

# Induction of labour trends in the Northern Territory between 2001 and 2012

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# Overview

- Background of IOL
- Aim
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- Conclusion
- Acknowledgements

# Background

- Induction of labour (IOL) is the artificial initiation of labour
- 'Best practice' indications, e.g. post date pregnancies, maternal hypertension.
- Increasing trends described among some Australian and international populations
- Are increasing trends evidence driven?

# Aim

- This study aims to explore the trends in IOL among NT Aboriginal and non-Aboriginal mothers between 2001 and 2012 and to identify the socio-demographic, medical and obstetric factors associated with these trends.

# Methods

- NT resident women who birthed in the NT between 2001 and 2012 and laboured at  $\geq 32$  weeks gestation
- Data obtained from the Midwives Collection
- Outcomes and analysis:
  - Bivariate analysis of independent factors, Odds Ratio (OR)
  - Number of Inductions/number of births, year
  - Main reason for induction, annual % change in OR
  - Multivariate logistic regression, OR
- Study approved by Human Research Ethics Committee of the NT DOH and Menzies School of Health Research

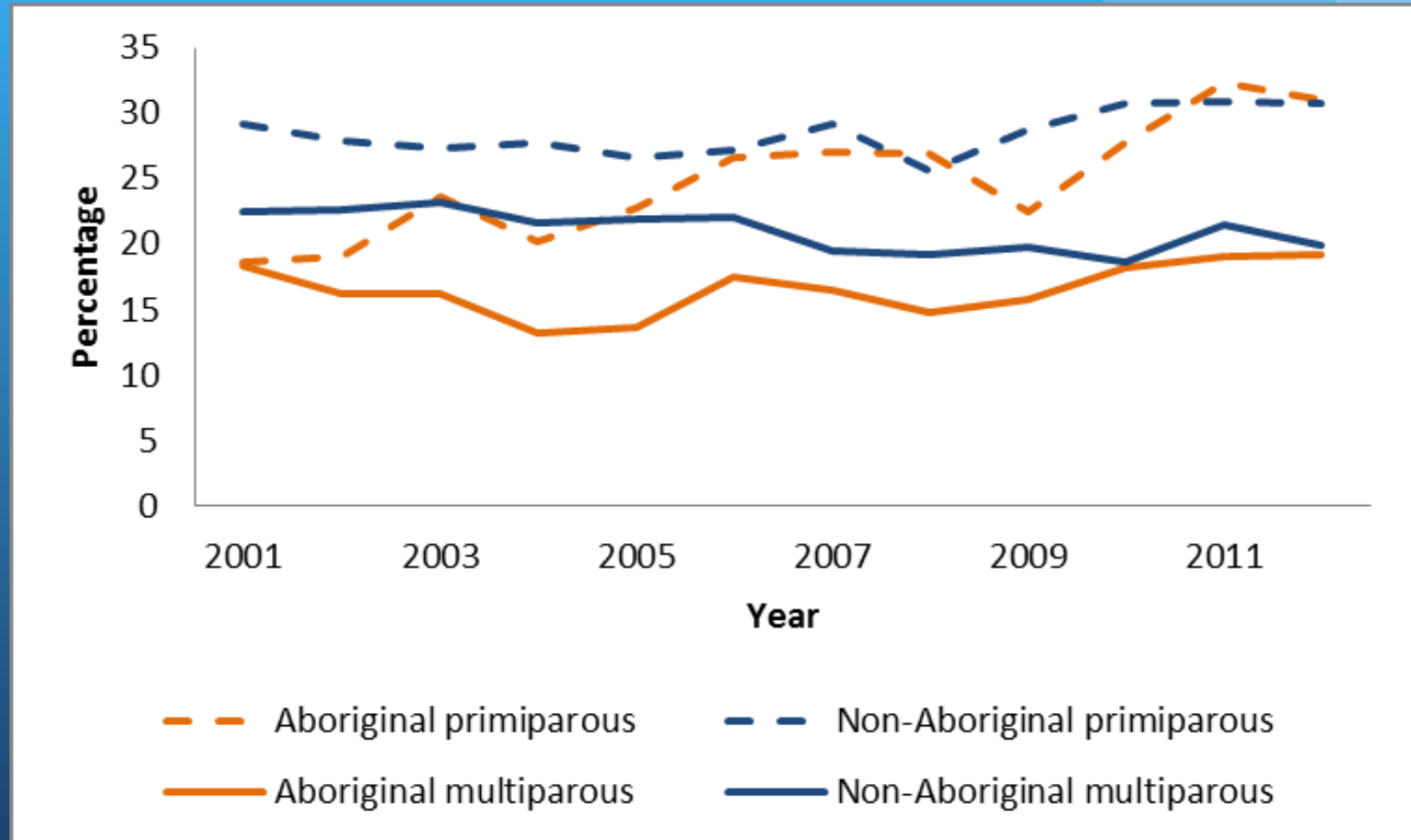
# Characteristics of NT women who birthed in 2001-2012 by Aboriginal and IOL status: demographics and obstetric history

	Aboriginal			Non-Aboriginal		
	Induced	Not induced	OR (95% CI)	Induced	Not induced	OR (95% CI)
Total births (number, %)	3012 (19.1)	12718 (80.9)		6570 (24.3)	20465 (75.7)	
Maternal demographic factors	%	%		%	%	
Less than 20 years	25.6	25.1	1.06 (0.97, 1.16)	4.0	4.4	0.90 (0.78, 1.03)
35 years and over	8.7	6.5	<b>1.39 (1.20, 1.61)</b>	19.1	19.7	0.96 (0.89, 1.03)
Private hospital	1.1	0.6	<b>1.80 (1.21, 2.70)</b>	37.5	26.9	<b>1.63 (1.53, 1.73)</b>
First-time mother	40.4	28.9	<b>1.86 (1.70, 2.05)</b>	51.5	41.3	<b>1.55 (1.46, 1.65)</b>
Remote	70.0	71.3	0.94 (0.86, 1.03)	11.1	12.2	0.90 (0.82, 0.98)
Obstetric history						
Early antenatal visit	42.3	39.1	<b>1.14 (1.05, 1.24)</b>	68.9	66.3	<b>1.13 (1.06, 1.19)</b>
Previous caesarean section	7.4	20.4	<b>0.31 (0.27, 0.36)</b>	3.6	18.0	<b>0.17 (0.15, 0.19)</b>
Smoked during pregnancy	38.1	44.8	0.76 (0.70, 0.82)	15.0	16.7	0.88 (0.81, 0.95)

# Characteristics of NI women who birthed in 2001-2012 by Aboriginal and IOL status: medical and obstetric complications

	Aboriginal			Non-Aboriginal		
	Induced	Not induced	OR (95% CI)	Induced	Not induced	OR (95% CI)
Total births (%)	19.1	80.9		24.3	75.7	
<b>Prolonged rupture of membranes</b>	16.5	3.1	<b>6.20 (5.39, 7.12)</b>	9.3	1.7	<b>6.04 (5.27, 6.91)</b>
Pre-eclampsia	14.4	3.1	5.27 (4.56, 6.07)	8.5	2.0	4.59 (4.03, 5.24)
Late term (≥41 weeks)	24.4	5.9	5.18 (4.64, 5.79)	27.9	8.5	4.15 (3.86, 4.46)
Maternal hypertension	7.5	2.5	3.13 (2.62, 3.73)	4.5	1.2	3.98 (3.35, 4.74)
Diabetes in pregnancy	17.4	8.0	2.42 (2.16, 2.71)	7.6	5.2	1.50 (1.35, 1.68)
Premature rupture of membranes	5.8	2.8	2.10 (1.74, 2.53)	2.2	1.4	1.63 (1.33, 2.00)
Macrosomia	10.8	6.7	1.69 (1.47, 1.93)	16.0	10.9	1.55 (1.43, 1.68)
Preterm delivery	10.4	12.3	0.83 (0.73, 0.94)	3.8	6.3	0.58 (0.51, 0.67)
Intrauterine growth restriction	18.5	17.7	1.05 (0.95, 1.17)	9.3	9.3	1.00 (0.91, 1.10)

# Rates of induction of labour 2001-2012 by Aboriginal status and parity





# Main reason given for IOL 2001-2012 by Aboriginal status

Main indication	Aboriginal mothers		Non-Aboriginal mothers	
	Overall %	Average annual % change in OR (95% CI)	Overall %	Average annual % change in OR (95% CI)
Post-dates	27.6	-0.2 (-2.4, 2.1)	35.5	2.7 (1.3, 4.2)
Other	17.1	0.9 (-1.8, 3.7)	25.1	3.3 (1.7, 5.0)
Hypertension	17.5	0.3 (-2.4, 3.0)	10.1	-6.2 (-8.3, -4.0)
Prolonged ROM	12.9	-4.4 (-7.2, -1.5)	7.8	-0.4 (-3.0, 2.1)
IUGR	8.5	-3.7 (-7.2, -0.2)	3.3	-2.4 (-6.1, 1.4)
<b>Diabetes</b>	<b>9.3</b>	<b>9.2 (5.3, 13.2)</b>	<b>4.7</b>	<b>11.3 (7.6, 15.2)</b>
Premature ROM	3.4	0.4 (-5.1, 6.3)	1.5	7.3 (1.3, 13.6)
Social reason	2.4	-0.1 (-6.6, 6.8)	9.3	-6.8 (-9.0, -4.5)
Fetal death in utero	1.0	3.7 (-6.3, 14.8)	0.5	-7.1 (-15.5, 2.3)
<b>Unknown</b>	<b>0.4</b>	<b>-22.2 (-35.7, -5.8)</b>	<b>2.1</b>	<b>-23.3 (-27.7, -18.6)</b>

IUGR: intra uterine growth restriction; ROM Rupture of membranes.

# Adjusted OR of factors among women who were induced

	<u>Aboriginal</u>	<u>Non-Aboriginal</u>
Characteristic	OR (95% CI)	OR (95% CI)
Year	<b>1.04 (1.03, 1.06)</b>	1.00 (0.99, 1.01)
<b>Maternal demographic factors</b>		
<i>Less than 20 years</i>	0.81 (0.72, 0.92)	0.97 (0.82, 1.14)
<b>Private hospital</b>	<b>2.68 (1.72, 4.16)</b>	<b>3.35 (3.11, 3.61)</b>
<b>Obstetric history</b>		
<i>Previous caesarean section</i>	0.26 (0.22, 0.30)	0.14 (0.13, 0.17)
<b><u>Medical and obstetric complications</u></b>		
<b>Prolonged rupture of membranes</b>	<b>11.67 (9.86, 13.81)</b>	<b>13.54 (11.56, 15.85)</b>
<b>Pre-eclampsia</b>	<b>10.53 (8.89, 12.48)</b>	<b>10.01 (8.58, 11.67)</b>
<b>Late-term (<math>\geq 41</math> weeks)</b>	<b>7.66 (6.77, 8.68)</b>	<b>6.13 (5.64, 6.67)</b>
<b>Maternal hypertension</b>	<b>4.29 (3.52, 5.23)</b>	<b>6.54 (5.40, 7.93)</b>
<b>Diabetes in pregnancy</b>	<b>3.62 (3.16, 4.16)</b>	<b>2.20 (1.94, 2.49)</b>
<b>Premature rupture of membranes</b>	<b>2.23 (1.70, 2.91)</b>	<b>2.72 (2.04, 3.64)</b>
<i>Preterm delivery</i>	0.43 (0.35, 0.51)	0.30 (0.24, 0.37)

# Discussion

- Difference in IOL trends and associated factors among Aboriginal and non-Aboriginal mothers
- Increasing trend remained significant for Aboriginal mothers
- Non-Aboriginal mothers no significant change overall: balance between rise and fall of various drivers and inhibitors.
- Aboriginal trends: no clear driver
  - Diabetes? Most dramatic change, but not common indicator.
  - Improved access to services?
  - Complexity of cases

# Implications

- Pregnancy outcomes:
  - Improved maternal/neonatal outcomes?
  - “IOL failure”: increase risk of emergency caesarean, vacuum extraction, epidural analgesia.
    - Increased risk of subsequent intervention among primiparous mothers?
      - Long term implications
- Gap between evidence-based practice and patient care, or gap between research design and clinical reality?

# Limitations

- Use of Midwives Collection database:
  - Missing variables
  - No validation against medical records
- High rate of “Other” as main reason for induction

# Conclusion

- IOL became more common for Aboriginal mothers in the NT.
- No overall change in non-Aboriginal mothers
- Increasing trend among Aboriginal mothers could not be explained by definitive medical indications
- Important to follow maternal and neonatal outcomes

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