

Appendix 1: Te Anga o ngā Horopaki Māori: A conceptual framework for considering Māori circumstances or environments.

Te Anga o ngā Horopaki Māori Domain	<i>Growing Up in New Zealand</i> research domain	Variables examined	Tools used
Mahi Arataki (Policy and Strategy)	Policy and strategy	Knowledge of optimal breastfeeding duration	Exclusive breastfeeding duration defined as per WHO guidelines ¹
	Knowledge resources Leadership and commitment	Breastfeeding limited by mother's return to work	Developed within <i>Growing Up in New Zealand</i>
Te Ao Māori (Cultural Identity)	Cultural identity	Cultural knowledge, participation, and values	Hawaiian Lifestyle Questionnaire ²
	Ethnicity Language Cultural practices	Positive and negative experiences of one's own culture	Youth 2007 Culture and Identity Tool ³
	Cultural heritage	Experiences of racist or discriminatory sentiments or behaviour	New Zealand Health Survey (2007) Discrimination Tool ⁴
Whai Rawa (Economic Resources and Capability)	Economic resources and capability	Socioeconomic deprivation	New Zealand Index of Deprivation (NZDep06) ⁵ - combines nine socioeconomic characteristics from 2006 census data collected at aggregations of approximately 100 people and assigned to individual households based on geo-coded address data
	Access to organisations and services	Availability and access to health services	Developed within <i>Growing Up in New Zealand</i>
	Income	Delay in access to maternity care	As described by Bartholomew et al. (2015) ⁶
	Occupation	Household income	Statistics New Zealand 2006 national census ⁷
	Education	Parent education Parent occupation	Statistics New Zealand 2008 General Social Survey ⁸
Taiao a Hapori (Environment and Community)	Environment and Community	Parental perception of the social cohesion of the neighbourhood – integration, safety and isolation	New Zealand Caregivers Survey ⁹
	Access to Transport and Drinking Water Neighbourhood perceptions Community belonging	External support	Tool validated in an Australian population across both urban and rural settings ¹⁰

Appendix 1 (continued): Te Anga o ngā Horopaki Māori: A conceptual framework for considering Māori circumstances or environments.

Te Anga o ngā Horopaki Māori Domain	<i>Growing Up in New Zealand</i> research domain	Variables examined	Tools used
Whanaungatana (Family and Home)	Parental relationship dynamics Household dynamics Whānau (extended family) connections	Family Cohesion	Family Adaptation and Cohesion Scales (FACES III) - relevance to the Māori concept of whanau ¹¹
		Family Support	Adapted from the Family Support Scale ¹²
		Partner conflict	Warmth and Hostility Scale ¹³ with six additional items designed to gauge the conflict dimension of the relationship
		Personal, relational, and structural inter-parental commitment	From a measure used to describe relationship commitment ¹⁴
		Family stress	Created specifically for <i>Growing Up in New Zealand</i> ¹⁵
Hauora (Health and Wellbeing)	Health and well-being Health status and behaviours Mental health Nutrition Parent-child relationships	Parent stress	Perceived Stress Scale ¹⁶
		Pre-pregnancy health	5-point scale from poor to excellent. This single question is a validated predictor of health status and mortality, in ethnically and socially diverse samples ¹⁷⁻¹⁹
		Mental health	Edinburgh Postnatal Depression Scale, validated for measurement of antenatal and postnatal depression ²⁰⁻²²
		Activity and exercise	International Physical Activity Questionnaire ²³
		Health behaviours	Adapted questions from the National Nutrition Survey ²⁴ and New Zealand Health Survey ²⁵
		Parental involvement	Lamb's parenting constructs of accessibility, engagement and responsibility ²⁶

Appendix 2: Mahi Arataki (Policy and strategy) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Mahi Arataki (Policy and strategy)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
How long mother thinks is best to breastfeed their baby*	935				<0.001
≤ 6 months	289 (31)	271 (94)	18 (6)	1.00	
> 6 months	646 (69)	550 (85)	96 (15)	2.63 (1.59-4.57)	
Mother's breastfeeding duration will be limited by return to work[†]	945				0.004
Yes	262 (28)	243 (93)	19 (7)	1.00	
No	588 (62)	511 (87)	77 (13)	1.93 (1.16-3.34)	
Maybe	95 (10)	76 (80)	19 (20)	3.20 (1.60-6.38)	

* Exclusive breastfeeding duration defined as per WHO guidelines¹

[†] Developed within *Growing Up in New Zealand*

CI – confidence interval

Appendix 3: Te Ao Māori (Cultural identity) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Te Ao Māori (Cultural identity)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Culture*†					
Knowledgeable about traditional culture	1050				0.383
Very	241 (23)	25 (10)	216 (90)	0.83 (0.50-1.37)	
Fairly	383 (36)	54 (14)	329 (86)	1.18 (0.78-1.78)	
Somewhat / Not very / Not at all	426 (41)	52 (12)	374 (88)	1.00	
Degree of involvement in traditional culture	1050				0.817
Very	141 (13)	14 (10)	127 (90)	0.78 (0.40-1.47)	
Fairly	268 (26)	38 (14)	230 (86)	1.17 (0.72-1.91)	
Somewhat	299 (28)	37 (12)	262 (88)	1.00	
Not very	268 (26)	33 (12)	235 (88)	0.99 (0.60-1.64)	
Not at all	74 (7)	<10 (12)	65 (88)	0.98 (0.43-2.05)	
Feelings about culture	1050				0.686
Very positive	490 (47)	61 (12)	429 (88)	1.00	
Fairly positive	350 (33)	47 (13)	303 (87)	1.09 (0.72-1.64)	
Neutral	178 (17)	18 (10)	160 (90)	0.79 (0.44-1.35)	
Negative	32 (3)	<10 (16)	27 (84)	1.30 (0.43-3.25)	
Frequency of associations with other people from same culture	1048				0.955
Most of the time	554 (53)	71 (13)	483 (87)	1.00	
Often	282 (27)	34 (12)	248 (88)	0.93 (0.60-1.43)	
Sometimes	155 (15)	20 (13)	135 (87)	1.01 (0.58-1.69)	
Not often / Almost never	57 (5)	<10 (11)	51 (89)	0.80 (0.30-1.80)	
Importance of maintaining cultural traditions and practices	1050				0.135
Very	460 (44)	65 (14)	395 (86)	1.00	
Fairly	293 (28)	27 (9)	266 (91)	0.62 (0.38-0.98)	
Somewhat	193 (18)	22 (11)	171 (89)	0.78 (0.46-1.29)	
Not very / Not at all	104 (10)	17 (16)	87 (84)	1.19 (0.65-2.09)	

Appendix 3 (continued): Te Ao Māori (Cultural identity) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Te Ao Māori (Cultural identity)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Discrimination [‡]					
Have you ever felt you have been a victim of a verbally ethnically motivated attack?	1059			0.207	
No	740 (70)	86 (12)	654 (88)	1.00	
Yes	319 (30)	46 (14)	273 (86)	1.28 (0.87-1.87)	
Have you ever felt you have been a victim of a physically ethnically motivated attack?	1059			0.716	
No	1017 (96)	126 (12)	891 (88)	1.00	
Yes	42 (4)	<10 (14)	36 (86)	1.18 (0.44-2.66)	
Have you ever felt you have been treated unfairly by a health professional because of your ethnicity?	1050			0.896	
No	942 (90)	118 (13)	824 (87)	1.00	
Yes	108 (10)	14 (13)	94 (87)	1.04 (0.55-1.83)	
Have you ever felt you have been treated unfairly at work or refused a job because of your ethnicity?	1037			0.354	
No	952 (92)	123 (13)	829 (87)	1.00	
Yes	85 (8)	<10 (9)	77 (91)	0.70 (0.31-1.40)	
Have you ever felt you have been treated unfairly when renting or buying a house because of you ethnicity?	1004			0.180	
No	882 (88)	118 (13)	764 (87)	1.00	
Yes	122 (12)	11 (9)	111 (91)	0.64 (0.32-1.18)	
Have you ever felt you have been treated unfairly by the police, the justice system or the corrections department because of you ethnicity?	981			0.240	
No	892 (91)	108 (12)	784 (88)	1.00	
Yes	89 (9)	<10 (8)	82 (92)	0.62 (0.26-1.29)	

Appendix 3 (continued): Te Ao Māori (Cultural identity) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Te Ao Māori (Cultural identity)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Have you ever felt you have been treated unfairly when asking for loans, a mortgage, hire purchase or credit cards because of you ethnicity?	977				0.864
No	933 (95)	119 (13)	814 (87)	1.00	
Yes	44 (5)	<10 (14)	38 (86)	1.08 (0.40-2.43)	
Have you ever felt you have been treated unfairly when attending a place of learning because of you ethnicity?	1051				0.875
Yes	865 (82)	108 (12)	757 (88)	1.00	
No	186 (18)	24 (13)	162 (87)	1.04 (0.63-1.64)	
Ever unfairly treated due to ethnicity?	979				0.348
No	477 (49)	56 (12)	421 (88)	1.00	
Yes	502 (51)	69 (14)	433 (86)	1.20 (0.82-1.75)	
Any verbal or physical attack	1059				0.222
No	723 (68)	84 (12)	639 (88)	1.00	
Yes	336 (32)	48 (14)	288 (86)	1.27 (0.86-1.85)	
Ever discriminated against	959				0.418
No	597 (62)	80 (13)	517 (87)	1.00	
Yes	362 (38)	42 (12)	320 (88)	0.85 (0.57-1.26)	

* Hawaiian Lifestyle Questionnaire²† Youth 2007 Culture and Identity Tool³‡ New Zealand Health Survey (2007) Discrimination Tool⁴

CI – confidence interval

Appendix 4: Whai rawa (Economic resources and capability) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Whai rawa (Economic resources and capability)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Household deprivation*	1060				0.704
1 to 2 (least deprived)	94 (9)	10 (11)	84 (89)	1.00	
3 to 4	122 (12)	16 (13)	106 (87)	1.27 (0.55-3.03)	
5 to 6	159 (15)	25 (16)	134 (84)	1.57 (0.74-3.57)	
7 to 8	244 (23)	28 (11)	216 (89)	1.09 (0.52-2.45)	
9 to 10 (most deprived)	441 (42)	53 (12)	388 (88)	1.15 (0.58-2.48)	
Education[†]	1058				0.023
No secondary education	180 (17)	11 (6)	169 (94)	0.41 (0.20-0.76)	
Secondary education	302 (29)	42 (14)	260 (86)	1.02 (0.67-1.51)	
Tertiary education	576 (54)	79 (14)	497 (86)	1.00	
Occupation[†]	1021				0.773
Employed	444 (43)	54 (12)	390 (88)	0.90 (0.59-1.38)	
Unemployed	124 (12)	12 (10)	112 (90)	0.70 (0.34-1.33)	
Student	115 (11)	14 (12)	101 (88)	0.90 (0.46-1.68)	
Not in workforce	338 (33)	45 (13)	293 (87)	1.00	
Household income per annum in \$NZ[†]	775				0.223
≤ 30,000	128 (17)	12 (9)	116 (91)	0.56 (0.27-1.06)	
>30,000 to ≤70,000	274 (35)	43 (16)	231 (84)	1.00	
>70,000 to ≤100,000	189 (24)	25 (13)	164 (87)	0.82 (0.48-1.38)	
>100,000	184 (24)	19 (10)	165 (90)	0.62 (0.34-1.09)	
Where child born[†]	1018				0.008
Larger hospital	690 (68)	80 (12)	610 (88)	1.00	
Smaller hospital	291 (29)	37 (13)	254 (87)	1.11 (0.73-1.67)	
Home birth	37 (4)	11 (30)	26 (70)	3.23 (1.48-6.62)	
Had a family doctor before becoming pregnant[†]	1060				0.458
Yes	951 (90)	116 (12)	835 (88)	1.00	
No	109 (10)	16 (15)	93 (85)	1.24 (0.68-2.12)	

Appendix 4 (continued): Whai rawa (Economic resources and capability) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Whai rawa (Economic resources and capability)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Seen any family doctor since becoming pregnant[‡]	964				0.716
Yes	734 (76)	86 (12)	648 (88)	1.00	
No	230 (24)	29 (13)	201 (87)	1.09 (0.68-1.69)	
This was the same family doctor as mother saw before becoming pregnant[‡]	797				0.562
Yes	605 (76)	79 (13)	526 (87)	1.00	
No	192 (24)	22 (11)	170 (89)	0.86 (0.51-1.40)	
Knows who family doctor for baby will be after the birth[‡]	954				0.396
Yes	742 (78)	93 (13)	649 (87)	1.00	
No	212 (22)	22 (10)	190 (90)	0.81 (0.48-1.30)	
Has a lead maternity carer (LMC)[‡]	1060				0.582
Yes	1028 (97)	127 (12)	901 (88)	1.00	
No	32 (3)	<10 (16)	27 (84)	1.31 (0.44-3.20)	
Type of lead maternity carer[‡]	1025				0.450
Independent Midwife	743 (72)	100 (13)	643 (87)	1.00	
Hospital Midwife	128 (12)	10 (8)	118 (92)	0.55 (0.26-1.03)	
Obstetrician	21 (2)	<10 (14)	18 (86)	1.07 (0.25-3.24)	
GP and Obstetrician	88 (9)	<10 (10)	79 (90)	0.73 (0.33-1.43)	
Other LMC combination	45 (4)	<10 (11)	40 (89)	0.80 (0.27-1.91)	
Consulted complementary or alternative practitioner or traditional healer during pregnancy[‡]	1060				0.232
Yes	127 (12)	20 (16)	107 (84)	1.00	
No	933 (88)	112 (12)	821 (88)	0.73 (0.44-1.25)	

Appendix 4 (continued): Whai rawa (Economic resources and capability) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Whai rawa (Economic resources and capability)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Attended pregnancy preparation class this pregnancy? ‡	1051				0.776
Yes	194 (18)	23 (12)	171 (88)	0.93 (0.57-1.48)	
No	857 (82)	108 (13)	749 (87)	1.00	
Ever attended pregnancy preparation class[†]	968				0.011
Yes	501 (52)	77 (15)	424 (85)	1.66 (1.13-2.47)	
No	467 (48)	46 (10)	421 (90)	1.00	

* Area-level socio-economic deprivation measured using the New Zealand Index of Deprivation (NZDep06), grouped as quintiles.⁵

[†] Statistics New Zealand 2006 national census⁷; Statistics New Zealand 2008 General Social Survey⁸

[‡] Developed within *Growing Up in New Zealand*⁶

CI – confidence interval

Appendix 5: Taiao Hapori (Environment and community) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Taiao a Hapori (Environment and community)	Duration of exclusive breastfeeding			
	≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value*
External support[†]	22.5 ± 5.5	23.2 ± 5.7	0.98 (0.95-1.01)	0.241
Neighbourhood Integration scale[‡]	33.7 ± 4.9	33.9 ± 5.3	0.99 (0.95-1.03)	0.589

* t-Test – pooled

[†] Tool validated in an Australian population across both urban and rural settings.¹⁰[‡] New Zealand Caregivers Survey⁹

CI – confidence interval

Appendix 6: Whanaungatanga (Family and home) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Whanaungatanga (Family and home)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Mother					
Relationship status*	961			<0.001	
No relationship or dating	183 (19)	18 (10)	165 (90)	1.18 (0.65-2.09)	
Cohabiting	473 (49)	40 (8)	433 (92)	1.00	
Married	305 (32)	56 (18)	249 (82)	2.44 (1.58-3.78)	
Household structure*	1059			0.025	
Parent alone or with non-kin	126 (12)	10 (8)	116 (92)	0.49 (0.23-0.93)	
Two Parents	559 (53)	84 (15)	475 (85)	1.00	
Parent with extended family	374 (35)	38 (10)	336 (90)	0.64 (0.42-0.96)	
Urban or rural dwelling*	1060			0.416	
Urban	982 (93)	120 (12)	862 (88)	1.00	
Rural	78 (7)	12 (15)	66 (85)	1.31 (0.66-2.40)	
Parity*	1060			0.028	
First born	406 (38)	39 (10)	367 (90)	1.00	
Subsequent	654 (62)	93 (14)	561 (86)	1.56 (1.06-2.34)	
People in family/whanau ask each other for help [†]	1060			0.497	
Never / Sometimes	230 (22)	24 (10)	206 (90)	0.74 (0.45-1.21)	
Usually	335 (32)	41 (12)	294 (88)	0.89 (0.58-1.35)	
Always	495 (47)	67 (14)	428 (86)	1.00	
We try to do something back for someone who does something good for our family/whanau [†]	1060			0.318	
Never / Sometimes	118 (11)	10 (8)	108 (92)	0.59 (0.28-1.13)	
Usually	395 (37)	48 (12)	347 (88)	0.88 (0.60-1.30)	
Always	547 (52)	74 (14)	473 (86)	1.00	
Our family enjoys doing activities that are just with our family/whanau [†]	1060			0.593	
Never / Sometimes	289 (27)	36 (12)	253 (88)	0.90 (0.57-1.41)	
Usually	383 (36)	43 (11)	340 (89)	0.80 (0.52-1.23)	
Always	388 (37)	53 (14)	335 (86)	1.00	

Appendix 6 (continued): Whanaungatanga (Family and home) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Whanaungatanga (Family and home)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
People in our family/whanau would provide for each other if there was very little to go around[†]	1060				0.099
Never / Sometimes	69 (7)	<10 (9)	63 (91)	0.60 (0.23-1.31)	
Usually	188 (18)	16 (9)	172 (91)	0.59 (0.33-0.99)	
Always	803 (76)	110 (14)	693 (86)	1.00	
We feel very close to our family/whanau[†]	1060				0.559
Never / Sometimes	90 (8)	<10 (9)	82 (91)	0.67 (0.29-1.36)	
Usually	244 (23)	32 (13)	212 (87)	1.04 (0.67-1.59)	
Always	726 (68)	92 (13)	634 (87)	1.00	
People in our family/whanau support each other at difficult times[†]	1060				0.926
Never / Sometimes	47 (4)	<10 (11)	42 (89)	0.83 (0.28-1.97)	
Usually	189 (18)	24 (13)	165 (87)	1.02 (0.62-1.61)	
Always	824 (78)	103 (13)	721 (88)	1.00	
When our family/whanau have an important activity such as a wedding or hui everyone tries to be present[†]	1059				0.580
Never / Sometimes	78 (7)	<10 (10)	70 (90)	0.75 (0.33-1.53)	
Usually	260 (25)	29 (11)	231 (89)	0.83 (0.52-1.27)	
Always	721 (68)	95 (13)	626 (87)	1.00	
We can easily think of things to do together as a family group[†]	1059				0.104
Never / Sometimes	192 (18)	15 (8)	177 (92)	0.55 (0.29-0.96)	
Usually	384 (36)	52 (14)	332 (86)	1.01 (0.68-1.49)	
Always	483 (46)	65 (13)	418 (87)	1.00	

Appendix 6 (continued): Whanaungatanga (Family and home) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Whanaungatanga (Family and home)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
We ask each other for advice about important decisions in our family/whanau[†]	1060				0.960
Never / Sometimes	243 (23)	30 (12)	213 (88)	0.96 (0.59-1.54)	
Usually	387 (37)	47 (12)	340 (88)	0.94 (0.62-1.43)	
Always	430 (41)	55 (13)	375 (87)	1.00	
Warmth and hostility scale[‡] (t-Test – pooled)		47.0 ± 8.4	46.0 ± 8.5	1.01 (0.99-1.04)	0.277
Relationship commitment[§] (t-Test – pooled)		9.3 ± 1.2	9.2 ± 1.4	1.10 (0.94-1.31)	0.275
Structural commitment (t-Test – pooled)		3.5 ± 1.7	3.6 ± 1.9	0.98 (0.87-1.09)	0.674
Physical conflict in last four weeks[¶]	862				0.011
No	691 (80)	95 (14)	596 (86)	1.00	
Yes	171 (20)	11 (6)	160 (94)	0.43 (0.21-0.79)	
Verbal conflict scale[¶] (t-Test – pooled)		17.6 ± 3.4	16.3 ± 4.2	1.09 (1.03-1.16)	0.003
Family cohesion score[#] (t-Test – pooled)		31.3 ± 3.7	30.6 ± 4.4	1.04 (0.99-1.09)	0.096
Family stress^{**} (t-Test – pooled)		11.4 ± 4.6	11.5 ± 4.3	0.99 (0.95-1.04)	0.790
Family support^{††} (t-Test – pooled)		24.7 ± 5.2	24.0 ± 5.4	1.03 (0.99-1.06)	0.189

* Developed within *Growing Up in New Zealand*† Family Adaptation and Cohesion Scales (FACES III) - relevance to the Māori concept of whanau¹¹‡ Warmth and Hostility Scale¹³§ From a measure used to describe parents' commitment to the relationship¹⁴|| From a measure used to describe parents' barriers to leaving the relationship¹⁴¶ Warmth and Hostility Scale¹³ with six additional items designed to gauge the conflict dimension of the relationship# Selected items from *FACES III* - Family Adaptation and Cohesion Scales¹¹** Created specifically for *Growing Up in New Zealand*¹⁵†† Adapted from the Family Support Scale¹²

CI – confidence interval; SD – standard deviation

Appendix 7: Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Maternal age and health					
Maternal age	1060				0.252
<20	119 (11)	<10 (8)	110 (92)	0.60 (0.27-1.18)	
20 to <30	530 (50)	64 (12)	466 (88)	1.00	
30 to <40	371 (35)	54 (15)	317 (85)	1.24 (0.84-1.83)	
≥40	40 (4)	<10 (12)	35 (88)	1.04 (0.35-2.53)	
General health before pregnancy*	1059				0.323
Poor	41 (4)	<10 (12)	36 (88)	1.11 (0.37-2.74)	
Fair	162 (15)	15 (9)	147 (91)	0.81 (0.43-1.48)	
Good	395 (37)	44 (11)	351 (89)	1.00	
Very good	305 (29)	43 (14)	262 (86)	1.31 (0.83-2.06)	
Excellent	156 (15)	25 (16)	131 (84)	1.52 (0.89-2.57)	
Long term disability	964				0.878
Yes	79 (8)	<10 (11)	70 (89)	0.95 (0.43-1.85)	
No	885 (92)	106 (12)	779 (88)	1.00	
Body mass index [†]	854				0.487
Underweight: BMI < 18.50 kg/m ²	18 (2)	<10 (17)	15 (83)	1.17 (0.27-3.71)	
Normal weight: BMI 18.5–24.99 kg/m ²	343 (40)	50 (15)	293 (85)	1.00	
Overweight: BMI 25–29.99 kg/m ²	253 (30)	35 (14)	218 (86)	0.94 (0.59-1.50)	
Obese: BMI ≥ 30.00 kg/m ²	240 (28)	25 (10)	215 (90)	0.68 (0.40-1.13)	
Ever diagnosed with depression	1058				0.167
No	824 (78)	109 (13)	715 (87)	1.00	
Yes	234 (22)	23 (10)	211 (90)	0.72 (0.44-1.13)	
Ever diagnosed with anxiety	1059				0.927
No	928 (88)	116 (13)	812 (88)	1.00	
Yes	131 (12)	16 (12)	115 (88)	0.97 (0.54-1.66)	
Maternal depression during pregnancy [‡]	965				0.002
Yes	195 (20)	10 (5)	185 (95)	0.34 (0.17-0.64)	
No	770 (80)	105 (14)	665 (86)	1.00	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Perceived Stress Score[§]		12.8 ± 6.6	15.0 ± 6.9	0.95 (0.92-0.98)	0.002
Maternal fertility/pregnancy characteristics					
Age of menarche (mean ± SD)		12.6 ± 1.5	12.5 ± 1.6	1.07 (0.95-1.20)	0.255
Regular menstruation prior to pregnancy	1040				0.909
Yes	813 (78)	99 (12)	714 (88)	1.00	
No	227 (22)	27 (12)	200 (88)	0.97 (0.61-1.51)	
Planned pregnancy	1056				0.064
Yes	390 (37)	58 (15)	332 (85)	1.42 (0.98-2.05)	
No	666 (63)	73 (11)	593 (89)	1.00	
Months taken to conceive for planned pregnancy	387				0.440
1 month	120 (31)	22 (18)	98 (82)	1.00	
2 to 3 months	97 (25)	10 (10)	87 (90)	0.51 (0.22-1.12)	
4 to 12 months	115 (30)	17 (15)	98 (85)	0.77 (0.38-1.54)	
> 12 months	55 (14)	<10 (15)	47 (85)	0.76 (0.30-1.77)	
Fertility treatment	390				0.800
Yes	23 (6)	<10 (13)	20 (87)	0.85 (0.20-2.59)	
No	367 (94)	55 (15)	312 (85)	1.00	
Gestation when aware of pregnancy	1054				0.586
1 to 3 weeks	116 (11)	17 (15)	99 (85)	1.19 (0.65-2.06)	
4 to 6 weeks	546 (52)	69 (13)	477 (87)	1.00	
7 or more weeks	392 (37)	44 (11)	348 (89)	0.87 (0.58-1.30)	
Nausea or morning sickness in first 3 months	1059				0.398
None	305 (29)	39 (13)	266 (87)	1.00	
Nausea only	280 (26)	42 (15)	238 (85)	1.20 (0.75-1.93)	
Occasional vomiting	248 (23)	26 (10)	222 (90)	0.80 (0.47-1.35)	
Frequent vomiting	226 (21)	25 (11)	201 (89)	0.85 (0.49-1.44)	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Perinatal characteristics					
Mode of delivery	1056				0.728
Spontaneous vaginal delivery	819 (78)	104 (13)	715 (87)	1.00	
Planned caesarean	54 (5)	<10 (7)	50 (93)	0.55 (0.16-1.38)	
Emergency or unplanned caesarean	110 (10)	13 (12)	97 (88)	0.92 (0.48-1.65)	
Other assisted birth	73 (7)	<10 (12)	64 (88)	0.97 (0.44-1.91)	
Birth gestation	1060				0.954
< 37 weeks	55 (5)	<10 (13)	48 (87)	1.03 (0.42-2.19)	
37 to 41 weeks	977 (92)	121 (12)	856 (88)	1.00	
> 41 weeks	28 (3)	<10 (14)	24 (86)	1.18 (0.34-3.12)	
Birth weight	1060				0.934
Low (<2500g)	38 (4)	<10 (11)	34 (89)	0.82 (0.24-2.12)	
Appropriate	848 (80)	106 (13)	742 (88)	1.00	
High (>4000g)	174 (16)	22 (13)	152 (87)	1.01 (0.61-1.63)	
Infant Sex	1060				0.144
Male	545 (51)	60 (11)	485 (89)	1.00	
Female	515 (49)	72 (14)	443 (86)	1.31 (0.91-1.90)	
Number of days mother in hospital after birth	1022				0.367
0 to 1	304 (30)	32 (11)	272 (89)	0.79 (0.50-1.23)	
2 to 3	494 (48)	64 (13)	430 (87)	1.00	
4 to 6	160 (16)	21 (13)	139 (87)	1.02 (0.59-1.70)	
7 or more	64 (6)	<10 (6)	60 (94)	0.45 (0.13-1.14)	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Maternal lifestyle characteristics before and during pregnancy					
Physical activity					
Days per week of vigorous physical activity before pregnancy	965				0.386
0	375 (39)	42 (11)	333 (89)	1.00	
1 to 3	291 (30)	41 (14)	250 (86)	1.30 (0.82-2.06)	
4 to 7	299 (31)	32 (11)	267 (89)	0.95 (0.58-1.54)	
Average length of vigorous physical activity before pregnancy	590				0.199
<30 min	68 (12)	11 (16)	57 (84)	1.00	
30-60 min	360 (61)	48 (13)	312 (87)	0.80 (0.40-1.70)	
>60 min	162 (27)	14 (9)	148 (91)	0.49 (0.21-1.17)	
Days per week of vigorous physical activity during first 3 months of pregnancy	961				0.968
0	612 (64)	72 (12)	540 (88)	1.00	
1 to 3	227 (24)	28 (12)	199 (88)	1.06 (0.65-1.66)	
4 to 7	122 (13)	15 (12)	107 (88)	1.05 (0.56-1.86)	
Average length of vigorous physical activity during first 3 months of pregnancy	349				0.329
<30 min	77 (22)	<10 (9)	70 (91)	1.00	
30-60 min	182 (52)	27 (15)	155 (85)	1.74 (0.76-4.51)	
>60 min	90 (26)	<10 (10)	81 (90)	1.11 (0.39-3.26)	
Days per week of vigorous physical activity since first 3 months of pregnancy	963				0.031
0	748 (78)	83 (11)	665 (89)	1.00	
1 to 3	149 (15)	27 (18)	122 (82)	1.77 (1.09-2.82)	
4 to 7	66 (7)	<10 (8)	61 (92)	0.66 (0.23-1.53)	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Average length of vigorous physical activity since first 3 months of pregnancy	215				0.532
<30 min	74 (34)	11 (15)	63 (85)	1.00	
30-60 min	107 (50)	18 (17)	89 (83)	1.16 (0.52-2.69)	
>60 min	34 (16)	<10 (9)	31 (91)	0.55 (0.12-1.93)	
Days per week of moderate physical activity before pregnancy	963				0.344
0	178 (18)	18 (10)	160 (90)	1.00	
1 to 3	323 (34)	45 (14)	278 (86)	1.44 (0.82-2.63)	
4 to 7	462 (48)	51 (11)	411 (89)	1.10 (0.64-1.99)	
Average length of moderate physical activity before pregnancy	783				0.653
<30 min	167 (21)	17 (10)	150 (90)	1.00	
30-60 min	427 (55)	55 (13)	372 (87)	1.30 (0.75-2.38)	
>60 min	189 (24)	24 (13)	165 (87)	1.28 (0.67-2.52)	
Days per week of moderate physical activity during first 3 months of pregnancy	963				0.647
0	286 (30)	31 (11)	255 (89)	1.00	
1 to 3	325 (34)	43 (13)	282 (87)	1.25 (0.77-2.07)	
4 to 7	352 (37)	41 (12)	311 (88)	1.08 (0.66-1.79)	
Average length of moderate physical activity during first 3 months of pregnancy	677				0.252
<30 min	192 (28)	18 (9)	174 (91)	1.00	
30-60 min	341 (50)	44 (13)	297 (87)	1.43 (0.82-2.61)	
>60 min	144 (21)	22 (15)	122 (85)	1.74 (0.90-3.42)	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Days per week of moderate physical activity since first 3 months of pregnancy	962				0.312
0	310 (32)	30 (10)	280 (90)	1.00	
1 to 3	332 (35)	42 (13)	290 (87)	1.35 (0.83-2.24)	
4 to 7	320 (33)	43 (13)	277 (87)	1.45 (0.89-2.40)	
Average length of moderate physical activity since first 3 months of pregnancy	651				0.378
<30 min	233 (36)	30 (13)	203 (87)	1.00	
30-60 min	306 (47)	36 (12)	270 (88)	0.90 (0.54-1.52)	
>60 min	112 (17)	19 (17)	93 (83)	1.38 (0.73-2.57)	
Alcohol consumption and cigarette use[¶]					
Frequency of alcohol consumption, standard drinks/week					
Before pregnancy	1055				0.002
None	227 (22)	40 (18)	187 (82)	1.00	
<1 to 3	408 (39)	59 (14)	349 (86)	0.79 (0.51-1.23)	
4 to 9	223 (21)	20 (9)	203 (91)	0.46 (0.26-0.81)	
≥10	197 (19)	13 (7)	184 (93)	0.33 (0.17-0.62)	
During pregnancy	1059				0.004
Yes	411 (39)	36 (9)	375 (91)	0.55 (0.36-0.82)	
No	648 (61)	96 (15)	552 (85)	1.00	
Smoking before pregnancy	1059				<0.001
Yes	445 (42)	35 (8)	410 (92)	0.46 (0.30-0.68)	
No	614 (58)	97 (16)	517 (84)	1.00	
Number of cigarettes per day smoked before pregnancy[§]	443				0.372
<1-5	97 (22)	11 (11)	86 (89)	1.73 (0.72-4.10)	
6 to 10	174 (39)	12 (7)	162 (93)	1.00	
>10	172 (39)	12 (7)	160 (93)	1.01 (0.44-2.34)	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
Age started smoking	444				0.191
7 to 13	124 (28)	<10 (4)	119 (96)	0.41 (0.14-1.02)	
14 to 17	247 (56)	23 (9)	224 (91)	1.00	
18 and over	73 (16)	<10 (10)	66 (90)	1.03 (0.40-2.40)	
Smoking during pregnancy	965				0.003
Yes	267 (28)	18 (7)	249 (93)	0.45 (0.26-0.74)	
No	698 (72)	97 (14)	601 (86)	1.00	
Number of cigarettes per day smoked during pregnancy	265				0.560
<1-5	123 (46)	10 (8)	113 (92)	1.20 (0.43-3.63)	
6 to 10	87 (33)	<10 (7)	81 (93)	1.00	
>10	55 (21)	<10 (4)	53 (96)	0.51 (0.07-2.31)	
Maternal parenting intentions					
To what extent do you hope to be involved in the day-to-day care of your baby, for example feeding, holding and changing? #	964				0.269
Not much/Some of the time**	<10 (1)	0 (0)	<10	N/A	
Most of the time	166 (17)	24 (14)	142 (86)	1.32 (0.80-2.10)	
All of the time	790 (82)	90 (11)	700 (89)	1.00	
How involved do you expect your partner will be in the day-to-day care of your baby?#	959				0.250
Not applicable	50 (5)	<10 (10)	45 (90)	0.90 (0.30-2.19)	
Not much/Some of the time	282 (29)	43 (15)	239 (85)	1.46 (0.93-2.28)	
Most of the time	418 (44)	46 (11)	372 (89)	1.00	
All of the time	209 (22)	21 (10)	188 (90)	0.90 (0.52-1.54)	

Appendix 7 (continued): Hauora (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

Hauora (Health and wellbeing)	Total N (column %)	Duration of exclusive breastfeeding			
		≥ 6 months n=132 n (row%)	< 6 months n=928 n (row%)	Odds Ratio (95% CI)	P-value
How much of the time do you expect to be directly responsible for your baby, for example, in sole care of him/her, making babysitting arrangements, looking after him/her if they are sick? #	964				0.117
Not much/Some of the time	22 (2)	<10 (9)	20 (91)	0.85 (0.13-2.99)	
Most of the time	268 (28)	41 (15)	227 (85)	1.53 (1.01-2.31)	
All of the time	674 (70)	71 (11)	603 (89)	1.00	
How often do you expect that your partner will be directly responsible for your baby?#	959				0.439
Not applicable	53 (6)	<10 (8)	49 (92)	0.70 (0.20-1.85)	
Not much/Some of the time	394 (41)	54 (14)	340 (86)	1.35 (0.86-2.16)	
Most of the time	314 (33)	33 (11)	281 (89)	1.18 (0.67-2.05)	
All of the time	198 (21)	24 (12)	174 (88)	1.00	
We would like to know how you are feeling about being the parent of this baby overall, do you feel that as a parent you will be: #	963				0.036
Not very good to average	148 (15)	<10 (5)	140 (95)	0.38 (0.17-0.77)	
A better than average parent	207 (21)	28 (14)	179 (86)	1.05 (0.65-1.65)	
A very good parent	608 (63)	79 (13)	529 (87)	1.00	
Mother's intentions for infant feeding	964				0.060
Breastfeeding	864 (90)	109 (13)	755 (87)	1.00	
Breast and bottle / Bottle only / Undecided	100 (10)	<10 (6)	94 (94)	0.44 (0.17-0.95)	
How long mother would like to breastfeed	937				0.001
Up to 6 months	307 (33)	21 (7)	286 (93)	0.42 (0.25-0.67)	
Longer than 6 months	630 (67)	94 (15)	536 (85)	1.00	
Decision regarding immunisation	964				0.008
Decided	826 (86)	89 (11)	737 (89)	1.00	
Undecided	138 (14)	26 (19)	112 (81)	1.92 (1.17-3.07)	

Appendix 7 (continued): Hauroa (Health and wellbeing) variables and associations with breastfeeding duration for women of self-identified Māori ethnicity.

* Validated predictor of health status and mortality, in ethnically and socially diverse samples¹⁷⁻¹⁹

† Based upon pre-pregnancy weight. As defined by the WHO and reported in the 2008/09 New Zealand Adult Nutrition Survey^{27, 28}

‡ As defined by an Edinburgh Postnatal Depression Scale score ≥ 13 ²⁰

§ Maternal perceived stress was assessed with the 10-item Perceived Stress Scale¹⁶

|| International Physical Activity Questionnaire²³

¶ Adapted from the National Nutrition Survey²⁴ and New Zealand Health Survey²⁵

Lamb's parenting constructs of accessibility, engagement and responsibility²⁶

** Not included in logistic regression analysis due to insufficient data

CI – confidence interval; N/A – Not Applicable; SD – standard deviation

Appendix 8: Hierarchical logistic regression analyses within the Te Anga o ngā Horopaki Māori framework. Variables in bold were retained for all successive multiple logistic regression models describing characteristics associated with exclusive breastfeeding in Māori women. Variables were added individually to the model and retained if $P < 0.20$.

Mahi Arataki – Policy and Strategy: Adjusted for **how long mother thinks is best to breastfeed; mother's breastfeeding duration limited by return to work.**



Te Ao Māori – Cultural Identity: Adjusted for **how long mother thinks is best to breastfeed; mother's breastfeeding duration limited by return to work; importance of maintaining cultural traditions/practices; treated unfairly due to ethnicity when buying a house.**



Whai Rawa – Economic Resources & Capability: Adjusted for **how long mother thinks is best to breastfeed; mother's breastfeeding duration limited by return to work; importance of maintaining cultural traditions/practices; maternal education; where child born; mother ever attended antenatal class.**



Taiao a Hapori – Environment & Community: Adjusted for **how long mother thinks is best to breastfeed; mother's breastfeeding duration limited by return to work; importance of maintaining cultural traditions/practices; maternal education; where child born; mother ever attended antenatal class; external support.**



Whanaungatanga – Family & Home: Adjusted for **how long mother thinks is best to breastfeed; mother's breastfeeding duration limited by return to work; importance of maintaining cultural traditions/practices; maternal education; where child born; mother ever attended antenatal class; external support; relationship status; household structure; parity; family/whanau will provide for each other if little to go around; easily think of things to do as a family group; physical conflict; verbal conflict; family cohesion; family support.**



Final Model

Hauora – Health & Wellbeing: Adjusted for **how long mother thinks is best to breastfeed; mother's breastfeeding duration limited by return to work; importance of maintaining cultural traditions/practices; maternal education; where child born; mother ever attended antenatal class; external support; relationship status; parity; easily think of things to do as a family group; physical conflict; verbal conflict; maternal depression during pregnancy; mother's physical activity after first trimester; mother's alcohol use during pregnancy; mother's smoking during pregnancy; mother's time as sole carer of baby; and mother's immunisation decisions.**

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