National Indigenous Reform Agreement: PI 06-Under five mortality rate by leading cause, 2019

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National Indigenous Reform Agreement: PI 06-Under five mortality rate by leading cause, 2019

Identifying and definitional attributes

Metadata item type:	Indicator
Indicator type:	Indicator
Short name:	PI 06-Under five mortality rate by leading cause, 2019
METEOR identifier:	697300
Registration status:	Indigenous, Superseded 17/11/2019
Description:	Mortality rates for children aged less than five, by leading causes of death (International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) (2015 version) chapter level), by Indigenous status. The Australian Bureau of Statistics (ABS) data for this indicator are for perinatal mortality, infant mortality (birth to less than 1 year), child 1–4 years mortality and child 0–4 years mortality.
Rationale:	It is the key component of measuring the Closing the Gap target to ‘Halve the gap in mortality rates for Indigenous children under 5 within a decade (by 2018)'.
Indicator set:	National Indigenous Reform Agreement (2019) Indigenous, Superseded 23/08/2019
Outcome area:	Indigenous children have the same health outcomes as other Australian children Indigenous, Standard 21/07/2010
Data quality statement:	National Indigenous Reform Agreement: PI 06-Under five mortality rate by leading cause, 2019; Quality Statement Indigenous, Standard 07/02/2019

Collection and usage attributes

Population group age to:

This indicator uses a number of different population group age bands:

- For perinatal: All fetal deaths of at least 20 completed weeks' gestation or at least 400 grams birthweight, and all live born babies who died within 28 days of birth (refer to definition under Computation)
- For infants: Live births, from birth to less than 1 year of age
- For children aged 1–4: population from 1 year of age to less than 5 years of age
- For children aged 0–4: population less than 5 years of age.

Computation description:

Rates are calculated for Indigenous and non-Indigenous Australians.

For children aged 1–4 and children aged 0–4:

- Rates for single year use single year for numerator and average of three years (with reference year as middle year) for denominator.
- Rates for 5 years combined use average of 5 years for numerator and denominator.

Variability bands are to be calculated for rates (single year and national data for 5 years combined) using the standard method (see Definitions below).

Reporting is only for those jurisdictions which have adequate levels of Indigenous identification (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory from 1998).

For trends: Percentage change and statistical significance of change are to be calculated (required for assessment of progress against targets).

Excludes deaths where Indigenous status was not stated.

Rate ratios and rate differences are calculated for comparisons between Indigenous and non-Indigenous Australians.

Note: Causes of death to be listed from highest to lowest Indigenous percentage for the most recent period (5 years combined).

Presentation:

Number, percentage, rate per 1,000 of all births (perinatal), rate per 1,000 live births (infant), rate per 100,000 population (children aged 1–4 and 0–4), rate ratio, rate difference and variability bands.

Note: Causes of death to be listed from highest to lowest Indigenous percentage.

Definitions:

This measure refers to 'leading causes of death'. Data are provided for 'selected causes of death' according to the ICD-10 codes used for 'leading causes of death' in the Aboriginal and Torres Strait Islander Health Performance Framework:

Perinatal mortality:

Main condition in the fetus/infant:

- Disorders related to length of gestation and fetal growth (P05–P08)
- Respiratory and cardiovascular disorders specific to the perinatal period (P20–P29)
- Infections specific to the perinatal period (P35–P39)
- Other conditions originating in the perinatal period (P10–P15, P90–P96)
- Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)
- Other conditions
- Total (all causes).

Main condition in the mother, fetus and newborn affected by:

- Maternal conditions that may be unrelated to present pregnancy (P00)
- Maternal complications of pregnancy (P01)
- Complications of placenta, cord and membranes (P02)
- Other complications of labour and delivery and noxious influences transmitted via placenta or breast milk (P03–P04)
- Total (all causes).

Infant mortality:

- Certain infectious and parasitic diseases (A00–B99)
- Diseases of the circulatory system (I00–I99)
- Diseases of the respiratory system (J00–J99)
- Certain conditions originating in the perinatal period (P00–P96)
- Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)
- Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99)
    - Sudden infant death syndrome (R95)
    - Sudden unexpected death in infancy (R99)
- Injury and poisoning (V01–Y98)
- Other causes
- Total (all causes).

Child aged 1–4 mortality:

- Certain infectious and parasitic diseases (A00–B99)
- Diseases of the nervous system (G00–G99)
- Diseases of the circulatory system (I00–I99)
- Diseases of the respiratory system (J00–J99)
- Certain conditions originating in the perinatal period (P00–P96)
- Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)
- Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99)
- Injury and poisoning (V01–Y98)

- Other causes
- Total (all causes).

Child aged 0–4 mortality:

- Certain infectious and parasitic diseases (A00–B99)
- Diseases of the nervous system (G00–G99)
- Diseases of the circulatory system (I00–I99)
- Diseases of the respiratory system (J00–J99)
- Certain conditions originating in the perinatal period (P00–P96)
- Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)
- Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99)
- Injury and poisoning (V01–Y98)
- Other causes
- Total (all causes).

'Standard method' for variability band computation:

Rates derived from administrative data counts are not subject to sampling error but may still be subject to natural random variation, especially for small counts. A 95% confidence interval (CI) for an estimate is a range of values which is very likely (95 times out of 100) to contain the true unknown value. Where the 95% CIs of two estimates do not overlap it can be concluded that there is a statistically significant difference between the two estimates. This is the standard method used in Australian Institute of Health and Welfare (AIHW) publications for which formulas can be sourced from Breslow and Day (1987) in the publication *Statistical methods in cancer research.* Typically in the standard method, the observed rate is assumed to have natural variability in the numerator count (for example, deaths, hospital visits) but not in the population denominator count. Also, the rate is assumed to have been generated from a normal distribution ('Bell curve'). Random variation in the numerator count is assumed to be centred around the true value, that is, there is no systematic bias.

Computation:

Perinatal and infant mortality rates: 1000 x (Numerator ÷ Denominator).

Child aged 1–4 and 0–4 mortality rates: 100,000 x (Numerator ÷ Denominator).

Rate ratio: Indigenous rate divided by non-Indigenous rate.

Rate difference: Indigenous rate minus non-Indigenous rate.

Variability band: to be calculated using the standard method for estimating 95% CIs as follows.

Crude rate:

$$CI(CR)_{95\%} = p \pm 1.96 \times \sqrt{\frac{pq}{n}}$$

Where CI = confidence interval

CR = crude rate

p = mortality rate

$q = 1-p$

n = denominator used to calculate mortality rate.

Percentage change: Calculated by multiplying the average annual change over the period by the number of data points less 1. This is then divided by the rate for the first year in the series and multiplied by 100.

The average annual change in rates, rate ratios and rate differences are calculated using linear regression which uses the least squares method to calculate a straight line that best fits the data and returns an array that best describes the line. The simple linear regression line, Y = a + bX, or ‘slope’ estimate was used to determine the average annual change in the data over the period. The formula used to calculate the slope estimate and standard error of the slope in Microsoft Excel is:

LINEST (known_y’s, known_x’s, true) entered as an array formula (Ctrl, Shift, Enter).

Statistical significance of change: The 95% CIs for the standard error of the slope estimate (average annual change) are used to determine whether the apparent increases or decreases in the data are statistically significant at the $p<0.05$ level. The formula used to calculate the CIs for the standard error of the slope estimate is:

$95\%\ CI(x) = x \pm 1.96 \times SE(x)$

where x is the average annual change (slope estimate).

If the upper and lower 95% CIs do not include zero, then it can be concluded that there is statistical evidence of an increasing or decreasing trend in the data over the study period.

Definitions:

‘Perinatal mortality’ is defined by the ABS as death of a baby within 28 days of birth (neonatal death) or of a fetus (unborn child) of at least 20 completed weeks of gestation or with a birthweight of at least 400 grams.

Numerator:

Perinatal: Number of perinatal deaths (fetal and neonatal)

Infant: Number of deaths among children aged less than 1 year

Child aged 1–4: Number of deaths among children aged 1–4 years

Child aged 0–4: Number of deaths among children aged 0–4 years

Numerator data elements:

Data Element / Data Set

Person—age

Data Source

ABS Death Registrations Collection

Guide for use

Data source type: Administrative by-product data.

Infant and child numerator data source.

Data Element / Data Set

Birth—birth status

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Perinatal numerator data source.

Data Element / Data Set

Number of fetal and neonatal deaths.

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Perinatal numerator data source.

Data Element / Data Set

Person—date of birth

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Infant and child numerator data source.

Data Element / Data Set

Person—date of death

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Infant and child numerator data source.

Denominator:

Perinatal: Number of all births (including live births, and stillbirths of at least 20 completed weeks of gestation or with a birthweight of at least 400 grams).

Infant: Number of registered live births

Child aged 1–4: Population aged 1–4 years

Child aged 0–4: Population aged 0–4 years

Denominator data elements:

Data Element / Data Set

Birth—birth status

Data Source

ABS birth registration data

Guide for use

Data Source type: Administrative by-product data.

Perinatal and infant denominator data source.

Data Element / Data Set

Person—age

Data Source

ABS Estimated resident population (2011 Census-based)

Guide for use

Data source type: ERP is derived from Census, Census PES and estimates of fertility, mortality and net migration.

Child 1–4 and 0–4 years denominator data source.

Data Element / Data Set

Person—estimated resident population of Australia

Data Source

ABS Estimated resident population (2011 Census-based)

Guide for use

Data source type: Estimated resident population (ERP) is derived from Census, Census Post Enumeration Survey (PES) and estimates of fertility, mortality and net migration.

Child 1–4 and 0–4 years denominator data source.

Data Element / Data Set

Person—age

Data Source

ABS Indigenous estimates and projections (2011 Census-based)

Guide for use

Data source type: Indigenous population data are derived from Census, Census PES and estimates of fertility, mortality, and net migration.

Child 1–4 and 0–4 years denominator data source.

Data Element / Data Set

Person—estimated resident population of Australia

Data Source

ABS Indigenous estimates and projections (2011 Census-based)

Guide for use

Data source type: Indigenous population data are derived from Census, Census PES and estimates of fertility, mortality and net migration.

Child 1–4 and 0–4 years denominator data source.

Disaggregation:

Reporting is only for those jurisdictions which have adequate levels of Indigenous identification (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory from 1998).

Current period: 5-year aggregate 2013–2017 supplied for perinatal, infant, child aged 1–4, and child aged 0–4 by all causes and by cause of death.

For Indigenous and non-Indigenous Australians (numbers, rates, percentage, rate ratios, rate differences, variability bands):

- Total (selected states/territories) by leading cause of death including total (ICD-10 chapter level and some subchapter level) by age group (perinatal, infant, child aged 1–4, and child aged 0–4).

For Indigenous and non-Indigenous Australians (numbers, rates, rate ratios, and rate differences):

- State/territory (including total) by age group (perinatal (fetal, neonatal and total perinatal), infant, child aged 1–4 and child aged 0–4).
- Total (selected states/territories) by age group (infant, child aged 1–4, and child aged 0–4): all causes of death.
- State/territory (including total) by age group (infant, child aged 1–4, and child aged 0–4): all causes of death.

Time series:

Single year data:

- 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 and 2017 (by all causes of death for infant and child aged 0–4; data for the years pre-2017 have been provided previously).
- 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015 and 2016 (previously provided) and 2017 (by all cause and cause of death for perinatal)

Up until the 2015-16 reporting cycle, causes of death and perinatal data lagged a year behind the all causes data. Final revised cause of death data are also provided for 2014 and preliminary revised data are provided for 2015. Revised preliminary data for 2016 are yet to be available for reporting.

For Indigenous and non-Indigenous Australians (numbers, rates, rate ratios, rate differences, variability bands, percentage change and statistical significance of change):

- Total (selected states/territories) by age group (perinatal, infant, and child aged 0–4).

Disaggregation data elements:

Data Element / Data Set

Person—area of usual residence, statistical area level 2 (SA2) (ASGS 2016)

Data Source

ABS Death Registrations Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—Indigenous status

Data Source

ABS Death Registrations Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—area of usual residence, statistical area level 2 (SA2) (ASGS 2016)

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—Indigenous status

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—underlying cause of death (ICD-10 2nd edn)

Data Source

ABS Causes of Death Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—area of usual residence, statistical area level 2 (SA2) (ASGS 2016)

Data Source

ABS Perinatal Deaths Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—Indigenous status

Data Source

ABS Perinatal Deaths Collection

Guide for use

Data source type: Administrative by-product data.

Data Element / Data Set

Person—underlying cause of death (ICD-10 2nd edn)

Data Source

ABS Perinatal Deaths Collection

Guide for use

Data source type: Administrative by-product data.

Comments:

Most recent data available for the 2019 National Indigenous Reform Agreement (NIRA) Report is 2017 for infant, child and perinatal mortality (both causes of death and all causes data). Data are by reference year.

Single year data for children under 5 by leading cause of death are not produced as the numbers are too small to identify trends. The body analysing progress against targets may reconsider this for future reports. Disaggregation by Indigenous status will be based on data only from jurisdictions for which the quality of Indigenous identification is considered acceptable.

At this stage, data from only selected states and territories (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory) are considered of acceptable quality for reporting Indigenous deaths for all ages.

National rates should include these five jurisdictions only.

Disaggregation by state/territory is based on state/territory of usual residence of the deceased.

Indigenous child and particularly infant mortality data are subject to high variability due to small numbers of deaths among children aged 0 to 4.

Due to the small number of Indigenous deaths reported each year, 5 year combined data are recommended for reporting for the current reporting period. Disaggregation by leading causes of death is recommended to be reported at the national level only and not by state/territory due to small numbers.

Single year data will be used for time series in the numerator and three year average for the denominator.

Perinatal, infant and child mortality:

Aggregated data (2013–2017) will be reported for both all causes mortality and causes of death data.

Up until the 2015-16 reporting cycle, causes of death data for infants and children lagged a year behind the all causes data.

Single year data (2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 and 2017) will be reported for time series analyses (all causes mortality and national level only). For the 2019 report, data re-supplied for 2014 (final revised) and 2015 (preliminary revised) for cause of death data.

Variability bands accompanying mortality data should be used for the purposes of comparisons over time and for national estimates at a point in time for Indigenous/non-Indigenous Australians and cause of death comparisons. They should not be used for comparing mortality rates at a single point in time between jurisdictions as the variability bands and mortality rates do not take into account differences in under-identification of Indigenous deaths between jurisdictions.

Baseline year for the Council of Australian Governments' National Indigenous Reform Agreement target (Halve the gap in mortality rates for Indigenous children under 5 within a decade) is 2008; data reported for this indicator since 2006; target year is 2018.

Child aged 1–4 and child aged 0–4 mortality measures are derived from ERPs and projections based on the 2011 Census. The non-Indigenous population will be calculated based on 2011 Census based ERP total population minus 2011 Census based projections. First release total population ERP is to be used until rebased.

The term ‘Aboriginal and Torres Strait Islander people’ is preferred when referring to the separate Indigenous peoples of Australia. However, the term ‘Indigenous’ is used interchangeably with ‘Aboriginal and Torres Strait Islander’ in this indicator set to assist readability.

Representational attributes

Representation class: Rate

Data type:	Real
Unit of measure:	Person
Format:	N[N].N

Indicator conceptual framework

Framework and dimensions:	Deaths

Data source attributes

Data sources:

Data Source

ABS birth registration data

Frequency

Annual

Data custodian

Australian Bureau of Statistics

Data Source

ABS Death Registrations Collection

Frequency

Annual

Data custodian

Australian Bureau of Statistics

Data Source

ABS Estimated resident population (2011 Census-based)

Frequency

Quarterly

Data custodian

Australian Bureau of Statistics

Data Source

ABS Causes of Death Collection

Frequency

Annual

Data quality statement

ABS causes of death collection, QS

Data custodian

Australian Bureau of Statistics

Data Source

ABS Indigenous estimates and projections (2011 Census-based)

Frequency

Periodic

Data custodian

Australian Bureau of Statistics

Data Source

ABS Perinatal Deaths Collection

Frequency

Annual

Data custodian

Australian Bureau of Statistics

Accountability attributes

Reporting requirements:	National Indigenous Reform Agreement.
Organisation responsible for providing data:	Australian Bureau of Statistics
Further data development / collection required:	Improve the quality of Indigenous identification in deaths data.

Source and reference attributes

Submitting organisation:	Australian Institute of Health and Welfare
Steward:	National Indigenous Reform Agreement Performance Information Management Group
Reference documents:	AIHW 2017. Aboriginal and Torres Strait Islander Health Performance Framework 2017: supplementary online tables. Cat. no. WEB 170. Canberra: AIHW. Breslow NE & Day NE 1987. Statistical methods in cancer research. Lyon: International Agency for Research on Cancer.

Relational attributes

Related metadata references:	Supersedes National Indigenous Reform Agreement: PI 06-Under five mortality rate by leading cause, 2018 Indigenous, Superseded 31/07/2018 Has been superseded by National Indigenous Reform Agreement: PI 06-Under five mortality rate by leading cause, 2020 Indigenous, Standard 17/11/2019 See also National Healthcare Agreement: PB b–Better health: halve the mortality gap for Indigenous children under five by 2018, 2018 Health!, Superseded 19/06/2019