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Trends in stillbirths and neonatal deaths among babies born to Indigenous and non-Indigenous women in Queensland, 1988-1992 to 2013-2017

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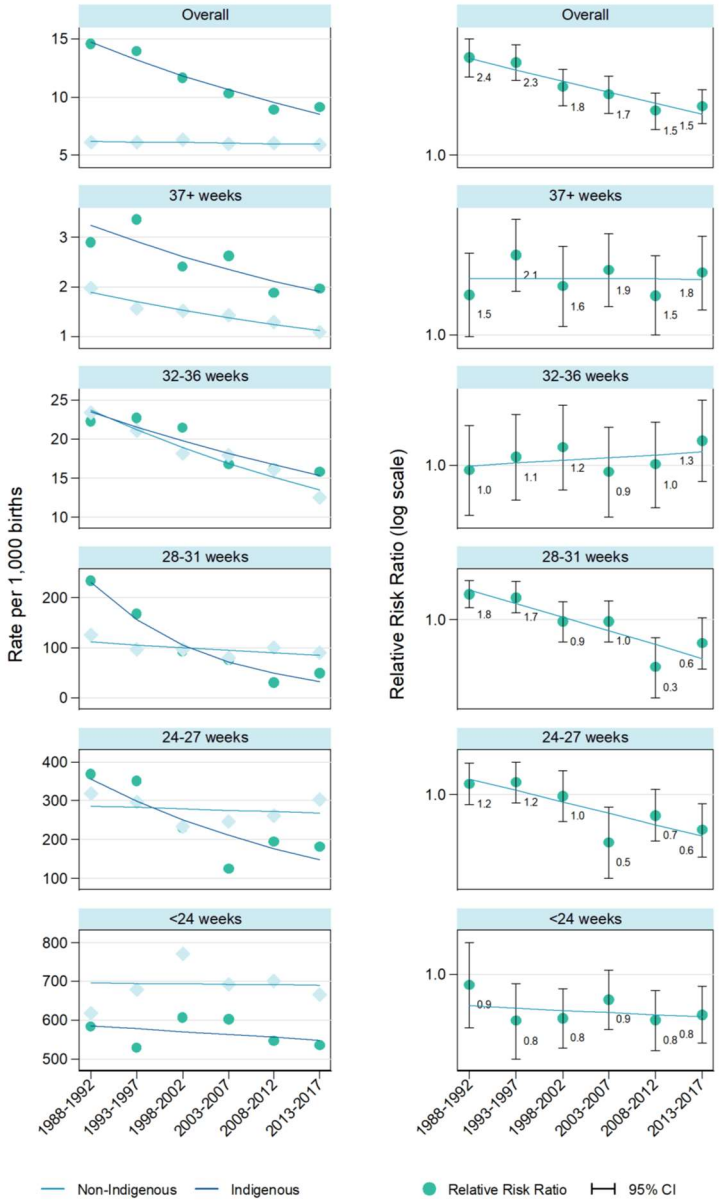
Across Australia, rates of adverse perinatal outcomes among babies born to Indigenous* women are higher than among babies born to non-Indigenous women. In Australia in 2017 babies born to Indigenous women were 1.6 times as likely to be stillborn compared to babies born to non-Indigenous women, 2.0 times as likely to die in the neonatal period and 1.7 times as likely to be born preterm[1 2]. While perinatal mortality and preterm birth rates among babies born to Indigenous women are slowly declining over time[3 4], these figures illustrate that a substantial gap remains.

This Statbite examines the trends in stillbirths, neonatal deaths, preterm births and low birthweight babies in Queensland and the gap between these outcomes in births to Indigenous and non-Indigenous women. This report updates previous research from the Statistical Services Branch[5 6] to examine whether perinatal disparities have diminished in recent years. All singleton births were extracted from the Queensland Perinatal Data Collection (PDC) from 1988 to 2017. Data were aggregated into quinquenniums for analyses to minimise the impact of random variation in rates due to the small numbers of outcomes that occur in a single year.

Figure 1 Trends in stillbirth rate and relative risk ratio by gestational age and Indigenous status of mother, Queensland, 1988-92 to 2013-17



Source: Queensland Perinatal Data Collection

Stillbirth

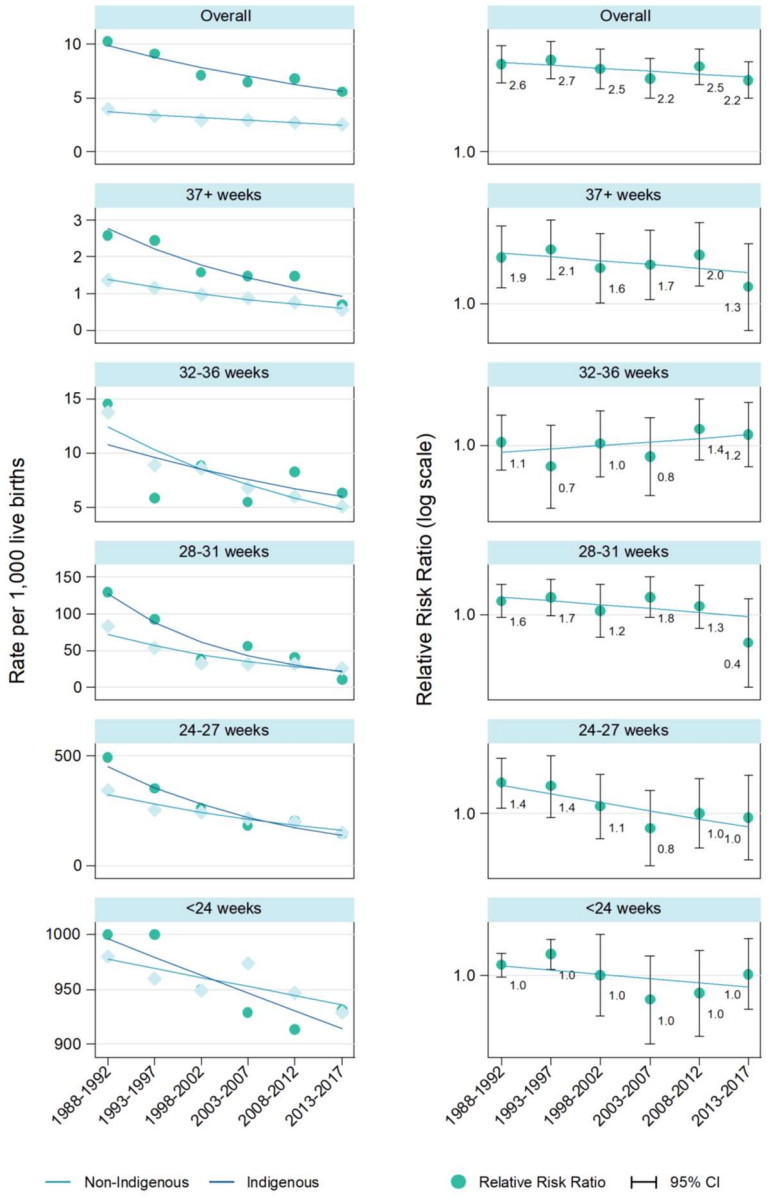
Overall stillbirth rates declined over the study period in births to Indigenous women (APC†: -2.1; 95% CI: -2.9,-1.4) but did not change among births to non-Indigenous women (APC: -0.2; 95% CI: -0.4, 0.1) (Figure 1 and Table 1). In the most recent quinquennium (2013-2017), babies born to Indigenous women were 1.5 (95% CI: 1.3, 1.8) times as likely to be stillborn than babies born to non-Indigenous women. This gap would be closed if the number of stillbirths among Indigenous women for the quinquennium was reduced from 179 to 116. This equates to about 13 fewer stillbirths per year. While a gap remains, the disparity in stillbirth rates has reduced over time. The relative risk ratio significantly decreased (APC: -2.0; 95% CI: -2.7-1.2), driven by the significant decline in the stillbirth rate for births to Indigenous women.

* The term Indigenous is used throughout this report when referring to Aboriginal and Torres Strait Islander people collectively.
† APC: Annual Percent Change

The pattern of disparities differed after stratifying by gestational age‡. Between 24 and 31 weeks, stillbirth rates declined at a significantly faster rate for babies born to Indigenous women than for babies born to non-Indigenous women, while stillbirth rates for pre-viable (<24 weeks) babies did not change over the time period. Between 32-36 weeks, stillbirth rates decreased for babies born to both Indigenous and non-Indigenous women with no statistically significant disparity over the study period. The largest disparity was observed for babies born at term (37+ weeks; 2013-2017 RRR§:1.8; 95% CI: 1.3, 2.6), where there was a similar relative decline in both groups so that the relative risk ratio has remained stable over time.

Although there has been an overall decline in stillbirth rates for babies born to Indigenous women over the study period, the rates may have plateaued in the latest decade.

Figure 2 Trends in neonatal death rate and relative risk ratio by gestational age and Indigenous status of mother, Queensland, 1988-92 to 2013-17



Source: Queensland Perinatal Data Collection

Neonatal Death

Overall neonatal death rates significantly declined over the study period in births to Indigenous women (APC: -2.2; 95% CI: -3.1, -1.3) and births to non-Indigenous women (APC: -1.6; 95% CI: -2.0, -1.3) (Figure 2 and Table 1). In the most recent quinquennium (2013-2017), babies born to Indigenous women were 2.2 (95% CI: 1.8, 2.7) times more likely to die in the neonatal period than babies born to non-Indigenous women. This gap would be closed if the number of neonatal deaths among babies of Indigenous women for the quinquennium reduced from 108 to 49. This equates to about 12 fewer neonatal deaths per year. The disparity in neonatal death rates did not significantly reduce over time (APC: -0.6; 95% CI: -1.6, 0.35).

Analyses by gestational age showed that neonatal death rates significantly decreased for babies born to Indigenous and non-Indigenous women in all viable gestational age groups (24 weeks or more), with babies born between 28-31 weeks showing the most rapid relative decrease in neonatal mortality rates over the study period. There were no statistically significant changes among pre-viable babies (<24 weeks). In the latest quinquennium (2013-2017), after stratifying by gestational age, no disparities in neonatal deaths were statistically significant.

‡ Analyses include terminations of pregnancy that are in-scope of the PDC. Interpretation of results, particularly for shorter gestational ages, should take this into consideration. See Limitations for further details.
§ RRR: Relative Risk Ratio

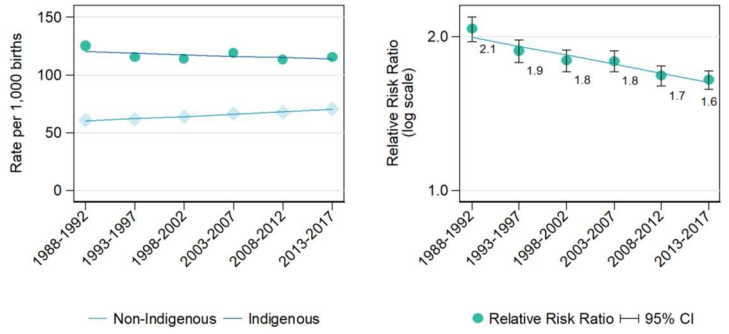
Discussion

The disparity in stillbirths between babies born to Indigenous women and babies born to non-Indigenous women significantly declined from 1988 to 2017, while the disparity in neonatal deaths also declined but not significantly. After stratifying analyses by gestational age, the only remaining significant disparity remains for stillbirths among babies born at term, with the gap having closed in other gestational ages, both for neonatal deaths and stillbirths. In the case of stillbirths, a study of stillbirths in Queensland attributed this disparity at term to maternal diabetes, perinatal infection, fetal growth restriction and unexplained antepartum fetal death.

While the gap in adverse perinatal outcomes largely narrowed within each gestational age stratum, a larger proportion of births to Indigenous women are preterm** or of low birthweight** compared with births to non-Indigenous women (Figure 3, Figure 4 and Table 1).

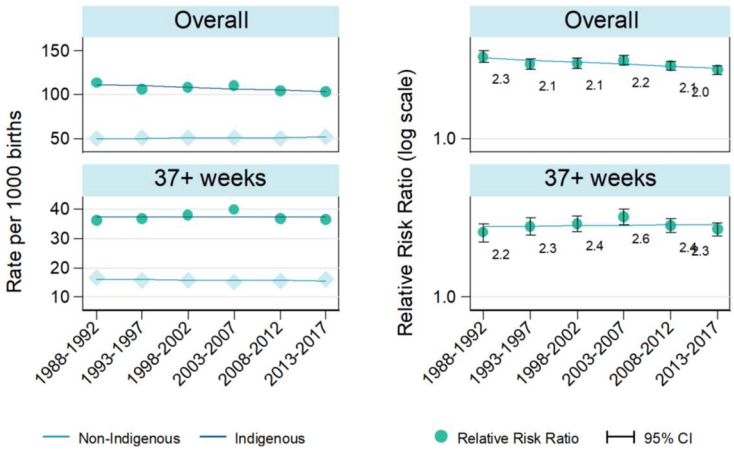
The rate of preterm (<37 weeks) births to Indigenous women decreased slightly but not significantly over the study period (APC: -0.2; 95% CI: -0.4, 0.0). The apparent closing of the gap is due to the increasing preterm birth rate among babies born to non-Indigenous women (APC: 0.6; 95% CI: 0.5, 0.7), driven mostly by an increase in slightly preterm births (32-36 weeks). Increasing preterm birth rates have been reported nationally[1] and internationally[8]. A New South Wales study partly attributed this to an increase in planned births before term[9]. Higher risk of preterm birth, particularly among Indigenous women, has been found to be associated with smoking during pregnancy, poor social support, pre-existing diabetes and lower attendance of antenatal care[10].

Figure 3 Trends in preterm (<37 weeks gestation) birth rate and relative risk ratio by Indigenous status of mother, Queensland, 1988-92 to 2013-17



Source: Queensland Perinatal Data Collection

Figure 4 Trends in low birthweight (<2500g) babies and relative risk ratio by Indigenous status of mother, Queensland, 1988-92 to 2013-17



Source: Queensland Perinatal Data Collection

Overall, the proportion of low birthweight babies born to both Indigenous and non-Indigenous women and the relative disparity has not significantly changed over the study period (APC: -0.4; 95% CI: -0.7, -0.2). Similarly, no significant changes were observed when limiting to term (37+ weeks) births.

Conclusion

The gap in adverse perinatal outcomes between babies born to Indigenous and non-Indigenous women has diminished from 1988 to 2017 but a disparity remains for babies born at term. A higher proportion of Indigenous babies are born preterm and/or of low birthweight, and there has been no significant change in these outcomes over the study period. The overall disparity in perinatal mortality outcomes is likely to remain until the gestational age/birthweight distribution of babies born to Indigenous women reconciles with that of babies born to non-Indigenous women.

** Analyses include all singleton births, regardless of whether the baby was stillborn or live born. Reporting of preterm birth and low birthweight typically restrict analyses to live births only. Such an approach underestimates the true burden of preterm birth[7] and low birthweight. In addition, analyses include terminations of pregnancy and interpretation of results should take this into consideration. See Limitations for further details.

Limitations

These analyses include terminations of pregnancy that are in-scope of the Queensland Perinatal Data Collection i.e. that occurred after 20 weeks gestation or where the baby weighed 400g or more. Over the past few decades there has been a suspected increase in the number of pregnancies that end in termination due to an increase in detection of severe congenital anomalies[11]. It is possible that detection of congenital anomalies and resultant termination rates differ by Indigenous status of mother, and hence interpretation of stillbirth (and to a lesser extent neonatal death) rates from these analyses must take this into consideration, most notably in shorter gestational age strata.

Similarly, rates of preterm birth and low birthweight reported in this Statbite also include terminations of pregnancy. However, rates and trends were assessed with stillbirths (and therefore most terminations) excluded and results showed the same patterns as those reported in this Statbite. Hence, the inclusion of terminations does not seem to have impacted on the trends or differentials for preterm birth and low birthweight.

Appendix

Table 1 Annual percent change (APC) of selected outcomes by gestational age and Indigenous status of mother, Queensland, 1988-92 to 2013-17

		<24 weeks	24-27 weeks	28-31 weeks	32-36 weeks	37+ weeks	Overall
Stillbirth	Indigenous	-0.26 (-1.49, 0.99)	-3.44* (-5.25, -1.60)	-7.52* (-9.72, -5.26)	-1.70 (-3.54, 0.17)	-2.12* (-3.75, -0.46)	-2.14* (-2.86, -1.41)
	Non-Indigenous	-0.03 (-0.45, 0.40)	-0.27 (-0.89, 0.36)	-1.08* (-1.84, -0.31)	-2.23* (-2.83, -1.62)	-2.09* (-2.59, -1.58)	-0.17 (-0.41, 0.08)
	Relative Risk Ratio	-0.23 (-1.53, 1.09)	-3.18* (-5.09, -1.23)	-6.51* (-8.85, -4.12)	0.54 (-1.44, 2.55)	-0.03 (-1.77, 1.74)	-1.98* (-2.74, -1.21)
Neonatal Death	Indigenous	-0.34 (-1.76, 1.10)	-4.64* (-6.65, -2.58)	-6.97* (-10.03, -3.80)	-2.34 (-5.16, 0.55)	-4.30* (-6.29, -2.27)	-2.25* (-3.14, -1.35)
	Non-Indigenous	-0.17 (-0.79, 0.45)	-2.72* (-3.51, -1.92)	-4.66* (-5.88, -3.43)	-3.68* (-4.59, -2.76)	-3.27* (-3.90, -2.64)	-1.63* (-1.97, -1.29)
	Relative Risk Ratio	-0.17 (-1.72, 1.40)	-1.98 (-4.19, 0.29)	-2.42 (-5.86, 1.14)	1.39 (-1.68, 4.56)	-1.06 (-3.21, 1.13)	-0.63 (-1.60, 0.35)
Preterm Birth (<37 weeks gestation)	Indigenous						-0.22 (-0.45, 0.01)
	Non-Indigenous						0.60^ (0.53, 0.68)
	Relative Risk Ratio						-0.82* (-1.06, -0.58)
Low Birth Weight (<2500g)	Indigenous					-0.01 (-0.44, 0.43)	-0.30* (-0.54, -0.06)
	Non-Indigenous					-0.11 (-0.27, 0.04)	0.11^ (0.03, 0.20)
	Relative Risk Ratio					0.11 (-0.35, 0.57)	-0.41* (-0.66, -0.16)

Source: Queensland Perinatal Data Collection
**Significant annual decrease*
^Significant annual increase

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