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Australian Institute of Health and Welfare

Pathways in Aged Care 2020
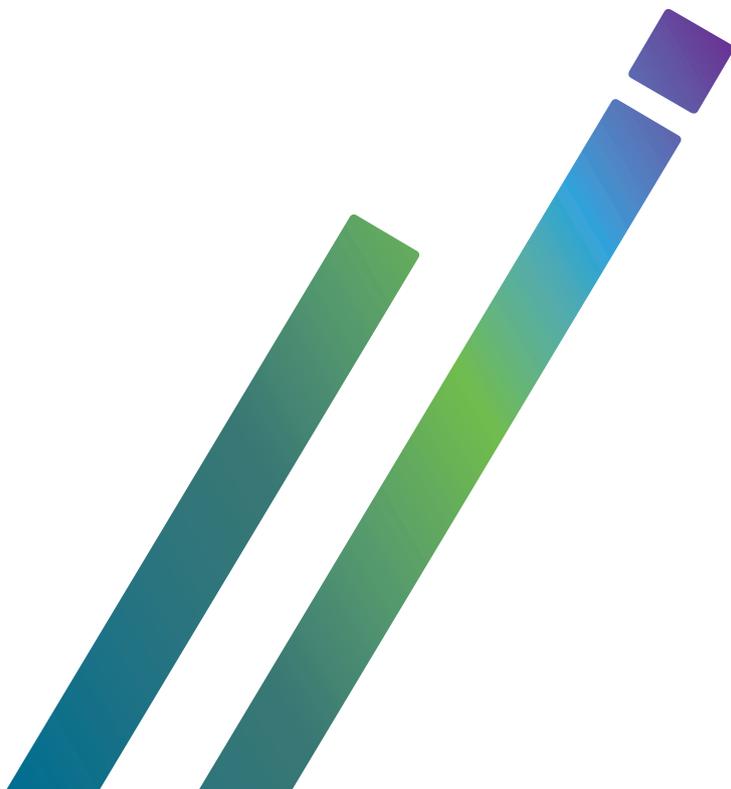
Technical guide

AIHW

Pathways in Aged Care 2020:
technical guide

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Contents

Summary

A person may use different government-funded aged care services during their lifetime. The administrative data collected for these services provide valuable information for research, policy and service delivery. However, these data are not automatically linked across programs. Therefore, it is not possible to explore people's use of different aged care services and programs with unlinked administrative data.

The Pathways in Aged Care (PIAC) link map brings together information, from different aged care data sources, about the same person. This is achieved using privacy-preserving linkage techniques that assigns a unique identifier for each person in each data source. The PIAC link map is a set of links to all records for each person. This allows us to construct of a chronological sequence of aged care events and present a more complete picture of aged care use, all the way from assessment and admission through to discharge and death.

This technical guide describes the PIAC 2020 link map, including data sources, linkage process and analysis data sets. Information on previous iterations of the PIAC link map – 2006 (cohort study), 2011 and 2014 – are available from gen-agedcaredata.gov.au.

Data linkage at the AIHW relies on the use of what is known as a 'spine', considered the root source of individual level personal information, and used as the basis to identify the same person in multiple data sources. The PIAC 2020 link map uses the Medicare Consumer Directory (MCD) as the spine for data linkage. Aged care program data and deaths data were individually linked to the MCD using the person's name, date of birth, sex, address and last date of program use and/or date of death. Both name- and key-based linkage were used, depending on the data collection. These linkage methods are described in more detail in chapter 2.

The PIAC 2020 link map contains aged care program data from the National Aged Care Data Clearinghouse (NACDC) and deaths data from the National Death Index (NDI). It spans 23 years of aged care program data (between 1 July 1997 and 30 June 2020) and deaths data to 31 December 2020. The aged care programs included in PIAC 2020 are:

- home support – Commonwealth Home Support Programme (CHSP) and its pre-2015 predecessor Home and Community Care (HACC)

- home care – Home Care Packages (HCP) Program and its pre-2013 predecessors Community Aged Care Program (CACP), Extended Aged Care at Home (EACH) and Extended Aged Care at Home Dementia (EACHD)

- permanent and respite residential aged care

- flexible care – Transition Care Programme (TCP) and Short-Term Restorative Care (STRC) Programme

- comprehensive and home support aged care eligibility assessments.

The PIAC 2020 link map was used to create 4 analysis data sets – Recipients, Events, Assessments and Services – with content from the NACDC and NDI. These data sets contain information on over 122 million aged care service events for more than 4 million people.

1   Data sources

The 3 main types of aged care services in Australia are home support, home care, and residential care. There are also several types of flexible care available to older people and their carers, and aged care assessments are used to decide the level of care needed.

The Pathways in Aged Care (PIAC) 2020 link map contains aged care program data from the National Aged Care Data Clearinghouse (NACDC) and deaths data from the National Death Index (NDI). The NACDC is an independent and central repository of national aged care data. Not all aged care services and programs are captured in the NACDC. PIAC 2020 spans 23 years of aged care program data (between 1 July 1997 and 30 June 2020) and deaths data to 31 December 2020.

Table 1.1 lists the aged care programs included in PIAC 2020. The scope of home support and aged care assessments data are based on the date of service or date of assessment being in the specified date range. Similarly, the scope of deaths data is based on the date of death being before 31 December 2020. However, the scope of home care, residential care and flexible care data are based on whether people were using those services anytime within the specified date range. That means some people may have entry dates before 1 July 1997 and some people may have exit dates after 30 June 2020, or no exit date.

Table 1.1: Aged care programs in PIAC 2020

Type	Program	Scope of data in PIAC 2020
Home support	Commonwealth Home Support Programme (CHSP)	CHSP services provided between 1 July 2016 and 30 June 2020
	Home and Community Care (HACC)	HACC services provided between 1 January 2001 and 1 April 2015
Home care	Home Care Packages (HCP) Program	People who used HCP between 1 August 2013 and 30 June 2020
	Community Aged Care Program (CACP)	People who used CACP between 1 July 1997 and 30 June 2013
	Extended Aged Care at Home (EACH)	People who used EACH between 1 July 1998 and 30 June 2013
	Extended Aged Care at Home Dementia (EACHD)	People who used EACHD between 1 March 2006 and 30 June 2013
Residential care	Permanent residential aged care	People who used permanent residential aged care between 1 July 1997 and 30 June 2020
	Respite residential aged care	People who used respite residential aged care between 1 July 1997 and 30 June 2020
Flexible care	Transition Care Programme (TCP)	People who used TCP between 1 October 2005 and 30 June 2020
	Short-Term Restorative Care (STRC) Programme	People who used STRC between 1 March 2017 and 30 June 2020
Aged care eligibility assessments	National Screening and Assessment Form (NSAF)	NSAF (screening, home support, comprehensive) assessments completed between 1 July 2015 and 30 June 2020
	Aged Care Assessment Program (ACAP)	ACAP (comprehensive) assessments completed between 1 January 2003 and 31 May 2016
Deaths data	—	People who died between 1 July 1997 and 31 December 2020

Home support

The **Commonwealth Home Support Programme (CHSP)** provides entry-level services for people to live independently at home and in the community. CHSP began on 1 July 2015, consolidating existing home support programs. CHSP was rolled out progressively across different states and territories from 2015, with Victoria and Western Australia transitioning from its precursor programs from 1 July 2016 and 1 July 2018, respectively. CHSP services are provided on an on-going or episodic basis, depending on need. Services include domestic assistance, allied health, home maintenance, transport and social support.

Home and Community Care (HACC) was the main predecessor of CHSP and has been operational since 1985. HACC was jointly funded by the Australian and state and territory governments to provide services for older people and people with disabilities. In July 2012, the Australian Government assumed responsibility for HACC services for older people in all states and territories except Victoria and Western Australia (known as 'Commonwealth HACC'). The HACC Minimum Data Set (MDS) data in PIAC 2020 includes Commonwealth HACC and HACC services for older people in Victoria and Western Australia. Collection of HACC MDS version 1 began in January 2001 and version 2 began in January 2006. The last year of complete HACC MDS data was 2014–15.

Home care

The **Home Care Packages (HCP)** Program provides comprehensive home-based care to improve people's quality of life and to help them remain active and connected to their communities. HCP began on 1 August 2013. It uses a consumer-directed approach and provides 4 levels of support, from Level 1 for people with basic care needs to Level 4 for people with high care needs.

HCP replaced 3 earlier home care programs:

- **Community Aged Care Program (CACP)** was introduced in 1992–93 and provided home-based care for people with low-care needs (equivalent to HCP Level 2).
- **Extended Aged Care at Home (EACH)** was introduced in 2001–02 and provided home-based care for people with high care needs (equivalent to HCP Level 4).
- **Extended Aged Care at Home Dementia (EACHD)** was introduced in 2005–06 and provided home-based care for clients with complex and high care needs associated with dementia (equivalent to HCP Level 4).

Residential care

Permanent residential aged care provides 24-hour care and accommodation for older people who are unable to continue living independently in their own home and need assistance with everyday tasks.

The level of Australian Government funding for permanent residential aged care is based on the assessed care needs of recipients. That means the care needs of people in permanent residential aged care are periodically assessed while they are in care:

- The **Aged Care Funding Instrument (ACFI)** was used to assess the care needs of permanent residential aged care recipients from 20 March 2008. The ACFI consists of 12 questions about assessed care needs across 3 domains – activities of daily living, cognition and behaviour, and complex health care – and 2 diagnostic sections for health conditions that most affect the person's care needs. While the ACFI captures details of

up to 3 mental and behavioural disorders and up to 3 other health conditions for permanent residential aged care recipients, these are only recorded where the condition affects their current care needs. People can be re-assessed as their care needs change.

- ACFI replaced the **Residential Classification Scale (RCS)**, which was in place from 1 October 1997 up to 19 March 2008. RCS categories 1–4 represent high-care needs and categories 5–8 represent low-care needs.

ACFI and RCS assessment events – unlike aged care eligibility assessments prior to entry – were not used to build the PIAC 2020 link map. However, data collected from these assessments can still be analysed for permanent aged care residents who are in-scope for PIAC 2020.

Box 1.1: Australian National Aged Care Classification

On 1 October 2022, the Australian National Aged Care Classification (AN-ACC) residential care funding model replaced the ACFI. The AN-ACC Assessment Tool focuses on the characteristics of residents that drive care costs in residential care.

AN-ACC data are not in-scope for PIAC 2020.

For more information about AN-ACC, see the AN-ACC Reference Manual and AN-ACC Assessment Tool <www.health.gov.au/resources/publications/an-acc-reference-manual-and-an-acc-assessment-tool>.

Respite residential aged care is short-term care provided in an aged care home to give an older person or their carer a break from their usual care arrangements. Respite residential aged care may be used on a planned or emergency basis. The person must be assessed as eligible for high-care or low-care prior to entry and is entitled to the same services as someone receiving permanent residential aged care. Eligible clients are entitled to 63 days of respite residential aged care in a financial year, and this can be extended by up to another 21 days.

Flexible care

Flexible care is for people who need a different care approach than what home care and residential care can offer. There are different types of flexible care, depending on the person's needs. They all help with day-to-day tasks, and to restore or maintain independence.

The **Transition Care Programme (TCP)** provides short-term care for older people leaving hospital to optimise their functioning and independence, and delay entry into residential care. TCP was introduced in 2004–05. It provides short-term care for up to 12 weeks in either a community setting or a residential care setting, or a combination of both. To be eligible for TCP support, a person must be admitted to hospital at the time of assessment.

The **Short-Term Restorative Care (STRC) Programme** provides early intervention to reverse or slow functional decline in older people, so they can regain or keep their independence at home. STRC was introduced in 2016–17. It provides a tailored package of services for a period of up to 8 weeks in either a community setting or a residential care setting, or a combination of both. A person can access 2 episodes of STRC within a 12-month period.

Aged care eligibility assessments

The **National Screening and Assessment Form (NSAF)** is used to screen and assess the aged care needs of people. The NSAF process began on 1 July 2015, however full coverage of NSAF data did not start until June 2016. It has 3 components:

- screening
- home support assessments
- comprehensive assessments.

Screening is conducted over-the-phone by My Aged Care contact centre staff after a person registers with My Aged Care. Contact centre staff may refer people for a home support assessment or comprehensive assessment.

Home support assessments are generally conducted face-to-face by the Regional Assessment Service (RAS) – teams of trained assessors who provide assessment, information and advice to people requiring low level support. They assess eligibility for CHSP. RAS may also refer people for comprehensive assessments.

Comprehensive assessments are conducted face-to-face by Aged Care Assessment Teams (ACATs) – teams of medical, nursing and allied health professionals managed by state and territory governments. They assess eligibility for HCP (and its pre-2013 predecessors CACP, EACH and EACHD), permanent and respite residential aged care, TCP and STRC. Approval can be given for more than one program and people may be re-assessed as their situation changes.

Before the introduction of the NSAF, comprehensive assessments completed by ACATs were known as the **Aged Care Assessment Program (ACAP)** and have been operational since 1985. The ACAP MDS was introduced in January 1994 and set out minimum reporting requirements for ACATs. Version 2 of the MDS was introduced in January 2003 as a client-centred data collection. Collection of person-level ACAP data with linkable client identifiers began in 2002–03 and was established nationwide in 2004–05. The last year of complete ACAP MDS data was 2014–15, though it continued to be collected until May 2016 before transitioning fully to the NSAF.

Deaths data

The NDI is a database that contains records of deaths registered in Australia since 1980. Data comes from Registrars of Births, Deaths and Marriages in each state and territory, the National Coronial Information System and the Australian Bureau of Statistics (ABS).

NDI records are supplemented with cause of death information using a once-off data linkage with the National Mortality Database (NMD). This enhancement enables research that requires both fact of death (whether a person died) and cause of death (what the person died from). For PIAC 2020, deaths registered in 2017 and earlier are based on the final version of cause of death data; deaths registered in 2018 are based on the revised version; and deaths registered in 2019 and 2020 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

2   Data linkage

The PIAC 2020 link map uses the Medicare Consumer Directory (MCD) as the spine for data linkage. The spine is an enduring piece of data infrastructure that improves the efficiency and quality of data linkage projects. Instead of pairwise linkages of individual aged care program data sets, they can all be linked to the spine once and then combined. The MCD contains data for all persons enrolled in Medicare since its inception in 1984, and each person on the MCD has a unique personal identification number (PIN). The MCD contains very accurate information about a person's full name, date of birth, sex and address, including the history of official name changes.

To identify unique, person-level aged care service use, all aged care program data in the NACDC and deaths data in the NDI were linked individually to the MCD. Both name- and key-based linkage were used, depending on the data available.

Name-based linkage

Probabilistic name-based linkage (NBL) was used when linking data sets that contained full name information and other demographic variables. This linkage procedure involved creating record pairs by combining personal information from records in the MCD with personal information from records in each of the other data sets. This approach was used when linking home care, residential care, flexible care and NSAF assessment data from the NACDC and deaths data from the NDI. That is, each data set was linked with the MCD.

NBL compared records from the two data sets being linked (i.e. each data set being individually linked with the MCD). A series of passes were run to allow for variation in full name information and demographic data, directly comparing various linkage data items at the record level. Each pass consisted of deterministic pairwise matching on selected variables (known as 'blocking' variables). This resulted in a set of record pairs that match exactly on the blocking variables. For example, if surname, given name(s), sex and date of birth were used to form record pairs, then records were grouped with other records that have the same surname, given name(s), sex and date of birth. As part of this process, a weight was calculated based on probabilities that the two records belong to the same person, given the values of the linkage variables in the matched pair.

Because NBL is a probabilistic process, a small percentage of the identified matches may not be correct, and a small number of actual matches could have been missed. To minimise the impact, clerical review was also undertaken, targeting those matched pairs likely to be of poorer quality. However, because people's information can be reported differently in different data sets, there are a number of cases where identifying true matches based on NBL can be difficult – even through clerical review.

Key-based linkage

Multi-step key-based linkage (KBL) was used where full names were not available for linkage. This approach was used for home support (CHSP and HACC) and ACAP assessment data from the NACDC. Linkage was done based on the statistical linkage key (SLK-581) and residential postcode provided within the NACDC data. That is, each data set was linked with the MCD.

SLK-581 has 6 components: 3 letters from the last name, 2 letters from the first given name, 3 date of birth components (day, month and year) and sex. Records with 2 or more missing

component of SLK-581 were considered to have insufficient information for client identification, and so were excluded from the linkage process, and consequently any analysis. Records with only 1 missing component were considered to have sufficient information for linkage if the record contained reported postcode and complete SLK-581 data except for 1 of sex, letters of first name or letters of last name. Records with any missing data in date of birth (for example, impossible year of birth, or with completely missing date of birth) were considered unlinkable. As with NBL, weights are calculated for record pairs and this information is used to finalise matches. Groups that are difficult to match correctly using NBL are also difficult to match correctly using KBL.

For CSHP and HACC data, a disproportionate number of records report a 1 January date of birth. These records were retained where they linked either to the MCD, NDI or other aged care data sets. If they did not link to any of these data sets, the records were assumed to have poor date of birth data, and therefore insufficient information to support data linkage.

Linkage process

Figure 2.1 depicts the linkage process and data flows for PIAC 2020. Aged care data are provided to the AIHW by the Department of Health and Aged Care. Linkage variables – including name information and linkage keys – are stored in the secure Data Integration Services Centre (DISC) linkage environment and de-identified aged care content data are stored in the NACDC. Deaths data with linkage variables are provided to the AIHW by state and territory Registrars of Births, Deaths and Marriages and stored in the secure DISC linkage environment.

Figure 2.1: Linkage process and data flows for PIAC 2020
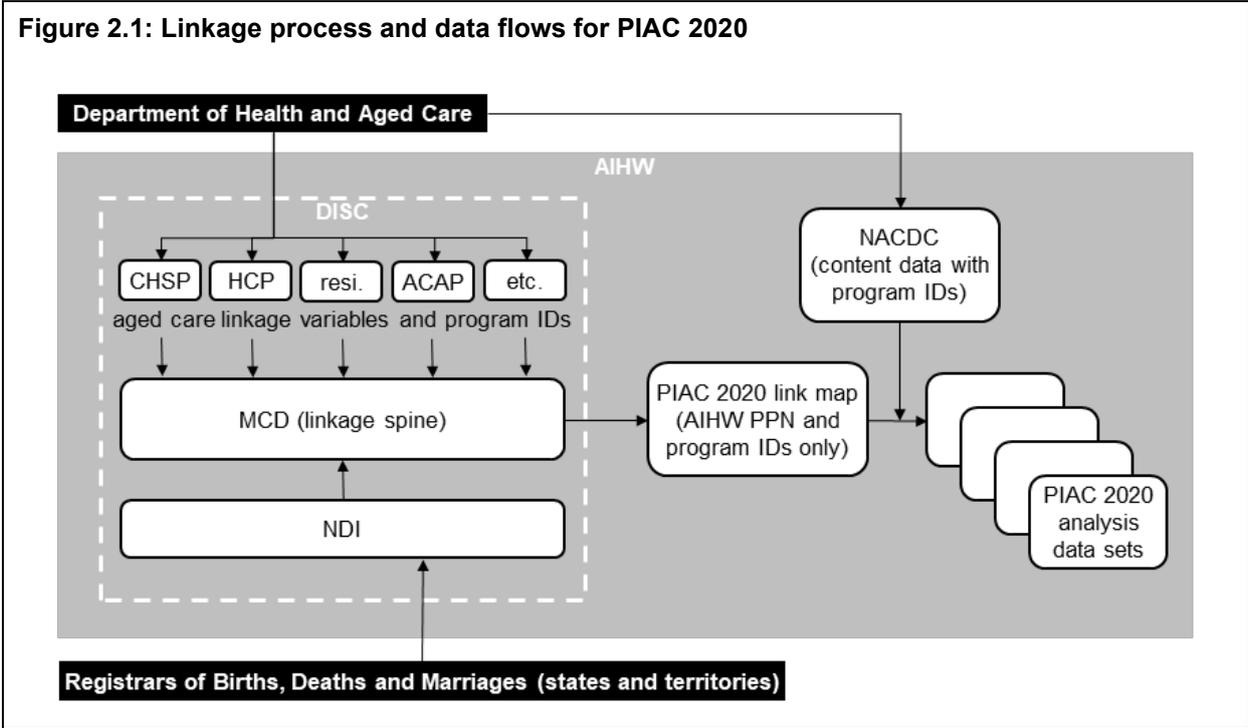
The linkage variables are used to link each aged care and deaths data set with the MCD. All person or services records were either assigned to a MCD PIN or to a list of MCD-unlinked PINs. These linkage results were then checked for any apparent inconsistencies.

The NDI was the first data set to be linked to the MCD and the linked date of death was then used to check for consistency when linking the service use data sets to the MCD. The NDI date of death was compared with:

- a date of death reported in aged care program data. Up to 1 year difference was allowed and records with large discrepancies were clerically reviewed.

- dates of program use (for example, if a person was reported as having used aged care after NDI date of death). All linkage results with date of death before the last service were clerically reviewed to gauge whether any inconsistencies were likely to be due to errors in date reporting.

When linking the aged care data sets, a slightly different approach was taken. They were also linked one at a time, but with the additional step that those aged care program PINs that did not match to the MCD list were linked directly to all PINs (both MCD-linked and unlinked) in aged care data sets that had already had their linkage to the MCD finalised, and to all NDI deaths since 1 July 1997. In this way, any additional variation in reporting of linkage variables in either the NDI or aged care data sets could be used to identify some previously missed matches. This second set of linkage also allowed us to gauge the level of overlap in the unlinked aged care program PINs.

Most aged care programs had a high rate of linkage to the MCD. Table 2.1 provides a summary of the linkage rates for PIAC 2020. Not surprisingly, NBL results are higher than KBL results. This demonstrates the quality of the name-based aged care data sets. It also demonstrates advantages of using the MCD as a spine with historical name and address changes, given that nearly all people using aged care services in Australia link to the MCD. For home care, residential care and flexible care, over 99% of program-specific client identifiers were able to be matched to the MCD. However, the linkage rate was lower for home support (97% for CHSP and 96% for HACC).

Table 2.1: Linkage rates for data sets linked to the MCD for PIAC 2020

| Data set	Linkage rate (per cent)
Name-based linkages	
home care	99.6
residential care	99.6
flexible care	99.6
aged care eligibility assessments (NSAF)	99.8
deaths data	99.9
Key-based linkages	
home support (CHSP)	97.0
home support (HACC)	96.3
aged care eligibility assessments (ACAP)	98.8

On completion of the linkage, each MCD PIN that was in-scope for PIAC 2020 (see Table 1.1) was assigned an AIHW-derived project-specific person number (AIHW PPN), or person identifier. The AIHW PPNs were output alongside all linked aged care program-specific client identifiers (program IDs) to create the PIAC 2020 link map. The link map is de-identified; it does not contain name information.

The program IDs in the link map are used to extract content data from the NACDC to create analysis data sets (Figure 2.1). For more information about analysis data sets, see chapter 3.

3   Analysis data sets

The PIAC 2020 link map was used to create 4 analysis data sets – Recipients, Events, Assessments and Services – with content from the NACDC and NDI. These are relational tables that enable person-based analysis of aged care pathways and patterns of program use over time. Figure 3.1 depicts the relational structure of the PIAC 2020 analysis data sets.

Figure 3.1: PIAC 2020 analysis data sets
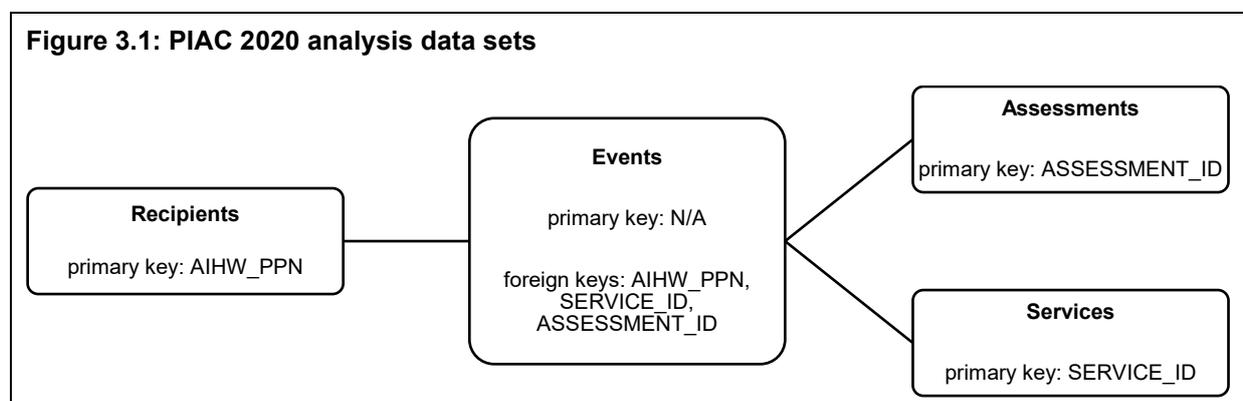
The **Recipients** table contains demographic information for people in PIAC 2020. The table has one record per person (4.3 million records). The primary key is AIHW_PPN. The Recipients table has a one-to-many relationship with the Events table.

The **Events** table contains information about each event – home support, home care, residential care, transition care, assessment or death – for people in PIAC 2020. The table has one record per event (122 million records). There is no primary key. The Events table contains 3 foreign keys: AIHW_PPN to join with the Recipients table, ASSESSMENT_ID to join with the Assessments table and SERVICE_ID to join with the Services table.

The **Assessments** table contains information about aged care eligibility assessments (comprehensive, home support and screening) for people in PIAC 2020. The table has one record per assessment (4.2 million records). The primary key is ASSESSMENT_ID. The Assessment table has a one-to-many relationship with the Events table.

The **Services** table contains information about home care, residential care and transition care services or providers in PIAC 2020, including their geographic location. The table has one record per service (7,400 records). The primary key is SERVICE_ID. The Services table has a one-to-many relationship with the Events table.

Table specifications

Detailed table specifications for these analysis data sets are provided in a separate online appendix accompanying this technical guide. The table specifications will be updated as new analysis data sets are created and is available to download from gen-agedcaredata.gov.au.

Accessing PIAC 2020

Summary data and tables from PIAC 2020 can be requested through the AIHW's data on request service. All requests for sensitive data are assessed against legislation and privacy principles and agreements with partner policy agencies to determine if the information can be lawfully disclosed. Some data requests, and all data linkage requests, require ethical approval. To lodge a request, visit www.gen-agedcaredata.gov.au/request-customised-data.

Data quality statements

This technical guide describes the PIAC 2020 link map, including data sources, linkage process and analysis data sets. Different data sources were used in the linkage process and to produce analysis data sets.

Data quality statements are available for the following AIHW data collections:

- National Aged Care Data Clearinghouse (NACDC), meteor.aihw.gov.au/content/735282
- National Death Index (NDI), meteor.aihw.gov.au/content/480010.

Abbreviations

ABS	Australian Bureau of Statistics
ACAP	Aged Care Assessment Program
ACAT	Aged Care Assessment Team
ACFI	Aged Care Funding Instrument
AN-ACC	Australian National Aged Care Classification
AIHW	Australian Institute of Health and Welfare
CACP	Community Aged Care Program
CHSP	Commonwealth Home Support Programme
DISC	Data Integration Services Centre
EACH	Extended Aged Care at Home
EACHD	Extended Aged Care at Home Dementia
HACC	Home and Community Care
HCP	Home Care Packages Program
KBL	key-based linkage
MCD	Medicare Consumer Directory
MDS	minimum data set
NACDC	National Aged Care Data Clearinghouse
NBL	name-based linkage
NDI	National Death Index
NMD	National Mortality Database
NSAF	National Screening and Assessment Form
PIAC	Pathways in Aged Care
PIN	personal identification number
PPN	project-specific person number
RAS	Regional Assessment Service
RCS	Residential Classification Scale
STRC	Short-Term Restorative Care [Programme]
TCP	Transition Care Programme

Related publications

PIAC 2020 publications

AIHW (2023) *Exploring pathways for younger people living in residential aged care*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/younger-people-living-residential-aged-care

AIHW (2023) *Pathways in aged care*, GEN Aged Care Data website.
www.gen-agedcaredata.gov.au/topics/pathways-in-aged-care

Previous PIAC technical guides

AIHW (2017) *Pathways in Aged Care 2014: technical guide*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/pathways-in-aged-care-2014-technical-guide

AIHW (2016) *Introduction to Pathways in Aged Care 2014*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/introduction-to-pathways-in-aged-care-2014

AIHW (2014) *Patterns in use of aged care: 2002–03 to 2010–11 [Appendix B Linkage and related data issues]*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/patterns-in-use-of-aged-care-2002-03-to-2010-11

AIHW (2011) *Comparing an SLK-based and a name-based data linkage strategy: an investigation into the PIAC linkage*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/comparing-an-slk-based-and-a-name-based-data-linka

AIHW, Karmel R (2005) Data linkage protocols using a statistical linkage key, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/data-linkage-protocols-statistical-linkage-key

Other related publications

AIHW (2020) *Interfaces between the aged care and health systems in Australia—movements between aged care and hospital 2016–17 [technical document]*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/movements-between-aged-care-and-hospital

AIHW (2020) *National Aged Care Data Clearinghouse Data Dictionary*, AIHW, Australian Government.
www.aihw.gov.au/reports/aged-care/national-aged-care-data-clearinghouse-data-diction

Future PIAC 2020 releases and related aged care data products will be published on the GEN Aged Care Data website <gen-agedcaredata.gov.au> and under the aged care topic on the AIHW website <www.aihw.gov.au/reports-data/health-welfare-services/aged-care>.

For more information about data linkage at the AIHW, visit the data linkage topic page on the AIHW website <www.aihw.gov.au/our-services/data-linkage>.
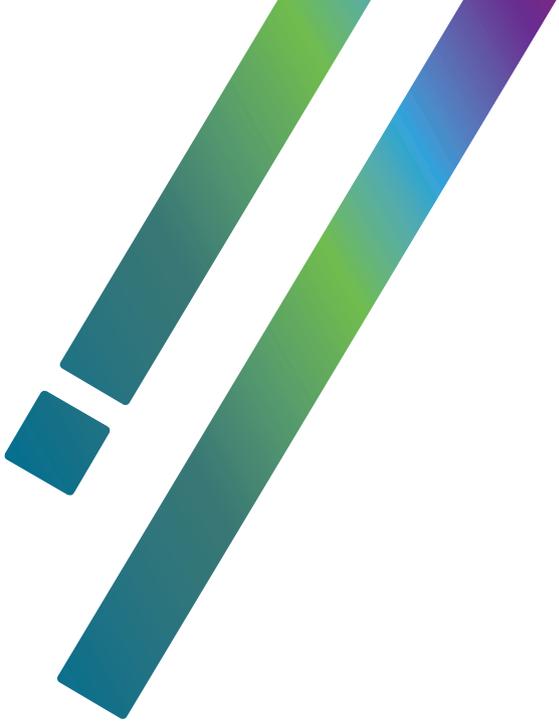
This technical guide describes the Pathways in Aged Care (PIAC) 2020 link map. It provides an overview of the data sources, linkage process and analysis data sets. It is designed to provide context for PIAC 2020 releases and support users of PIAC 2020 data.

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