

National Health Workforce Data Set: nurses and midwives 2011: National Health Workforce Data Set, 2011; Data Quality Statement

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Identifying and definitional attributes

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Data quality

Data quality statement summary: The National Health Workforce Data Set (NHWDS): nurses and midwives 2011 contains information on the demographics, employment characteristics, primary work location, and work activity of all professionally registered nurses and midwives in Australia who renewed their registration with the Nursing and Midwifery Board of Australia via the National Registration and Accreditation Scheme (NRAS) introduced on 1 July 2010.

This is the second data release from the new national registration scheme and the first for the nursing and midwifery profession. The data set is comprised of registration (including demographic) information provided by the Australian Health Practitioner Regulation Agency (AHPRA) and workforce details obtained by the Nursing and Midwifery Workforce Survey. The survey instrument varies significantly in some areas from previous years; however, it is now nationally consistent (that is, one survey questionnaire administered nationally).

Institutional environment: The Australian Institute of Health and Welfare (AIHW) is a major national agency set up by the Australian Government under the *Australian Institute of Health and Welfare Act 1987* (Cwlth) to provide reliable, regular and relevant information and statistics on Australia's health and welfare. It is an independent statutory authority established in 1987, governed by a management Board, and accountable to the Australian Parliament through the Health and Ageing portfolio.

The AIHW aims to improve the health and wellbeing of Australians through better health and welfare information and statistics. It collects and reports information on a wide range of topics and issues, ranging from health and welfare expenditure, hospitals, disease and injury, and mental health, to ageing, homelessness, disability and child protection.

The Institute also plays a role in developing and maintaining national metadata standards. This work contributes to improving the quality and consistency of national health and welfare statistics. The Institute works closely with governments and non-government organisations to achieve greater adherence to these standards in administrative data collections to promote national consistency and comparability of data and reporting.

One of the main functions of the AIHW is to work with the states and territories to improve the quality of administrative data and, where possible, to compile national data sets based on data from each jurisdiction, to analyse these data sets and disseminate information and statistics.

The *Australian Institute of Health and Welfare Act 1987*, in conjunction with compliance to the Privacy Act 1988 (Cth), ensures that the data collections managed by the AIHW are kept securely and under the strictest conditions with respect to privacy and confidentiality.

For further information see the AIHW website <http://www.aihw.gov.au>.

The AIHW receives registration (including demographic) information on nurses and midwives via the mandatory national registration process administered by AHPRA and the voluntary Nursing and Midwifery Workforce Survey data collected at the time of registration renewal. The registration and workforce survey data are combined, cleansed and adjusted for non-response to form a national data set known as NHWDS: nurses and midwives.

The AIHW is the data custodian of the NHWDS: nurses and midwives.

Timeliness:

The NHWDS: nurses and midwives will be produced annually during the national registration renewal process, conducted between 1 April and 31 May each year, including the collection of the Nursing and Midwifery Workforce Survey. The period for the 2011 renewal process was extended to the end of June 2011 for Queensland and end of December 2011 for Western Australia registrants. Future registration renewals in Queensland and Western Australia are expected to align with the official AHPRA closing date of 31 May.

The 2011 renewal process was extended until 30 June 2011 in Queensland and 31 December 2011 in Western Australia and therefore respondents were able to complete the survey up to the end of the respective periods.

Extraction of the data was delayed till September 2011 to allow for the delay to Queensland data. This delay has also enabled a significant proportion of the Western Australian data to be collected. Though there were still incomplete surveys at this time, the number was small enough to not affect the workforce survey estimates, but was noted in the *Nursing and Midwifery Workforce 2011* report.

The release of this data was later than originally scheduled, as the AIHW expected to receive both the registration and workforce survey data simultaneously at the end of September 2011, and due to a number of factors, useable registration and workforce survey data was not received from the AHPRA until late December 2011.

The bulk of paper form data (including some extra late-supplied forms and, in particular, further Western Australian forms) was not supplied until January 2012. Investigation of response rates by the AIHW uncovered a shortfall of paper forms for the Australian Capital Territory which were subsequently located and loaded in April 2012, together with some additional late Western Australian paper survey forms.

These data were then revised in September 2012 when large differences were found between Medical practitioner data for 2010 and 2011 data, which prompted a change in extract methodology. Nursing and midwifery 2011 registration data were re-extracted from the AHPRA backup database as at the end of November 2011.

Accessibility:

Results from the NHWDS: nurses and midwives 2011 are published in the *Nursing and Midwifery Workforce 2011* report. The report, workforce survey questionnaire, user guide to the data set and additional detailed tables are available on the AIHW website <http://www.aihw.gov.au/workforce-publications/> (select link to *Nursing and Midwifery Workforce 2011*).

Users can request data not available online or in reports via the Communications, Media and Marketing Unit on (02) 6244 1032 or via email to info@aihw.gov.au. Requests that take longer than half an hour to compile are charged for on a cost-recovery basis.

Access to the master unit record file may be requested through the AIHW Ethics Committee.

Interpretability:

Information to aid in interpreting the NHWDS: nurses and midwives 2011 may be found in Appendix A of the *Nursing and midwifery workforce 2011* report. The report is based on this data set. (See 'Accessibility' for details.)

Relevance: Nurses and midwives are required by law to be registered with the Nursing and Midwifery Board of Australia to practise in Australia. All nurses and midwives must complete the formal registration renewal form(s) to practise in Australia. This is the compulsory component of the renewal process. In 2011, Queensland and Western Australia nurses and midwives with registrations expiring after the official AHPRA closing date of 31 May (extended to 30 June for Queensland and to 31 December for Western Australia) had their registration details migrated from the respective state nursing and midwifery board/council. (See 'Accuracy' for quality of migrated data.)

The Nursing and Midwifery Workforce Survey is voluntary and only practitioners who are on the register at the time of the survey and required to renew their registration receive a questionnaire for completion. Typically, new registrants registering outside the registration renewal period will not receive a survey form. These practitioners will receive a survey form when they renew their registration the following year, during the registration renewal period.

Scope and coverage

The NHWDS: nurses and midwives 2011 contain registration details of all registered nurses and midwives in Australia as at 31 May 2011.

Data were extracted from the AHPRA backup database as at the end of November 2011 to allow for late registrations from Queensland and Western Australia. Queensland and Western Australia nurses/midwives with registrations expiring after the official AHPRA renewal date of 31 May (extended to 30 June for Queensland and to 31 December for Western Australia) had their registration details migrated from the respective state nursing and midwifery board/council. (See 'Accuracy' for quality of migrated data.)

It also has workforce data of respondents, obtained from the Nursing and Midwifery Workforce Survey 2011.

Accuracy:

Data manipulation and estimation processes

The registration and workforce survey data are combined, cleansed and adjusted for non-response to form the National Health Workforce Data Set (NHWDS). The cleaning and editing procedures included range and logic checks, clerical scrutiny at unit record level, and validation of unit record and aggregate data.

The data have undergone imputation for item non response and are weighting to adjust for population non response. It should be noted that both of these kinds of non-response are likely to introduce some bias in the final survey data and any bias is likely to become more pronounced when response rates are low. Care should be taken when drawing conclusions about the size of the differences between estimates.

As a result of the estimation method to adjust for non-response, numbers of nurses/midwives may have been in fractions, but have been rounded to whole numbers for publication. The FTE rate calculations are based on rounded numbers.

Response rates and mode

The NHWDS: nurses and midwives 2011 contains registration details of all registered nurses and midwives in Australia as at 31 May 2011. Therefore, all registrants are notionally in the data set.

The data set also contains workforce information for registered nurses and midwives who completed the Nursing and Midwifery Workforce Survey. The overall response rate to the 2011 survey was 85.1%; that is, the number of responses to the survey represented 85.1% of registered nurses and midwives. Of these responses, 86.7% completed the survey online and 13.3% used the paper form.

The 2011 survey excluded some nurses and midwives whose principal state of practice was Western Australia because not all registrations in this state expired by the national registration deadline of 31 May 2011. Irrespective of this shortcoming, the apparent response rate for Western Australia of 62.1% was almost double the response rate of 35.4% achieved for Western Australia in the 2009 AIHW Nursing and Midwifery Labour Force Survey.

Survey response rates rose significantly in 2011, by 41.8 percentage points from 44.4% in 2009 to 86.2% in 2011, although response rates for 2011 are not directly comparable with those for prior years because the previous jurisdiction-based data

collection used to collect information was replaced with a single data collection as part of the national registration scheme introduced on 1 July 2010.

Registration data from the NRAS

Registration details were migrated from the respective state and territory professional board (or council) for practitioners with registrations expiring after the official AHPRA closing date for their profession.

Some data items collected as part of the previous AIHW Nursing and Midwifery Labour Force Survey—such as date of birth, sex, and country of first qualification—are now data items collected as part of the registration and renewal process. However, either the data for some of these items are incomplete or the data migrated from previous jurisdictional registration systems is incomplete.

In particular, there were issues with the quality and completeness of date of birth, sex and state and territory of principal practice, which is of particular concern as these data items are used in the estimation process. A small number of missing values of date of birth and sex were imputed, and thus affected the weighting method.

Nurses/midwives who reside overseas have been included with practitioners whose state or territory of principal practice and state or territory of main job, respectively, could not be determined. Therefore, the missing values cannot be imputed, and thus affected the weighting method.

Citizenship and residency status data are not consistent for many nurses and midwives. For example, nurses and midwives reported being Australian citizens and permanent residents.

Nurses and midwives may be registered in multiple categories such as registered nurse and midwife, registered and enrolled nurse, enrolled nurse and midwife, or registered and enrolled nurse and midwife. Registered nurses include those registered as midwives but not as nurses. Midwives appear as a subset of the registered and enrolled nurses categories. Those registered as midwives only were included in people registered as a midwife.

For a large number of nurses and midwives, country of birth and country of initial qualification data contained 3-character codes rather than the names of countries. Most of the codes were successfully mapped to a country in the Standard Australian Classification of Countries (SACC), but there were some for which a country could not be determined. These records were coded to 'Not stated'.

Postcodes of principal practice and residence contained text strings, such as invalid postcodes, suburb names and overseas postal codes. Therefore, after cleaning and recoding, many of these were still coded to the 'Not stated' category. As a result, the derivation of Australian Standard Geographic Classification Remoteness Area categories for these records was not possible.

Invalid values and formats for date of birth and year of initial qualification appeared in the registration data collected by the NRAS. For example, system dates such as 1 January 1900, University of Sydney.

Health Workforce Survey

Not all registrations in Western Australia expired on 31 May 2011, the extended date set by the AHPRA as the official closing date for registration. The registration for these practitioners was transferred to the national scheme and there was no renewal required; surveys were not completed for these practitioners.

Those not required to renew their registration in 2011 will renew their registration in either 2012 or 2013.

Workforce Survey 2011 design

In 2011, the online survey questionnaire did not include electronic sequencing of questions to automatically guide the respondent to the next appropriate question based on previous responses to questions. This resulted in a number of inconsistent responses. For instance, respondents not correctly following the sequencing instructions for the employment questions may be assigned to an incorrect labour force status or not assigned a status due to incomplete data.

The order of the response categories for the 'Reason not working in medicine in

Australia' question appears to be an issue. The question has 'Retired from regular work' after 'Not working in paid employment at all' which may not be logical as practitioners may be retired but may still work irregularly (for example, as an occasional temporary nurse). On this basis, the category 'Retired from regular work' should appear before 'Not working in paid employment at all'. The issue with the order in the 2011 survey questionnaire is that it may lead to an undercount of those retired from regular work and over-representation of those not working in paid employment.

Variation between the online and paper surveys has provided additional data quality issues for a number of questions. For example, the state of main job included the category 'Other territories' on the paper form while the same response category in the online form was labelled 'Other'. The data showed a large number in the 'Other' category captured in the online method, which was not similarly found in the paper responses. In addition, state/territory of principal practice and residence data items does not include the category 'Other territories' or 'Other'. Adding to this confusion was the treatment of people who had overseas addresses, as many of them ticked the box 'Other territories' and reported non-Australian addresses.

In 2011, the online Nursing and Midwifery Workforce Survey did not ask practitioners to answer whether or not they are a temporary resident, but only to enter their visa category number if they self-identify as a temporary resident. However, the paper form asks practitioners to check 'Yes' or 'No' to the temporary resident question and, depending on the response, either answer or skip the visa category question. The temporary resident status data item is incomplete.

Inconsistencies between workforce survey and registration data

There were a number of inconsistencies between the data sourced from the NRAS and the workforce survey data.

There were many records where the response to the survey question regarding temporary residency visa was inconsistent with registration data for citizenship and residency status (which themselves were occasionally inconsistent). For example, some citizens and permanent residents reported temporary visas and vice versa.

Location of principal practice recorded in the registration data was different from the corresponding details of their main job self-reported by nurses and midwives in the survey.

Although this is valid for states and territories with common borders, there were some records where the two locations did not adjoin each other. The state or territory with the worst alignment is the Northern Territory, where it appears that 9% more nurses and midwives have the Northern Territory as their state of main job in the week before the survey than have it as their principal practice location.

The decision was therefore taken to use a derived location based firstly on main job information and then on principal practice location if the main job location was missing, and subsequently on residential address if the principal practice location was also missing. This derived state is used in all tables except where otherwise stated.

Structure and format of data items

Due to unstructured data entry formats, a number of items in the NHWDS: nurses and midwives 2011 that required a numeric value contained text string responses. Where possible, these were recoded to the appropriate numeric value, but this was not possible in all instances. For example, for a number of records, postcode of principal practice contained values other than valid postcodes, including text strings, overseas postal identifiers, and so forth. Conversely, suburb of main job contained invalid suburb names and 4-digit codes resembling postcodes. Processing these was complicated as some countries (including New Zealand) use 4-digit postal identifiers superficially identical to Australian postcodes.

Coherence:

Workforce Survey 2011—coherence with previous surveys

Nursing and midwifery labour force data published by the AIHW before the NRAS was established were the result of collated jurisdiction-level occupation-specific surveys. The current survey, Nursing and Midwifery Workforce Survey 2011, collects similar data items; however, the survey methodology has changed, as has the method of obtaining benchmark data on which the numbers of total registrations are based. With the establishment of the AHPRA, there is one source of

benchmark data instead of eight and there is less chance of inconsistency between jurisdictions and years in the scope of benchmark data.

The scope and coverage of the Nursing and Midwifery Workforce Survey 2011 is also different from that of the previous surveys because in some jurisdictions not all types of registered nurses and midwives were sent a survey form.

Date of birth, country of initial qualification, specialty of practice and sex are some data items previously collected by the AIHW Nursing and Midwifery Labour Force Survey, but now collected by the NRAS. However, data for some of these items are either incomplete or inaccurate (see 'Accuracy').

Temporary resident status was not collected on a national basis before 2011 in the AIHW Nursing and Midwifery Labour Force Survey. Some jurisdictions collected temporary resident status. Visa category number was not collected in prior years.

The three employment-related questions in the Nursing and Midwifery Workforce Survey 2011 questionnaire are nationally consistent. This is an improvement on the previous AIHW Nursing and Midwifery Labour Force Survey where the questionnaire varied across jurisdictions, including the questions and definitions of data items collected. However, the redesigned question on working status no longer includes in its explanation of 'Working in nursing' or 'Working in midwifery' a description of work activity/hours (that is 'worked for a total of 1 hour or more last week in a job or business (including own business) for pay, commission, payment in kind or profit; or hours usually worked but away from work on leave, or rostered off last week'). Inclusion of the additional explanation may have avoided confusion for nurses and midwives who worked during the survey reference week but in a voluntary capacity.

A change in the response options in the questions covering principal role, area of nursing or midwifery and work setting of main job all contributed to differences in reporting.

Number of years intended to remain in the workforce was not previously collected by the AIHW Nursing and Midwifery Labour Force Survey on a national basis. A small number of jurisdictions collected this information previously as part of their survey questionnaire, but it is now included for all respondents.

Due to the differences in data collection methods, including survey design and questionnaire, it is recommended that comparisons between workforce data in the NHWDS: nurses and midwives 2011 and previous AIHW Nursing and Midwifery Labour Force Survey data be made with caution.

Workforce Survey 2011—coherence with other data sources

ABS Census

The ABS Census of Population and Housing, conducted every 5 years, is the other main source of data on health workforce numbers in Australia. The Census is self-enumerated by respondents and therefore the numbers of people who report their occupation as a health professional is not directly comparable with numbers from the NRAS or estimates from the Workforce Surveys. The results of the 2011 Census include data on occupations classified using the Australian and New Zealand Standard Classification of Occupations revision 1 (ANZSCO) (ABS 2009). Occupation data are collected for the main job held during the week before Census night.

The ANZSCO definition of medical practitioners and dentists effectively excludes non-clinicians but the nursing and midwifery group includes categories for nurse managers, educators and researchers.

In the 2011 Census results there were :

257,182 nurses and midwives, compared to 286,701 employed nurses and midwives in the NHWDS: nurses and midwives 2011 (11.5% higher). There was no nursing survey conducted in 2006 so there is no comparator for the 2006 Census, but the difference is marginally higher than that for Medical practitioners and may reflect some nurses being reported in non-nursing categories; for example, nurse clinical directors are grouped with Health and Welfare Service Managers. There were 227,712 employed clinical nurses and midwives in the NHWDS: nurses and midwives 2011.

There were 189,017 not stated and unknown responses to the occupation field in the census plus 32,125 Professionals (no further description) plus 2,114 Health professionals (no further description) coded in the Census. If these unknowns were evenly distributed across professions the Census figures above would be around 4% higher.

Report on Government Services (ROGS) data

The rates in the ROGS report are based on people in the nursing and midwifery workforce, while the AIHW generally reports only on those who are employed. As a result, the rates in the ROGS report are slightly higher than those published elsewhere.

Registration data from the NRAS—coherence with published Board data

AIHW numbers are a point in time estimate while the AHPRA numbers include people registered in the previous 12 months, thereby including registrants whose registration terminated during that period (including short term registrants)

The nurses/midwives registration data for 2011 is consistent with data reported in the 2010–11 AHPRA annual report, with 330,680 total registrations on the files used by AIHW for 2011, compared with 332,185 registrations at 30 June 2011 in the AHPRA annual report. The Nursing and Midwifery Board of Australia in their quarterly data tables reported 341,189 for March 2012 and 343,703 for June 2012.

Source and reference attributes

Submitting organisation: Australian Institute of Health and Welfare

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