National Health Workforce Data Set: dental practitioners 2012; Data Quality Statement

Identifying and definitional attributes

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Data quality

Quality statement summary:

Summary of key issues

The NHWDS: dental practitioners 2012 contains information on the demographics, employment characteristics, primary work location and work activity of all dental practitioners in Australia who renewed their registration with the Dental Board of Australia via the National Registration and Accreditation Scheme (NRAS) introduced on 1 July 2010.

This is the second data published for dental practitioners from the NRAS. The data set is comprised of registration information provided by the Australian Health Practitioner Regulation Agency (AHPRA) and workforce details obtained by the Dental Workforce Survey.

This data quality statement should be read in conjunction with the footnotes and commentary accompanying tables and graphs throughout the *Dental workforce 2012* publication.

Description

The NHWDS: dental practitioners 2012 is a combination of data collected through the dental practitioner registration renewal process.

Registration data
All dental practitioners must be registered with the AHPRA to practise in Australia. Dental practitioners 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 suc has age, sex and country of birth
- details of health qualification(s)
- registration status.

This is the compulsory component of the registration process.

Registration details on NHWDS: dental practitioners 2012 were collected either from the compulsory registration renewal form, new registrations or 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 Dental Board of Australia (DBA) website, which can be accessed from the AHPRA website http://www.ahpra.gov.au/.

Dental Workforce Survey data
When dental practitioners renew their registration online they are asked to complete an online survey. When dental practitioners renew their registration using a paper form they are also asked to complete a paper version of the survey.

Dentists, oral health therapists, dental hygienists, dental therapists and dental prosthetists complete the same survey form.

Copy of the Dental Workforce Survey questionnaire is available from the AIHW website http://www.aihw.gov.au/workforce-publications/ (select link to Dental workforce 2012, additional material).

Database creation

The AHPRA stores both the online registration data and the survey information in separate databases. They send these 2 de-identified data sets to the Australian Institute of Health and Welfare (AIHW), where they are merged into a national data set.

The paper registration and survey forms are sent to the AHPRA, where the paper registration forms are scanned and merged with the data obtained from the online process. The AHPRA sends the paper survey forms to the Health Workforce Australia (HWA) to be scanned into a data set. The HWA sends this data set to the AIHW for merging with the online survey forms and registration data, cleansing (including derivation of primary dental practitioner type) 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: dental practitioners.

The AHPRA collects information on each division of general registration; that is dentist, oral health therapist, dental hygienist, dental therapist and dental prosthetist. It is possible for dental practitioners to have more than 1 division of general registration e.g. registered as a dental hygienist and dental therapist. The AIHW assigns a primary registration division to practitioners with more than 1 division of general registration. The method used changed from 2011 and 2012 (see Box 1); therefore, comparison of 2011 and 2012 data should be made with caution.

Box 1: Primary dental division of general registration

In the NHWDS: dental practitioners, dental practitioners who are registered in more than 1 division of general registration have been assigned a primary (or main) division. The methodology to assign a primary dental division of general registration changed from 2011 and 2012, with the treatment of practitioners with both dental hygiene and dental therapy registrations being the main difference.

In 2011, oral health therapists included those with both dental therapy and dental hygienist registrations. In 2012, practitioners with both dental hygiene and dental therapy registrations were treated as either a dental therapist or dental hygienist depending on other eligibility criteria (e.g. principal area of main job, whether worked more hours in private or public sector and geographic location). The different methods may, in part, have contributed to a 30.6% decrease in oral health therapists and an increase in dental hygienists and dental therapists (36.1% and 8.3%, respectively).

Further details of the 2011 and 2012 methods are below.

2011 method

The method was based on the following criteria applied to dental practitioners with 2 types of general registrations:

- if they had both dental hygienist and dental prosthetist registrations, then the practitioner was treated as a dental hygienist
- if they had both dental therapist and dental prosthetist registrations, then the practitioner was treated as a dental therapist
- if they had both dental hygienist and dental therapist registrations, then the practitioner was treated as an oral health therapist.

2012 method
Dental practitioners are assigned a primary division of registration based on the following criteria in the order listed:

- if they have a dentist registration, then the practitioner is treated as a dentist.
- if they have an oral health therapist registration, then the practitioner is treated as an oral health therapist.
- if they have both dental hygienist and dental therapist registrations and if their principal area of practice is dental hygiene, then the practitioner is treated as a dental hygienist.
- if they have both dental hygienist and dental therapist registrations and if their principal area of practice is dental therapy, then the practitioner is treated as a dental therapist.
- if they have both dental hygienist and dental therapist registrations and if they are in Western Australia and work the majority of hours in the private sector, then they are treated as a dental therapist.
- if they have both dental hygienist and dental therapist registrations and if they are not in Western Australia and work the majority of hours in the private sector, then they are treated as a dental hygienist.
- if they have both dental hygienist and dental therapist registrations and if they work the majority of hours in the public sector, then they are treated as a dental therapist.
- the remaining practitioners with both dental hygienist and dental therapist registrations are treated as dental hygienists.
- the remaining practitioners with a dental hygienist registration are treated as a dental hygienist.
- the remaining practitioners with a dental therapist registration are treated as a dental therapist.
- the remaining practitioners with a dental prosthetist registration are treated as a dental prosthetist.

Institutional environment:

Australian Institute of Health and Welfare

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 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, and 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* (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 AIHW is the data custodian of the NHWDS: dental practitioners 2012.

Australian Health Practitioner Regulation Agency

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.

Health Workforce Australia

The HWA is an Australian government agency established by the Council of Australian Governments to address the challenges of providing a skilled, flexible and innovative health workforce that meets the needs of the Australian community. The HWA are responsible for the development of the Dental Workforce Survey and other profession-specific workforce surveys.

Timeliness:

The NHWDS: dental practitioners, is produced annually from the national registration renewal process, and conducted between 1 October and 30 November (the renewal date) each year. Although the reference time is notionally the renewal date, 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 before the registrations are considered expired. Consequently the extraction of data occurs (the extraction date) a month and a half after the renewal date.

The survey data are also collected between 1 October and 30 November, as their collection is administered as part of the registration renewal process.

The exceptions to this timetable are in relation to limited and provisional registrations, where the registrant is renewed on the anniversary of their commencement. These responses are included with the regular survey respondents.

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

Data provided needed joint reviews by the AHPRA, 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. The process also led to improvements in AHPRA's extracting scripts to provide consistency in data exchange specifications. This process delayed the supply of data but improved the overall quality. The HWA has provided funding and assistance to the AHPRA to improve their survey tool infrastructure to improve timeliness and quality of data provision in future.

The AIHW did not receive complete data for 2012 until July 2013. The AHPRA have indicated that future data provision is anticipated to be timely and be 6 weeks from the close of registration on 30 November.

Accessibility:

Results from the NHWDS: dental practitioners 2012 are published in the *Dental workforce 2012* report. The report and workforce survey questionnaire are available from the AIHW website http://www.aihw.gov.au/workforce-publications/ (select link to Dental workforce 2012).

Users can request data not available online or in reports 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 file may be requested through the AIHW Ethics Committee.

The HWA provide a data tabulation tool, including data from the National Health Workforce Data Set, on their website http://www.hwa.gov.au/work-programs/information-analysis-and-planning/health-workforce-data.

Interpretability:

Descriptions of data items in the NHWDS: dental practitioners 2012 are available on request from the Expenditure and Workforce Unit at the AIHW.

The Dental Workforce Survey questionnaire is available from the AIHW website http://www.aihw.gov.au/workforce-publications/ (select link to Dental workforce 2012, additional material).

Relevance:

The primary purpose of the NHWDS: dental practitioners 2012 is to provide information on the number and demographic and employment characteristics of dental practitioners.

The NHWDS: dental practitioners 2012 is relevant for understanding the size and characteristics of the dental workforce in Australia.

The NHWDS: dental practitioners 2012 is therefore highly relevant for health agencies involved in workforce planning, as well as 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 dental practitioners are highly useful for workforce planning within states and territories and nationally. Information on qualifications is relevant for the relevant professional associations and educational planning.

Scope and coverage

The NHWDS: dental practitioners 2012 contains registration details of all the registered dental practitioners in Australia at the extraction date, a month and a half after the nominal renewal date of 30 November 2012.

The NHWDS: dental practitioners 2012 also contain details from the Dental Workforce Survey. The survey collects information on the employment characteristics, work locations and work activity of dental practitioners. Completion of the survey is voluntary and only dental practitioners who are on the register at the time of the survey and required to renew their registration receive a questionnaire for completion. 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.

Accuracy:

Estimation procedures

The AIHW uses registration data together with survey data to derive estimates of the total dental practitioner workforce. Not all dental practitioners who receive a survey respond, because it is not mandatory to do so. In deriving the estimates, 2 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 practitioners who receive a questionnaire respond.

A separate estimation procedure is used for each. Imputation is used to account for item non-response, and weighting 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. Imputation is usually applied only in cases where the proportion of missing values is less than 5% of the total.

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 or the sequential hot deck imputation method. 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 and sex 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.

Weighting: estimation for population non-response

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 total number of registered dental practitioners is used to benchmark the survey.

The calculation of weights is usually part of the data processing for a sample survey in which the sample is selected before the survey is done. In the 2012 survey of dental practitioners, all renewing registrants were sent a workforce survey questionnaire when registration renewal was due. Therefore, technically, it was a census of dental practitioners. However, because not all renewing registrants in scope respond to the survey, there is a non-response bias in the data. Because the group of respondents in the data set is not random, standard errors are not a suitable means of gauging variability.

The benchmark data used for weighting are the number of registered dental practitioners in each state and territory (based on the location of principal practice), within the registratin data, grouped by:

- broad registration type—'general and specialist' (including people with only a specialist registration), 'provisional', 'non-practising' and 'general' (including general and limited registrations)
- type of dental practitioner—'dentist ', 'oral heath therapist', 'dental hygienist', 'dental therapist', 'dental prosthetist'
- whether registered in the profession or not
- age group
- sex.

Producing estimates for the dental profession by weighting the data from respondents adjusts for bias in the responding group of dental practitioners, but only for known population characteristics (such as age and sex, where provided). If information for a variable is not known for the whole population, the variable cannot be used in the calculation of weights and cannot be used in the adjustment process.

For variables not used in the calculation of weights (for the NHWDS: dental practitioners 2012, that is all variables other than state and territory of principal practice, broad registration type, type of dental practitioner, whether registered or not, 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.

Survey responses

The response rates for each type of dental practitioner are listed in Table 1.

Table 1: Survey response rates, states and territories[(a)], 2011 and 2012

Division of general registration	Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Dentist	2011	89.2	87.5	87.7	85.3	91.5	87.6	91.2	84.9	88.3

	2012	93.0	91.4	92.0	90.9	90.9	92.7	93.2	95.8	92.1
Oral health therapist	2011	80.8	83.5	86.8	88.2	87.7	66.7	88.9	90.9	85.2
	2012	81.5	83.2	92.5	100	67.1	80.0	100	80.0	84.7
Dental hygienist	2011	88.8	94.6	91.5	84.3	84.4	85.7	100	100	88.7
	2012	90.9	97.5	96.2	95.1	93.8	100	96.1	92.3	94.5
Dental therapist	2011	95.9	92.2	90.0	87.6	97.2	94.4	93.3	100	91.9
	2012	94.4	95.6	94.4	94.3	96.5	100	88.9	94.7	94.9
Dental prosthetist	2011	89.4	83.7	86.0	81.8	91.1	94.1	93.3	80.0	87.0
	2012	92.1	89.3	92.7	91.9	96.2	100	92.3	100	92.0
All dental practitioners	2011	89.2	87.5	87.7	85.5	90.6	89.5	92.5	87.8	88.3
	2012	92.5	91.5	92.5	92.1	90.7	95.2	93.5	94.9	92.2

(a) Data are derived from state and territory of principal practice where available; otherwise, state and territory of main job is used as a proxy. If main job details are unavailable, state and territory of residence is used. Records with no information on all 3 locations are coded to 'Not Stated'.
Sources: NHWDS: dental practitioners, 2011 and 2012.

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 dental practitioners who did not state or adequately describe their location as well as employed dental practitioners who were overseas. Therefore, the national estimates include these groups.

Coherence:

This is the second time data on dental practitioners has been produced using data collected through the NRAS. The 2011 and 2012 data for oral health therapists, dental hygienists and dental therapists are not directly comparable due to a change in the methodology to derive the primary practitioner type of those practitioners registered to practise in more than 1 dental profession (see Box 1). Data for dentists and dental prosthetists are generally comparable from 2011 and 2012.

The Dental Workforce Survey questionnaire changed from 2011 to 2012. Firstly, the 2012 survey asked 3 additional questions. These questions relate to:

- country of initial qualification
- method used to qualify for registration in Australia for dental practitioners whose initial qualification is from overseas
- the job location details when a dental practitioner works in a regional, rural or remote area.

Secondly, the principal area of main job question has 5 new response categories—dental hygiene, dental therapy, dental prosthetic, oral health therapy and forensic odontology; as a result, data are not directly comparable from 2011 and 2012. Lastly, the 'Other community healthcare service' work setting category in the 2012 survey replaced the 'Community healthcare service' category in 2011; as a result, comparison of these work settings are not directly comparable and should be made with caution.

There was also a change in population estimates used for calculating full time equivalent (FTE) rates. The FTE rates for 2011 and 2012 published in the *Dental workforce 2012* report are derived using population estimates based on the 2011 Census of Population and Housing, and released by the ABS on 30 August 2013. Whereas, the FTE rates for 2011 published in the *Dental workforce 2011* report used 2006 Census-based population estimates. As a result, the FTE rates for 2011 published in *Dental workforce 2011* may not be equivalent to those reported in *Dental workforce 2012*.

Due to the differences in data collection methods, including survey design and questionnaire, data for 2011 and 2012 are not directly comparable with data published by the AIHW prior to 2010, and therefore comparisons should be made with caution. Data published by the AIHW prior to 2010 were based on jurisdiction-based board registration and survey data; while data for 2011 and 2012 are collected through the NRAS.

Source and reference attributes

Submitting organisation: Australian Institute of Health and Welfare