412.0), Chapter 6, 'Special article: Adjustments to overseas migration estimates'.</p> <p>From the implementation of the improved NOM estimation methods category jumping will refer to an adjustment applied to final NOM estimates that corrects for differences between traveller intention and actual behaviour.</p>
Category of movement	<p>Overseas arrivals and departures are classified according to length of stay (in Australia or overseas), recorded in years, months and days by travellers on passenger cards. There are three main categories of movement:</p> <ul style="list-style-type: none"> ■ permanent movements; ■ long-term movements (one year or more); and ■ short-term movements (less than one year). <p>A significant number of travellers (i.e. overseas visitors to Australia on arrival and Australian residents going abroad) state exactly 12 months or one year as their intended period of stay. Many of them stay for less than that period and on their departure from, or return to, Australia are therefore classified as short-term. Accordingly, in an attempt to maintain consistency between arrivals and departures, movements of travellers who report their actual or intended period of stay as being one year exactly are randomly allocated to long-term or short-term in proportion to the number of movements of travellers who report their actual length of stay as up to one month more, or one month less, than one year.</p>
Estimated resident population (ERP)	The official measure of the population of Australia is based on the concept of residence. It refers to all people, regardless of nationality or citizenship, who usually live in Australia, with the exception of foreign diplomatic personnel and their families. It includes usual residents who are overseas for less than 12 months. It excludes overseas visitors who are in Australia for less than 12 months.
Long-term arrivals	<p>Long-term arrivals comprise:</p> <ul style="list-style-type: none"> ■ overseas visitors who intend to stay in Australia for 12 months or more (but not permanently); and ■ Australian residents returning after an absence of 12 months or more overseas.
Long-term departures	Long-term departures comprise:

Long-term departures <i>continued</i>	<ul style="list-style-type: none"> ■ Australian residents who intend to stay abroad for 12 months or more (but not permanently); and ■ overseas visitors departing who stayed 12 months or more in Australia.
Main destination	Australian residents travelling overseas are asked on departure for the name of the country in which they intend to spend most time.
Main state/territory of stay	Overseas visitors are asked on departure for the name of the state or territory in which they spent the most time.
Migration adjustment	The ABS applies a number of adjustments to overseas arrivals and departures data in order to produce estimates of net overseas migration (NOM). These mainly comprise adjustments designed to reflect differences between stated travel intentions and actual travel behaviour. Until recently adjustments used by ABS to produce NOM estimates were collectively referred to as 'category jumping adjustments'. They are now referred to more simply as 'migration adjustments'.
Migration adjustment value	A migration adjustment value is assigned to each individual traveller in the final estimates stage. It is not used in determining final NOM but is used for calculating preliminary estimates two years later. It is equal to the difference between a traveller's actual contribution to NOM (i.e. +1, 0 or -1) for a reference quarter and their initial contribution to NOM based on their category of travel (i.e. +1 for a permanent or long-term arrival; -1 for a permanent or long-term departure; and 0 for a short-term arrival or departure).
Net overseas migration (NOM)	Net overseas migration (NOM) is net permanent and long-term overseas migration, adjusted for change in traveller duration, intention and multiple movement error.
Net permanent and long-term movement	The difference between the number of permanent (settler) and long-term arrivals and the number of permanent and long-term departures. Short-term movements are excluded.
Overseas arrivals and departures (OAD)	Overseas arrivals and departures (OAD) refer to the arrival or departure of persons, through Australian airports (or sea ports), which have been recorded. Statistics on OAD relate to the number of movements of travellers rather than the number of travellers (i.e. the multiple movements of individual persons during a given reference period are all counted).
Overseas migration adjustment	See <i>migration adjustment</i> .
Permanent arrivals (settlers)	<p>Permanent arrivals (settlers) comprise:</p> <ul style="list-style-type: none"> ■ travellers who hold migrant visas (regardless of stated intended period of stay); ■ New Zealand citizens who indicate an intention to settle; and ■ those who are otherwise eligible to settle (e.g. overseas-born children of Australian citizens). <p>This definition of settlers is used by the Department of Immigration and Citizenship (DIAC). Prior to 1985 the definition of settlers used by the Australian Bureau of Statistics (ABS) was the stated intention of the traveller only. Numerically the effect of the change in definition is insignificant. The change was made to avoid the confusion caused by minor differences between data on settlers published separately by the ABS and the DIAC.</p>
Permanent departures	Permanent departures are Australian residents (including former settlers) who on departure state that they are departing permanently.
Short-term arrivals	<p>Short-term arrivals comprise:</p> <ul style="list-style-type: none"> ■ overseas visitors who intend to stay in Australia for less than 12 months; and ■ Australian residents returning after a stay of less than 12 months overseas.
Short-term departures	<p>Short-term departures comprise:</p> <ul style="list-style-type: none"> ■ Australian residents who intend to stay abroad for less than 12 months; and ■ overseas visitors departing after a stay of less than 12 months in Australia.

State or territory of clearance	State or territory of clearance refers to the state or territory in which a passenger is cleared by Customs and Immigration authorities. Embarkation or disembarkation and clearance are usually, but not necessarily, in the same state or territory.
State or territory of intended residence	State or territory of intended residence is derived from the intended address given by permanent arrivals (settlers), and by Australian residents returning after a journey abroad. Particularly in the case of the former, this information does not necessarily relate to the state or territory in which a traveller will eventually establish a permanent residence.
State or territory of intended address/where lived	Overseas visitors are asked on arrival in Australia for their state or territory of intended address. On departure from Australia overseas visitors are asked the state or territory where they spent most time. Australian residents are asked on departure for the state or territory in which they live/lived. Residents returning to Australia are asked for their state or territory of intended address.
State or territory of intended stay	See State or territory of intended address/where lived.
12/12 month rule	A method for measuring an overseas traveller's duration of stay or absence in which the 12 month usual residence criterion in population estimates is measured across a 12 month period. Under a 12/12 month rule, overseas travellers must be resident in Australia for a <i>continuous</i> 12 month period or more to be included in the ERP. Similarly, Australian residents travelling overseas must be absent from Australia for a <i>continuous</i> 12 month period or more to be removed from ERP.
12/16 month rule	A method for measuring an overseas traveller's duration of stay or absence which takes a <i>non-continuous</i> approach to measure usual residence, as opposed to the continuous approach used under a 12/12 month rule. Under a 12/16 month rule, overseas travellers must have been resident in Australia for a total period of 12 months, or more, during the 16 month follow-up period to be included in ERP. The 12/16 month rule therefore takes account of those persons who may have left Australia briefly and returned, while still being resident for 12 months out of 16. Similarly, it takes account of Australians who live most of the time overseas but periodically return to Australia for short periods.

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ISBN 0 642 48208 X

RRP \$11.00