Supplementary Table 1: Secondary Outcomes according to the 21 themes that make the QFC Research Collaborative. Research measures and samples used to address the secondary outcomes and the collaborations involved in addressing these questions. *Collection measures planned for the future \$Age appropriate measures to be collected in the future.

Theme	Major Research Question	Primary Exposure Measures Collected		Collaborations
		Histories/Surveys/Questionnaires	Measures/Biological Samples	
Cardiovascular function	 ▶ Characterisation of the cardiovascular systems of our reproductive population and its relationship to fetal growth and child cardiovascular function ▶ The relationship between maternal cardiovascular system and placental circulation and fetal cardiac output (fetal distress, tachycardia, congenital heart defects) ▶ The relationship between maternal cardiovascular system and placental circulation and fetal kidney development 	 Delivery Details Demographics Family History Medical History Medication and Lifestyle Medication chart review for medication during labour and delivery Pregnancy Complications 	 ▶ Blood pressure ▶ Cord blood ▶ Heart rate ▶ Height ▶ Placenta and Placenta Measures ▶ Skinfold thickness ▶ Ultrasound data ▶ Urine ▶ Weight, BMI ▶ PeaPod 	 Fetal Growth Kidney Function Medication Usage Neonatal/Child Body Composition and Growth Pregnancy and Pregnancy and Complications
Education	 What are the educational achievements of the parents and attitudes to linguistics? How does maternal-baby interaction influence early oracy? What is the impact of the parents' social and family networks on child literacy? 	 ▶ Childcare ▶ Department of Education* and NAPLAN data linkage* ▶ Education history ▶ Pregnancy Complications ▶ Reading for Enjoyment ▶ Reading for Occupation 	none	 Epidemiology and Health Economics Pregnancy and Pregnancy Complications Social Determinants of Health Outcomes

		 Tracking the relationship between child health and academic achievement through data linkage Impact of preterm delivery on linguistics, oracy and academic attainment Impact of childcare on oracy and literacy 			
_	Environmental and Occupational Interactions	 Examine impact of environmental exposures on microbiome Are there similarities between the impact of environmental exposures on families in Australia relative to families in China? What is the impact of air quality on pregnancy outcomes and respiratory health? Gestational elemental exposures and its impact of pre and postnatal growth and development 	 ▶ Adult Sleep Patterns ▶ Alcohol Consumption ▶ Australian Eating Survey Food Frequency ▶ Breastfeeding Questionnaires ▶ Delivery Details ▶ Demographics ▶ Depression Anxiety Stress Scale ▶ Education History ▶ Employment History ▶ Indoor/Outdoor air sample ▶ Medical History ▶ Medication and Lifestyle ▶ Medication chart review for medication during labour and delivery ▶ Postcode / Geocode ▶ Pregnancy Complications ▶ Residential Housing Questionnaire 	 ▶ Baby Measures ▶ Blood ▶ Breast milk ▶ Hair ▶ Toenail ▶ Urine 	 ▶ Immunology ▶ Lactation ▶ Medication Usage ▶ Microbiome ▶ Nutrition ▶ Pregnancy and Pregnancy Complications ▶ Respiratory

		➤ Smoking Status Assessment of Quality of Life questionnaire		
Epidemiology and Health Economics	 How does health utility change throughout pregnancy and post-partum? Is there inequality of opportunity in parental mental health outcomes and use of mental health and other health services? What are the payment mechanisms for health services for parents? Does travel impede their use of services? Does alcohol and substance abuse change health care utilisation during pregnancy? 	 ▶ Alcohol Consumption ▶ Cultural background ▶ Demographics ▶ Education history ▶ Employment history ▶ European Quality of Life 5-Dimension ▶ Medical History ▶ Medication Treatment* ▶ PBS/MBS data linkage* ▶ Postcode / Geocode ▶ Pregnancy Complications 	none	 Education Medication Usage Mental Health and Cognitive Development Pregnancy and Pregnancy Complications Social Determinants of Health Outcomes
Fetal growth	 ▶ Characterise the variables contributing to idiopathic growth restriction and large for gestational age ▶ How does fetal growth influence other early life characteristics (education, physical and mental health, social behaviour) 	 ▶ Delivery Details ▶ Department of Education* and NAPLAN data linkage* ▶ Medical History ▶ Pregnancy Complications 	 ▶ Baby Measures ▶ Cord blood ▶ Middle Cerebral Artery Doppler/Placental Artery Doppler ▶ Peapod ▶ Placenta and Placenta measures ▶ Ultrasound data 	 ▶ Education ▶ Neonatal/Child Body Composition and Growth ▶ Pregnancy and Pregnancy Complications
Genomics and Bioinformatics	► The relationship between the genome, complex traits and disease, mental health, maternal	▶ Medical History▶ Family History▶ Demographics	▶ Blood▶ Cheek swab▶ Cord blood	► Mental Health and Cognitive Development

	and fetal health, pregnancy outcomes, and development ➤ The impact of the mitochondrial genome on pregnancy outcomes ➤ The interaction of the genome with the microbiome ➤ The role of and prevalence of somatic and de novo genomic variation ➤ Twin studies	► Pregnancy Complications	 Heel prick Microba swab Placenta: dimensions, samples Stool 	▶ Microbiome▶ Pregnancy and Pregnancy Complications
Immunology	 ▶ The in utero and early life contributions to childhood allergy, autoimmunity and disease development ▶ The influence of the maternal microbiome on childhood allergy, autoimmunity susceptibility and disease development ▶ The impact of maternal and childhood infection on child health and development ▶ The relationship between child microbiome and disease ▶ How extrinsic and intrinsic factors influence the development of the immune system 	 Asthma control questionnaire Sino-Nasal Outcome test Medical History Medication and Lifestyle Medication chart review for medication during labour and delivery Pregnancy Complications 	 ▶ Blood ▶ Cord blood ▶ Microba swab ▶ Saliva ▶ Stool ▶ Urine ▶ Vaginal swab 	 ▶ Medication Usage ▶ Microbiome ▶ Pregnancy and Pregnancy complications ▶ Respiratory
Kidney Function	► What genetics factors contribute to kidney disease and kidney disease risk? Can these	 ➤ Alcohol Consumption ➤ Australian Eating Survey Food Frequency ➤ Delivery Details 	 Baby Measures Blood Blood Pressure Height 	 Cardiovascular Function Fetal Growth Medication Usage

	 mutations be reversed to prevent kidney disease? What pregnancy related events compromise fetal kidney development? How does prematurity affect kidney development? What are the population-based characteristics of kidney function? Determinant of infant kidney size and function 	 Demographics Medical History Medication and Lifestyle Medication chart review for medication during labour and delivery Pregnancy Complications 	 ▶ PeaPod ▶ Ultrasound data ▶ Urine ▶ Weigh, BMI 	 Neonatal/Child Body Composition and Growth Nutrition Pregnancy and Pregnancy Complications
Lactation	 Characterisation of breastfeeding habits in current population and parents views on breastfeeding Identification of factors that inhibit breastfeeding in first 6 weeks postpartum Identifying the impact of mastitis on breastfeeding continuation Determining the impact of BMI on breastfeeding continuation Impact of tongue tie on breastfeeding success 	 ▶ Alcohol Consumption ▶ Australian Eating Survey Food Frequency ▶ Baby Nutrition ▶ Breastfeeding questionnaires ▶ Delivery Details ▶ Demographics ▶ Intention to breastfeed ▶ Pregnancy Complications ▶ Skin-skin contact ▶ Time to first breastfeed 	 Baby Measures Breast milk Colostrum Height Photographs of mouth and tongue Skin swab Vaginal swab Videos of feeding Weight, BMI 	 Microbiome Nutrition Pregnancy and Pregnancy Complications Social Determinants and Health Outcomes
Medication Usage	► To evaluate medication (prescription and non-prescription) usage patterns in mothers, partners and their children.	 Delivery Details Demographics Medication and Lifestyle Medication chart review for medication during labour and delivery 	► Baby Measures	 Immunology Mental Health and Cognitive Development

	► To assess health outcomes (beneficial or adverse) and wellbeing of mothers, partners and their children in relation to medication use	▶ Medication Treatment*▶ Pregnancy Complications		➤ Pregnancy and Pregnancy Complications
Mental Health, Brain Development and Cognition	 ▶ The relationship between maternal mental health and wellbeing and its impact on pregnancy and child neurodevelopmental outcomes ▶ The relationship between mental health status of partners and its impact on maternal mental health and wellbeing, pregnancy outcomes and child development ▶ Interaction and dependencies between mental and physical health 	 ▶ Assessment of Quality of Life questionnaire ▶ Bayley Scales of Infant and Toddler Development* ▶ Child Behaviour and Neurodevelopment*\$ ▶ Couple Satisfaction Index ▶ Depression Anxiety Stress Scale ▶ Edinburgh Post-natal Depression Scale ▶ European Quality of Life 5-Dimension ▶ Medical History ▶ Medication and Lifestyle ▶ Medication chart review for medication during labour and delivery ▶ Medication Treatment* ▶ Multidimensional Scale of Perceived Social Support ▶ DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure - Adult ▶ Social Readjustment Rating Scale 	 ▶ Blood ▶ Cheek swab ▶ Cord blood ▶ Urine ▶ Weight, BMI 	 ▶ Fetal Growth ▶ Immunology ▶ Medication Usage ▶ Physical Exercise ▶ Pregnancy and Pregnancy Complications ▶ Social Determinants of Health Outcomes

Microbiome		To examine the interaction	► Bristol stool chart	► Cheek swab	► Immunology
		between mother, father and	➤ Constipation score	► Cord blood	► Lactation
		baby microbiome (normal	► Demographics	Microba swab	► Medication Usage
		microbiome)	► Family History	► Placenta and	Pregnancy and
	>	To examine the impact of	► Hyperemesis Questions	Placenta Measures	Pregnancy
		pregnancy and pregnancy	► Medical History	➤ Skin swab	Complications
		complications on maternal and	► Medication and Lifestyle	► Stool	
		neonatal microbiome (infection,	► Medication chart review for	▶ Urine	
		preterm birth, pre-eclampsia,	medication during labour and	Vaginal swab	
		hyperemesis gravidarum)	delivery		
	>	To examine the role of nutrition,	► Pregnancy Complications		
		feeding and supplement usage			
		in microbiome development and			
		stability (method of feeding,			
		vitamin/mineral			
		supplementation)			
	>	To examine the impact of			
		medical interventions pre- and			
		post-conception on the			
		microbiome (IVF, medications)			
	>	The characteristics of the			
		vaginal microbiome in			
		complicated pregnancies			

Musculoskeletal function	 ▶ Is obstructive defaecation associated with mode of delivery during childbirth? ▶ What is the prevalence, severity and impact of foot pain during pregnancy and postpartum and is predictive of peri-or postnatal prolapse? ▶ Is physical activity in the anteand post-natal period related to the prevalence of Pregnancy-related Low back pain, pelvic girdle pain and Stress Urinary Incontinence? 	 ▶ Adult Sleep Patterns ▶ Bristol stool chart ▶ Constipation score ▶ Demographics ▶ Employment History ▶ Medical History ▶ Musculoskeletal function ▶ Physical Activity ▶ Pregnancy Complications ▶ Pregnancy History ▶ Residential Housing Questionnaire ▶ Smoking Status 	▶ Height▶ Weight, BMI▶ Blood	 ▶ Pregnancy and Pregnancy Complications ▶ Physical Exercise
Neonatal/Child Body Composition and Growth	 Is infant body composition related to later health and disease? Characterisation of body composition from in utero to early life Genetic factors that contribute to obesity in childhood Impact of preterm delivery on body composition What is the contribution of early life nutrient to body composition over time 	 Baby Nutrition* Breastfeeding questionnaires Demographics Feeding your baby Medical History Medication and Lifestyle Pregnancy Complications PBS/MBS data linkage* 	 Baby measures Cheek swab Cord blood Guthrie Heel Prick NICU body measures for preterm infants PeaPod Ultrasound data 	 ▶ Cardiovascular Function ▶ Fetal Growth ▶ Genomics and Bioinformatics ▶ Medicine Usage ▶ Nutrition ▶ Pregnancy and Pregnancy Complications
Nutrition	► How does maternal dietary intake, micronutrient supplement intake, and gestational weight gain change	 Alcohol consumption Australian Eating Survey Food Frequency Breastfeeding Questionnaires 	▶ Baby measures▶ Bioimpedance▶ Blood▶ Height	▶ Education▶ Medication Usage

	during pregnancy and the early postpartum period, and how does this compare with guidelines? What is the relationship between dietary intake and gestational weight gain across pregnancy? What is the relationship between maternal and paternal characteristics and (i) dietary and (ii) gestational weight gain guideline attainment? What maternal characteristics mediate the relationship between dietary intake/micronutrient supplement intake and nutrient status during pregnancy and the early postpartum period, and how does this affect birth outcomes? What is the relationship between maternal dietary intake/micronutrient supplementation and her gut microbiome, and how does this affect birth outcomes?	 ▶ Delivery Details ▶ Demographics ▶ Medical History ▶ Medication and Lifestyle ▶ Pregnancy Complications 	 ▶ Skin fold thickness ▶ Waist circumference ▶ Weight, BMI ▶ Placenta and Placenta Measures ▶ Stool ▶ PeaPod 	 ▶ Mental Health and Cognitive Development ▶ Microbiome ▶ Neonatal/Child Body Composition and Growth ▶ Pregnancy and Pregnancy Complications
Oncology	 Pregnancy and melanoma risk Breast cancer and breastfeeding Origins of childhood cancer Lifestyle factors and risk of cancer 	 Alcohol consumption Australian Eating Survey Food Frequency Baby Nutrition* Breastfeeding Questionnaires 	▶ Breastmilk▶ Blood▶ Placenta▶ Saliva	 Genomics and Bioinformatics Lactation Medication Usage Nutrition

	 ▶ Ovarian cancer and pregnancy ▶ Identification of risk factors for melanoma during pregnancy and beyond 	 Demographics Exposure Measurements (Water, Sun, Chemicals, Pesticides)* Family History Malignant melanoma risk Medical History Medical Scans (x-ray, PET, CAT)* Medication and Lifestyle Medication Treatment* Pregnancy Complications 		► Pregnancy and Pregnancy Complications
Physical Exercise	 ▶ Activity changes with pregnancy ▶ The effect of exercise during pregnancy on domains of early childhood development ▶ How does activity in Australian women now compare to the Australian women's longitudinal study data of aged matched women from the 1990s ▶ The role of movement across the day on maternal mental health ▶ Effect on physical activity on placental thickness 	 ▶ Alcohol Consumption ▶ Australian Eating Survey Food Frequency ▶ Demographics ▶ Family History ▶ Medical History ▶ Medication and Lifestyle ▶ Physical Activity ▶ Smoking Status 	 ▶ Baby Measures ▶ Blood ▶ Cord blood ▶ Height ▶ Placenta ▶ Placenta and Placenta Measures ▶ Saliva ▶ Weight, BMI 	 Education Medication Usage Mental Health and Cognitive Development Nutrition Pregnancy and Pregnancy Complications Social Determinants and Health Outcomes
Pregnancy and Pregnancy Complications	► What are the pregnancy related risk factors, placenta function and outcomes associated with PE, PTD, GD, IUGR?	 ▶ Alcohol Consumption ▶ Asthma Control Questionnaire ▶ Australian Eating Survey Food Frequency 	 ▶ Baby Measures ▶ Blood ▶ Cheek swab ▶ Cord Blood ▶ Guthrie blood spot 	 Fetal Growth Genomics and Bioinformatics Microbiome

	 Placental micronutrient environment and its relationship to maternal nutrition The impact of endocrine disruptors on thyroid function and placental TSH pathways Link between genetics and pregnancy complications Placental iron transfer and iron bioavailability in infants of asthmatic mothers The role of eicosanoids in midlate gestation 	 Delivery Details Demographics Family History Hyperemesis questions Medical History Pregnancy Complications 	 ▶ Placenta and Placenta Measures ▶ Ultrasound Data ▶ Vaginal swab 	Neonatal/Child Body CompositionNutrition
Respiratory	 What is the prevalence of asthma in the reproductive age population? Does maternal asthma worsen with pregnancy and is it related to environmental pollutants? What pregnancy related variables influence the development of asthma in childhood? How does rhinitis in pregnancy influence neonatal outcome? 	 ▶ Alcohol Consumption ▶ Asthma Control Questionnaire ▶ Delivery Details ▶ Demographics ▶ Exacerbation Questionnaire ▶ Family History ▶ Medical History ▶ Medication and Lifestyle ▶ Physical Activity ▶ Pregnancy Complications ▶ Sino-nasal Outcome Test ▶ Smoking Status 	 ▶ Blood ▶ Height ▶ Photographs of Rash ▶ Weight, BMI 	 Immunology Medication Usage Pregnancy and Pregnancy Complications
Sleep and Circadian Rhythms	 Impact of parental sleep and stress on parental physical, social and mental health Impact of pregnancy on sleep patterns and sleep disturbance 	 ➤ Adult Sleep Patterns ➤ Australian Eating Survey Food Frequency ➤ Couple Satisfaction Index ➤ Delivery Details ➤ Demographics 	 Baby Measures Height Weight, BMI Bioimpedance 	 Education Mental Health and Cognitive Development Medication Usage

	 ▶ Relationship between early identification of snoring and sleep disturbance with pregnancy complications: gestational diabetes, preeclampsia, fetal growth restriction, preterm delivery, autism ▶ Impact of parental and child sleep on child development and physical health outcomes ▶ Relationship between environmental and biological factors with parental and child sleep 	 ▶ Depression Anxiety Stress Scale ▶ Edinburgh Post-natal Depression Scale ▶ European Quality of Life 5-Dimension ▶ Infant sleep diary ▶ Medical History ▶ Medication and Lifestyle ▶ Multidimensional Scale of Perceived Social Support ▶ Physical Activity ▶ DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure - Adult ▶ Social Readjustment Rating Scale ▶ Pregnancy Complications 	 NICU body measures in preterm infants ▶ Peapod 	► Pregnancy and Pregnancy Complications
Social Determinants of Health Outcomes	 ▶ Impact of social disadvantage on maternal, paternal health in Qld ▶ Does parental social determinants of health (housing, education, employment) impact on pregnancy and birth outcomes? ▶ Social networks and their impact on child development ▶ Social disadvantage and its impact on child nutrition, cognitive development and 	 ▶ Childcare ▶ Demographics ▶ Depression Anxiety Stress Scale ▶ Edinburgh Post-natal Depression Scale ▶ Education History ▶ Employment History ▶ European Quality of Life 5-Dimension ▶ Family history ▶ Multidimensional Scale of Perceived Social Support ▶ Physical Activity 	none	 Education Epidemiology and Health Economics Genomics Mental Health and Cognitive Development Nutrition Pregnancy and Pregnancy complications

- subsequent child educational outcomes
- ➤ What are the characteristics of individuals who are resilient in the face of early life adversity?
- ► How does developmental trauma and early adversity among individuals affect longterm trajectories
- ➤ DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure - Adult
- ► PBS/MBS Data Linkage*
- ► Residential housing questionnaire
- ► Social Readjustment Rating Scale