Measuring International Migration with Traveller-completed Passenger Cards: The Conceptual, Administrative and Statistical Challenges Experienced by Australia

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Abstract

Australia, an island state of 20 million people inhabiting a continent of 7.7 million square kilometres with 59,700 kilometres of coastline has over 18 million people cross its borders each year. A small proportion contribute to estimates of immigration and emigration. Accurate measures of international migration are important as this component accounts for just over half of Australia's 1.2% annual population growth. Arrival and departure cards completed by travellers at Australian ports have been the only data source for measuring international migration in Australia for many decades. Recent challenges have been encountered in using this administrative data to compile reliable net international migration estimates. Increases in traveller volumes and frequency of travel have presented conceptual, operational, reporting and statistical challenges. The limitations and recent developments to adjust the reported data suitable for international migration and resident population statistics are described.

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Measuring International Migration with Traveller-completed Passenger Cards: The Conceptual, Administrative and Statistical Challenges Experienced by Australia

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1. Background

Australia, an island state of 20 million people inhabiting a continent of 7.7 million square kilometres with 59,700 kilometres of coastline has over 18 million people cross its borders each year. These movements are of short-term, long-term and permanent natures. A small proportion contribute to estimates of immigration and emigration. Accurate measures of international migration are important as this component accounts for approximately half of Australia's 1.2% annual population growth.

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. Australia's census and statistics laws requires that the Australian Statistician conduct a population census every 5 years and compile and publish statistics of the number of people of each State as on the last day of March, June, September and December in each year. These quarterly population estimates are the official measure of the Australian population and are used for a wide variety of purposes. These include the distribution of Australian Government funds to state, territory and local governments, as well as determining the number of seats for each state and territory in the House of Representatives of the Australian Parliament. Laws related to the sharing of taxation revenue with state and territory governments require the 31 December population estimates to be available before 6 June in the following calendar year.

Official Australian population estimates, termed the estimated resident population (ERP), are based on the concept of usual residence. The ERP includes all people, regardless of nationality or citizenship, who usually live in Australia, with exception of foreign diplomatic personnel and their families. It includes usual residents who are overseas for less than 12 months and excludes overseas residents who are in Australia for less than 12 months. The ERP at the end of the reference period is obtained by adding to the estimated population at the beginning of the period the components of natural increase (on usual residence basis) and net overseas migration for the reference period. For the states and territories, account is also taken of estimated interstate movements involving a change of state of usual residence.

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Australia has a long-standing formal program of immigration. In recent years, temporary migration has also become increasingly important with students, business entrants and working holiday makers staying for periods between three months and four years. Australian residents are also departing overseas in greater numbers on a long-term temporary and permanent basis. Currently, there are between 1.2 and 1.7 million arrivals and departures at Australian borders each month.

The pattern of annual international migration flow to and from Australia is very high so monitoring and measuring this is a huge task. The quality of measurement of overseas migration into and out of Australia and the net geographic distribution impact is important because of its impact on Australia's resident population size, electoral distribution, grant distribution and many other government, community and business decisions, programs and policies.

The measurement of international migration for the purposes of population estimates in Australia has changed over time. The concept of 'resident population' was introduced in 1981. This was a shift from a de facto population count to a de jure count, with de jure residence defined in Australia by a period of 12 months or more. Net overseas migration is one component of population change used to estimate the resident population. Initially net overseas migration was based on the net between the total number of international arrivals and departures. However, with increased ease of international travel from the 1970s onward, statistics on overseas migration became increasingly volatile. Net overseas migration is now based on net permanent and long-term (12 months or more) movements into and out of Australia.

Ideally, permanent and long-term immigrants should be added to the resident population in their quarter of arrival and permanent and long-term emigrants removed from the resident population in their quarter of departure. However, a person's travel behaviour can change from their initial reported intentions. Accordingly, an adjustment factor known as "category jumping" was introduced in the early 1980s. Category jumping is a retrospective change in category of travel (permanent/long-term/short-term) based on subsequent duration of stay or absence. In recent years, the ABS has found the category jumping methodology was problematic. An interim "migration adjustment" was implemented and methodological research commenced in search of an improved conceptual framework and measurement method.

In the late 1990s, the historical source of data, traveller-completed passenger cards were changed to reduce reporting burden in preparation for the 2000 Sydney Olympic Games and make border entry procedures more efficient. Additional data item derivation processing was introduced to eliminate duplicate reporting of duration of stay/absence by travellers on arrival and departure. The new information from the matching of dates of arrival and departure to calculate actual duration of stay in Australia (or absence from Australia) revealed a discontinuity in

this data item when compared with the information previously reported by travellers. A passenger reported actual duration of stay/absence was found to be quite different to the continuous duration method used by matching cards for each border crossing. For example, a temporary but long-term migrant who has lived in Australia for several years, may have their duration of stay reduced to the period of time since their most recent international border movement (e.g. a short overseas trip). This is increasingly problematic as many students and others may come and go for short periods several times a year, but should be considered as part of the resident population as Australia is their main place of residence over a period totalling several years. These problems with the estimation of international migration were recognised by the ABS and are under active investigation.

Increasing volumes of international movements across Australian borders, changes in the composition of international visitors to Australia and operational changes to more efficiently process travellers entering and exiting Australia have all presented difficulties in accurately deriving international migration statistics for Australia.

The paper highlights the issues and the impact these have had on statistics derived from the administrative data source. The basis of the preliminary and revised adjustments in compiling recent estimates of net overseas migration, the circumstances which require the calculation of both, their limitations and options for further improvement are discussed. The paper also examines the conceptual and measurement processes and issues relating to international migration statistics in Australia and those recommended by the United Nations (United Nations, 1998b). Finally, the refinements required for the measurement of net overseas migration and options to improve the calculation are discussed.

2. Data Source

Internationally, there is no single source of data that can reflect the growing complexity of the international population movements. A variety of data sources, including household based inquiries, border statistics, administrative registers and other administrative sources, produce different types of migration statistics, each with its own strengths and limitations (United Nations, 2002). Population censuses or household surveys can yield an estimate of international migration stock at a country level, when appropriate questions are included in the census and survey questionnaire. However, the census information cannot be updated easily and also fail to capture the circulatory nature of international migration.

For an island country like Australia, having well controlled ports of entry and departure, border statistics can be considered the most appropriate source for direct measurement of international migration flows. Countries often apply different degrees of control depending on citizenship of travellers and mode of transport. In general, greater control is exercised upon arrivals than upon departures.

2.1 Administrative data source

In Australia, the main source of data for estimating international migration flows are the incoming and outgoing passenger cards completed by all persons who enter or leave Australia. Australia is in a very unique position to have any data on people leaving the country, something that is generally not available for most countries.

Incoming persons who are not citizens of Australia also provide information in their visa (entry permit) applications that is used for statistical purposes (Gray et al., 2003). The information is collected by the Australian Government Department of Immigration and Multicultural and Indigenous Affairs (DIMIA) and aggregate statistics are published by both DIMIA and the ABS. DIMIA publishes data according to legal categories: visa type (DIMIA, 2004), while ABS publishes data according to demographic categories: category of traveller (whether a resident or visitor) and short-term, long-term, and permanent duration of stay (ABS, 2004a).

There has been discussion about the use of visa (entry permit) data to determine estimates of net overseas migration. Among the suggestions have been the use of visa data to directly determine the number of persons that are in Australia at the time and use of stock flows for updating net overseas migration. This raises a number of queries. Firstly, this definition is trying to follow a legal definition rather than one of residential behaviour which is how the current definition of estimated resident population is based. Secondly, visa data is one way. It will provide some information on visitors coming to Australia but it does not provide any information on Australians departing or even those returning from an extended stay abroad. Thirdly, it is fairly well known that the duration of someone's visa is generally not a reliable predictor of how long they will actually spend in the country. Some people may have a long-term visa for travel to Australia but not actually be resident here. It is also not uncommon for individuals to change, update or extend their visas as their circumstances change.

Under the Migration Regulations (Migration Act 1958), Australia has used administrative data collected on incoming and outgoing international passenger cards for compiling statistics on international migration. The passenger cards completed by travellers are collected at Australian ports (both air and sea). Information sought on the cards is managed by the DIMIA using the services of a private company to capture, code and process the data. Data from passports and visa application/approvals are also extracted from the Department's Travel and Immigration Processing System (TRIPS). The processed data file is then provided to the Australian Bureau of Statistics on a monthly basis, three weeks after the end of the calendar month.

The incoming and outgoing passenger cards, to be filled by every incoming and outgoing passenger are shown in Appendix 1. These contain questions relating to personal information and about intended length of stay. The most important questions impacting on the calculation of international migration estimates are of intended length of stay in Australia for temporary resident or entrants under box B of the incoming passenger card, and intended length of stay overseas for Australian

resident departing temporarily under box E of the outgoing passenger card. The problem arises, when the stated intention does not match with their actual stay in Australia or overseas. The ABS is looking to determine a refined measurement method based on person-level overseas arrivals and departures data.

3. Methodology

One of the most important uses of migration figures is in deriving population estimates. The Australian Bureau of Statistics (ABS) derives population estimates at the end of a reference period (usually a calendar quarter) by adding natural increase and net overseas migration during the reference period to the population at the beginning of the reference period. This is known as the cohort component method, and is represented by the following equation:

$$P_{t+1} = P_t + B - D + NOM$$

where:

P_t= the estimated resident population at time point *t;*

P_{t+1}= the estimated resident population at time point *t+1*;

B = the number of births occurring between *t* and *t+1*;

D = the number of deaths occurring between *t* and *t+1*; and

NOM = net overseas migration occurring between *t* and *t+1*.

At the national level, the population balancing equation shows that an existing population estimate can be updated to give a new population estimate by adding births, taking away deaths and adding the net effect of overseas migration. For state and territory population estimates, an additional term is added to the equation representing net interstate migration occurring between *t* and *t+1*.

3.1 Net Overseas Migration

Overseas migration covers short-term, long-term and permanent movements. The short-term movements consist of people entering or leaving Australia for a period of less than 12 months. Long-term covers those who are entering or leaving Australia for a period of 12 months or more, but not permanently. The permanent category refers to immigrants who are entering Australia to live permanently or to residents of Australia who are leaving Australia permanently.

In this paper, we are focussing more on the concept of net overseas migration (NOM), that is, how it is conceptualised and derived. The concept of NOM can be puzzling to conceptualise and challenging to measure. Public commentators frequently confuse the concept of NOM with the outcome of the Australian Government's Migration and Humanitarian programs. In simple words, NOM refers to permanent and long-term overseas arrivals minus permanent and long-term departures. Currently a person who spends 12 months or more in Australia is added to the population while a person who spends less than 12 months in Australia is not added to the population for the reference period. Conversely, a resident of Australia

who departs overseas for 12 months or more is taken out of the Australian population, whereas if they depart overseas for less than 12 months, they are not removed from the population estimate. In its simplest form, this can be shown as:

NOM= A - D

where:

A= arrival of persons not already included in Australian population; and
D= departure of persons already included in the population in the reference period.

For the purposes of calculating NOM, arrivals and departures are broken down further into:

A= permanent arrivals + long-term arrivals; and
D= permanent departures + long-term departures.

Conceptually then, NOM is the difference between permanent and long-term arrivals and permanent and long-term departures and can be shown as:

NOM= PLTA - PLTD

where:

PLTA= permanent and long-term arrivals; and
PLTD= permanent and long-term departures.

PLTA also includes the return to Australia of residents who have been overseas for 12 months or more and PLTD also includes the departure from Australia of visitors who have been resident in Australia for 12 months or more.

3.2 Migration Adjustment in NOM

In order to measure NOM there is a requirement for an extra conceptual consideration. At the time people cross the Australian border, they fill out a passenger card stating whether they are a visitor or an Australian resident. They also state an intended length of stay in Australia (for a visitor arrival) or an intended length of stay overseas (for a resident departure). This information of stated-intention is used by the ABS to calculate a preliminary population estimate. Returning Australian residents are not asked how long they intend to stay before a future departure overseas, and similarly, departing overseas visitors are not asked whether they intend to return to Australia and if so, in what timeframe.

Travellers can change travel intentions and behaviour and their actual duration of stay or absence can be different from that first stated on arrival or departure. At the time a person crosses Australia's border, it is not empirically known how long they will spend in Australia (for an arrival) or overseas (for a departure). Actual behaviour is not known until one year after the initial border crossing, but this is often too late to meet the requirement for timely population estimates. The only

useful data the ABS has at its disposal prior to 12 months after the reference period is based on what people state they intend to do and previous history. Accordingly, a migration adjustment is required to account for changes in traveller's actual behaviour compared to their stated intentions for both arrivals and departures.

Therefore the final equation for estimating NOM can be expressed as:

NOM= PLTA - PLTD + MA

where:

PLTA= permanent and long-term arrivals;
PLTD= permanent and long-term departures; and
MA= migration adjustment (for actual duration of stay or absence).

Previously the migration adjustments were referred to as migration 'category jumping'. However, the simpler term 'migration adjustment' is now used. Due to timeliness requirements preliminary quarterly estimates of NOM are compiled and published 5-6 months after the reference period and these are currently revised 15 months after the end of the financial year (July to June) when subsequent travel events can be taken into account.

3.3 Preliminary NOM

Migration adjustments applied to passenger card based data in compiling preliminary NOM estimates, are based on the trends observed for the proportions of long-term and short-term arrivals and departures who change their travel behaviour in the last year. Based on these trends, modelled adjustments are made to account for persons whose stated intentions are likely to differ from actual travel behaviour:

- Long-term visitor arrivals assumed to be staying in Australia short-term, subtract from NOM;
- Long-term resident departures assumed to be staying overseas short-term, add to NOM;
- Short-term visitor arrivals assumed to be staying in Australia long-term, add to NOM; and
- Short-term resident departures assumed to be staying overseas long-term, subtract from NOM.

Preliminary migration adjustments are only applied to the above four major movement categories. Changes in the movements of permanent arrivals and departures are not accounted for in the preliminary NOM as these are small in number.

3.4 Revised NOM

From July 1998, a unique person identifier became available for each arrival/departure passenger card record where it could be matched to a passport movement transaction within DIMIA's systems. This data item enables the ABS to match consecutive international movements and derive an improved measurement for changes from intended duration to actual duration at person level rather than at an aggregate level.

Using matched passenger records the current estimation method looks at the travel sequence (or movement history) of each person over a period of one year period and calculates their actual duration of stay in that one-year window. By comparing their stated travel intentions with actual behaviour, adjustments are made in compiling revised NOM estimates for persons whose stated intentions differed from actual travel behaviour:

- Long-term visitor arrivals who actually stayed in Australia short-term, subtract from NOM;
- Long-term resident departures who actually stayed overseas short-term, add to NOM;
- Short-term visitor arrivals who actually stayed in Australia long-term, add to NOM; and
- Short-term resident departures who actually stayed overseas long-term, subtract from NOM.

People who arrive permanently as a migrant and Australian residents who depart permanently for overseas are not required to provide any intended duration on the passenger card. However, in deriving revised estimates for NOM, ABS has considered adjustment in these two small groups of people as follows:

- Permanent migrants who arrived and left Australia in the same quarter without any return in one year period are taken out, and
- Australian residents who left permanently but returned back in the same quarter without any further departure within a one year period are added back.

A final adjustment is made for persons who carry out multiple travel within the reference quarter with more than one movement with long-term travel intention.

4. Conceptual definition, comparability and quality in international standards

International migration, with its intricate web of demographic, social, economic and political determinants and consequences, is a topic that has moved to the forefront of the national and international agenda. The United Nations (UN) has been active in its efforts to improve the quality and comparability of international migration statistics. In this attempt, for integrating and improving international migration flows, the UN has so far issued three sets of successive recommendations over the years with significant revisions each time (United Nations, 1953, 1976, and 1998). Its latest 1998 recommendations on international migration statistics is in response to increasing international population movements (United Nations, 1998b).

The aim in carrying out the 1998 revision of the recommendations has been to outline a process by which both the quality and the comparability of international migration statistics may be improved while at the same time ensuring that users have access to meaningful and sound information on several aspects of international migration. So as to understand the dynamics of international migration, a framework was proposed to provide a means of answering certain crucial questions such as:

- Overall annual net gain or loss of population through international migration;
- International migrants admitted annually with their country of origin;
- Migrants exercising free provision of citizenship with their country of origin;
- Number of citizen emigrants every year with country of destination;
- Emigrant citizens returning every year with countries to which they are returning;
- Migrant workers admitted annually and leaving the country permanently;
- Asylum seekers arrived annually and admitted on humanitarian grounds (including refugees);
- Persons admitted for family reunification over a year; and
- Total number of international migrants in the country and those economically active.

The above do not have equal relevance for all countries and is also not an exhaustive list covering all significant issues relating to international migration and its measurement.

According to the latest recommendations of the United Nations on statistics of international migration (UN, 1998b), an international migrant is defined as *"any person who changes his or her country of usual residence"*. The concept of place of residence is used in censuses to mean the geographical place where the enumerated person usually resides (United Nations, 1998a). The concept of country of usual residence is also used to determine who is a visitor for the purpose of international tourism statistics. Therefore, the latest revised recommendations of the United Nations (1998) on international migration distinguish between visitors, short-term migrants, long-term migrants and permanent settlers as follows:

- *Visitors* are defined as persons who do not reside in a country of arrival and who are admitted for short stays where their movement to that country is for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage;

- *Short-term migrants* are defined as persons who move to a country other than that of their usual residence for a period of at least 3 months but less than a year (12 months) except in cases where the movement to that country is for purposes of recreation, holiday, visits to friends or relatives, business, medical treatment or religious pilgrimage. The country of usual residence of short-term migrants is considered to be the country of destination during the period they spend in it;

- *Long-term migrants* are defined as persons who move to a country other than that of their usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes their new country of usual residence; and

- *Migrants for settlement* are defined as persons granted the permission to stay for a lengthy period, who are subject to virtually no limitations regarding the exercise of an economic activity, i.e. have right to employment.

Very few countries have implemented the above UN recommended definitions strictly in reporting. Difficulties are encountered in distinguishing between short-term and long-term; lack of comparability between the duration of presence or absence calculated and the intended duration given; and the level of completeness and reliability varies greatly according to the sources used (United Nations, 2001d; 2001e). Countries also use different duration criterion to distinguish between permanent/ long-term and short-term migrants (United Nations, 2001a; 2001b). Similarly, a migration adjustment based on changing/switching migration categories is only applied in a small number of countries, each with different criteria (Office of National Statistics, 2004).

The lack of uniformity among countries in defining a migrant has been a key source of inconsistency in international migration statistics. The UN recommended that multilateral efforts to standardise international migration information and statistics should be strengthened in order to improve the cross national comparability. High priority should be given to facilitating governments' use of the UN recommendations, in particular, the framework proposed to integrate the information obtained from different sources should be promoted (Population Division, 2002).

Quality, completeness and timeliness are important elements of international migration data. Halting or significantly reducing the movement of undocumented migration should receive priority (United Nations, 2003). The 2002 UN Report provides a wealth of information on international migration levels, trends and policies. Nevertheless, migration remains incomplete and often inaccurate.

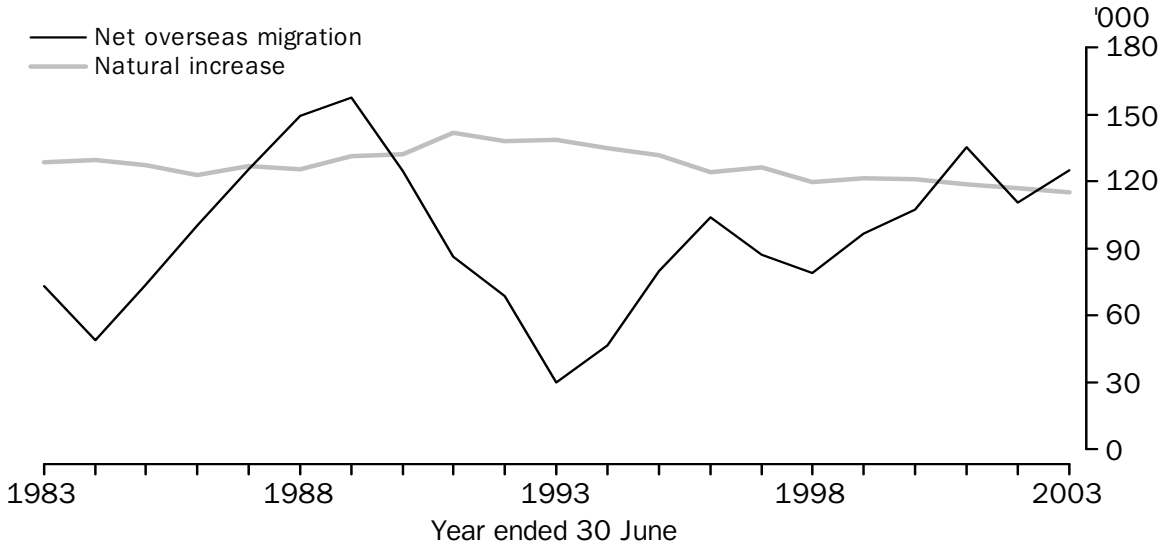
5. Analysis and Findings

Few issues are as important for Australia as the changes to its population and the impact overseas migration has had in changing Australia's population. Over the last 25 years, the contribution of net overseas migration to population growth has averaged around 39 percent per year but this has fluctuated significantly from a low of 18 percent in 1993 to a high of 55 percent in 1989. It is subject to considerable fluctuation from year to year. Average net overseas migration to Australia has been around 90,000 per year over the last 50 years (DIMIA, 2004).

Table 1 indicates estimated resident population and net overseas migration (NOM) from 1983 to 2003 in Australia. At 30 June 2003, the preliminary estimated resident population of Australia was 19.9 million. Over the preceding twelve months the population increased by 240,500 persons, representing national population growth rate of 1.2% since 30 June 2002. In the year ended 30 June 2003, the estimate of net overseas migration was 125,300, representing 52% of Australia's growth for the year. The remainder (48%) of this growth was due to natural increase (the net effect of births and deaths).

Figure 1 shows the trend in population growth of the past two decades, with relatively stable natural increase and markedly fluctuating net overseas migration. These fluctuations in net overseas migration are largely the result of changes in the Australian Government's Migration and Humanitarian program targets over the period, movement of New Zealand citizens to and from Australia, movement of long-term visitors and the prevailing economic conditions in Australia and overseas. The peak of 157,400 people in 1989 resulted in net overseas migration being the main contributor to Australia's population growth in that year (55%), while the trough of 30,000 people in 1993 contributed only 18% to population growth. Net overseas migration has fluctuated since then but has been above 100,000 since 2000 and has contributed around half of population growth each year since 2001 (ABS, 2004a).

FIGURE 1: COMPONENTS OF POPULATION GROWTH



5.1 Estimates of Preliminary NOM

The preliminary estimates of NOM are required to derive preliminary population estimates 5 to 6 months after the end of the reference quarter. During preliminary estimation, not all data required for an adjusted estimate of NOM are available. Therefore, a model based approach has been considered suitable and is applied for the preliminary estimation of NOM. Analysis of four quarters data by the ABS, beginning from September quarter 2001 to June quarter 2002, have shown a somewhat stable relationship between the number of travellers in each of the four major movement categories and the number who changed their actual duration of stay or absence during the revised NOM estimate. The proportion of travellers who had changed their duration of stated stay or absence have had small variations between quarters for each category of travel. For example, during 2001-02 about 70% of all long-term visitors were taken out of the preliminary NOM and about 50% of long-term Australian residents were added back to the preliminary NOM (Table 2).

Under the assumption of similar patterns, these relationships were used to derive preliminary NOM estimates for each of the quarters in 2002-03. The overall preliminary estimates of the adjustment are approximately -29,000 for the 2002-03 financial year (Table 3). As more data becomes available, the relationships used in the model are subject to revision and so are the preliminary estimates of NOM. Only the four major groups of travellers (long-term and short-term overseas visitors and Australian residents departing long-term and short-term) have been adjusted to derive the preliminary estimates which are added to unadjusted permanent arrivals and departures.

Figure 2 indicates how preliminary NOM for 2002-03 have been derived from different components of all overseas movements. It is evident that most of the overseas movements into and out of Australia are short-term. During 2002-03 there were 8.3 million arrivals, of which 7.9 million (95%) were short-term, 328,500 (4%) were long-term and 93,900 (1%) were permanent (settler) arrivals. In the same year, there were 8.2 million departures, of which 7.9 million (96%) were short-term, 246,700 (3%) were long-term and 50,500 (1%) were permanent departures. Of all movements, the proportion which have been long-term or permanent (and have therefore contributed to NOM and ERP) has been under 6% each year from 1983 to 2003 (ABS, 2004a).

5.2 Estimates of Revised NOM

Until June 1998 the measurement of duration of stay or absence was based on passenger responses recorded on arrival or departure cards. This self reported duration, which itself was subject to reporting error, was used to determine the time at which a person arrived (for visitors) or left Australia (for Australian residents). However, from July 1998 onwards, implementation of a new passenger card design and processing systems enabled DIMIA to derive actual duration of stay or absence by matching both arrival and departure cards rather than relying on passenger reporting their duration of stay or absence.

Using the current method, the ABS has applied a revised NOM adjustment of -23,100 for 2001-02 (Table 3). The method also enables an adjustment for people who have been added to or taken out of the ERP multiple times due to frequent overseas travel. An analysis conducted by McDonald et al. (2003) proposed an adjustment of -37,000 for the same period. McDonald et al. combine DIMIA stock data (based on student visas, business visas and number of other small, temporary long-term visa types) with preliminary data on net overseas migration published by the ABS. The two estimation methods are not strictly comparable as they each use different methodologies. However, they did indicate variations and need for improvement.

The revised estimate of net overseas migration was 110,600 for 2001-02. The distribution of adjustments to components from original to adjusted estimates for 2001-02 is presented in figure 3. Net adjustment to long-term movements often mask the impact of adjustments from short-term to long-term, and from long-term to short-term. In 2001-02 in the arrival category, the largest adjustment to NOM was short-term visitor arrivals changed to long-term visitor arrivals (182,500), followed by long-term visitor arrivals changed to short-term visitor arrivals (128,100). In the departure category, the largest adjustment to NOM in 2001-02 were also short-term to long-term resident departures (122,400) and long-term to short-term resident departures (46,900). Similar pattern of movements has been noted for 2002-03 (ABS, 2004b).

5.3 Treatment to Travel Category

Treatment of people with respect to estimated resident population (ERP) by category of travel is shown in Table 4. A person making a movement (both arrivals and departures) at any point in time must fall under one of the following 10 categories:

1. Settlers arrival;
2. Long-term residents returning;
3. Long-term visitors arriving;
4. Short-term residents returning;
5. Short-term visitors arriving;
6. Settlers/residents departing permanently;
7. Long-term residents departing;
8. Long-term visitors departing;
9. Short-term residents departing; and
10. Short-term visitors departing.

How the ABS treat different groups of people in relation to the Australian ERP at their point of entry or departure, and how they should be treated after one year from the first movement in question for migration adjustment estimation are shown in the table. Also, long-term travellers need to be assessed for multiple long-term intention within the reference quarter.

5.4 Magnitude of Adjustment and Limitations

The difference between original and adjusted components of NOM varies over time, and for each component (Table 5). The total net adjustment in the revised estimates of NOM for 2001-02 was -23,100, and for the preliminary estimates of NOM total net adjustment for 2002-03 was -28,900. These figures represented a reduction of 17% and 19% respectively from unadjusted figures. For some components, adjustments were of much larger magnitude than the net migration adjustment. Long-term visitor arrivals were adjusted up by 31% for 2001-02 and 26% for 2002-03, where long-term visitor departures were increased from unadjusted figures by 82% in 2001-02 and 90% in 2002-03. Both permanent arrivals and permanent departures were adjusted much less, by 5% each in 2001-02 (adjustments are preliminary for 2002-03, and permanent movement is not adjusted on a preliminary basis) (ABS, 2004a).

The process of adjusting movement data on travellers' stated duration of stay/absence intentions to reflect their actual duration of stay/absence behaviour are complex, and depend upon the amount and type of movement data available at a particular point in time. The method currently used compares data on actual travel movements over a one year period with those first advised by individual travellers (ABS 2004b). In order to conduct such a comparison, data for a 15 month period (i.e. one year plus one quarter) are required.

The current method of estimating migration adjustment is different from the method previously used by the ABS (ABS, 1995). A major criticism to the previous method is that with the changed and increasing number of international movements the method failed to produce reasonable estimates of migration adjustment. A minor criticism was that the method was based on a residual of gross movements (i.e. arrival/departure cards). A person making multiple movements was therefore likely to be counted more than once into or out of the Australian ERP (ABS, 2004c). Producing migration adjustment by relating movements to person level is a major improvement to the earlier method.

However, the current method used by the ABS to estimate NOM also has some limitations. The method removes from the population, through the adjustment for actual duration, some long-term visitors who are residing long-term in Australia but are making short periods of overseas travel during their overall long-term period of residency in Australia. An illustrative but not exhaustive or limiting example would be 3 or 4 year overseas students studying at Australian universities who travel back to their country of origin (or any other country) at least once a year. Similarly, some Australians residing overseas may also be making short visits to Australia (for example, annual holidays or family visits) during their overall longer stay overseas. Although there could be strong argument to retain or exclude these people in ERP, the current estimation technique does not allow this unless a change in the measurement of a 'usual resident' is adopted.

The ability to adjust for category jumping requires information on intended and actual duration of stay or travel. It is understood that besides Australia and New Zealand none of the countries collects this information. In the United Kingdom, on the basis of International Passengers' sample survey, migrant switcher adjustments of 5% and 1% are applied to immigrants and emigrants for changing their intended stay or absence respectively. Australia is the only known country adjusting for category jumping, taking into consideration all long-term movements. It is able to make this adjustment largely because of the system it has in place to collect and process arrivals and departures data, yielding statistics on international movements that are much more detailed and complete than those in other countries. As such, very little can be learnt from the experience of other developed countries to further improve the migration adjustment methodology.

Independent reviews of the measurement effects of category jumping were undertaken by Khoo and McDonald (2000, 2002), McDonald and Kippen (2002a) and McDonald et al (2003). These reviews showed that adjusting for category jumping could make a significant difference to annual estimates of net overseas migration. However, its impact on population estimates was much smaller because category jumping has been positive in some years but negative in others. Further, the first review, Khoo and McDonald (2000) noted that it was inadvisable to estimate category jumping on a quarterly basis before full information was available that enabled the accurate calculation of appropriate correction factors. Annual category jumping calculated on the basis of data available some 15 months after the reference quarter was considered preferable. The review also found that the vast majority of new arrivals who stated that they intended to stay for exactly 12 months left before

the 12 months had elapsed. Several options were discussed, yet none was considered perfect in addressing the issue totally. The review concluded that a combination of options may be an appropriate approach to deal with various issues and problems with estimation of NOM including an adjustment for category jumping.

6. Options for Improvement and Recommendation

Compared with data on fertility and mortality, compilation of international migration data are problematic for nearly all countries and statistics needed are very often lacking. While birth and death occur only once in an individual's life, migration may occur repeatedly, which contributes to the difficulties in measuring it. International migration data is problematic and not universally comparable, and Australia is not an exception. The United Nations International Migration Report 2002 (United Nations, 2002) notes that migration data in Australia is of good quality which reports all important arrivals and departure statistics. Although Australian data on international movements is of good quality, there is room for improvement to make it more comparable internationally and also meet Australia's statistical, program, policy and research requirements.

Multiple movements lead to complexity in the derivation of category jumping, particularly for long term visitor arrivals and long term resident departures. A visitor arriving to Australia with an intended duration of greater than 12 months may temporarily leave the country for a short period and then again return to Australia. An earlier ABS investigation showed that such a movement pattern was more common among long-term visitors coming to Australia with student visas, many of them going back to their home country during academic holidays. Parallel to above, a long term Australian resident may leave the country with an intended duration of over 12 months but could temporarily come back for a shorter duration (e.g. summer holidays) and then leave again.

The United Nation's recommendations do not specify whether the 12 month period for distinguishing between short-term and long-term/permanent migrants is continuous (United Nations, 1998b). Since most developed countries other than Australia define residence based on travellers' intentions, continuity of the period of stay is probably not considered (United Nations, 2001d).

The current Australian application of the "twelve month rule" requires a continuous period of stay or absence of twelve months before a person is included or excluded from the population. For example, if someone stays 364 days out of 365 days they are not considered a usual resident. This would mean that many overseas students studying in Australia are excluded from the population, while many Australians living overseas are included in the population.

Under the definition of a long-term movement defined as 12 months or more, a student visiting their home country during holidays would be classified as a category jumper. A student or person who largely spends a period of 3 or more years in Australia except for short trips overseas each year should probably be included as part of the resident population of Australia. Similarly, Australian's who largely spend several years overseas but return to Australia for brief periods should probably not be included in the resident population of Australia. One option to resolve this incongruence would be to alter the criteria of the measurement of usual residence to permit brief interruptions to a long term stay in Australia or overseas. However, changing the criteria too far will substantially increase the number of long-term arrivals and departures, affecting category jumping positively to a great extent. This is currently due to the number of visitors to Australia outweighing the number of Australian residents going overseas.

A plausible option would be to retain the 12 month or more rule, but relax the "continuity" criteria. This might be operationalised by using say 12 months accumulated period over a 16 months period. Such a concept would provide, for example, that students who spend up to 9-10 months out each year in Australia over say a 3 or 4 year period of stay be regarded as residents of Australia. Development of this "accumulation" method will require analysis to ensure the optimal threshold. However, the implications of using a period of 16 months in which the 12 months residence can be accumulated will have implications for the timeliness of revised estimates.

The definition of 12 months currently used in Australia for long-term migrants is in agreement with the UN recommendation and with most of the countries. This is also in agreement with the UN's recommended definition of usual residence. There is no need to revise the definition of long-term movements to include a greater proportion of overseas movements. In the proposed methodology, overseas students and other long-term visitors will be included in population estimates if they spend at least 12 months in Australia against their overall long-term stay. Similarly, Australian residents who are abroad for at least 12 months against their overall long-term absence will be excluded. In each case short overseas visits during the long residency period will be permitted and will not be a basis to exclude or include a traveller in ERP.

This measurement change may reduce the volatility in category jumping estimates by removing a significant proportion of increasingly large temporary migrant groups, such as students and business categories from being included in category jumping. It is hoped that the proposed option is likely to improve migration adjustments and NOM estimates, that are feasible from a data management perspective and conforms with the UN recommendations of a 12 month residence criteria for long-term migrants. We are not recommending any change in the conceptual rule of 12 months residency, but suggesting a change in the measurement procedure. This option will also aim to minimise the gap between preliminary and revised estimates. However, the recommended option needs to be tested with actual data including a comparison between preliminary and revised estimates for a particular period.

The application of a 12-month continuous stay rule for defining a resident is currently under review. A modified definition (12 out of 16 months) and procedures to operationalise the definition are being assessed for implementation by the ABS. The authors are aware of the fact that the current approach of sorting out long-term from short-term migrants is based on a massive record linkage exercise that involves all movements in and out of the country. Since the net long-term migration is a relatively small part of the total movements in and out of the country, the impact of errors in reporting and errors in record linkage is also being assessed carefully.

Further, we recommend that the method chosen to determine migration adjustment for preliminary and revised estimates needs to be updated as often as possible to reflect the changes in international travel patterns over time.

Figure 2: COMPONENTS OF ALL OVERSEAS MOVEMENTS (Preliminary) - 2002-03

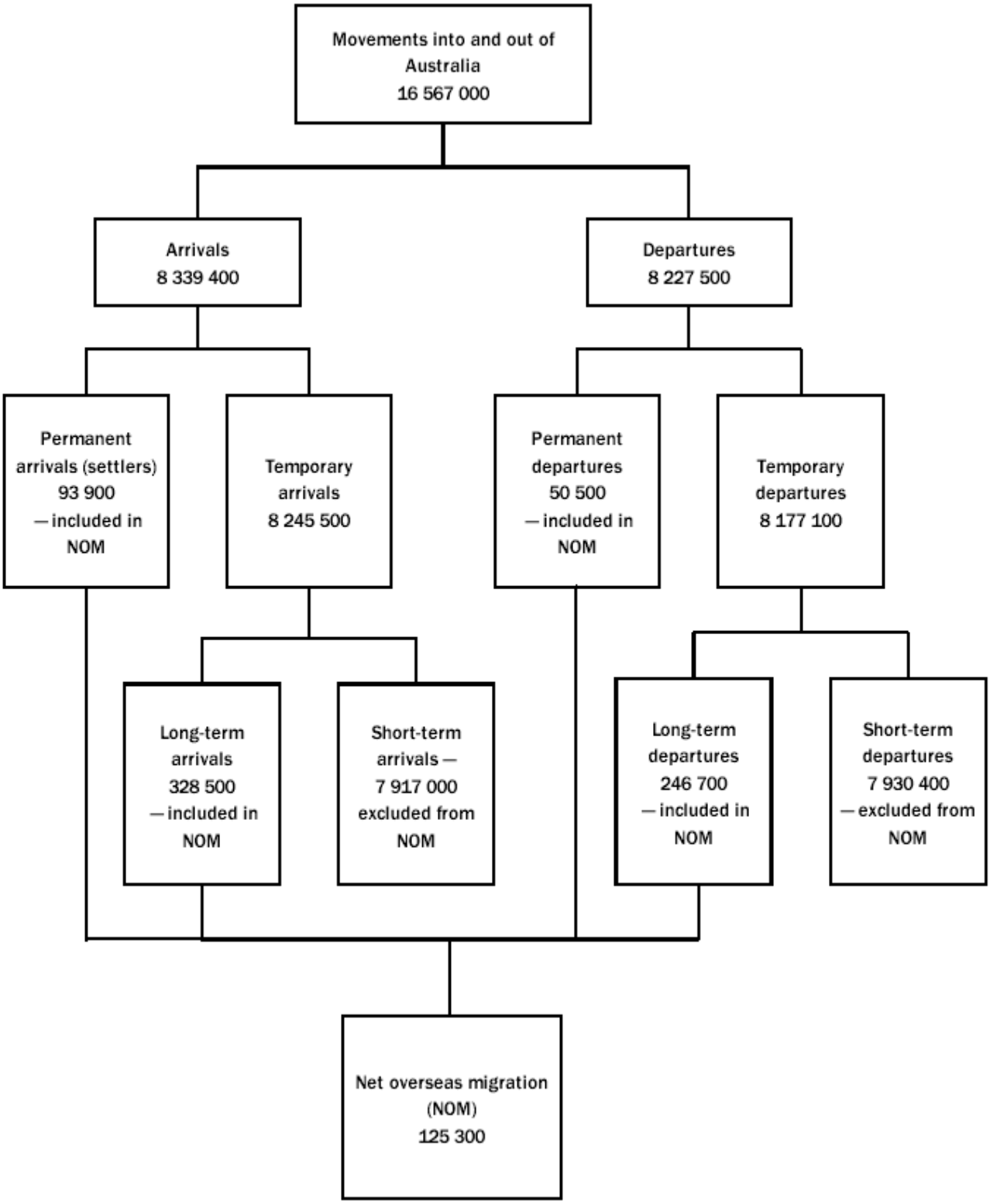


Figure 3: Adjustment to movements 2001-02

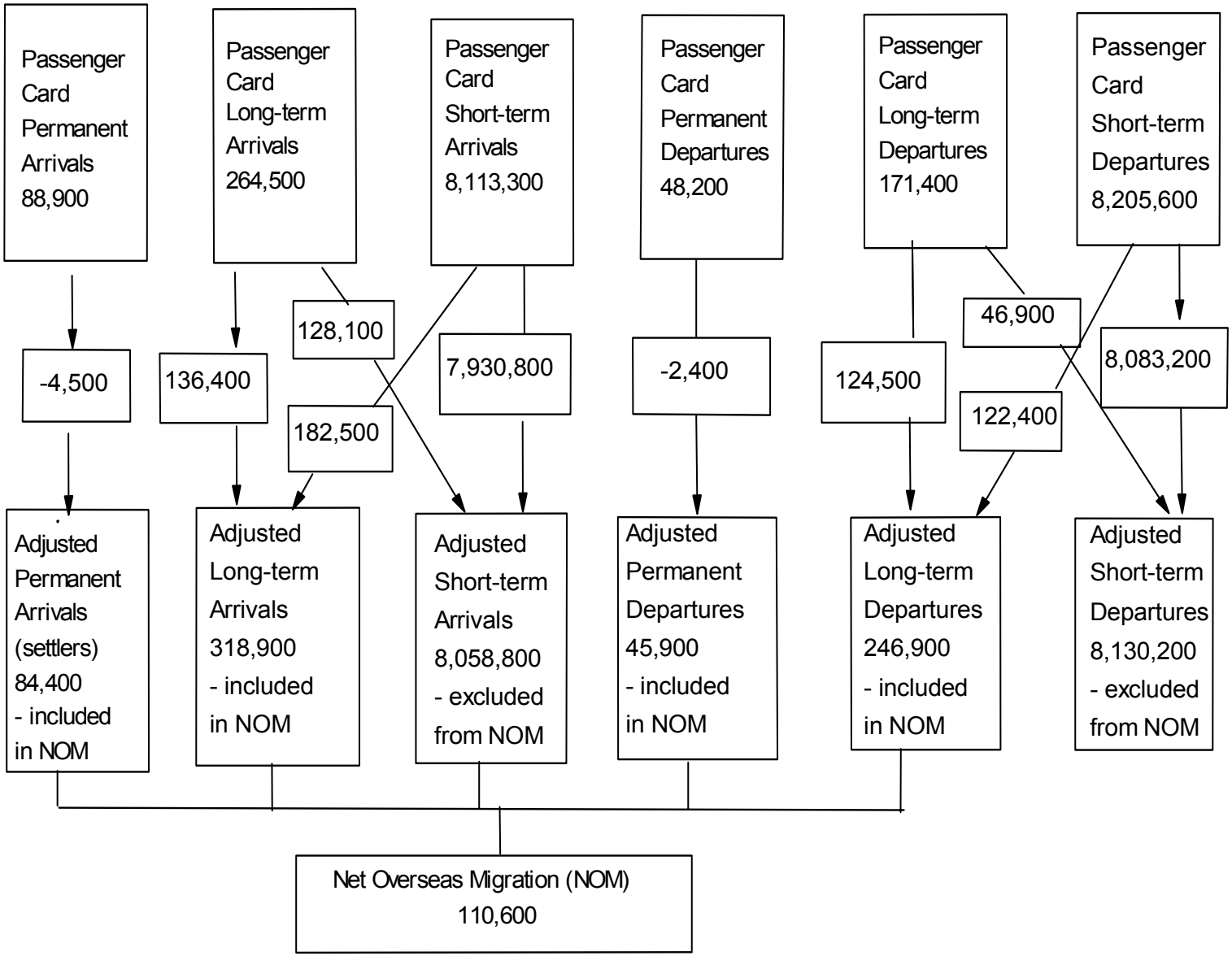


Table 1: Estimated resident population and net overseas migration (NOM) 1983-2003, Australia

Year ended 30 June	Population ('000)	Population increase (%)	Net overseas migration ('000)	NOM contribution to population increase (%)
1983	15,393.5	1.38	73.3	36.3
1984	15,579.4	1.21	49.1	27.5
1985	15,788.3	1.34	73.7	36.6
1986	16,018.4	1.46	100.4	44.9
1987	16,263.9	1.53	125.7	49.8
1988	16,532.2	1.65	149.3	54.3
1989	16,814.4	1.71	157.4	54.5
1990	17,065.1	1.49	124.6	48.5
1991	17,284.0	1.28	86.4	37.9
1992	17,494.7	1.22	68.6	33.1
1993	17,667.1	0.99	30.0	17.8
1994	17,854.7	1.06	46.5	25.7
1995	18,071.8	1.22	80.1	37.8
1996	18,310.7	1.32	104.1	45.6
1997	18,517.6	1.13	87.1	40.8
1998	18,711.3	1.05	79.2	39.8
1999	18,925.9	1.15	96.5	44.2
2000	19,153.4	1.20	107.3	47.0
2001	19,413.2	1.36	135.7	53.4
2002	19,641.0	1.17	110.6	48.6
2003	19,881.5	1.22	125.3	52.1

Note: Net Overseas Migration figures for 2003 are based on preliminary estimates.
Source: ABS, 2004a (Table 3.7).

Table 2: Percent of travellers who changed from stated duration of stay or absence , by category of movement and Period

Quarter	Long-term visitor arrival (%)	Short-term visitor arrival (%)	Long-term resident departure (%)	Short-term resident departure (%)
September 2001	70.6	4.1	49.2	3.7
December 2001	69.3	3.6	47.8	3.7
March 2002	71.3	4.1	52.3	4.1
June 2002	69.0	3.5	48.7	3.2
Average (4 most recent quarters)	**70.0**	**3.8**	**49.5**	**3.7**

Source: ABS, 2004b (Table 2).

Table 3: Components of net overseas migration 1983-2003, Australia

Year ending 30 June	Net overseas migration (no.)	Share of net long-term movements (compared to permanent movements) in NOM (%)	Category Jumping (no.)
1983	73,295	9.6	-2,155
1984	49,098	4.4	2,560
1985	73,708	16.0	5,698
1986	100,359	20.7	6,425
1987	125,730	14.2	16,589
1988	149,341	14.1	6,149
1989	157,436	9.9	20,195
1990	124,647	10.1	20,781
1991	86,432	4.4	-8,325
1992	68,580	12.9	-21,308
1993	30,042	22.7	-32,629
1994	46,549	36.9	-20,832
1995	80,125	35.0	-12,917
1996	104,137	35.7	-5,524
1997	87,079	40.8	-7,317
1998	79,162	42.7	-
1999	96,483	49.3	-
2000	107,275	52.3	-
2001	135,673	55.2	-
2002	110,556	65.1	-23,128
2003	125,295	65.3	-28,930

Note: For years ending 30 June 1997 to 2001, category jumping was set to zero. For 2002, category jumping (migration adjustment) is on revised basis; while for 2003, it is on preliminary basis.
Source: ABS, 2004a (Tables 3.8 and 6.2).

Table 4: Treatment of people with respect to ERP by category of travel

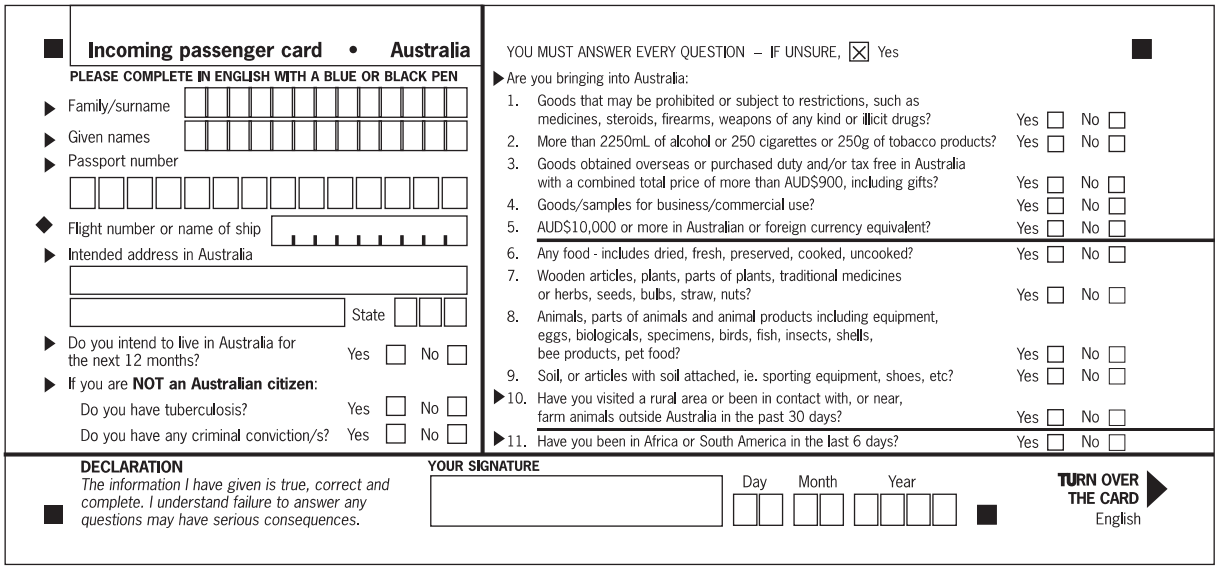
Category of Travel	Treatment at point of Entry/Departure	Follow-up treatment after 12 months	Additional checks/workload
Arrivals	**Treatment at Entry**		
Settler arrival	Added to ERP	No action is required under previous method; however, checks are needed for a new estimation method	
Long-term residents returning	Added back to ERP	No action is required	
Long-term visitors arriving	Added to ERP (on the basis of 'intended duration of stay' for 1 year or more)	Should be subtracted from reference month ERP if actual duration of stay was <1 year	Needs to check for multiple moves: (i) prior to arrival (ii) after arrival
Short-term residents returning	No addition to ERP is required	No action is required	
Short-term visitors arriving	No addition to ERP is required (on the basis of 'intended duration of stay' <1 year)	Should be added to reference month ERP if actual duration of stay was >=1 year	Need to check for multiple moves: (i) prior to arrival (ii) after arrival
Departures	**Treatment at Departure**		
Settlers/Residents departing permanently	Subtracted from ERP	No action is required under previous method; however, checks are needed for a new estimation method	
Long-term residents departing	Subtracted from ERP (on the basis of 'intended duration of stay' for 1 year or more)	Should be added back to reference month ERP if actual duration of stay was <1 year	Needs to check for multiple moves: (i) prior to departure (ii) after departure
Long-term visitors departing	Subtracted from ERP	No action is required	
Short-term residents departing	No subtraction from ERP is required (on the basis of 'intended duration of stay' for <1 year	Should be subtracted from reference month ERP if actual duration of stay was >=1 year	Needs to check for multiple moves: (i) prior to departure (ii) after departure
Short-term visitors departing	No subtraction from ERP is required	No action is required	

Table 5: Original net long-term and permanent movement and NOM, 2001-02 and 2002-03

Period	Net unadjusted long-term and permanent movement (no.)	Adjustment (no.)	Adjustment (%)	Net overseas migration (no.)
September quarter 2001	35,650	-7,938	-22.3	27,712
December quarter 2001	27,452	3,737	13.6	31,189
March quarter 2002	50,588	-14,233	-28.1	36,355
June quarter 2002	19,994	-4,694	-23.5	15,300
2001-02	**133,684**	**-23,128**	**-17.3**	**110,556**
September quarter 2002	39,941	-14,164	-35.5	25,777
December quarter 2002	28,525	7,292	25.6	35,817
March quarter 2003	60,374	-18,725	-31.0	41,649
June quarter 2003	25,385	-3,333	-13.1	22,052
2002-03	**154,225**	**-28,930**	**-18.8**	**125,295**

Note: Adjustments and NOM estimates for 2001-02 are on revised basis; while for 2002-03 these are on preliminary basis.
Source: ABS, 2004a (Table 6.2).

Australian Incoming Passenger Card



Incoming passenger card • Australia

PLEASE COMPLETE IN ENGLISH WITH A BLUE OR BLACK PEN

- Family/surname
- Given names
- Passport number
- Flight number or name of ship
- Intended address in Australia
  - State
- Do you intend to live in Australia for the next 12 months? Yes ☐ No ☐
- If you are **NOT an Australian citizen**:
  - Do you have tuberculosis? Yes ☐ No ☐
  - Do you have any criminal conviction/s? Yes ☐ No ☐

YOU MUST ANSWER EVERY QUESTION – IF UNSURE, ☒ Yes

Are you bringing into Australia:

1. Goods that may be prohibited or subject to restrictions, such as medicines, steroids, firearms, weapons of any kind or illicit drugs? Yes ☐ No ☐
2. More than 2250mL of alcohol or 250 cigarettes or 250g of tobacco products? Yes ☐ No ☐
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 ☐ No ☐
4. Goods/samples for business/commercial use? Yes ☐ No ☐
5. AUD$10,000 or more in Australian or foreign currency equivalent? Yes ☐ No ☐
6. Any food - includes dried, fresh, preserved, cooked, uncooked? Yes ☐ No ☐
7. Wooden articles, plants, parts of plants, traditional medicines or herbs, seeds, bulbs, straw, nuts? Yes ☐ No ☐
8. Animals, parts of animals and animal products including equipment, eggs, biologicals, specimens, birds, fish, insects, shells, bee products, pet food? Yes ☐ No ☐
9. Soil, or articles with soil attached, ie. sporting equipment, shoes, etc? Yes ☐ No ☐
10. Have you visited a rural area or been in contact with, or near, farm animals outside Australia in the past 30 days? Yes ☐ No ☐
11. Have you been in Africa or South America in the last 6 days? Yes ☐ No ☐

DECLARATION
The information I have given is true, correct and complete. I understand failure to answer any questions may have serious consequences.

YOUR SIGNATURE Day Month Year

TURN OVER THE CARD
English

YOUR CONTACT DETAILS IN AUSTRALIA

Phone ( )
E-mail
OR
Address State

EMERGENCY CONTACT DETAILS (FAMILY OR FRIEND)

Name
E-mail, Phone OR Mail address

PLEASE COMPLETE IN ENGLISH

- In which country did you board this flight or ship?
- What is your usual occupation?
- Nationality as shown on passport
- Date of birth Day Month Year

PLEASE ✕ AND ANSWER A OR B OR C

A Migrating permanently to Australia ☐

B Visitor or temporary entrant ☐

- Your intended length of stay in Australia Years Months OR Days
- Your country of residence
- Your main reason for coming to Australia (✕ one only)
  - Convention/conference ☐ 1
  - Employment ☐ 4
  - Holiday ☐ 7
  - Business ☐ 2
  - Education ☐ 5
  - Other ☐ 8
  - Visiting friends or relatives ☐ 3
  - Exhibition ☐ 6

C Resident returning to Australia ☐

- Country where you spent most time abroad

MAKE SURE YOU HAVE COMPLETED BOTH SIDES OF THIS CARD. PRESENT THIS CARD ON ARRIVAL WITH YOUR PASSPORT.

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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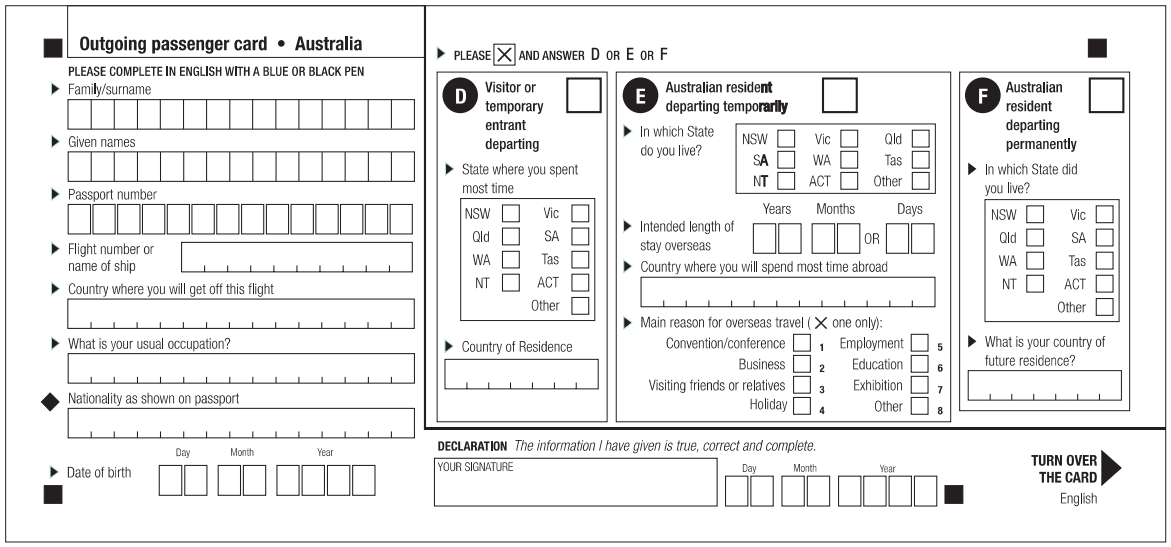
Australian Outgoing Passenger Card



Outgoing passenger card • Australia

PLEASE COMPLETE IN ENGLISH WITH A BLUE OR BLACK PEN

Family/surname

Given names

Passport number

Flight number or name of ship

Country where you will get off this flight

What is your usual occupation?

Nationality as shown on passport

Date of birth (Day Month Year)

PLEASE ☒ AND ANSWER D OR E OR F

D Visitor or temporary entrant departing

State where you spent most time: NSW Vic Qld SA WA Tas NT ACT Other

Country of Residence

E Australian resident departing temporarily

In which State do you live? NSW Vic Qld SA WA Tas NT ACT Other

Intended length of stay overseas: Years Months Days OR

Country where you will spend most time abroad

Main reason for overseas travel (☒ one only):
Convention/conference 1 Business 2 Visiting friends or relatives 3 Holiday 4 Employment 5 Education 6 Exhibition 7 Other 8

F Australian resident departing permanently

In which State did you live? NSW Vic Qld SA WA Tas NT ACT Other

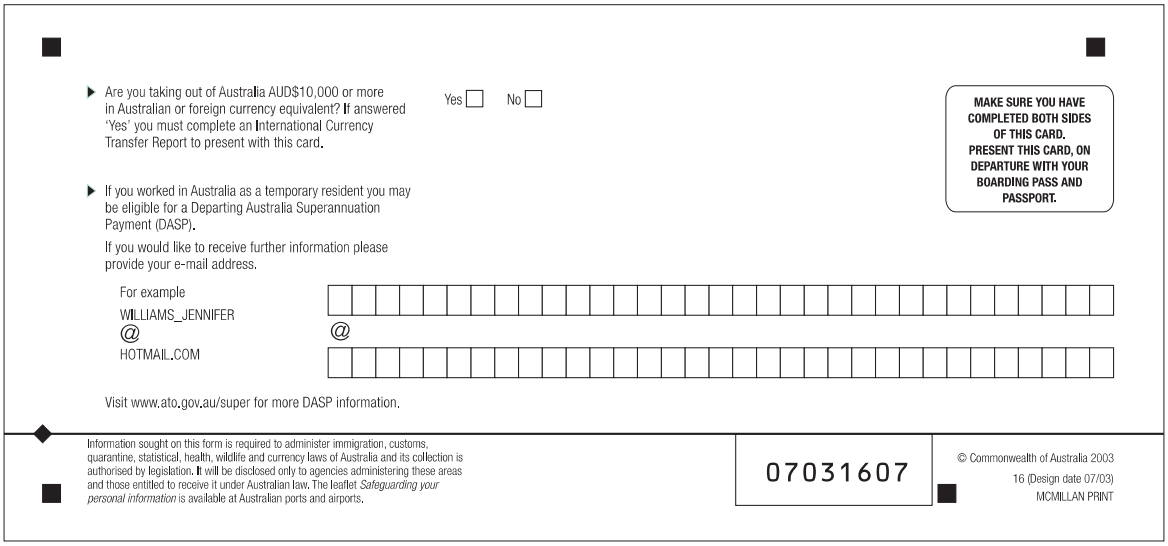
What is your country of future residence?

DECLARATION *The information I have given is true, correct and complete.*

YOUR SIGNATURE Day Month Year

TURN OVER THE CARD

English



Are you taking out of Australia AUD$10,000 or more in Australian or foreign currency equivalent? If answered 'Yes' you must complete an International Currency Transfer Report to present with this card. Yes ☐ No ☐

MAKE SURE YOU HAVE COMPLETED BOTH SIDES OF THIS CARD. PRESENT THIS CARD, ON DEPARTURE WITH YOUR BOARDING PASS AND PASSPORT.

If you worked in Australia as a temporary resident you may be eligible for a Departing Australia Superannuation Payment (DASP).

If you would like to receive further information please provide your e-mail address.

For example
WILLIAMS_JENNIFER
@
HOTMAIL.COM

Visit www.ato.gov.au/super for more DASP information.

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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