National Health Workforce Data Set: nurses and midwives 2013: National Health Workforce Data Set, 2013; Data Quality Statement

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Identifying and definitional attributes

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Data quality

Data quality statement summary:

Summary of key issues

The National Health Workforce Data Set (NHWDS): nurses and midwives 2013 contains information on the demographics, employment characteristics, primary work location and work activity of nurses and midwives in Australia who renewed their registration via the National Registration and Accreditation Scheme (NRAS) in 2013.

This is the third data set published for nurses and midwives from the new national registration scheme. The data set is comprised of registration information provided by the Australian Health Practitioner Regulation Agency (AHPRA) and workforce details obtained by surveys.

This data quality statement should be read in conjunction with the footnotes and commentary accompanying tables and graphs in the web pages http://www.aihw.gov.au/workforce/nursing-and-midwifery/.

Description

The NHWDS: nurses and midwives 2013 is a combination of registration and survey data collected through the nurse and midwife registration renewal process.

Registration data
All nurses and midwives must be registered with the AHPRA to practise in Australia. Nurses and midwives (see Box 1.3) are required by law to renew their registration through the NRAS, either online via the AHPRA website or using a paper form provided by the AHPRA. For initial registration, practitioners must use a paper form and provide supplementary supporting documentation.

Whether for renewal or initial registration, this information is referred to as 'registration data'. Data collected includes demographic information such as age, sex and country of birth; and details of health qualification(s) and registration status. This is the compulsory component of the registration process.

Registration details on NHWDS: nurses and midwives 2013 were collected either from the compulsory registration renewal form, from new registrations or from registration details migrated from the respective state and territory health boards before their dissolution. Copies of registration forms for new registrants are available on the relevant board websites, which can be accessed from the AHPRA website http://www.ahpra.gov.au/.

Between 2012 and 2013, there was a drop in midwife registrations, from 35,632 to 33,969. This was due to a drop in dual midwife/nurse registrations. In regards to this, the 2012-13 Annual report: AHPRA and National Boards states 'Many registrants who held dual registration when the National Scheme began have, over time, chosen to renew their registration in one of the professions. This is likely to be related to the requirement in the National Scheme for registrants to meet the requirements in the registration

standards for recency of practice and continuing professional development relevant to each profession when they renew their registration.' (AHPRA 2014, p 61).

Survey data
When nurses and midwives renew their registration online they are asked to complete an online survey customised for each profession. When nurses and midwives renew their registration using a paper form they are also asked to complete a paper version of the relevant survey. Copies of the survey forms are available from the AIHW website http://www.aihw.gov.au/workforce/nursing-and-midwifery/.

Database creation
The AHPRA stores both the online registration data and the online survey information in separate databases. They send these two de-identified data sets to the AIHW, where they are merged to form part of the national data set.

The paper registration data and paper survey forms were also received by the AHPRA. The AHPRA then sent these paper forms to Health Workforce Australia (HWA) to be scanned into a data set. HWA sent this data set to AIHW for merging with online registration data and data from the online survey forms, and for cleansing and adjustment for non-response to form a nationally consistent data set. The final data set is then known as the National Health Workforce Data Set: nurses and midwives.

Institutional environment:

The AIHW is a major national agency set up by the Australian Government under the Australian Institute of Health and Welfare Act 1987 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 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 with non-government organisations to achieve greater adherence to these standards in administrative data collection 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 to disseminate information and statistics.

Compliance with the Australian Institute of Health and Welfare Act 1987 and the Privacy Act 1988 (Cwlth) 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 AHPRA is the organisation responsible for the implementation of the NRAS across Australia. The AHPRA works with the National Health Practitioner Boards to regulate health practitioners in the public interest and to ensure a competent and flexible health workforce that meets the current and future needs of the Australian community.

HWA were responsible for the development of the workforce surveys.
The AIHW receive registration information and voluntary survey data from the AHPRA on allied health practitioners via the mandatory national registration process, collected at the time of registration renewal. The registration and survey data are combined, cleansed and adjusted for non-response to form a national data set known as NHWDS: nurses and midwives 2013.

The AIHW is the data custodian of the NHWDS: nurses and midwives 2013.

Timeliness:

The NHWDS: nurses and midwives 2013 is created through the national registration renewal process, which was conducted between 1 April and 31 May 2013. Although the reference time is notionally the renewal date, 31 May 2013, legislation allows for a 1 month period of grace. Thus, the final registration closure date is 1 month after the renewal date. The AHPRA allows a further 2 weeks to allow for mail and data entry delays for completeness. Consequently the extraction of data occurs a month and a half after the renewal date ('the extraction date').

The survey data were also collected between 1 April and 30 June 2013, as the survey is administered as part of the registration renewal process.

Due to delays with release of data from the new national registration system, complete and final data were provided to the AIHW later than originally scheduled.

The data needed joint reviews by the AHPRA, the AIHW and HWA to manage the range of considerations and data quality issues. This review process improved data quality, data definitions, metadata and data cleansing. This process delayed the supply of data but improved the overall quality.

The AIHW did not receive complete data for 2013 until February 2014, with data initially having been expected in July 2013. The AHPRA have indicated that future data provision is anticipated to be more timely and to be provided six weeks from the close of registration on 31 May. The release date of the NHWDS: nursing and midwifery 2013 is the 9th of September 2014.

Accessibility:

Users can request data not available online or in reports through the AIHW data request management system http://www.aihw.gov.au/custom-data-request-service/ or via the Media and Strategic Engagement 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 files may be requested through the AIHW Ethics Committee.

Interpretability:

Descriptions of data items in the National Health Workforce Data Set: nurses and midwives 2013 are available on request from the Expenditure and Workforce Unit at the AIHW.

The surveys used by nurses and midwives are available from the AIHW website http://www.aihw.gov.au/workforce/nursing-and-midwifery/.

Relevance:

The primary purpose of the National Health Workforce Data Set: nurses and midwives 2013 is to provide information on the number and the demographic and employment characteristics of nurses and midwives in Australia.

The NHWDS: nurses and midwives 2013 is relevant for understanding the size and characteristics of the nursing and midwifery workforce in Australia. It is therefore highly relevant for health agencies involved in workforce planning as well for health policy planning and implementation in general.

The location and distribution of the workforce, as well as demographic details such as age and sex of nurses and midwives, are useful for workforce planning within states and territories and nationally. Information on qualifications is relevant for the relevant professional associations and for educational planning.

Accuracy:

Survey responses

The response rates for the Nursing and midwifery survey in 2013 was 87.6% slightly down from the 93.3% achieved in 2012. The response rate for Non-Practicing registrants, of which there were only 3,796, was lower at 66.9%. The response rates remain significantly better than response rates under the pre 2011 system where response rates in 2009 (for example) were only 44.4%.

Data are reported on the basis of the most current address at the time the survey was undertaken, unless stated otherwise. The data include employed nurses and midwives who did not state or adequately describe their location as well as employed nurses and midwives who were overseas. The national estimates include these groups.

In 2012 the survey design changed so that the hours reported were split by nursing and midwifery. In 2013, a total of 9,414 nurses and midwives reported working the same number of hours in both nursing and midwifery (up from 5,377 in 2012), so the total hours worked in each may be a duplication. This may result in an over-estimate of the total hours worked by up to 0.3%. It is apparent that data for some groups will be more significantly affected than others and, in particular, data for midwives are not presented as the total hours as they may be overstated by up to 32%.

Estimation procedures

The AIHW uses registration data together with survey data to derive estimates of the total nursing and midwifery workforce. Not all nurses and midwives who receive a survey respond, because it is not mandatory to do so. In deriving the estimates, two sources of non-response to the survey are accounted for:

- item non-response—occurs as some respondents return partially completed surveys. Some survey records were so incomplete that it was decided to omit them from the reported survey data.
- survey non-response—occurs because not all registered nurses and midwives who receive a questionnaire respond.

A separate estimation procedure is used for each. Imputation is used to account for item non-response and weighting is used for survey non-response.

Imputation: estimation for item non-response

The imputation process involves an initial examination of all information provided by a respondent. If possible, a reasonable assumption is made about any missing information based on responses to other survey questions. For example, if a

respondent provides information on hours worked and the area in which they work, but leaves the workforce question blank, it is reasonable to assume that they were employed.

Missing values remaining after this process are considered for their suitability for further imputation. Suitability is based on the level of non-response to that item.

In imputation, the known probabilities of particular responses occurring are used to assign a response category value to each record, using a random number generator. Imputed values are based on the distribution of responses occurring in the responding sample. Therefore, fundamental to imputing missing values for survey respondents who returned partially completed questionnaires is the assumption that respondents who answer various questions are similar to those who do not.

Age values within each state and territory of principal practice are first imputed to account for missing values. Other variables deemed suitable for this process were then imputed. These include hours worked in the week before the survey and principal role of main job.

Imputation: estimation for population non-response
This year the methodology for population non-response has changed from a weighting based methodology to a randomised sequential hot deck based imputation similar to that used for imputing unreported hours in prior years.

A weighting methodology is where each survey record (or respondent) is assigned a weight that is calibrated to align with independent data on the population of interest, referred to as 'benchmarks'. In principle, this weight is based on the population number (the benchmark) divided by the number in the responding sample. The resulting fraction becomes the expansion factor applied to the record, referred to as the 'weight', providing an estimate of the population when aggregate output is generated. Therefore, the weight for each record is based on particular characteristics that are known for the whole population.

The strata used for imputation are division/midwifery categorisation, sex, age group, remoteness area and state, in that order. The data is sorted into strata so that imputations will be made using survey data from records that have similar registration details and that the appropriate survey type is used. Donor records are spaced evenly within strata to ensure records will be used within the strata an equal number of times plus or minus 1 and that most strata within the hot deck will be restricted to within strata imputations. For example, if there are 5 respondents and 12 non respondents in a cell the expected number of uses would be 2.4, resulting in each donor being used either 2 or 3 times. This is almost equivalent to a weighting strategy except that instead of all the data being weighted only the non-registration data are weighted.

Because the data are imputed and not weighted some data will be biased in different ways from that previously published. In particular, because a nurse or midwife's location of main job is most likely to be the same as their registration address this has been used for the location estimation of non-respondents. We know however that for respondents the location of main job is not always the same as the registered address and this will lead to some bias. The estimated number of registered nurses and midwives in Northern Territory is 1.2% lower under imputation than under weighting. The estimated number of registered nurses and midwives in very remote areas is 5.6% lower under imputation than under weighting.

For variables not used in the imputation (for the NHWDS: Nurses and Midwives 2013, that is all variables other than the registration type, Division/midwifery category, remoteness area, state and territory of principal practice, age and sex), it is assumed, for estimation purposes, that respondents and non-respondents have the same characteristics. If the assumption is incorrect, and non-respondents are different from respondents, then the estimates will have some bias. The extent of this cannot be measured without obtaining more detailed information about non-respondents. Therefore, there will be some unquantifiable level of bias in the estimates.

The 2012 survey introduced a new set of questions specifically addressed at collecting hours worked in midwifery as opposed to hours worked in nursing. An unforseen consequence of the new questions was that in 2012 there were 5,377

people registered as both nurses and midwives who reported working the same number of hours in both nursing and midwifery so the total hours worked in each may be a duplication. This may result in an over-estimate of the total hours worked in the order of 0.2%, or the total average hours by 0.06. On the other hand the leverage of 5,377 potential duplications on the 30,791 midwives is of the order of 17%, though some of these may be legitimate records where equal hours were worked in nursing and midwifery.

The number of respondents who reported working the same number of hours in both nursing and midwifery in 2013 was 9,414. Leverage of 9,414 records on 29,831 midwives in 2013 is 32% - a difference of 14 percentage points. As such, analysis based on total working hours (including calculation of full time equivalents) for those registered midwives who did not state any hours worked in midwifery should not be included. For data on groups involving large numbers of midwives, such as the area of maternity care in nursing, should be treated with extreme caution.

Coherence:

Data collected for NHWDS: nurses and midwives 2013 is comparable with 2012 data for most variables as the survey structure was largely comparable, with some new categories and questions introduced and some categories collapsed. Exceptions include:
New questions on:

- Country of Initial Nursing and Midwifery degree,
- Attendance of births as the primary midwife.
- Hours per month working in a(nother) regional rural or remote location.

In 2012 the questions regarding hours worked in the public and private sector were based on all hours worked whilst the questions in 2013 have been limited to clinical hours only.

Two new categories were added to the Principal area of practice for nurses 'Drug and alcohol' and 'Palliative care'. In addition 'Community nursing' replaced 'Community health'. The Work setting categories for nursing were reduced, collapsing residential facilities and community services and dropping maternity service from the list. The categories in the equivalent question for midwives did not change.

The Nursing and Midwifery Workforce Survey 2013 collected temporary resident status and visa allowing only the most common responses in previous surveys from pick lists. In 2012 and previously, the visa category number was collected in a 4 character set of boxes where the number could be written in.

Due to the differences in data collection methods, including differences in the design of surveys and questionnaires, it is recommended that comparisons between workforce data in the NHWDS: nurses and midwives 2011 to 2013 and previous AIHW Nursing and Midwifery Labour Force Survey data be made with caution.

Data products

Implementation start date: 22/08/2014

Source and reference attributes

Submitting organisation: Australian Institute of Health and Welfare

Steward: Australian Institute of Health and Welfare

Relational attributes

Related metadata references: Has been superseded by National Health Workforce Data Set: nurses and midwives 2014: National Health Workforce Data Set, 2014; Data Quality Statement AIHW Data Quality Statements, Standard 04/08/2015