Knowledge Laboratory of the Early life Course

COMPASS Colloquium
July 2014

COMPASS RESEARCH CENTRE

FACULTY OF ARTS
THE UNIVERSITY OF AUCKLAND

Whare Wānanga o Tāmaki Makaurau

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MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

Outline

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- Background
  - MEL-C project
    - Insights
    - Observations
- Knowledge Lab project
  - Plan
  - Progress
  - Issues
  - Next Steps

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Background - MEL-C

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- Modelling the Early Life-course (MEL-C)

1. Goals … what did we do?

- Developed a software application as a decision-support tool for policy-making

2. Rationale … why did we do it?

- To improve policymakers' ability to respond to issues concerning children and young people

3. Means … how did we do it?

- By building a computer simulation model with data from existing longitudinal studies to quantify the underlying determinants of progress in the early life course

MEL-C
- Conceptual framework

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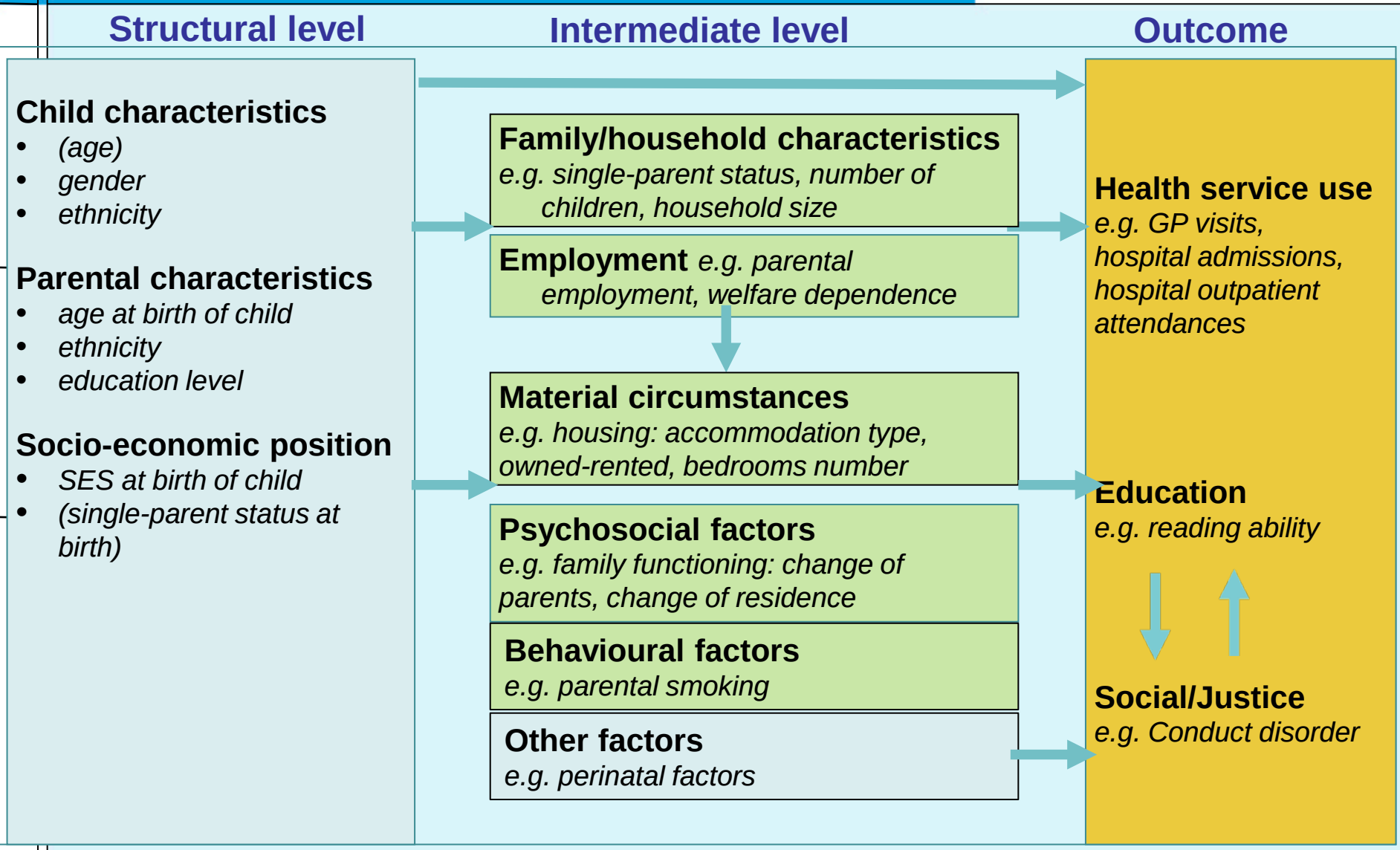

MEL-C
- Modelling software

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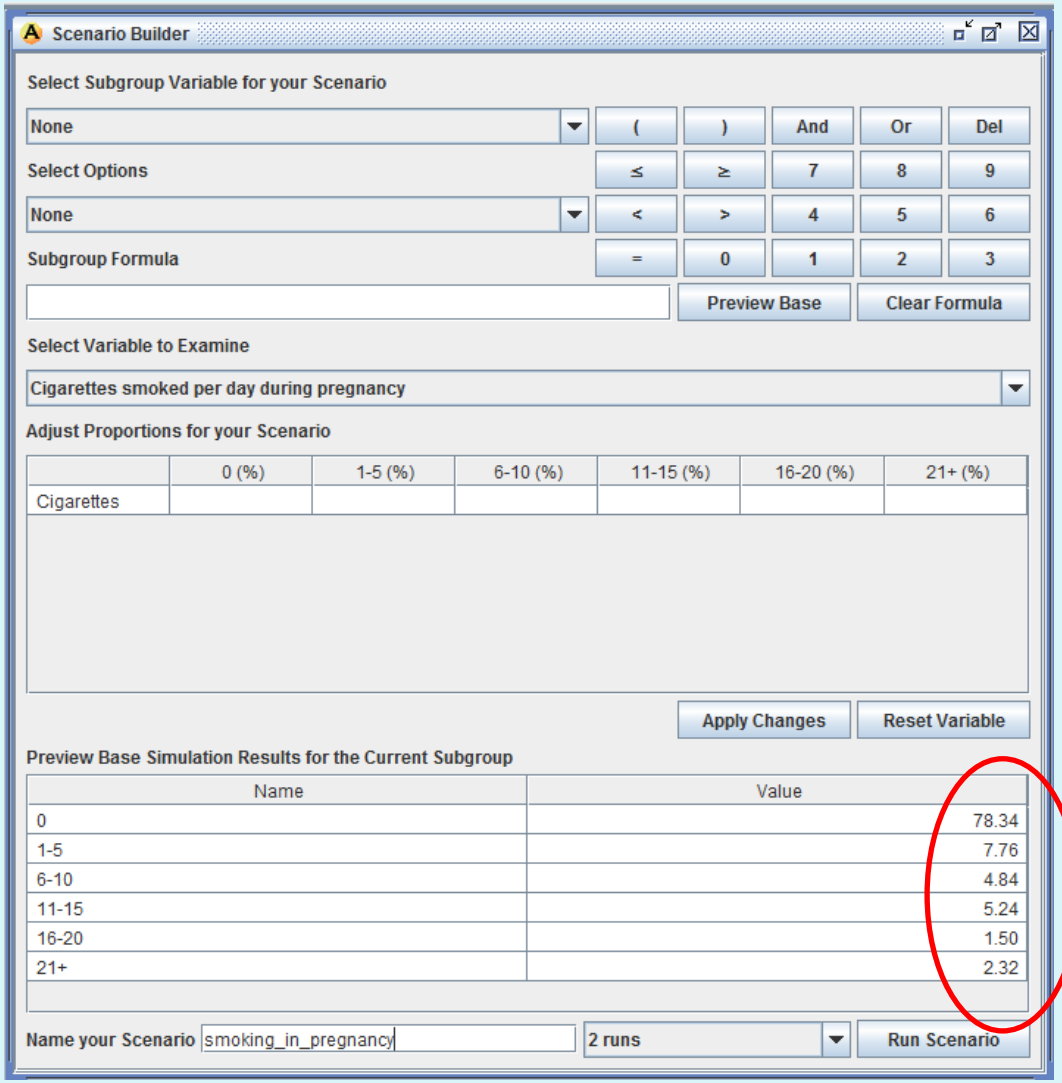

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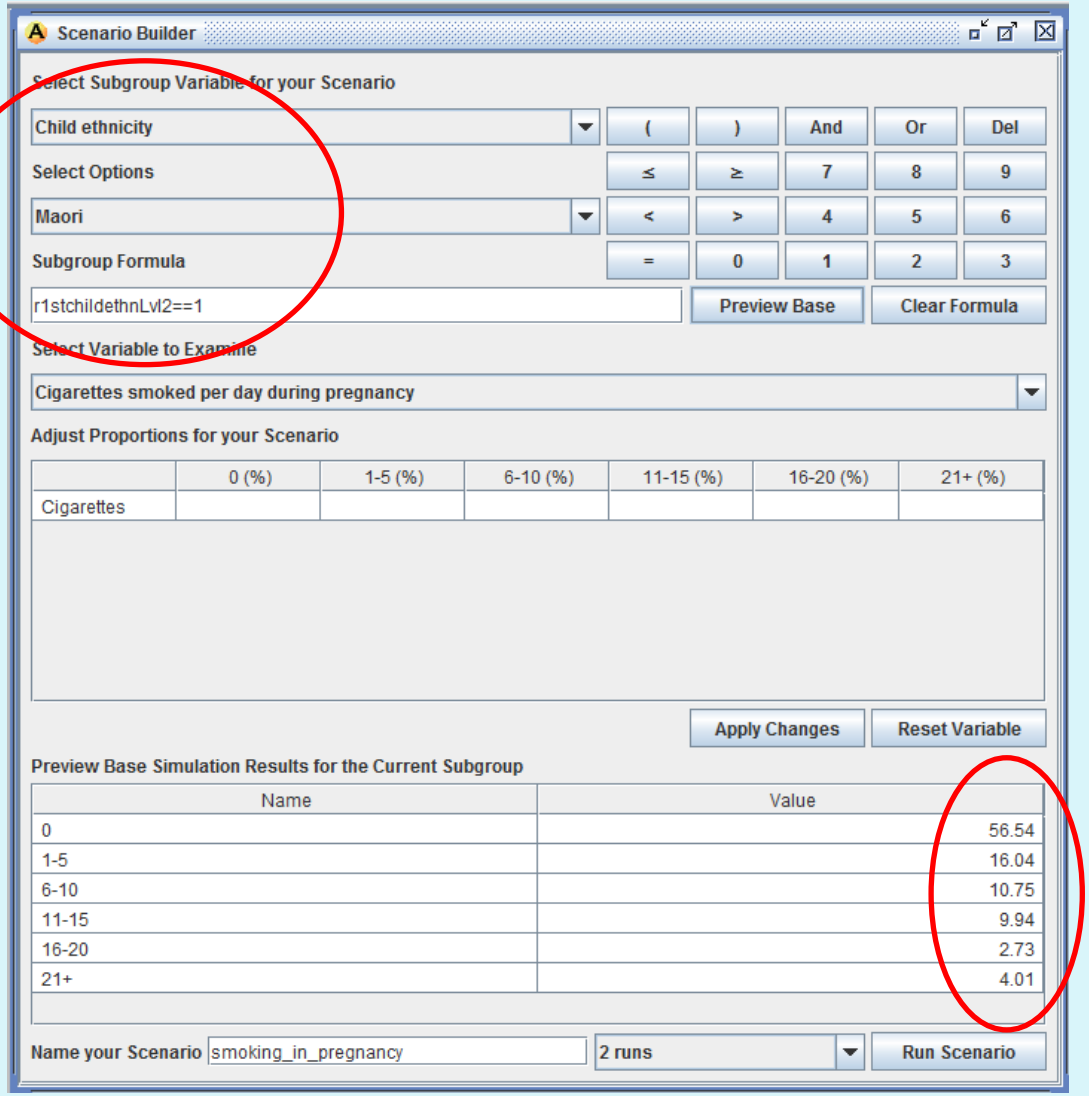

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MEL-C
Modelling software

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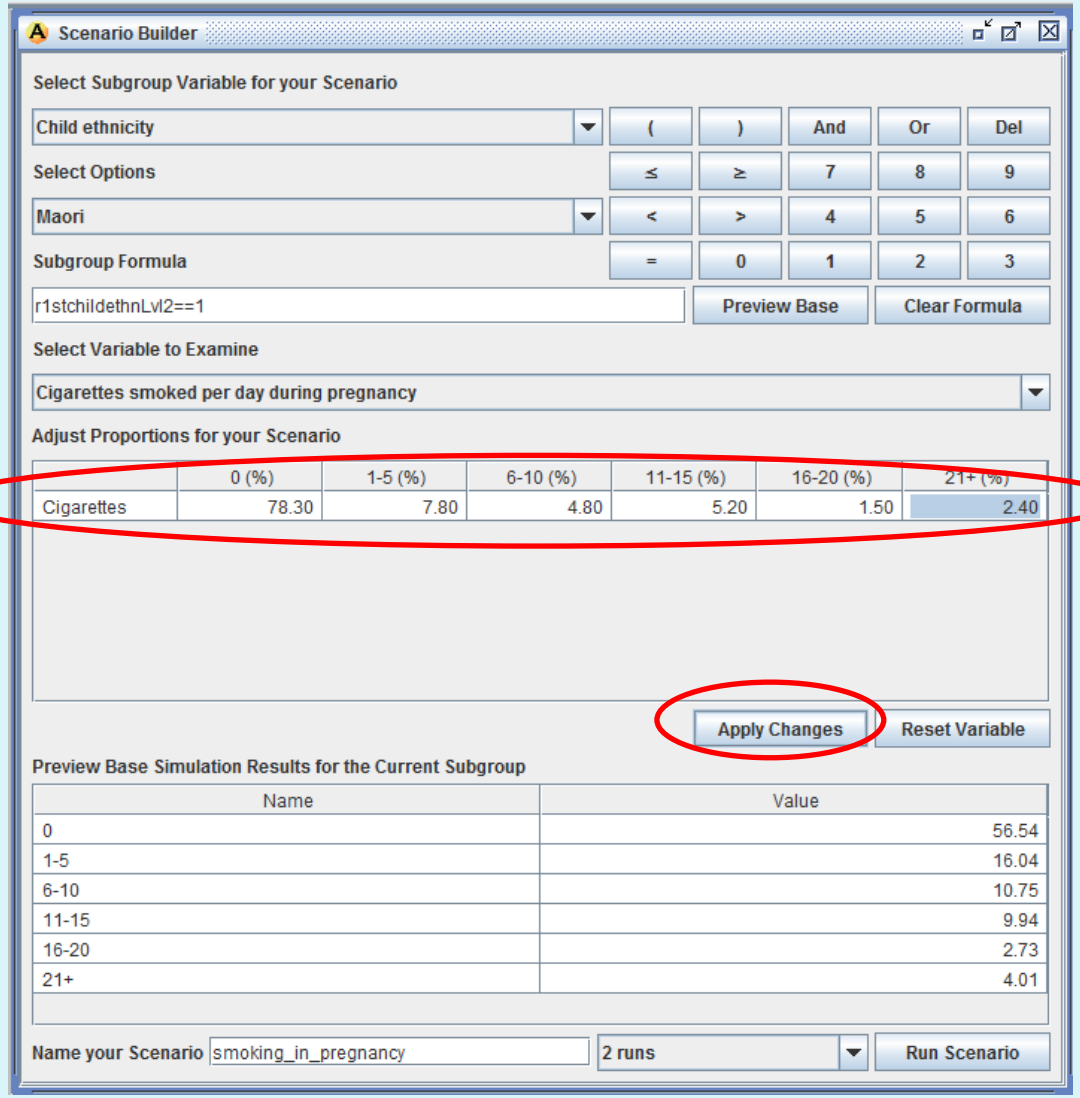

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MEL-C
- Insights

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- Able to model early life-course very well
- Changing factors in children's lives often had weak effects on child outcomes
  - Is that just the reality of policy impact?
  - Does it indicate that estimates based on observational analysis do not reflect causal effect of interventions?
- Policy relevance increased by increasing range of outcomes and factors
- Childhood factors have impacts into adulthood

MEL-C
- Observations

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- Astute observation 1
  - There are many well-established estimates for factors that impact the lives of children, but these exist in isolation; micro-simulation offers a way to bring these together
    - John Lynch, Professor of Public Health, University of Adelaide
- Astute observation 2
  - ‘Best’ estimates are thought to be derived from systematic reviews/meta analyses, but it is difficult to test their validity.
    - David Gough, Professor of Evidence Informed Policy and Practice, Institute of Education

Knowledge Laboratory - Plan

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- Identify key determinants of child and adolescent outcomes
- Integrate estimates from systematic reviews/meta analyses into working model of early life course
  - Developed from MEL-C; extended in breadth (more determinants and outcomes), and length (to age 18)
- Use as knowledge laboratory
  - Test the validity of ‘best’ estimates
  - Test policy scenarios using validated model

Knowledge Laboratory - Plan

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- To extend MEL-C model to include estimates derived from systematic reviews/meta analyses
- To do this we will:
  - Determine important factors to model (in consultation with an end user advisory group)
  - Conduct literature search for these factors
  - Update conceptual framework to include these factors
  - Update micro-simulation model
  - Validate model
  - Deploy model and test policy scenarios

Knowledge Laboratory - Progress

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- End User Advisory Group (EUAG)
  - Model is (ultimately) for policy makers, so we want to involve them in its development
  - Precedent for MEL-C
    - 4 Government Ministries – Health, Education, Social Development, Justice
    - Regular meetings to discuss progress & next steps
    - Deployment of tool with these ministries
  - Augmented for Knowledge Lab
    - 4 additional agencies: Te Puni Kōkiri, Families Commission, Children's Commission, Pacific Islands Families Study
    - Same format

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- Determine important factors

Alcohol and drug use	**Ethnicity**	**Justice contacts**	**Physical activity**
Ambulatory Sensitive Hospitalisations	**Family transitions – formation/disintegration**	**Lead Maternity Carer enrolment**	**School type (single sex/co-ed)**
Asthma/respiratory health	**Food in schools**	**Maltreatment**	**Smoking**
Birth weight/gestational age	**Health visits**	**Mental Health**	**Socioeconomic measures (income, deprivation, living standards)**
Books in home	**Home visiting**	**Nutrition**	**Suicide**
Breastfeeding	**Housing quality**	**Obesity**	**Teaching quality**
Conduct disorder	**Immunisation**	**Otitis Media**	**Transfer payments**
Early Childcare education (amount, quality, type)	**Injuries**	**Parental and intergenerational welfare dependence**	**Transition to employment**
Early parenting	**Involvement in Child Health groups (e.g., plunket)**	**Parental involvement in schools**	**Violence in families**
Education		**Parental mental health**	

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- Determine search strategy
  - First attempt
    - ARTICLE TYPE: Systematic Review OR Meta Analysis
    - PUBLICATION DATE: Last 5 years
    - SPECIES: Human
    - AGES: Birth-18; 19-24
  - Searched PubMed

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Search	Search terms	Result	Unique
Alcohol	"alcohol" or "alcoholism" or "drinking"	525	521
Ambulatory sensitive hospitalizations	"ambulatory sensitive hospitalizations" or "avoidable hospitalizations"	x	x
Asthma	"asthma"	445	400
Birth weight/ gestational age	"birth weight" or "gestational age"	673	644
Books in home	"books" or "literacy"	116	65
Breastfeeding	"breastfeeding"	305	232
Child health groups	"health group"	28	19
Drug abuse	"drug abuse" or "drug dependence" or "cannabis" or "methamphetamine" or "cocaine" or "heroin"	94	50
Early childhood education	"early childhood education"	34	34
Early parenting	"teen parents" or "teen pregnancy" or "early pregnancy"	19	3

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Search	Search terms	Result	Unique
Education	"education"	722	548
Ethnicity	"ethnic" or "ethnicity" or "race" or "racial"	658	448
Family transitions*	"parental separation" or "father absence" or "parental death" or "family transition" or "family formation" or "family disintegration"	8	6
Food in schools	"school" and ("food" or nutrition")	301	40
Health visits	"health visit"	x	x
Home visiting	"home visit"	27	8
Housing quality	"housing" or "overcrowding"	30	17
Immunisation	"immunisation" or "vaccination"	374	301
Injuries	"injury"	1177	973
Justice contacts	"criminal" or "justice"	66	36
Lead maternity care enrolment	"pregnancy care" or "midwife"	101	45
Maltreatment	"child abuse" or "child health" or "maltreatment"	179	149

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Search	Search terms	Result	Unique
Mental health			
ADHD	"attention deficit"	243	126
Anxiety	"anxiety" or "anxious" or "panic" or "phobia" or "agoraphobia" or "obsessive compulsive disorder"	396	375
Conduct disorder	"conduct disorder" or "conduct problem" or "antisocial"	65	50
Depression	"depression" or "depressive"	577	291
Eating	"eating disorder" or "bulimia" or "anorexia"	103	36
Psychosis	"manic" or "mania" or "bipolar" or "psychosis" or "schizophrenia" or "schizophreniform" or "schizotypy"	297	153
Nutrition	"nutrition"	684	364
Obesity	"obsesity"	679	325
Otitis media	"otitis media" or "hearing"	336	239
Parental involvement in schools	"parent" & "schools" & "involvement"; yielded some references but not along lines hoped for	x	x

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Search	Search terms	Result	Unique
Physical activity	“physical activity” or “exercise”	646	240
Respiratory health	“respiratory”	822	387
School type (single-sex/co-ed)	school & (single-sex or co-educational)	x	x
Smoking	“smoking” or “tobacco”	348	113
Socioeconomic measures	“income” or socioeconomic” or “deprivation”	648	303
Suicide	“self harm” or “suicide”	132	29
Teacher quality	(teacher or teaching) & quality	x	x
Transfer payments	“transfer payments”; a few different combinations	x	x
Transitions to employment	“employment”	109	59
Violence in families	“violence”	286	28
Welfare dependence	“welfare” or “poverty”	506	111
Total		**12759**	**7768**

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- A lot of refs!

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- A lot of refs! But that's OK.
  - Most are irrelevant (don't investigate impact of risk factor X on outcome Y)
  - Relatively quick to scour even this number of records to find potentially relevant papers

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Knowledge Lab - Conceptual framework

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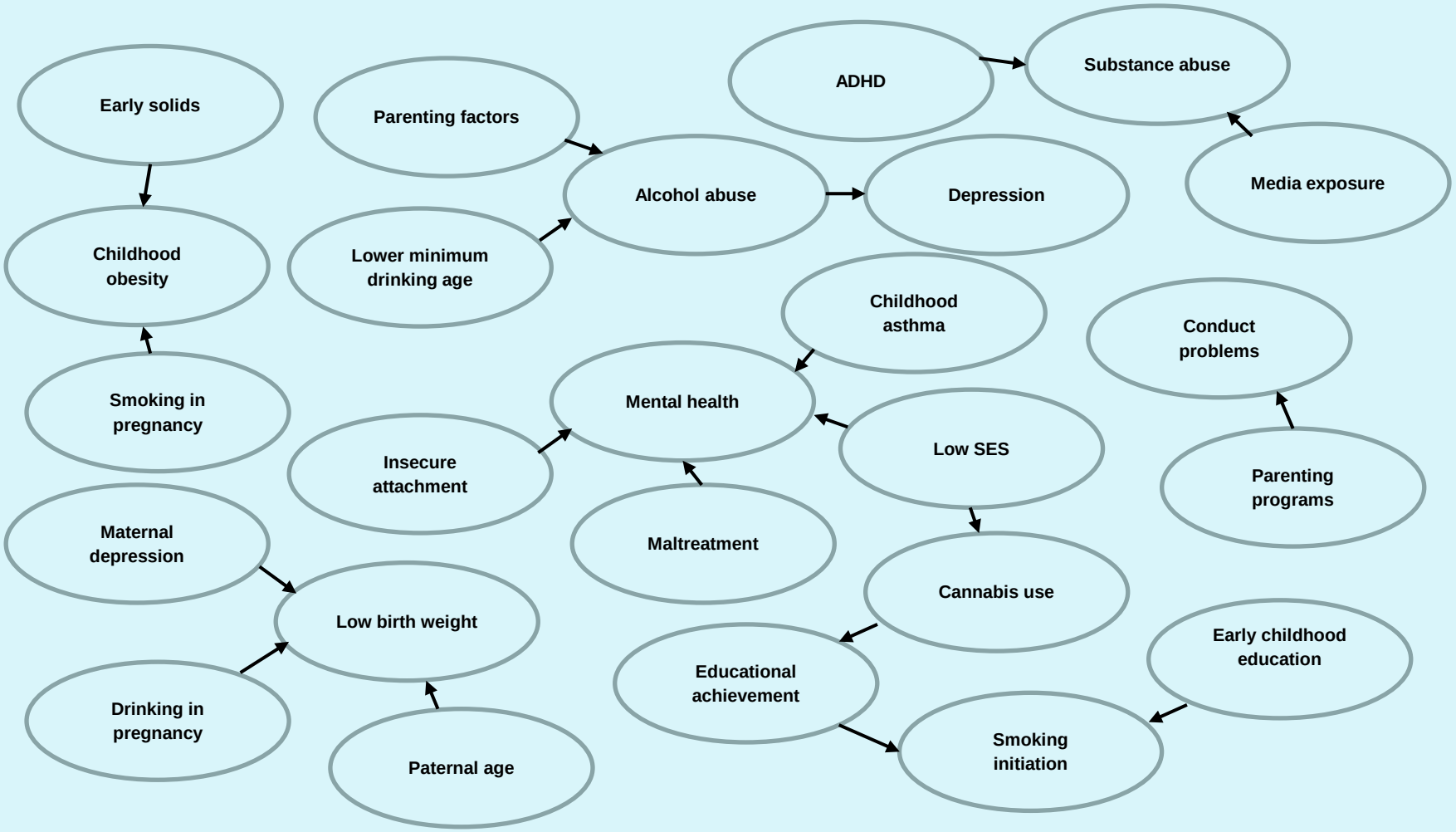

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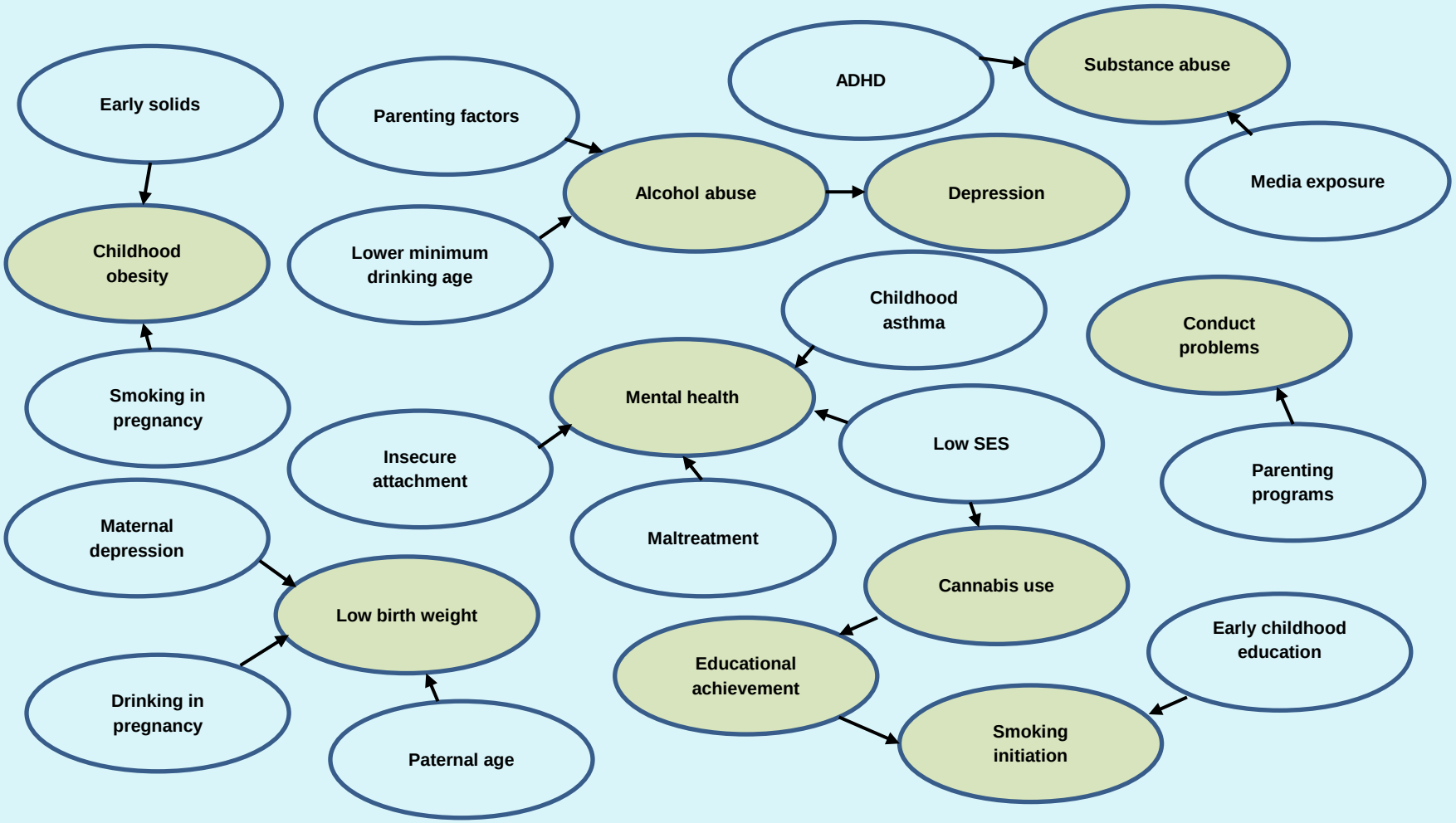

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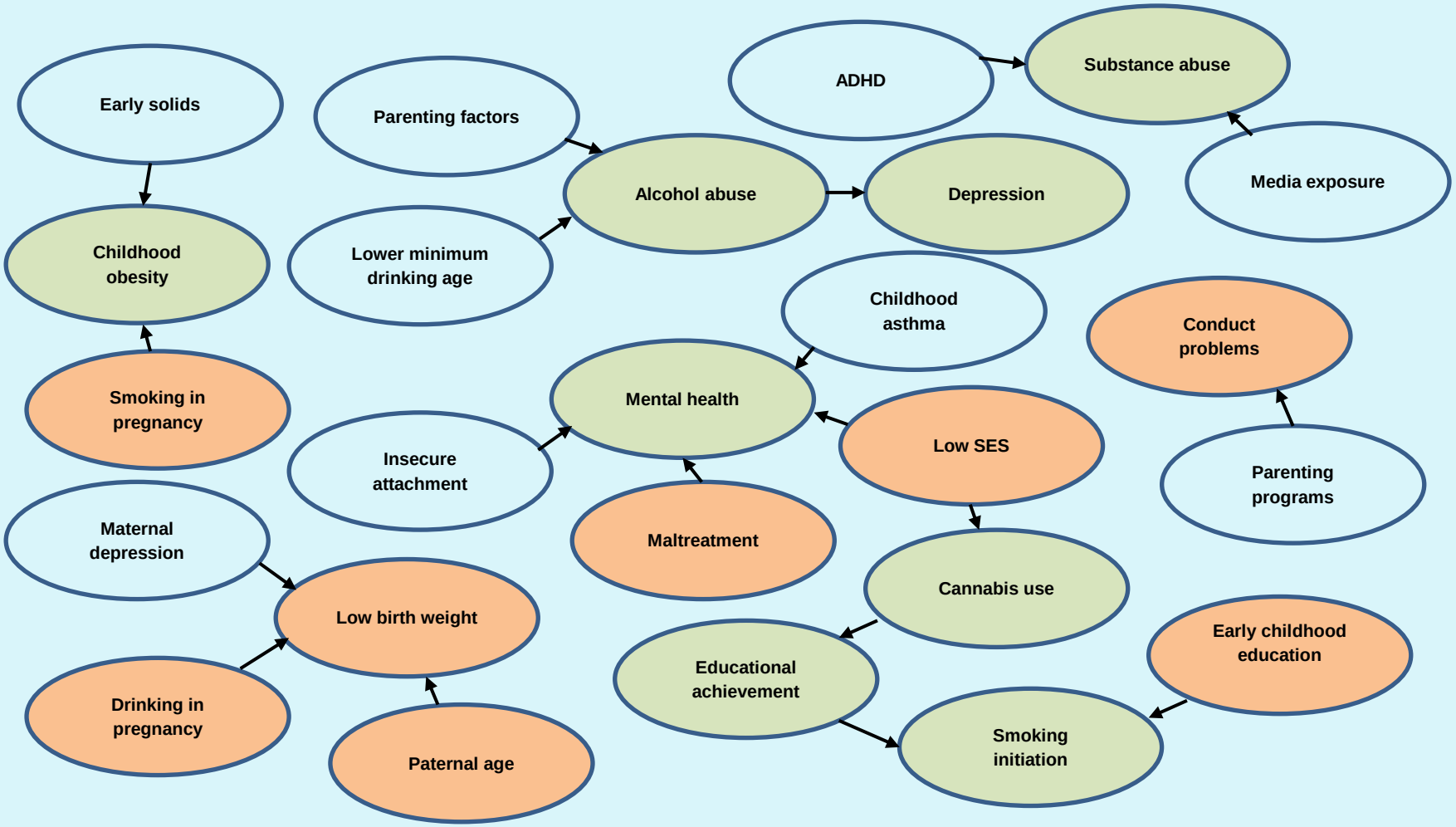

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Knowledge Lab - Issues

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- International studies (not surprisingly) so relevance to NZ unclear …
  - But can be tested
- Very few have looked specifically at Māori and Pacific groups
- Still need NZ rates for risk factors to plug into model
  - And may need models for these
- May need to model death and immigration/emigration

Knowledge Lab - Next Steps

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- Complete literature search
  - More databases
- Update conceptual model
- Use estimates derived from literature search in the micro-simulation model
  - Program estimates into SIMARIO, in the order specified by the conceptual model
- Validate model, as per MEL-C
  - Check it is producing New Zealand rates
  - ***This is a test of the ‘best’ estimates***

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- Deploy model in software
  - JAMSIM?
    - Developed by COMPASS; User friendly
    - Not web deployable
  - MODGEN?
    - Developed and used by StatsCan
    - Web deployable
    - As user friendly? Basic model set-up different
- Hand over to end users to test scenarios

Questions

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- Acknowledgements
  - COMPASS team: Peter Davis, Roy Lay-Yee, Jessica McLay, Martin von Randow
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QUESTIONS?